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Naval Postgraduate School

Self-Study for
Reaffirmation of Accreditation

Volume I

Submitted to the

Western Association of
Schools and Colleges

December 1998

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Studies and Analyses on Graduate Education and the Naval Postgraduate School: The Road to a Strategic Plan*
For several years, the Naval Postgraduate School has been embarked on a journey to define who we are, who our customers are and how well we serve them, and in what direction we are headed as a university. This journey, which began in 1992, is our Strategic Planning Process. Through this process, we have defined our mission and our vision and have developed Strategic Initiatives that will enable us to realize this vision.

NPS took advantage of the opportunity to conduct a Self-Study as a way to ensure campus-wide involvement in the continued development and execution of the NPS Strategic Plan. We hoped that faculty, staff, students, and administration would feel they are not only part of the plan but also critical to its success. Additionally, we hoped to ensure that the plan and its Initiatives represent the right direction and focus for the institution.
We realize that one key to a successful strategy, and to a thriving university, is assessment. We should constantly evaluate our effectiveness as a university, as a military institution, and as a professional organization. From the self-study process, we found that we effectively monitor our progress in many areas and have many valuable assessment mechanisms and systems in place. Additionally, we have made significant progress in evaluating our effectiveness over the past several years; however, we still have much to learn as well as much to gain as the result of effective assessments.

This Self-Study documents our findings. This first volume is an Introduction to NPS. It provides an overview of our Strategic Plan, describes our self-study process and its results, and discusses steps we have taken to address the concerns and issues from our last WASC visit. It also discusses the lessons learned and recommendations from our Self-Study and provides insights on the direction in which the School will proceed as a result of the Self-Study.

Volume II is an in-depth look at the Strategic Initiatives. It looks at each in terms of its current status and provides an analysis and evaluation of our progress in achieving it. Recommendations are also provided. The recommendations extend from what should be done to improve the relevance of the Strategic Initiatives to how NPS can successfully meet their intent. Existing and suggested ways to assess our success in terms of each Initiative are also provided.

Finally, Volume III addresses each WASC Standard, together with its substandards, and ensures that NPS meets or exceeds these standards.

THE NPS STRATEGIC PLAN

NPS Mission

Increase the combat effectiveness of U.S. and Allied armed forces and enhance the security of the United States through advanced education and research programs focused on the technical, analytical, and managerial tools needed to confront defense-related challenges.

NPS Vision

- To be the world leader in defense-related graduate education and supportive research
- To prepare the intellectual leaders of tomorrow’s forces
- To be the Department of Defense university of the future

NPS Guiding Principles

We are committed to:
• Creating satisfied customers
• Treating everyone with respect and dignity
• Honesty, integrity, and commitment
• Creativity, innovation, teamwork, and high quality performance
• Developing the full capabilities of all our students, staff, and faculty
• Investing in the technology and facilities needed to fulfill our mission

NPS Strategic Initiatives

1. Position NPS to meet the challenges of the Revolution in Military Affairs
2. Increase the efficiency and effectiveness of NPS
3. Develop the technologically-integrated Defense University of the Future
4. Develop a consensus within each service on the importance of graduate education as an investment in human capital
5. Obtain the resources needed to accomplish our mission
6. Create the correct balance between funding current operations and reinvestment
7. Recruit, develop, and retain high quality staff.
8. Recruit, develop, and retain a high quality faculty.

NPS SELF-STUDY PROCESS

The preparation for the NPS Self-Study and WASC visit began in December 1996 when a team from NPS attended a WASC workshop on the process. At that meeting, the idea that the Self-Study could be used not only to assure compliance with the WASC Standards but also to provide a learning and growing experience that would be beneficial to NPS sparked interest within the team. Early in 1997, the Superintendent and the Provost designated a Steering Committee to guide the NPS process. This committee consisted of the following members:

Dr. Richard Elster, Provost
Dr. John P. Powers, Professor of Electrical and Computer Engineering
Dr. Gerald H. Lindsey, Professor of Aeronautics and Astronautics
Dr. Maurice D. Weir, Professor of Mathematics and Associate Provost for Instruction
Dr. Gilbert Howard, Director of Academic Planning
Mr. George Conner, Senior Lecturer of Operations Research and Assistant Provost
Ms. Julie Dougherty Filizetti, Lecturer in Manpower Analysis
After much deliberation, the Steering Committee decided to center the Self-Study around the NPS Strategic Plan (Assessment #3). They saw the potential for the Self-Study to help ensure campus-wide involvement in the continued development of the Plan and allow faculty, staff, students, and administration to feel they are not only part of the Plan but also critical to its success. Additionally, although all parts of the campus had contributed to the development of the Plan, the Self-Study was viewed as a way to validate the Plan and its Initiatives and ensure that the Plan represents the right direction and focus for the institution.

**Self-Study Task Groups**

The Steering Committee formed Task Groups around the eight Strategic Initiatives in the NPS Plan. The two Initiatives that dealt with resources (#5 & #6) were given to a single Task Group. Additionally, a Task Group was formed to measure NPS compliance against the WASC Standards as the standards represent excellent criteria against which to evaluate NPS as an institution. Finally, as assessment and evaluation are so critical to the success of any organization, an additional Assessment Task Group was formed to look at the assessment mechanisms used by NPS and to suggest additional ones.

The Task Groups for each of the Strategic Initiatives were asked to study the overall NPS Strategic Plan and report on the Initiatives. As guidance, they were asked to address the following areas in their reports:

- **Current Status**: a review of present activities and services dealing with the specific Strategic Initiative.
- **Analysis and Evaluation**: a comprehensive and critical assessment of the current status of the Initiative at NPS, to include the appropriateness of the Initiative for NPS, any studies accomplished, any processes implemented, and the mechanisms for using the assessment measures to change the processes. This is an objective assessment of the appropriateness of the goals involved and whether NPS has made progress in achieving those goals.
- **Recommendations**: suggested implementation strategies to move from current status toward accomplishment of the Strategic Initiative and the NPS vision.
- **Measures**: assessment plan to gauge progress toward the goals and to provide feedback and assessment results to planners and implementers. The aim is to
identify ways that results and feedback/assessments can be used for continual improvement of NPS processes.

Database of Assessments, Policies, and Background Information

NPS realized that it was important to collect the various assessment mechanisms, related policies, and background information critical to an effective Self-Study and organize the documents in a way that would be meaningful for both NPS and the WASC Visit Team. The documents were collected, categorized, and analyzed for their contribution to the Self-Study. Document names are listed in a database, categorized as Assessment, Policy or Background Documents, and then by both what Strategic Initiative(s) and/or WASC Standard(s) they support. The database documents themselves are available to the WASC Visit Team.

Some of the assessment items are routine reports while others are data collected as background for one or more task group reports. A number of the assessment documents are studies or reports that NPS has conducted over the years for various purposes, though not always with self-assessment in mind. However, when viewed together as part of this self-study, they represent a fairly comprehensive evaluation of many aspects of NPS.

As much as possible, the key data from many of these documents are contained in this report. Where further information would be valuable to the reader, the database item number is also referenced.

**MAJOR RESULTS OF THE NPS SELF-STUDY**

Complete reports by each of the Task Groups are contained in Volume II. Several themes and recommendations emerged from their reports and are presented below.

**THEME 1: The Strategic Plan and the planning process need to be improved, and the plan needs to better link resources with academic objectives.**

NPS has more work to do to ensure that all members of the NPS community feel that they are part of the Strategic Planning Process. Although the interests of all NPS constituencies are represented in the NPS Strategic Plan, the result is viewed as too "top down." NPS needs to attain more "buy-in" from all levels of the organization.

Although the Strategic Plan is grounded in the assumption of high quality academics, there is no Strategic Initiative that directly addresses the quality of education and research at NPS.

The Strategic Plan uses the term "Initiative," which suggests something that is new or not currently done. Many of the Initiatives are instead long-standing practices or goals
of NPS. For example, the Initiative to recruit, develop and maintain a high-quality faculty suggests that this was not done in the past, when it in fact has always been a hallmark of NPS quality.

The School’s Strategic Planning Process is too dependent on changes in leadership. The process should be institutionalized and given a permanence that still responds to changes in leadership and incorporates its new insights and goals.

The Strategic Plan should link resources with academic objectives. The links should be clearly articulated to the faculty and staff, and processes for starting new programs or initiatives should be made clear. Currently, the approval and development processes are not well integrated with the processes for estimating and obtaining resources. Consequently, programs are begun without adequate consideration of resource implications.

NPS needs to improve its institution-wide assessment process and consider the re-establishment of the Office of Institutional Research.

**THEME 2: NPS and the Navy need to investigate different pedagogies and their effectiveness in delivering advanced education.**

NPS’ resources should be allocated to investigate different pedagogies (e.g., web-based instruction, videoteleconferencing, interactive video) and to assess their effectiveness. Long-term planning must balance investment expenditures between traditional, proven methods of education and innovation.

Faculty must be given both the proper incentives and the proper education and training to effectively teach in the different pedagogies and to evaluate themselves and their students accordingly.

A requirement to assess the effectiveness of different educational methods for different purposes must be included in a long-term plan. Different delivery methods may work for in-residence versus distributed learning, preparatory work versus continuing education, and for different disciplines.

**THEME 3: NPS and the Navy must invest in the School’s intellectual capital in order to maintain its high quality.**

The Navy must ensure that Naval officers are given the opportunity to maximize their advanced education opportunities. NPS continues to have high quality curricula that meet the needs of Naval officers. NPS is also developing new curricula and delivering education in innovative ways that capitalize on advances in technology and communication.
NPS and the Navy must provide for re-capitalization of faculty expertise. NPS faculty members are experts in areas that are of utmost importance to our national defense, and the knowledge base that exists at NPS is critical to the future of the Navy. NPS must ensure that this base is maintained through recruitment and development of high quality faculty.

NPS must provide incentives for faculty to participate in distributed learning, internet-based course development and delivery, and other innovations in education.

NPS must also ensure that its staff is afforded sufficient access and opportunity to attend training and education programs. Staff should be well-represented on NPS boards and decision-making organizations.

NPS and the Navy must continue to invest in the academic infrastructure at NPS. The laboratories, computers, library and facilities are critical to the academic mission. NPS must ensure that they capitalize on cost-saving innovations and look for opportunities to further reduce operating expenses.

**NAVAL POSTGRADUATE SCHOOL: AN OVERVIEW**

*NPS Mission: To increase the combat effectiveness of U.S. and Allied armed forces and to enhance the security of the United States through advanced education and research programs focused on the technical, analytical, and managerial tools needed to confront defense-related challenges.*

The Naval Postgraduate School (NPS) provides unique professional military-relevant graduate education to mid-career military officers. Owned and operated by the United States Navy, the School prides itself on its ability to maintain the highest academic standards while responding to the dynamic needs of the Navy and other military services. NPS is constantly developing new educational programs and delivery methods, and modifying its existing programs, to meet the emerging requirements of the services.

The Naval Postgraduate School was originally established as the Postgraduate Division of the U. S. Naval Academy in 1909 in response to Marconi’s 1901 invention of the "wireless," the Wright brothers’ flight of 1903, and the global trek of the steam-powered White Fleet from 1907 to 1909. These events fostered the view that advanced education for U.S naval officers was intrinsically valuable to the Navy.

Throughout its almost-ninety-year history, the Naval Postgraduate School has evolved its organization and academic programs to meet the ever-changing needs of the Navy. In 1949, as part of a Department of Defense reorganization, Congress moved the Naval Postgraduate School from Annapolis, Maryland, to Monterey, California. In 1951, it
officially opened at its current location. A more detailed history of the School can be found on the NPS homepage at http://www.nps.navy.mil/history.html.

The Naval Postgraduate School specializes in education at the Master’s degree level, although a limited number of Ph.D. and Bachelor’s degrees are also awarded each year. The education is designed to meet the needs of the Navy; however, the curricula are developed within a framework of classical academic degrees and, as such, are in keeping with the highest academic standards. Officers attending NPS are practicing military professionals who receive a mid-career education directly relevant to the challenges and concerns of their military careers. The School’s curricula are therefore focused on science, engineering, technology, policy, operations, management, and international relations as they are applied to the Navy and other military services.

Enrollment at the Naval Postgraduate School fluctuates between 1,300 and about 1,900 students, as shown in Figure 1 on the following page (see also Assessment #40). The student body is comprised of military officers from all branches of the United States services, international military students, and government civilians. Generally assigned to NPS only after completing five to eight years of service, Navy students have demonstrated their professional competence and have already served in positions of major responsibility. More than 200 international students represent over 47 countries from all seven continents, including Antarctica. About twenty U.S. government civilians are also currently enrolled in various Master’s or Ph.D. programs, representing numerous Department of Defense agencies, including the National Security Agency, the Department of the Army, and various intelligence agencies.
The majority of military officers are junior officers in the United States Navy (USN) and, as indicated in Figure 1, the declining trend in USN student enrollment accounts for the trend in overall enrollment. This trend and the steps that the Naval Postgraduate School has taken to address it are discussed later in this report.

Figure 1. NPS enrollment by category of student, 1988 to 1998

The educational and research activities of NPS faculty and students cover the complete range of scholarship classifications — discovery, application, instruction, and integration. Additionally, faculty at NPS are expected to become expert both in their disciplines and in the military applications of those disciplines, and to develop a one-on-one rapport with students. Courses are designed to be relevant to the students’ professions. This relevance can range from inclusion of military case examples in basic courses to courses that are wholly classified because of their relevance to national security. It is noteworthy that, despite the School’s focus on master’s level education, faculty research programs are recognized for their high quality both nationally and internationally.

Studies and Analyses on Graduate Education and the Naval Postgraduate School: The Road to a Strategic Plan

As noted by the last WASC visit team, the Department of Defense, the Department of the Navy, the Navy’s operating forces, and consequently NPS are changing in many significant ways. Much of this change is now driven by the end of the Cold War and the subsequent downsizing of the nation’s military forces. For NPS, the immediate
consequences of these changes are significant because they affect both the number of officers the Navy is sending to NPS and the School’s budget.

But these changes also have a much more profound impact on the future of NPS. As the military redefines its roles and missions, NPS must position and re-position itself to provide the education officers will need in a timely and appropriate fashion throughout their careers. And NPS must do so while still maintaining the high academic quality and rigor of its academic programs.

Over the last ten years, as a result of studies initiated by NPS, by the Navy, and by the Department of Defense, NPS and its operations have been evaluated in many different ways. This section will describe some of the studies that NPS and the Navy have undertaken, their results, and the resulting changes and actions at the School.

**Zero-Based Education and Training Review**

In 1993, this Navy-wide initiative considered all Navy education and training activities and processes to determine if cost savings could be achieved through streamlined processes, elimination of duplicative efforts, or consolidation of activities. The question was asked whether the Navy could accomplish the same graduate education at a lower cost through the use of civilian institutions. A Department of the Navy team of analysts determined that the same education obtained by NPS students could not be duplicated by civilian institutions at significantly lower cost to the Navy. This argument was largely based on the number of credit hours the Navy requires of its students in degree programs. (A copy of this analysis, Graduate Education Costs, can be found in the WASC library as Assessment #45.)

**Base Alignment and Closure Process**

The Base Realignment and Closure Process is a Congressionally mandated process designed to decide in a non-partisan way which military bases to close or re-align to achieve significant savings. NPS was among the Navy’s list of bases to be considered for submission to the Department of Defense. As part of this process, NPS formally addressed such issues as the cost to re-create the School at a different location, excess capacity, and the value of its graduate education. Due to the results of these studies and other reasons, NPS was never submitted as a base for consideration by the BRAC commission.

**Professional Military Education**

In 1988, Congress passed the Goldwater-Nichols Act, designed to ensure that all U.S. military services emphasize joint operations and joint warfighting, as well as the education required to ensure such jointness. In this context, "joint" refers to the ability of the different military services to operate in concert with one another. This Act gave
increased power to the Chairman of the Joint Chiefs of Staff, now a familiar figure to most Americans as the representative of all the U.S. armed forces for military operations. It also provides guidelines on the education required of military officers. Goldwater-Nichols specifies the need for education in military history, ethics, and the art of war in the development of officers. Traditional education in the sciences, engineering, technological and managerial areas is also viewed by many as critical to the development of officers, although it was not explicitly mentioned in Goldwater-Nichols. This act has had a significant impact on how graduate education is perceived, delivered, and valued by the military services. As such, it has also had a significant impact on NPS as the university looks to provide both military-relevant graduate education and the education required by Goldwater-Nichols. Several NPS curricula have been certified as meeting both criteria. NPS is also working with the Naval War College so that students in other curricula can fulfill the requirements of Goldwater-Nichols while obtaining a graduate degree at NPS. For more information on Joint Professional Military Education and its impact on NPS, see the NPS Self-Study report conducted for accreditation of joint education, Assessment #7.

Center for Naval Analyses (CNA) Report: Bottom-Up Review of the Navy’s Flagship Institutions

In 1996, in response to a concern by the Naval Postgraduate School that funding limitations were possibly driving the Navy’s flagship educational institutions towards mediocrity, the Center for Naval Analyses was asked to conduct a study of those institutions. In addition to NPS, the Navy’s flagship educational institutions include the United States Naval Academy, the Naval War College, and the Armed Forces Staff College. The report made some significant recommendations, many of which the Navy is now working to implement. Of note is that a thorough NPS analysis of the report demonstrates that the School’s year-round instruction, availability of government-funded housing, refresher courses used to transition students into new areas of study, and high intensity of academic programming indicated by contact-hour loading combine to make NPS highly efficient and cost-effective in achieving its graduate education mission when compared to civilian institutions. (Both the Center for Naval Analyses report and the NPS Faculty response to it are available as Assessment #6.)

Chief of Naval Operations’ Executive Panel Task Group on Advanced Education

After years of recommendations by the NPS Board of Advisors that a strategic review of graduate education be undertaken by the Navy, the issue of advanced education found its way to the forefront of issues to be considered by the Chief of Naval Operations (CNO). At the recommendation of the Graduate Education Review Board, this study took the form of a Chief of Naval Operations Executive Panel Task Group. The Task Group’s members represented a cross-section of civilians from government, business, and academia. Their mandate was to make both broad and specific recommendations
about graduate education. Many of their recommendations were in concert with the recommendations of the report by the Center for Naval Analyses. The Navy is now working to implement many of these recommendations. The key recommendations that impact NPS are an increased emphasis on advanced education by Navy leadership, changes to the Navy’s system of managing officers with graduate-level education, and exploring ways to reduce the costs of graduate education for the Navy, specifically at NPS. (The Chief of Naval Operations’ Executive Panel Task Group report, as well as several presentations made both by the Panel and by Navy leadership in response to it, are available as Assessment #46.)

The Strategic Planning Process at NPS

As a direct result of the studies described above and in an effort to position NPS for the future, many changes have occurred in both NPS’ and the Navy’s organizational structures. The process by which many of these changes have been identified, implemented, and monitored at NPS is the NPS Strategic Planning Process. The changes internal to NPS generally fall into three major categories — academics and research, facilities and environment, and organizational and administrative.

Shortly after the last WASC visit, the Navy adopted the principles of continuous improvement and Total Quality as important to strategic planning. Thus, NPS embarked upon its own Strategic Planning Process, transitioning its existing Planning Board into an Executive Steering Committee headed by the Superintendent, with the School’s key personnel as members.

Early in this Strategic Planning Process, NPS identified its core strength as providing education that is militarily "unique, excellent, and relevant." In an effort to validate this assessment, NPS invited a number of well-respected academics to visit the School and evaluate its academic programs, students, and educational processes. The reports of these visiting civilian professors, who supported this identification of NPS’ core strength, are available as Assessment #44.

The Strategic Planning Process at NPS has now continued through four Superintendants. As is to be expected with so many changes in this key leadership position, as well as the false starts that accompany any such planning process, there have been a number of adjustments to the Plan along the way.

At the beginning of the Self-Study process, the NPS Strategic Plan consisted of the School’s mission, vision, and guiding principles, along with the eight Strategic Initiatives listed above and in the NPS Strategic Plan (see Assessment #3.) This Self-Study was seen as an opportunity to validate and refine the Plan, as well as to ensure campus-wide participation in it. As will be shown throughout this report, the Self-
Study’s goals have largely been met. The Strategic Planning Process, in fact, continues with this WASC Self-Study and its resulting recommendations.

**NPS Governance**

NPS was established by federal law as a military institution under Title 10 U.S.C. Section 7041-7047 and thus operates under the national command authority. Its administration is responsible to the Navy for the operation of the School and is therefore organized differently than a traditional civilian university. (A copy of Title 10 U.S.C. Section 7041-7047 and other sections of law that apply to NPS are available as Policy #9.)

*The Role of the Superintendent*

Rear Admiral Robert C. Chaplin, USN, is the current Superintendent of the Naval Postgraduate School. He is the chief executive officer, chief operating officer, and the commanding officer of NPS. A two-star Navy rear admiral, he reports to the highest ranking officer of the Navy, the Chief of Naval Operations, through the Vice Chief of Naval Operations. The Superintendent is responsible for all operations of the Naval Postgraduate School and its tenant commands, as well as for the Navy’s graduate education programs, which include curricula at NPS as well as at civilian institutions. The Superintendent also serves as the Chief of Naval Operations’ advisor on graduate education. As with other military officers, the Superintendent is assigned to NPS for approximately three years.

*The Role of the Governing Board*

The role and responsibilities of the governing bodies of the Naval Postgraduate School have undergone significant changes as a result of the last WASC visit for reaffirmation of accreditation. These changes also reflect changes within the Navy’s organizational structure, and in response to NPS and the concerns of WASC. The Graduate Education Review Board, a primarily military governing board, and the NPS Board of Advisors together continue to fill the roles of a governing board, similar to a more traditional Board of Trustees. However, the responsibilities, membership, and procedures of these groups have changed significantly over the last several years.

*The Role of the Graduate Education Review Board*

The Graduate Education Review Board is a group comprised primarily of senior military officers assigned to the Board as a result of their authority and stake in graduate education deriving from their positions within the Navy. The Board is chaired by the Vice Chief of Naval Operations, and its membership includes the Director of the Navy Staff; the Deputy Chief of Naval Operations for Resources, Warfare Requirements, and Assessment; the Director of Naval Training; the Deputy Chief of Naval Operations for Manpower and Personnel; the Director of Space and Information
Warfare; and the commander of one of the Naval Systems Commands on a rotating basis. The heads of the Naval Postgraduate School and Naval War College are also members of the Board. Additionally, the Chair of the NPS Board of Advisors has recently been made a member of the Graduate Education Review Board, to provide a different perspective on matters relating to NPS and to graduate education in general, and to serve as a conduit between the two boards.

The Graduate Education Review Board’s primary duties are to advise the Chief of Naval Operations on graduate education in the Navy. This advice includes a review and assessment of NPS as the primary source of graduate education for the Navy’s officer corps. The Graduate Education Review Board also sets broad educational policies for the Navy and provides resource oversight for its graduate education programs.

The Graduate Education Review Board meets twice annually and assumes many, but not all, of the functions of a traditional Board of Trustees. These functions include shaping the overall mission and guiding principles of the School, approving its strategic and operating plans, influencing student enrollment and budgeting, and monitoring the assignment of graduates to ensure that the needs of the Navy are being met.

The Graduate Education Review Board also works with the Training Resources Board, which is a special meeting of the Navy’s Resource Requirements Review Board. Although normal funding for NPS and other graduate education programs is accomplished through the Navy’s planning and budget process, any significant changes that occur outside of the normal budget process concerning education and training go through the Training Resources Board.

**The Role of the Board of Advisors**

Complementing the Graduate Education Review Board is the NPS Board of Advisors. This board meets annually and reports to the Secretary of the Navy and Chief of Naval Operations on the role and status of graduate education in the Navy and at NPS. The Board of Advisors is composed of twelve civilian members appointed for up to four-year terms by the Secretary of the Navy. In addition, two federal government members with full voting privileges, currently Rear Admiral Paul Gaffney, Chief of Naval Research, and Vice Admiral Patricia Tracey, Director of Naval Training, serve until relieved by the Secretary of the Navy or until detached from their current positions. Vice Admiral John W. Craine, Jr. will replace Vice Admiral Tracey as the Director of Naval Training in December 1998.

The Board of Advisors’ current membership is presented in Table 1 on the following page. This membership has changed substantially in terms of diversity of experience,
expertise, and gender since the 1990 WASC Visit. (Copies of Board of Advisor reports to the Secretary are available as Background Item #2.)

**Table 1. Current members of the NPS Board of Advisors**

<table>
<thead>
<tr>
<th>Board Member</th>
<th>Title</th>
<th>Affiliation</th>
<th>Term/Expires</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walter Anderson</td>
<td>Editor</td>
<td>Parade Publications</td>
<td>4 years/30 Sep 2000</td>
</tr>
<tr>
<td>Dr. Jack Borsting</td>
<td>Executive Director</td>
<td>University of Southern California</td>
<td>4 years/30 June 2002</td>
</tr>
<tr>
<td>Gen. Michael Carns, (USAF Ret)</td>
<td>Executive Director</td>
<td>Center For International Political Economy</td>
<td>4 years/31 Jan 2002</td>
</tr>
<tr>
<td>Lawrence Cavaiola</td>
<td>Vice President</td>
<td>Ingalls Shipbuilding</td>
<td>4 years/31 Jan 1999</td>
</tr>
<tr>
<td>Dr. Evan Dobelle</td>
<td>President</td>
<td>Trinity College</td>
<td>4 years/30 Sep 2000</td>
</tr>
<tr>
<td>RADM Paul Gaffney USN</td>
<td>Chief of Naval Research</td>
<td>Office of Naval Research</td>
<td>*</td>
</tr>
<tr>
<td>T. Morris Hackney</td>
<td>Chairman</td>
<td>Citation Corporation</td>
<td>4 years/31 Jan 1999</td>
</tr>
<tr>
<td>Ronnie Liebowitz</td>
<td>Partner</td>
<td>Hellring Lindeman Goldstein &amp; Siegal</td>
<td>3 years/30 Sep 1999</td>
</tr>
<tr>
<td>Prof Carolyn Staton</td>
<td>Associate Provost and</td>
<td>University of Mississippi</td>
<td>4 years/30 Sep 2000</td>
</tr>
<tr>
<td></td>
<td>Associate Vice Chancellor for Academic Affairs</td>
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Resource Sponsorship

Although the Superintendent of the Naval Postgraduate School is responsible to the Chief of Naval Operations, through the Vice Chief of Naval Operations, for graduate education of Naval officers and the operation of the Naval Postgraduate School and other graduate education programs, it was determined in about 1994 that responsibility for Navy education and training resources should rest with a single organization. Thus, the Director of Naval Training became the Resource Sponsor for NPS along with the Navy’s other educational institutions. Resources for graduate education are now considered by a special meeting of the Resource Requirements Review Board called the Training Resources Board, as indicated earlier. The Training Resources Board is co-chaired by three three-star Navy admirals who are significant stakeholders in the graduate education of Naval officers. In addition to the Director of Naval Training, the Deputy Chief of Naval Operations for Manpower and Personnel and the Deputy Chief of Naval Operations for Assessments co-chair the Training Resources Board.

This arrangement has proven to be very good for NPS, as it has given the School increased visibility in Washington, D.C. Issues such as funding for NPS laboratories, the library, and a local area network have received attention, and thereby funding, through this arrangement (see Volume II and Assessment #31 for a more complete funding picture). The Training Resources Board also established four task groups to work on issues of student requirements, resource requirements, innovation, and education policy, as necessary. The most active of these committees has been the student requirements task group, which has become involved in restructuring the Navy’s
subspecialty system, the system by which the Navy tracks the need and supply of Naval officers with graduate education in specific areas. The new task group structure has also allowed issues of importance to graduate education and to NPS to be considered on a more regular basis than previously, essentially eliminating the need for the Graduate Education Review Group, as most of its members are also members of the Training Resources Board.

**NPS Funding through the Defense Budget**

NPS is funded via the annual budget cycle of the federal government as part of the U.S. Navy. Each year, the School’s funding is approved by Congress as a budget line item under the Department of the Navy’s professional development education program. The current annual funding level is approximately $68 million for instructional programs and the NPS-sponsored portion of the School’s research program, base support, and maintenance. An additional approximately $28 million in research projects, distance learning, executive education, and other activities is brought in to the School from other sources on a reimbursable basis — that is, for specific services the budgeted funds do not cover.

Figure 2 on the following page provides both historical and projected funding levels for Academics (Mission), base support (OBOS), and maintenance of real property (RPM). The Mission line includes $5.5 million in 1997 for a computer network and laboratories, and $1.7 million in 1998 for the laboratories and the library. For the years 2000 and 2001, mission funding includes $2.55 million to $3 million for distributed learning course development.

Some of NPS’ facilities and property are funded through a separate organization, Naval Support Activity Monterey Bay (NSAMB). NSAMB provides public works support and other administrative support to NPS and other military facilities in the local geographic area. Finally, major construction projects are funded separately, where appropriate, through a separate military construction budget. Each of these budgets is separately proposed, revised, approved, and executed through multiple layers of the federal government, including NPS, the Navy’s Field Support Activity and Planning Offices, the Department of Defense, the Office of Management and Budget, and Congress, including both House and Senate committees. Significant changes can be made at any level, resulting in some uncertainty in funding lines from year to year.
The organization of academic activities at NPS is shown in Figure 3 on the following page.

The Superintendent is the chief executive officer of the Naval Postgraduate School and assumes many of the roles of a traditional university president. The Provost is the chief academic officer and academic dean responsible for the quality of all academic programs. A Deputy Superintendent position was established by Rear Admiral Chaplin in 1998, to assist in the day to day operation of NPS.

Although NPS is primarily an academic institution, it is also both a military command and a governmental agency. Integrating these three different cultures — each of which comes with its own assumptions, constraints, and way of doing business — into a seamless whole is a continuous challenge. The partnership between the Superintendent and Provost is critical to meeting this challenge; and, as will be seen throughout this Self-Study, the military-academic partnership in all phases of its operation is what makes NPS both unique and successful.
As shown in Figure 3, there are eleven academic departments, five academic groups, and two academic committees at NPS. Dr. Richard S. Elster became Provost in 1995. Shortly thereafter, he commissioned a faculty committee to evaluate the academic organization of NPS and recommend possible changes. The resulting reorganization is a simplified structure with all the academic departments, groups, and committees reporting to one of three academic deans for administrative matters. The duties of the Dean of Instruction and Dean of Faculty were divided among the three deans and the Associate Provost for Instruction. The positions of Associate Provost for Innovation and Associate Provost for Computer Information Systems were also created at that time. The responsibilities of the Dean of Research/Associate Provost for Research remained unchanged, whereas the position of the Director of Library was made to report directly to the Provost.

The position of Dean of Research had been re-established at NPS in 1990 after the WASC Visit. This position has evolved over the past eight years from the principal administrative officer for research to provider of support for the School's research program, to acting as the focal point for research policy and its integration into the mission and curricula at NPS, and to the catalyst for interdisciplinary research and establishment of active research relationships with other organizations.
Other key positions in the NPS organization are held by military officers, as is appropriate for the School’s mission. The Director or Resource Management, the Dean of Students/Director of Programs, the Assistant Provost for Military Faculty, the Director of Professional Military Education, and the Commanding Officer of the Naval Support Activity Monterey Bay are all Navy captains. They report directly to the Superintendent for military matters and coordinate with the Provost on all matters pertaining to academics.

The Superintendent also has four other organizations under his cognizance that report directly to him for the accomplishment of their missions. They are the School of Aviation Safety, the Defense Resources Management Institute (DRMI), the Institute for Defense Education and Analysis (IDEA), and the Center for Civil-Military Relations. Each of these organizations completed its own Self-Study in preparation for this WASC Visit. They also based their Self-Studies on their Strategic Plan and how well they were accomplishing their missions. Their reports are included as appendices to Volume II of this report.

**NPS Students**

NPS was founded on the need for graduate education for Naval unrestricted line (URL) officers, specifically Navy warfighters — those who fly airplanes, drive ships and submarines, and who would effectively fight a war. Since the end of the Cold War, military downsizing has resulted in fewer Navy officers overall, but the demand for these officers in warfighting roles, as opposed to officers in other service jobs, remains high. As a result, availability for graduate school has decreased more rapidly for warfighting officers than for the Navy as a whole. From 1991 to 1998, the number of officers in the Navy, excluding doctors and dentists, decreased by about one-fourth. During this same period, the number of officers given the opportunity to attend funded graduate programs decreased by 41 percent. These enrollment trends are shown in Figure 4 on the following page. Note that the URL population accounts for a significant amount of the decline in overall enrollment, while the population of Navy Restricted Line (RL) and Staff Corps officers has increased slightly. RL and Staff officers are officers who provide support to warfighters in areas such as engineering, oceanography, law and supply.

**International Students**

As indicated in Figure 4 below, in addition to U.S. Navy officers, NPS students also represent other U.S. services as well as many other nations. This diversity within the student body is extremely valuable to the success of NPS and the accomplishment of its mission.
Since the last WASC Visit, NPS has worked to expand its international student population in terms of both number of countries represented and number of students. Over the past ten years, international student enrollment at NPS has constituted 12 to 15 percent of the overall student body. This rather substantial percentage, which has been accomplished through extensive marketing of NPS programs, has generated tuition monies (through the Foreign Military Training program) of between $3 million and $5 million annually.

In 1991, NPS established a recruitment goal of fifty countries and an international-student average-on-board of 300 officers. As a result of a number of factors largely out of the School’s control discussed later in this report, this number has proven to be unrealistic. In fact, NPS works hard to maintain a threshold of 200 international students. Nevertheless, the fifty-country target is proving to be attainable. Forty-five countries are currently on board, with five to six additional nations expressing interest in sending officers to NPS over the next year or so. A more complete discussion of enrollment of international students is provided in Volume II.

![NPS AOB](image)

**Figure 4. NPS "Average on Board" (AOB) number of NPS students**

*Trends in Navy Enrollment*

In recent years, NPS has been concerned with the decline in the number of warfighters attending graduate education programs as discussed in the previous section. As the Navy and the world become increasingly complex, these Naval officers, especially, will require enhanced intellectual capital to keep the U.S. Navy on the forefront of both technology and operations. Thus, over the last several years, the School has embarked on major efforts to define and meet these needs of the Navy. The initiatives undertaken
include the development of new curricula, such as Special Operations; Leadership Education and Development; Modeling, Virtual Environments, and Simulation; and Information, Strategy and Operations designed to give warfighting officers the education they need to effectively perform their duties. Other initiatives include implementing distance learning and distributed learning programs; the formation of inter-disciplinary curricula; and the expansion into new areas of the School’s research programs. The Navy has also begun to re-emphasize the importance of advanced education, as evidenced by the recent heightened interest in graduate education at the Chief of Naval Operations level. These initiatives are discussed further in later sections of this report.

Academic Programs at NPS

NPS offers 47 different curricula in 28 Master’s degree programs. Curricula are designed to meet the specific requirements of the Navy and other military services while meeting the academic standards set by the NPS Academic Council. Completion of a curriculum results in both a degree and, for Naval officers, a Navy subspecialty code indicating that the officer has the education and skills required by particular jobs within the Navy. Other services have similar means of tracking their NPS graduates as well as those who complete other graduate programs. (A complete description of the Navy’s subspecialty system can be found in Background Item #25.)

The Academic Council

The ultimate authority for academic programs at NPS lies with the Academic Council. The Council’s membership includes the Provost, the Associate Provost for Instruction, the Dean of Students/Director of Programs, the Chair of the Faculty Scholarship Committee and elected representatives of all academic departments and groups. The purpose of the Academic Council is to establish, monitor, review, certify, and advise on policies and procedures that ensure high and consistent academic standards for graduate education throughout the Naval Postgraduate School. The Council accomplishes this by reviewing curricula and degree program requirements; by adjudicating exceptions and deviations from standard procedures in particular instances or special circumstances; and by advising the Provost on ways to maintain and improve the quality of education at the School.

The Academic Council is concerned both with quality control aspects of the School’s academic programs and with ways to promote the development of academic excellence in the unique context of professional graduate education. Its procedures, policies and guidance are contained in the Academic Council Policy Manual, Policy Document #5. It may also be found on the NPS homepage at http://math.nps.navy.mil/~vhenson/manual/manual.html.)
The Curriculum Review Process

Each NPS curriculum has a Navy or other-service sponsor called a Primary Consultant. Primary Consultants review their curricula every two years. These reviews include a look at the duties and responsibilities of positions identified as requiring subspecialty codes. These duties and responsibilities are then translated into Educational Skill Requirements, which NPS faculty include in courses and degree programs. During each curriculum review, an assessment is made as to whether the Educational Skill Requirements accurately reflect the skills required to perform in the designated positions, how well the courses meet the Educational Skill Requirements, the degree of military relevance required and offered in the curricula, and how effectively the Navy uses its officers in the designated positions.

The curriculum review process is discussed in greater detail in Volume II. Additionally, curriculum reviews may be found in Assessment #8, and a description of the Navy’s subspecialty system may be found in the Officer Subspecialty System Handbook, Background Item #30.

Some of the most notably unique curricula of significant military relevance offered by the Naval Postgraduate School are:

- Joint Command, Control, Communications, Computers and Intelligence
- Information Warfare
- Space Systems Operations/Engineering
- Undersea Warfare
- Special Operations
- Civil-Military Relations
- Meteorology and Oceanography

These are notable in the sense that virtually no other university has even similar programs. However, significant military applications and relevance also appear in all the School’s programs. Other curricula that contain a significant number of military-relevant courses include Operations Analysis; Operational Logistics; Engineering Acoustics; Modeling, Virtual Environments and Simulation; Total Ship Systems Engineering; Combat Systems; Electronic Warfare Systems International; Leadership Education and Development; Defense Systems Analysis; and Scientific and Technical Intelligence. Some of the courses in these curricula are classified and require a SECRET clearance.

The military relevance of programs is a cornerstone of NPS education, and, although it is difficult to measure, NPS has taken several steps to evaluate the extent to which this military relevance permeates its curricula. Curriculum reviews stress its importance. During the reviews, NPS relies heavily on the Primary Consultant’s review of course
descriptions and Educational Skill Requirements to ensure that they are relevant and current to the problems NPS graduates will face upon completing their programs. Knowing that its professors will bring their work into the classroom, NPS also emphasizes military relevance in research. In addition, visiting civilian professors were invited to NPS in 1993-94 to conduct external reviews of the School’s various programs, and to assess their military relevance and the feasibility of their own universities doing such work. (The reports of their visits are available as Assessment #44.) NPS also compiled a list of representative unique courses in May 1997 (Assessment #47.) In 1998, at the request of the Chief of Naval Operations’ Executive Panel on Advanced Education, NPS was asked to evaluate the military relevance of courses in representative curricula. (These evaluations are available as Assessment #48.)

In general, students from all NPS curricula receive traditional academic degrees. For example, students in the Information Warfare curricula are awarded a Masters in Systems Engineering, while students in Space Systems Engineering can elect degree programs in such areas as Electrical Engineering, Physics, or Computer Science. A complete listing of curricula and their associated degrees appears on page 16 of the 1998 Naval Postgraduate School catalog (Background Item #24), or on-line at http://web.nps.navy.mil/~ofcinst/frame.htm.

Degree requirements are determined by the academic department or group that has primary responsibility for the curriculum and by the School’s Academic Council, which approves the requirements for each degree program and establishes School-wide minimum requirements for all degrees. The Academic Policy Manual described earlier (Policy Item # 5) provides further information and is located on the Naval Postgraduate School website at http://math.nps.navy.mil/~vhenson/manual/manual.html.

Master’s Thesis

The Master’s thesis is one of the key assessment mechanisms for evaluating student learning at NPS. All curricular programs — with the exception of Civil-Military Relations and International Security — require students to write an acceptable Master’s thesis. (A thesis is optional for Civil-Military Relations, as approved by the Academic Council.) The thesis requirement is an Educational Skill Requirement specified by the Primary Consultant for each program and is also a requirement for awarding an NPS Master’s degree in most cases.

The purpose of the thesis is for a student to demonstrate individual initiative and creativity in applying the skills and knowledge gained from his or her educational program. For many NPS students, the thesis represents the first major independent project that he or she has undertaken. As such, it is an integral part of the Master’s degree program. As the primary objective of the thesis is to further the student’s education, the thesis process focuses on building and strengthening the student’s
abilities for independent inquiry. The thesis may also contribute to the professional body of knowledge in a given field through the resolution of a problem, by providing a clearer understanding of relationships, or by improving a process. The thesis is a scholarly report of research and must therefore meet rigorous academic standards and requirements.

Theses typically are highly relevant to the Department of Defense, and some carry a SECRET classification. The thesis topic is determined by the student working closely with his or her thesis advisors, usually one year prior to the expected graduation date. Each thesis student has two advisors and every thesis must be approved by the chair of the department. Occasionally, NPS staff, faculty of other academic institutions, members of Naval laboratories, or others with expertise also serve as thesis co-advisors with NPS faculty. All relevant NPS theses are published and cataloged with the Defense Technical Information Center. (Representative theses are available as Assessment #39. Theses Abstracts for each academic quarter are available as Assessment # 55.)

Transition and Refresher Programs

NPS has mastered the many challenges of providing adult learners with a mid-career education. Since as officers, students have been away from an academic environment for many years, the School offers an efficient refresher program to help them readjust to academic life. In assigning officers to NPS, the Navy considers its future manpower needs to ensure adequate numbers in each skill area. As a result, some officers are assigned to a graduate degree field completely different from that of their undergraduate studies. A mechanical engineer, for example, may transition to become a computer scientist; or a music major may be trained to become an astronautical engineer, as was the case with NPS graduate and astronaut Winston Scott. In most cases, the School is able to efficiently provide for such educational transitions with a minimal need for extra program time.

The Curricular Officer/Academic Associate Team

In addition to the traditional academic departments and groups, NPS also has a complementary structure that works to ensure fulfillment of both the military and academic goals of the School and its students. There are ten Curriculum Offices, each headed by a Curricular Officer — typically a Navy Commander. Curricular Officers are assigned to the School by the Navy and report directly to the Dean of Students/Director of Programs. Many are former graduates of the programs they oversee. These Curricular Officers work closely with Academic Associates — NPS professors appointed by the department chairs who are responsible for specific curricula typically for a period of three to five years. Together, the Curricular Officer and Academic Associate are designated as the CO/AA team for a particular curriculum or program. As such, they are the direct link between the School and the program’s military sponsor.
Academic Associates are appointed upon the recommendations of the Dean of Students and the Associate Provost for Instruction and report to the Associate Provost for Instruction.

The CO/AA team, working closely with the faculty in pertinent departments, is largely responsible for ensuring that the team’s curriculum meets its Educational Skill Requirements. The team designs a "matrix" of courses (typically four courses per quarter, for six to eight quarters), structuring the program with both relevant academic topics and military applications. This process is particularly challenging for unique, interdisciplinary programs, which often require the design of some new courses. Once the program has been set up, the CO/AA team monitors the program, as well as individual student progress through it, on a continual basis, possibly making minor modifications along the way. All new programs, including distance learning, and new courses require approval by the Academic Council before they can be offered by the School for credit.

The CO/AA team also acts as the individual student’s academic advisor, with the Academic Associate — a faculty member — generally taking the lead. Academic Associates are empowered to make minor changes in an approved program to suit the background and/or interests of an individual student, as long as the academic integrity and intent of the program, as approved by the Academic Council, is preserved.

Students report directly to their Curricular Officers on all military matters, the Curricular Officer being a student’s immediate reporting senior officer within his or her military hierarchy. Any academic disciplinary matters are normally handled by the Academic Department, in conjunction with the Curricular Officer.

**Student Services and Support**

The Naval Support Activity Monterey Bay (NSAMB) provides various services to the students of NPS. As military officers and mid-career professionals, the students require services more typical of those provided by a military base with some overlap of the support generally found on an academic campus. On base are a Navy Exchange, or mini-department store with two barber shops, a uniform store, a retail store, a mini-mart, and an auto shop as well as dry-cleaning and optical stores. The School also has a family housing community with 589 family units. In this La Mesa community, there are several schools for children, as well as a Child Development Center. Many students also live in military housing at the former Fort Ord, about eight miles away, that has its own quality-of-life support facilities.

The Morale, Welfare, and Recreation department within NSAMB provides a wide range of activities for the students, including gym facilities, an 18-hole golf course and driving range minutes from the School, and an outdoor swimming pool. Sailboats are available.
at the nearby Coast Guard Pier for qualified students and staff to take out and sail around Monterey Bay. The Information, Tickets, and Tours office offers low-priced tickets to many area attractions.

A Family Services Center is also available to students, their family members, and to single students as well. The Family Services Center offers family-related classes and counseling, as well as assistance with relocation and many other important personal issues faced by military personnel. On-base religious programs are available through the NPS Chaplain’s Office. Medical care for military students is offered at the Presidio of Monterey Army Clinic. The Navy Federal Credit Union has a branch office on campus in the basement of Herrmann Hall.

Students have a role in governance of NPS through the Officer Student Advisory Committee, recently renamed the Superintendent’s Student Council. This Council meets monthly and is open to all students. Each Curriculum Office has a representative on the Council, which has an executive board. The role of the Council is to inquire into issues of student interest and concern relating to academic and support activities at NPS, make recommendations to the Superintendent based on the information gained, and inform students about the results of Student Council inquiries. The Superintendent’s Student Council has representatives on many of the NPS standing committees, including the Faculty Council and Computer Advisory Board. Minutes of the Council meetings are available on the NPS homepage at http://web.nps.navy.mil/~osac/.

**New Programs and Directions for NPS Academic Programs**

NPS has been exploring the development of programs tailored specifically to officers’ operational careers. Under the direct supervision of the Chief of Naval Operations’ Advisor on graduate education, NPS has been concerned with the Navy’s inability to enroll the requisite number of warfighters in graduate education programs. This concern has been echoed at meetings and in reports of both the Graduate Education Review Board and the NPS Board of Advisors. Because the Navy has a limited number of officers and a wide range of missions to accomplish, the School realized that the Navy could not afford to educate officers for secondary positions in their career paths. Thus, NPS began to focus on the development of curricula that would meet the demands of the Unrestricted Line (URL) officers in their primary occupations, i.e., as warfighters. These curricula will reflect the needs of the Revolution in Military Affairs, discussed in detail in Volume II, and will be developed in conjunction with Navy sponsors.

**The First Unrestricted Line Curriculum: Systems Engineering Integration**

The first NPS curriculum designed for Navy Unrestricted Line officers in their primary warfighting occupations, along with warfighters from the other services, will focus on
the design and utilization of military systems. Thus, the curriculum will focus on operational capabilities in modern warfare, utilize a systems engineering approach, and concentrate on the analysis of overall system effectiveness. As a result, officer students will obtain a detailed understanding of military systems, operational environments, financial and physical constraints, national and international political environments, and operations analysis. They will emerge from the curriculum with the skills needed to make maximum use of various military systems, as well as to participate in their design and operational introduction.

Development of the Unrestricted Line curriculum is not yet complete, although it has been approved by the Graduate Education Review Board. A more complete description of the curriculum content and design may be found in Task Group #1’s report in Volume II.

Information, Strategy and Operations

The second Unrestricted Line initiative involves an effort by NPS and the Director of Space and Information Warfare, the Primary Consultant for several existing curricula, to respond to rapid advances in information technology. These changes will affect the full spectrum of conflict in the 21st century and are therefore critical to the success of the Navy by a two-pronged approach. The first prong involves an initiative to combine a core set of skills in several existing curricula into a single curriculum while providing specialty tracks of in-depth knowledge in such areas as Computer Science, Information Warfare, and Space Systems. The second prong is development of a curriculum for Unrestricted Line officers that will provide them with the analytic skills, frames of reference, and broad-based knowledge of information systems and their operations.

The Seaman to Admiral Program: NPS and Undergraduate Education

NPS specializes in, and its faculty are expert at providing, Master’s degree education, although a small number of doctorates and Bachelor’s degrees may be awarded in any year. At the instigation of the late Chief of Naval Operations, Admiral Jeremy Boorda, NPS embarked on a Seaman to Admiral Program, through which highly qualified enlisted sailors could earn a Bachelor’s degree, qualifying their entry into the officer corps. NPS was selected as the institution of choice for this program. Partnering with local area universities to provide the liberal arts and other courses NPS does not currently teach, NPS provides the technical courses for the degree program. The first six selectees in this program are currently enrolled at NPS and should complete their degrees in 1999. Although there is significant merit in assigning Naval personnel to NPS for their undergraduate education, the Navy has recently determined it is more cost-effective to send these personnel to civilian universities and to administer this program through the Naval Reserve Officer Training Corps program. Therefore, no further Seaman to Admiral entrants at NPS are currently expected.
Distribution and Distance Learning

In July 1994, NPS initiated its first synchronous Distance Learning program, through real-time interactive video-conference technology in the Aeronautical Engineering Department. Additional Distance Learning programs and courses are currently being offered in Computer Science, Electrical and Computer Engineering, and Systems Management. (For more information, see the 1998 NPS Catalog, p. 321; the Distance Learning Program brochure; or the web at http://web.nps.navy.mil/~ofcinst/dlc_htm.htm.)

As of April 1998, 347 distant-site students have taken NPS Distance Learning courses for credit. Of these, 130 were enrolled in a Master’s degree program, of which 20 have satisfactorily completed all degree requirements and graduated. Volume II contains a discussion of the Strategic Initiative on making NPS the technologically integrated Defense University of the Future provides further detail on the current status of this program and its effectiveness.

In March 1998, NPS initiated an effort to purchase, develop, and deliver asynchronous (non-real-time) Distance Learning courses and products, coordinated through the School’s Institute for Defense Education and Analysis (IDEA). A Distributed Learning Council composed of School faculty and staff was appointed by the Superintendent and the Provost to make recommendations to them and to the Academic Council, as appropriate, regarding degree requirements and student qualifications, business procedures and faculty incentives, and program priorities and requirements. The Distance Learning Council has also been tasked to help set up on-going assessments and evaluations of the School’s asynchronous programs, as well as to coordinate plans for faculty development in instructional design and delivery of the programs. (Policy Item #10 is the charter for the Distributed Learning Council.)

NPS Faculty

Faculty Governance

The Faculty of the Naval Postgraduate School is organized through a Faculty Council whose purpose is to promote understanding and communication between members of the faculty and the administrative staff, to protect and promote the professional stature of its members, and to assist the administration in accomplishing the goals of the Naval Postgraduate School. The Faculty elect a Chairman annually and a Secretary every two years, as well as members of five standing committees: Nominating; Professional Practices; Scholarship; Retirement, Insurance, and Special Functions; and Plans, Facilities, and Support Services. Each standing committee member is elected for a staggered three-year term, with the most senior member in terms of years on the committee serving as chairman. The NPS Faculty homepage is found at http://fc.nps.navy.mil/.
In addition to these committees, the Faculty annually elects one member each to a Computer Advisory Board and a Research Board, established by the School’s administration. The chairman of the Computer Advisory Board is the Associate Provost for Computing and Information Systems, while the Research Board chairman is the Associate Provost for Research. Other members have department or school-wide positions, as specified in the instructions setting up the groups. The Faculty may also appoint ad hoc committees as special needs arise.

The Faculty meets regularly twice a year, in May and November. All Faculty members are entitled to vote at these meetings. The Superintendent normally presents a State of the School address at the May meeting, and the Provost a corresponding address at the November meeting, at which Faculty elections are also held. Either the Provost or Faculty Chairman may call meetings of the Faculty, which are chaired by the Provost or, in his absence, the Faculty Chairman.

The Faculty Council began in the mid-sixties when the Faculty established it to represent Faculty interests on a continuing basis to the School’s administration. The Faculty Chairman and Faculty Secretary serve in corresponding capacities on the Faculty Council, which meets monthly, except for May and November, when the Faculty meets as a whole. Each of the School’s academic departments selects a representative and an alternate to the Faculty Council, who serve concurrent three-year terms. The Faculty also elects three members-at-large to the Faculty Council, each serving staggered three-year terms. All Faculty members are invited to meetings of the Faculty Council, but only Faculty Council members are entitled to vote at these meetings.

The agenda for Faculty Council meetings is set by an Executive Board consisting of the Faculty Chairman, the Faculty Secretary, the Faculty Chairman Elect, and four other Faculty Council members elected at the December meeting of the Faculty Council. Faculty Committee chairmen are invited to give committee reports at each regular meeting of the Faculty Council, as well as at meetings of the assembled Faculty. The Executive Board meets weekly on Mondays, except for the first Monday of each month. On this day, the Executive Board meets with the Provost and Deans as the Joint Policy Council. This structure is designed to ensure the free flow of information between Faculty and Administration, as well as their mutual support, particularly in matters involving the School as a whole.

In addition to chairing Faculty and Faculty Council meetings, as well as meetings of the Executive Board and the Joint Policy Council, the Faculty Chairman represents the Faculty on a number of high-level administration panels, dealing with such matters as pay, promotion, and tenure. The Faculty Secretary keeps and publishes minutes of all meetings of the Faculty and the Faculty Council, and maintains correspondence as
directed by either body. (The minutes of the meetings are available on the NPS Intranet.)

The Faculty Handbook (Policy Item #7) contains the bylaws of the Faculty, together with the following mission statement (Article II): "The object of this organization will be to promote understanding and communication between members of the Faculty and members of the Administration staff, to protect and promote the professional stature of the members, and to assist the Administration in accomplishing the mission of the Naval Postgraduate School."

Faculty Data

The Naval Postgraduate School has a mix of tenure-track and non-tenure-track civilian faculty. At NPS, the term "tenure track faculty" is used to include faculty who already have tenure, as well as untenured faculty who are on a "tenure track." As of July 1998, in the eleven academic departments and five groups (excluding the Defense Resources Management Institute, Aviation Safety, Civil-Military Relations, and Institute for Defense Education and Analysis) there were approximately 174 tenured faculty, 51 untenured tenure-track faculty, and 116 non-tenure-track faculty. Table 2 on the following page shows, by department, the number of 12-month work-years executed in FY98 by the School’s tenured and tenure-track faculty, and the type of funding for those work-years. The portion paid by reimbursable funds shows work-years devoted to externally sponsored research.

Among the tenure track faculty at NPS, nearly all have a Ph.D. or the corresponding terminal degree in their field of study. Among the 225 tenure track faculty, 216 hold a Ph.D., three a DBA, two a JD, and one each DSC, EDD, MS, and MBA degrees. NPS faculty are graduates of quality schools commonly producing the faculty of the nation’s universities. Table 3 lists the schools from which NPS’ tenure-track faculty received their degrees. Only the twenty-five most frequently occurring are shown.

Table 2. Distribution by department or program of tenured, untenured tenure-track, and non-tenure-track faculty (left columns) and division of faculty between direct-funded (NPS-funded) and reimbursable-funded research.

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Table 3. NPS faculty academic background

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</table>
In addition to its civilian faculty, NPS has approximately 30 military officers assigned as faculty. These officers have special skills relevant to the programs in which they instruct and do research. Most military faculty have a Masters degree, although some possess a Ph.D. or other terminal degree as well.

Table 4 shows the age distribution of NPS civilian tenure-track faculty.

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<tr>
<td>70-</td>
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Table 5 shows the distribution of years of service at NPS for the tenure-track faculty. The average length of service at NPS for its tenure-track faculty exceeds 14 years.

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In the past few years, Department of Defense and Navy budgets have decreased, and NPS has not been immune to these budget reductions. The School has had to make significant reductions in the number of work-years funded, and there has been a parallel increase in the number of faculty funded from reimbursable sources.

The Mission Long Range Labor Plan in Table 6 on the following page shows the historical and projected labor execution for fiscal years 1991 through 2002. It includes the Average-On-Board (AOB) student count, the average over the period of interest of the number of students enrolled. Because nearly all students (with the exception of a
few NPS staff) are full-time, and since very few students drop out, the AOB is an accurate reflection of the School’s full-time student load.

Table 6 also shows some staff-to-faculty ratios, student-to-faculty ratios, and other derived ratios. Of particular note is that although the student population has decreased by about 33 percent over the last several years, NPS has been able to maintain tenure track faculty by shifting faculty workyears from direct to reimbursable. Additionally, the staff workload has been shifted from direct funding to indirect and reimbursable. This shift allows NPS to retain high quality faculty and staff and to ensure a breadth of expertise important to the mission of the school.

### Table 6. Long-range labor plan for faculty and civilian staff (excludes IDEA, DRMI and CMR).

*Note:* "Direct" funding includes foreign military tuition, non-Navy tuition, and Navy facilities support [O&MN]. AOB=Average on Board, TT=Tenure Track, WY=work-year

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<tr>
<td>AOB/Direct WY</td>
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<tr>
<td>Direct WY/TT(count)</td>
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<tr>
<td>Reimb WY/Direct WY</td>
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- 40 -
Research at NPS

Historical Overview

During the past ten years there have been both evolutionary and rapid changes in the NPS research program. Rapid changes include the almost complete shift in funding support from internal to external and the re-establishment of the position of the Dean of Research. Evolutionary changes include an increasing reimbursable support level, a gradual shift toward interdisciplinary and applied research, and intertwining of instruction with research.

The externally mandated use of Direct Funded/Institutional Research in 1987 and its subsequent rapid decline brought with it many hurdles which had to be overcome. The most severe of these may have been the estrangement of the NPS faculty from their reimbursable sponsors. In 1987, an external mandate suspended NPS’ authority to accept sponsored research funding from the Navy. Funding for research was "Direct Funded," that is, provided for in the NPS budget. Over the next few years, budget cuts severely reduced the institutionally funded Direct Funded Research Program. At the same time, however, the authority to accept sponsored funding from the Navy was reinstated, which over the years has more than offset the loss of institutional research funds. Again, Table 6 above shows the shift from direct to reimbursably funded workyears since 1991.

The strength of the NPS Research Program, which has more than doubled over the past ten years, continues to be a principal dedication of the faculty. The sponsored program is healthy and growing, and the institutionally funded program is being fine-tuned to achieve maximum return on investment.
Purpose/Value

The research program at the Naval Postgraduate School exists to support the graduate education of its students. It does so by providing militarily relevant thesis topics that address issues from the current needs of the Fleet and Joint Services and the science and technology required to sustain long-term superiority of the U.S. Navy and Department of Defense. The School’s research program attracts and retains quality faculty and keeps them current on Navy/Department of Defense issues, permitting them to maintain the content of upper division courses at the cutting edge of their disciplines.

Students with operational experience working with faculty experienced in Navy/Department of Defense issues provide a unique capability for addressing and solving warfighter problems. This capability is especially important at the present time when technology in general, and information operations in particular, are rapidly changing.

NPS has a unique attribute among universities: an experienced and active research-oriented faculty focused primarily on the Master’s degree. This focus provides an optimal environment for the School’s officer students who must develop innovative capabilities to apply their knowledge and skills to the solution of complex problems. This combination of unique knowledge of the operational Navy/Armed Forces and a challenging thesis project requiring students to apply a focused graduate education is one of the most effective means for solving immediate Fleet problems and instilling a life-long ability to apply basic principles to the creative solution of complex problems. The operational relevance and high academic quality of NPS theses is demonstrated by the theses abstracts and examples of Outstanding Theses available as Assessment Items #55 and #39 respectively.

Faculty and Research

All tenure-track faculty are expected to be active in both instruction and research. NPS has a policy that not more than 50 percent of a permanent faculty member’s academic session (ten months) can be spent on research. On a yearly basis, approximately 42 percent of tenure-track faculty time is spent on research.

Non tenure-track/research faculty are also an important part of NPS’ research program. There are also nineteen active chair professorships that bring individuals to the School who have the special expertise needed for program enhancement. The majority of these chair professorships are sponsored by an outside agency, with the only cost to NPS being office space and administrative support.

NPS participates in post-doctoral programs sponsored by the National Research Council and the American Society for Engineering Education. Approximately ten post-
doctoral associates are in residence each year. These associates enhance the quality of the research program.

**Funding**

NPS research funding is provided by both sponsored/reimbursable and institutional sources, and varies from very fundamental to very applied, and from unclassified to all levels of classification. Figure 5 provides a summary of the funding history for the School’s research program, as that program has transitioned from being predominately direct/institutionally-funded in the late 1980s through 1990, to the present day. The sponsored/reimbursable part of the program has grown steadily since the rapid reduction in institutional funding, to provide faculty and staff with the support required to sustain a strong and viable graduate institution.

The ratio between sponsored and institutionally supported research at NPS has changed dramatically in the past several years. In FY97, approximately 80 percent of the NPS Research Program was sponsored externally. Figure 6 shows that the external sponsorship is primarily Navy/Department of Defense, but also includes the National Science Foundation, other government agencies, industry, and other universities.

![Figure 5. NPS reimbursables by fiscal year. “NPS-funded” indicates research. “Reimbursables” indicates reimbursable research and instruction.](image)

*Figure 5. NPS reimbursables by fiscal year. ”NPS-funded" indicates research. "Reimbursables" indicates reimbursable research and instruction.*
Interdisciplinary Programs

The formation of interdisciplinary groups and the recent academic reorganization, which has put computer and information sciences and operations into one division, have pushed some of the School’s research towards interdisciplinary/interdepartmental efforts. Examples are research on autonomous underwater vehicles, which involves students and faculty from three departments (ECE, Mechanical Engineering, and Computer Science); on unmanned aerial vehicles, which has resulted in activities among most of the departments/groups as well as the School of Aviation Safety; and by the Institute for Joint Warfare Analysis, which emphasizes modeling and simulation and is currently developing joint efforts with the Naval War College. Spacecraft Design and Total Ships Systems Engineering are examples where curricula and research sponsors are combined to enhance the educational process in areas of specific Navy needs.

Yet another evolution has been research support for interdisciplinary systems-engineering studies. These studies utilize students and faculty from across the campus in team efforts, as well as visiting external experts, and often require wargaming to focus the solution direction for the problems involved.

Figure 6. Distribution of externally sponsored research at NPS for FY1997. Note: CRADA = Cooperative Research and Development Agreements with private industry.
NPS has also entered into relationships with external sponsors (Office of the Chief of Naval Operations, etc.) to provide "umbrella" research funding for interdisciplinary programs providing direct links between NPS and the Department of Defense sponsor requirements.

**Special Research Facilities**

As a federal military installation, NPS has many facilities that support military-related research and instruction, including facilities handling all levels of classified materials and information. Some of these military-relevant facilities are:

- Secure Computer and Simulation Laboratory (for wargaming)
- Fleet Satellite Communications Laboratory (for satellite and ground control station)
- Sensitive Compartmented Information Facilities
- Secure Systems Technology Laboratory (advanced Command, Control, Communications, Computers and Intelligence with Fleet connectivity)
- Propulsion Laboratories (for propulsion research and testing)
- Secure Computer Network Research Laboratory
- Center for Interdisciplinary Remotely Piloted Aircraft Studies (manned and unmanned air vehicles for science missions, payload evaluation and Fleet exercises)
- Signal Enhancement Laboratory (correction of signal reception problems at Department of Defense facilities)
- Secure Ocean Acoustic Observatory (underwater acoustic array)
- Interactive Digital Environmental Analysis (IDEA) Laboratory (military meteorological laboratory)
- Virtual Environment Laboratory (human-computer interactions)
- Secure Space Systems Research Laboratory (signal processing for space-based sensors)

**Technology Transfer**

The NPS research program also utilizes Cooperative Research and Development Agreements with private industry. The use of Cooperative Research and Development Agreements by the faculty is expanding as they realize the benefits of collaborative efforts with industry. Cooperative Research and Development Agreements are currently less than one percent of the Sponsored Research Program, and the number of patents with commercial potential which require marketing are also currently very small. Therefore, the newly established position of Director of Technology Transfer was dissolved, though the full-time position may be reestablished as this program grows in the future.
NPS participates in consortia with other government laboratories and universities, and provides off-campus courses. The latter are most often reimbursably sponsored and are currently offered either on-site or by video teleconferencing. In the near future, these courses will also include asynchronous, web-based instruction.

**Current Initiatives**

In 1990, the Dean of Research position was re-established at NPS. As noted earlier, this position has evolved during the past eight years from serving as the principal administrative officer to supporting the research program, to being the focal point for research policy, its integration into the NPS mission and curricula, the catalyst for interdisciplinary research, and the establishment of active research relationships with other organizations.

In addition, an NPS Research Plan is being developed both to facilitate a laboratory investment strategy and to provide a rationale for identifying required faculty expertise. This plan is based on individual Department/Group plans, developed from self-studies initiated to address emerging and long-term goals.

The Dean of Research relies on a Research Board, consisting of representatives from each academic department and group, as well as a Faculty Council representative, to keep him apprised of the research environment within the respective departments and to advise him on research policy. The Board members also evaluate all internally funded research to help ensure its quality.

The NPS Institutionally Funded Research Program, formerly the Direct Funded Research Program, and the Institute for Joint Warfare Analysis have been revamped both as a result of a decrease in available funds and the desire to use them as tools to focus portions of the School’s research program into current and emerging areas of critical importance to the operating forces. For example, the Institute for Joint Warfare Analysis program now interacts with the Naval War College to provide modeling and simulation, experiment planning, and data analysis in support of Fleet Battle Experiments. The NPS Institutionally Funded Research program continues to provide initial support to new faculty to help them establish their research programs. It now also provides support for major new interdisciplinary initiatives, enhances productive research that is reimbursably sponsored, contributes to the re-capitalization of major scientific research equipment, and cost-shares the support of a strong post-doctoral program.

To foster collaborative work, NPS allows and encourages its faculty and students to form research centers whose primary purpose is to provide externally recognized facilities of excellence, grouping faculty with a common interest in interdisciplinary research areas.
The Dudley Knox Library

Three key areas of concern in the 1990 WASC Evaluation Report addressed the Dudley Knox Library — in the areas of material budget constraints, inadequate staffing, and insufficient building facilities. During the past ten years, Library management has made a number of improvements affecting each of these areas. A complete description of Library services can be found on page 9 of the 1998 NPS Catalog.

Reorganization

In 1993, the School hired a new Library Director, Dr. Maxine Reneker. Shortly thereafter, in 1994, the Library began an extensive strategic planning process resulting in the creation of "Meeting and Exceeding User Needs" (Policy Item #11), along with specification of the Library’s mission:

"The mission of the Dudley Knox Library is to serve the students, faculty and staff of the Naval Postgraduate School, the Department of Defense, and other clientele in their quest for excellence in academic and research achievement. The Library is dedicated to furthering that quest by identifying, accessing, organizing, publicizing and disseminating vital information resources."

In 1996, in a move designed to link its services more closely than before to the School’s academic mission, the Library was organizationally redirected to report directly to the Provost, Dr. Richard Elster. This change was recommended in the 1993 Inspector General Report, which is Policy Item #26.)

In 1997, the Library revised the key issues and questions it needed to address to achieve its mission, to include: 1) How can the Library best identify and fully integrate its services and resources into the NPS mission? 2) How can the Library best "add value" to its resources? 3) How can the Library most effectively organize its staff and use its resources to accomplish its mission? And 4) How can the Library best strengthen interchange between its services/resources and faculty/students to ensure accurate and timely feedback to Library staff about departmental needs, changing curricula, user satisfaction, and concordance with the School’s overall mission and strategic direction?

Greater emphasis on collection development was also a recommendation of the Inspector General’s Report. As a result, the Library established twelve subject specialists from within its staff to liaison with the academic departments.

Although the total number of Library staff has basically remained constant since 1990, institutional organization has changed significantly. In 1994, Acquisitions was combined with Cataloging, Processing and Periodicals, and this integrated organization became Technical Services in 1996. Automation of monograph ordering using World Wide Web tools, use of the federal credit card to purchase monographs, and improved
FEDLINK services resolved many of the problems resulting from the dissolution of Blanket Purchase authority mentioned in the 1990 WAC Evaluation Report. Based on a declining use of resources in the Library’s Classified Reports area and the need to integrate public support services, Information Services absorbed the Classified Research Reports Division in early 1988.

The Library’s ongoing process of organizational evaluation, reflected in staffing decisions, is focused on both the changing environment within the Library and at the Naval Postgraduate School in general. This process has resulted in the creation of several new positions including a Government Documents Librarian, an Electronic Resources Librarian, a Computer Specialist in the Systems Office, additional Reference Librarians with specialization in science and technology, and an Interlibrary Loan/Document Delivery Librarian. Support staff positions have changed as well, from general clerk-typists to more diverse and specialized library technicians, providing for greater staff growth potential.

In 1997, the Library Director was authorized to manage the library’s labor budget. Prior to this, Library labor budgets were centrally managed by the administration. Library management of payroll to budget has removed artificial constraints instituted by the prior "manage to billet" system, which directed both the number and grade level of staff allowed. With this additional authority, the Library can both create new positions based on the changing environment and staff them within federal guidelines as long as allowed labor budget targets are met. The Library Director retains full control of the labor budget. As a result, in 1997, the Library was able to recover and apply toward the purchase of additional print and electronic resources over $100,000. The excess labor dollars resulted from difficult-to-fill library vacancies occurring the same year.

**Budget**

As reflected in Table 7, over the past ten years, the Library’s material budgets have not significantly increased. Library materials — books, periodicals, electronic resources and operating utilities such as RLIN and OCLC — have consistently represented between 75 percent and 88 percent of the resource budget. Judicious management of the Library’s material budget has minimized potential negative impacts on its resources and services.

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To maximize availability of resources, a paradigm shift in collection management was initiated in 1995, emphasizing electronic access to full-text documents over acquisition of print resources. This shift began with the purchase of indexing and abstracting tools using CD-ROMs and on-line databases, and with the expansion of World Wide Web Internet tools. The switch from NOTIS to the current client-server architecture also supported this changeover. With the exception of 1994, the portion of the Library’s budget devoted to purchasing access to electronic resources has steadily increased, from virtually nothing in 1992 to over $100,000 in 1998.

When possible, the Provost has shielded the Library from major budgetary cuts affecting the School. A full summary of the Library Operations (OPTAR) budget for 1991-98 is provided in Table 8.

### Table 8. NPS Knox Library operations (OPTAR) budget, 1991-98

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<td>26.3</td>
<td>37</td>
<td>20</td>
<td>15</td>
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<td>Travel</td>
<td>6.4</td>
<td>7.6</td>
<td>14.6</td>
<td>6</td>
<td>4.5</td>
<td>6</td>
<td>6</td>
<td>14</td>
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<tr>
<td>Registration/Training</td>
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<td>2.4</td>
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<td>3</td>
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<td>53.2</td>
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<td>43.3</td>
<td>57</td>
<td>55</td>
<td>44.1</td>
</tr>
<tr>
<td>Binding</td>
<td>4.3</td>
<td>5</td>
<td>29</td>
<td>14.4</td>
<td>21.7</td>
<td>8</td>
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<td>TOTAL BUDGET ($K)</td>
<td>861.5</td>
<td>997.3</td>
<td>1,044.2</td>
<td>960.2</td>
<td>1,048.2</td>
<td>1,047.7</td>
<td>1,084.3</td>
<td>1,072.0</td>
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</table>

**Facilities**
In 1994, a large remodeling project was completed which increased existing Library space by more than 40 percent. This project also modernized student study facilities, added a Secure Word Processing Facility to enable students to produce classified theses, and replaced some existing Library furniture. With remaining funds from the project, the Library upgraded user seating and student study spaces, and covered the cost of moving its collections to new shelving. In 1995, the Library deployed advanced technology to establish an Electronic Resources Room. Also in 1995, it allocated additional space for a map collection and for a special non-circulating collection of intelligence resources. Additional seating was provided in both the periodical and newspaper reading rooms. In 1996, the entire collection was shifted to provide improved access to library materials. Monographs are now on the second floor and journals on the first floor, with issues published prior to 1970 located in the basement.

Access Services / Automation

Major changes to the Library’s automated on-line catalog have also occurred over the past ten years. The 1990 WASC Library Self-Study discussed a planned conversion to a NOTIS OPAC for the general collection, along with conversion to a stand-alone STILAS system for the Classified Reports Division. Conversion of the SABIRS system to STILAS in the Classified area was completed in 1995. The next year, the Library acquired a second, much larger client-server system for its general collection. In early 1997, Web access to BOSUN became available. These technological advances enabled the Library to begin meeting its key goal of "delivering full-spectrum information resources to the desktop."

The Library is open for services seven days a week, 329 days a year, for an average of 89.5 hours per week. Hours are extended an additional two hours per day during finals week. The Library is closed on official federal holidays and reduces its hours during two-week breaks at Christmas and in the summer. In addition, numerous resources, including full text, index, and abstract tools, are available 24 hours a day, every day, through the Library’s on-line catalog.

Both the circulation of Library resources and volume of processed interlibrary loans have increased to support the NPS student population, as indicated by Tables 9, 10 and 11. Although the student population decreased over this period, the Library continues to support the full spectrum of academic programs taught at NPS.

<table>
<thead>
<tr>
<th>Tables 9 and 10. Circulation and interlibrary loans</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CIRCULATION</strong></td>
</tr>
<tr>
<td>Items Circulated</td>
</tr>
<tr>
<td>Reports Circulated</td>
</tr>
</tbody>
</table>
These tables reflect a 42 percent increase in the circulation of general collection materials between 1990 and 1996. At the same time, the circulation of classified materials decreased 8 percent, while the number of items borrowed through Interlibrary Loan increased 98 percent. In addition to the increased number of borrowed items, the Library has subsidized full-text document delivery of many periodical articles through UnCover. An on-going periodical use analysis combined with expanded document delivery and increased availability to students of full-text materials provides the basis for effective management of the Library’s periodical and serial resources.

**Reference/Instruction/Tours**

Reflecting an increase in the number of reference staff available to support students, the number of reference questions answered, as well as the complexity of questions, has increased 75 percent since 1990. Reference staff now accept questions through the Library’s website. A significant effort has also gone into organizing subject-specific resources, which can also be accessed through the website. The identified links and resources support the unique variety of curricula taught at NPS and have been widely used over the Internet.

Since new students begin at NPS each quarter, the Library’s reference staff provides general and subject-oriented informational tours and instruction on the use of selected resources (e.g., Lexis/Nexis). In 1997, over 238 students took advantage of these
services. Librarians are also available to provide this orientation in the classroom, when requested by a faculty member.

**Special Collections**

The Library is an established partial Federal Documents Depository with holdings now in the 25 percent range. Aggressive collection development in the Government Documents area has greatly benefited the research of some faculty and continues to support student thesis research efforts.

In 1996, Library staff began development of a map collection, which now contains over 1,800 topographic, nautical, and thematic maps from all over the world used by students in several NPS curricula, particularly by National Security Affairs students for assigned course work. The Library also continues to add to its established Buckley Collection, which highlights maritime and Naval history and includes some rare book materials.

**NPS Buildings and Facilities**

NPS occupies over 600 acres and includes academic buildings and laboratories, a military housing area, and some recreational facilities. Since the last WASC team visit, the NPS campus has undergone some significant changes and improvements. Most notable are the new buildings — Glasgow Hall that houses the Operations Research, Mathematics, National Security Affairs Departments and a Secure Compartmented Information Facility for classified teaching and research, the Mechanical Engineering Building, and the Mechanical Engineering Auditorium.

An expansion of the Library was also completed in 1994, increasing existing Library space by more than 40 percent. This project also modernized student study facilities, added a Secure Word Processing facility to enable students to produce classified theses, and replaced existing Library furniture. With remaining funds from the project, the Library upgraded user seating and student study spaces, and covered the cost of moving its collections to new shelving. In 1995, the Library also deployed advanced technology to establish an Electronic Resources Room.

In addition to the on-campus buildings that support academic life at NPS, several improvements have been made in other areas. With the closure of the Army base at Fort Ord, the Navy took over many of the housing units previously used by the Army. This acquisition increased the number of houses available for military students, staff and faculty to 1,196 in four residential areas. The two major areas, Fort Ord and La Mesa, include childcare facilities. Additionally, the Family Service Center which provides a wide range of support services including financial counseling, job placement, access to support groups and a wide variety of other services, has been moved to the family
housing area at La Mesa to provide easier access than previously for a large number of people. Just recently, the renovation of the fitness center was completed. It provides a variety of classes, fitness equipment and facilities in support of NPS students, faculty, staff, and their families.

The NPS academic buildings and facilities have a current plant value of approximately $58 million. However, there is a maintenance backlog on these buildings of almost $23 million, or about 40 percent of their current value. Many of the buildings are close to 40 years old and are therefore in great need of repair and/or replacement of their electrical and mechanical systems and roofing, require additional work to meet fire codes, and may need upgrade of their architectural structures. NPS and Naval Support Activity Monterey Bay have developed a Facilities Strategic Master Plan that prioritizes and plans for improvements to these buildings. Though funding levels are not adequate to completely eliminate the backlog, NPS is working with the Navy to gain additional funds. (The Facilities Strategic Master Plan is available as Background Item #27.)

**NPS RESPONSE TO 1990 WASC FINDINGS**

In this section, NPS presents its responses to the findings from the 1990 WASC visit. These concerns and findings were presented both in the letter sent by WASC to NPS and in the Report of the Team Visit. There is some overlap in the concerns; however, they are all listed in the order in which they appeared in the separate documents.

**Responses to Findings from the Letter from WASC to NPS**

1. **The Standard 3.A of the Commission requires that the ultimate policy making authority of an accredited institution be vested in a Board of Trustees that is both active and informed. Neither the institution’s self study nor the report of the visiting team provide assurance that the various board functions and responsibilities are carried out by the Graduate Education Review Board alone or by the Graduate Education Review Board in concert with the Graduate Education Review Group and the Board of Advisors.**

The role and responsibilities of the governing boards of the Naval Postgraduate School have undergone significant changes as a result of the last WASC visit for reaffirmation of accreditation. These changes have occurred as a result of changes within the Navy and in the needs of NPS. Together, the Graduate Education Review Board, a primarily military governing board, and the NPS Board of Advisors continue to fill the roles of a governing board, similar to a Board of Trustees. However, the responsibilities,
membership, and procedures of the groups have changed significantly over the last several years.

The role and missions of the Graduate Education Review Board and Board of Advisors are described in the Introduction to NPS at the beginning of this report. NPS and the Navy have taken the following steps since the last WASC visit:

- The composition of the Board of Advisors has undergone significant changes since 1990. Special consideration has been given to reduce military officer dominance and ensure a broader spectrum of expertise of the members of the Board. Although several of the members are retired military officers, they are also successful in second careers in industry and academia. It is believed that their knowledge of military matters, combined with their additional expertise in business and education, make them exceptional advisors for the Secretary of the Navy.
- In 1990, the WASC team noted that very few of the members of the Board of Advisors physically attended its meetings. NPS has since taken care to coordinate meetings of the Board to ensure that as many members attend as possible. Table 12 shows the composition of the Board in terms of military background (active or retired military officers) and gender, together with the attendance record of the last several meetings compared with the meeting in 1989.

### Table 12. Board of Advisor membership trends

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Members</strong></td>
<td>16</td>
<td>18</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td><strong>Prior/Current Military</strong></td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Members Attended</strong></td>
<td>8</td>
<td>15</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Military</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Percent Attended</strong></td>
<td>50%</td>
<td>83%</td>
<td>83%</td>
<td>94%</td>
</tr>
<tr>
<td>Military</td>
<td>75%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
New members of the Board of Advisors are invited to attend an orientation session prior to the next official meeting of the Board. Although these members are usually familiar with NPS and its mission, the orientation session is used to show them the campus, give them additional background information, and introduce them to some of the faculty and students.

In 1998, the Secretary of the Navy approved the addition of the Navy’s Director of Training, a vice admiral, as a member of the NPS Board of Advisors. Although this adds an additional military member to the Board, it is believed that the advantage outweighs any disadvantage and allows the two boards to better fulfill the roles and responsibilities of a governing board. This change was made on the recommendation of NPS to ensure that there was more coordination between the Graduate Education Review Board and the Board of Advisors. The Navy’s Director of Training is the resource sponsor for NPS, is a member of the Training Resources Board which makes budget decisions regarding NPS, and is a member of the Graduate Education Review Board. As such, the incumbent has a great deal of influence over funding for graduate education. As a member of the Board of Advisors, the Navy’s Director of Training hears different perspectives on NPS and graduate education that should be considered in making resource decisions. Similarly, since the Board of Advisors does not have the control over resources that a traditional Board of Trustees might have, the Navy’s Director of Training can provide insight into resource decisions and help focus the Board of Advisor’s influence.

At the same time, NPS has recommended to the Chief of Naval Operations that a member of the Board of Advisors be made a member of the Graduate Education Review Board, for the same reasons of coordination and perspective as discussed above.

The Graduate Education Review Board now meets twice annually to address issues of importance to NPS and graduate education in the Navy.

Recent Graduate Education Review Board meetings have focused on NPS resources, development of new curricula, the NPS Strategic Plan, reaffirmation of WASC accreditation, plans for distributed learning, and other issues that a Board of Trustees would normally address.

Volume III, Compliance, Standard 3 provides additional information on specific ways that the Graduate Education Review Board and Board of Advisors fulfill the role of the NPS governing board.
1. The newly revised Standards of the Commission place high priority on issues of racial and ethnic diversity. As reported by the team, the gender and racial composition of the student body reflect the composition of the Naval officer pool. The same diversity does not characterize the governing board, the administration, or the faculty.

The governing boards of NPS are the Graduate Education Review Board and the Board of Advisors. As both the Training Resources Board and the Graduate Education Review Board are comprised primarily of senior military officers assigned to the boards as a result of their positional authority and a stake in graduate education as a result of their position within the Navy, NPS has little control their composition. Efforts in the Navy to improve racial and gender diversity that began almost twenty years ago are just now being reflected in the senior leadership of the Navy and are therefore also being experienced by NPS. VADM Patricia Tracey, the Director of Naval Education and Training, and an active participant in both the Graduate Education Review Board and the Board of Advisors, is the highest-ranking female officer in the United States Navy. From 1995 through September of 1997, RADM Marsha Evans was Superintendent of NPS. Thus, for a short time, the two highest-ranking female officers in the Navy played a very active role in the governing and administration of NPS. The military officer corps is and has been recruiting minority officers and, as the officer population becomes more diverse, the composition of the Graduate Education Review Board and Training Resources Board will also reflect these changes.

NPS has more influence over the membership of the Board of Advisors as the members are appointed by the Secretary of the Navy, often upon recommendation of NPS. The ethnic and gender diversity of the Board of Advisors has also been addressed. In 1989, the single female member of the board was not present at the meeting. The board currently (1998) has two female members, with a third pending confirmation. VADM Tracey has also recently become a member of this board, although her membership is based upon her position within the Navy. All four female members of the Board attended the 1998 meeting.

In the area of gender diversity among the faculty, NPS has continued to increase the percentage of women on the faculty. Table 13 shows the total number of faculty, the number of women faculty, and the percentage of women faculty for each year since 1988.

Table 13. Number and percentage of women faculty at NPS (excluding Aviation Safety, DRMI and IDEA)
<table>
<thead>
<tr>
<th>Year</th>
<th>Faculty</th>
<th>Women</th>
<th>%</th>
<th>Year</th>
<th>Faculty</th>
<th>Women</th>
<th>%</th>
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<tr>
<td>1988</td>
<td>340</td>
<td>9</td>
<td>2.6</td>
<td>1994</td>
<td>354</td>
<td>27</td>
<td>7.6</td>
</tr>
<tr>
<td>1989</td>
<td>344</td>
<td>15</td>
<td>4.4</td>
<td>1995</td>
<td>353</td>
<td>27</td>
<td>7.6</td>
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<tr>
<td>1990</td>
<td>364</td>
<td>24</td>
<td>6.6</td>
<td>1996</td>
<td>369</td>
<td>33</td>
<td>8.9</td>
</tr>
<tr>
<td>1991</td>
<td>340</td>
<td>18</td>
<td>5.3</td>
<td>1997</td>
<td>369</td>
<td>34</td>
<td>9.2</td>
</tr>
<tr>
<td>1992</td>
<td>338</td>
<td>18</td>
<td>5.3</td>
<td>1998</td>
<td>353</td>
<td>33</td>
<td>9.3</td>
</tr>
<tr>
<td>1993</td>
<td>332</td>
<td>25</td>
<td>7.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

While the increase is not dramatic, it reflects the result of an on-going effort to recruit women faculty. It should be mentioned that many of the academic fields at NPS are ones not traditionally selected by women, hence the number of candidates available is not large.

Among tenured and tenure-track faculty, the number of women rose from 10 in 1993 to 14 in 1998. During that period, during which NPS actually reduced the number of tenure-track faculty, there were a total of 33 tenure-track hires. Among the 114 non-tenure-track faculty hired in that period, 12 were women.

With respect to ethnic and racial diversity among the faculty, NPS (including Aviation Safety, DRMI, and Institute for Defense Education Analysis (IDEA)) had 402 faculty in 1997 including 62 from racial minority groups. NPS continues to observe all EEO requirements and actively recruits minority faculty.

The academic administration of NPS is largely selected from the faculty. As the diversity of the faculty increases, the diversity of the administration should follow. Of note, the Director of the Library, the Director of Human Resources, and the Comptroller are female and are active members of many of the decision-making bodies at the School.

An annual workforce profile for NPS and Naval Support Activity Monterey Bay compiled by the EEO office at the School provides further information and is available in the reference material provided (as Assessment #29.)

2. The heavy course loads carried by the students may not allow them sufficient time for thoughtful analysis of the content of their courses. The team reports that it is not at all clear that research and professional training experiences are
fully integrated into the educational programs, nor that course requirements call for the heavy use of primary sources.

It is generally accepted that the students at NPS are older, more mature students who are working professionals accustomed to the rigors of a demanding career. Accordingly, they are better prepared for the challenges of academic life and better able to manage their time and energy than a typical graduate student. However, in an effort to reduce student average course loads, the Academic Council enacted the following policy:

"6.5 Course Enrollment Limitations (Approved April 13, 1994)

Without special permission, a student may enroll for no more than 17 total credit hours or more than four 3000-level and/or 4000-level courses per quarter.

A student may enroll in more than 17 and less than 21 total credit hours with explicit permission of the Associate Provost for Instruction, and for more than 21 hours only with explicit permission of the Provost.

If an established degree program’s course matrix includes a quarter with more than 17 hours, the students in the program need not apply for a course enrollment limitation waiver. This limit is automatically waived in these cases."

With regard to the integration of research and professional training experiences into educational programs, NPS relies heavily on the curricular review process, on faculty research, on the maturity and experience levels of the students, and on the thesis process to ensure that this integration takes place. The Educational Skill Requirements are developed by the sponsors and NPS faculty and reflect both the academic skills required and the applications of those skills to military problems. Most of the upper-division courses make extensive use of military examples and case studies. Almost all students are required to complete a thesis as part of their graduate program. The emphasis on thesis topic selection is on real-world military problems. Many faculty involve thesis students in their sponsored research work. The Library contains primary sources required by all NPS disciplines, and both faculty and students make use of these sources as needed.

3. The team questions whether some classes in certain departments have become too large for quality instruction at the graduate level.

Part of this problem has been eased by the downsizing of U.S. Naval forces resulting in a decline of average on board (AOB) from 1,673 (1989) to 1,346 (1998). The average class size for classes with more than five students has thus been reduced from 18 (1989) to 16 (1998) students. Additionally, in 1989, 19% of
classes had more than 25 students, compared to 11% in 1998. At the same time, there has been no significant change in the total number of NPS classes taught, nor in the average number taught per quarter, over the same 1989-1998 time period.

4. A large proportion of NPS students succeed in completing their degrees and the School has a good system for evaluating subsequent job performance in the Navy. However, it is not clear that this information is used at an institution-wide level to review academic programs or to guide changes.

The curricular review process is the primary source of program review for NPS. Individual curricula and programs are reviewed with the Primary Consultants. Additionally, on an institution-wide basis, NPS has addressed the concern in several ways. The most dramatic way involves two initiatives NPS has been working on for several years.

The first is to develop a curriculum designed for Navy Unrestricted Line officers, the warfighters of the Navy, along with the warfighters from the other services. This new curriculum will provide these officers with an education that will be relevant to their primary military occupations. The need was identified by faculty members working with Naval and Joint commands based on the Navy’s inability to send such officers to graduate education programs in the numbers required to ensure a sufficient pool of officers. Demand for these officers in their primary occupational fields is so great that they have limited opportunity to work outside of them. This curriculum, referred to as the Unrestricted Line Curriculum, will result in an M.S. degree in Systems Engineering or a related area. It is further described in the section of this report called New Programs and Directions for NPS Academic Programs.

The second initiative — development of the Information, Strategy and Operations and related curricula — is also described earlier in this report. Again, this curriculum is designed in direct response to Navy needs.

Other ways that NPS is addressing this concern involve internal processes. Part of the curricular review process that occurs every two years for each curricular program includes a review of the jobs or billets that the graduates of the program are supposed to fill. Although the Primary Consultant has responsibility for this review, NPS is often involved in the review process. Curriculum Officers and Academic Associates review the job descriptions along with the Primary Consultant. The results are used to modify the Educational Skill Requirements. To strengthen this process even further, the School instituted an Internal Curriculum Review process, which occurs about six months prior to the formal biennial Curriculum Review. In the Internal Curriculum Review process, student
utilization rates and input quotas are carefully analyzed together with their potential impacts on the curriculum.

Additionally, two new surveys have been developed. The first is of NPS alumni Naval officers to be administered at one, three and five years after graduation. The second survey will be sent to the commanding officers of those same officers. These surveys are designed to assess how an officer’s educational experience at NPS has affected his or her performance in subsequent assignments. It is intended that the results of these surveys will become part of the Internal Curriculum Review process. (See Assessment #43.)

The NPS Strategic Initiatives on the Revolution in Military Affairs and the DoD University of the Future also describe ways that NPS is changing on an institution wide level based on the needs of the Navy.

5. The team reports that there is little evidence of the integration of the comprehensive plan for physical and financial resources with the academic goals and objectives of the School.

A key part of the NPS Strategic Planning process has centered around the need for NPS to integrate resources, plans, and facilities with academic objectives. Two Strategic Initiatives address this concern. One highlights the need for obtaining necessary resources and the other for ensuring a balance between current operations and reinvestment. Volume II contains a complete description of these initiatives and how NPS is attempting to address this concern.

Naval Support Activity Monterey Bay has become much more focused than previously on long-range facilities planning and on balancing infrastructure investment needs against current projects and is developing a long-range facilities plan. The Facilities Strategic Master Plan (Background Item #27) provides more detail on the integration of academic objectives.

With the establishment of the Naval Support Activity Monterey Bay, NPS also designated a single point of contact for interaction with Naval Support Activity Monterey Bay on support issues that impact the School’s academic mission or structure. This contact is the Director of Academic Planning. The Director and his staff work closely with the Provost and Deans, and with Naval Support Activity Monterey Bay, to integrate facilities planning with academic plans.

6. There are deficiencies in funding for equipment repair and maintenance as well as in support for the library. These two problems reflect the larger reality that there has been a substantial depletion in non-personnel budgets in recent years.
This issue is also addressed in Volume II in the report on Strategic Initiatives on resources. As described earlier in this report, NPS funding is provided as part of the Department of Defense and Navy budget process. NPS has made a concerted effort to represent the needs of the library and laboratories and to ensure funding for these important resources. Since the last WASC visit, two specific accounts have been established for equipment repair and maintenance. For the two accounts together, the amount is about $400,000 annually.

The NPS academic buildings and facilities have a current plant value of about $58 million. However, there is a maintenance backlog on the buildings of almost $23 million, or about 40 percent of the current value. Many of the buildings are close to 40 years old and therefore are in great need of repair or replacement of electrical and mechanical systems, roofs, fire code requirements, and architectural structures. NPS and the Naval Support Activity Monterey Bay have developed a Facilities Strategic Master Plan that prioritizes and plans for improvements to the buildings. Funding levels are not adequate to completely eliminate the backlog; however, NPS is working with the Navy to gain additional funds and to look for innovative ways to offset costs. (See the Facilities Strategic Master Plan, Background Item #27.)

Figure 7 shows historical and projected real property maintenance. While Figure 8 gives the more complete picture of how historical and projected funding levels for academics (Mission), base support (OBOS), and maintenance of real property (RPM) contribute to the overall funding picture. Of note, the Mission line includes $5.5 million in 1997 for a computer network and laboratories, and $1.7 million in 1998 for the laboratories and the library. For the years 2000 and 2001, mission funding includes $2.55 million to $3 million for distributed learning course development.
Laboratory Funding

As part of its long-range planning process, projecting seven to eight years into the future, NPS determines the requirements for laboratory upgrades and new laboratory development. This process, while not new, is still not well understood by faculty. The Navy insists on well-defined requirements before committing any funding for laboratories, a requirement that extends throughout the service’s own seven- to eight-year planning horizon. And because requirements for some NPS labs are not well defined, the labs do not compete well in the overall funding of the federal government. To address this problem, the School needs to clarify and clearly define the requirements for each of its laboratories, eliminating functional redundancies where appropriate.

In recent years, as funding levels were transitioned from one account (Other Procurement, Navy) to another (Operation and Maintenance, Navy), the Navy failed to also migrate funding for laboratories. Today, the NPS requirements have been reinstated and funding for labs has been partially restored. But because of the reduced level of overall funding and the need to maximize savings, major laboratory-related funding decisions are made on a campus-wide basis. This process leads to conflict, with some departments maintaining that the decisions should be made at the individual department level.

Efforts are ongoing to identify new methods of upgrading, combining or eliminating labs. In some cases, support for labs has been consolidated, resulting in savings. Other efforts include increasing the joint use of research and instructional laboratory equipment, as well as seeking help from the NPS
Foundation to obtain funding and equipment donations from industry and other government agencies.

The question is: How does the School establish criteria to prioritize competing departmental laboratory plans, especially when the traditional laboratory budget planning process typically lacks clear and measurable criteria? Because of the lack of such criteria, some potential advantages of School-wide planning have not yet been realized, and some economies of scale have been difficult to visualize and achieve.

Given that credible final priorities are difficult to determine and justify, the School’s actual laboratory plan is traditionally determined through negotiations between Division Deans and Department Chairs. Typically, the departmental operating (OPTAR) budget for current operations is released for expenditure at the beginning of the fiscal year, while funds are withheld for new initiatives and laboratory investment. After School-wide requirements have been considered, the withheld funds are released to department chairs who arbitrate the competing faculty needs and interests.

In recent years, as a result of an increased emphasis on campus-wide laboratory planning, more and more accurate Laboratory Development Plans have been communicated to NPS decision makers. The latest of these plans, the FY2000-05 Lab Plan (see Assessment #2), includes a new laboratory classification based on the level of support a lab provides to a specific curriculum and to students’ coursework. Armed with comparative information about its labs, NPS is now able to rank requirements in terms of "most impact to curriculum and students" with a higher degree of certainty than ever before. Funding priorities can also now be established on a campus-wide basis with a new degree of confidence.

**Library Funding**

Funding for the library was discussed in detail earlier in this report. Some areas will be highlighted again here to address this specific concern from the last WASC visit.

Although the total number of library staff has basically remained constant since 1990, institutional organization has changed significantly. In 1997, the Library Director was authorized to manage the library’s labor budget. Prior to this, library labor budgets were centrally managed by the administration. Library management of payroll to budget has removed artificial constraints instituted by the prior "manage to billet" system, which directed both the number and grade level of staff allowed. With this additional authority, the library can create new positions based on the changing environment and staff them within federal
guidelines as long as allowed labor budget targets are met. The Library Director retains full control of the labor budget.

As reflected in Table 14, over the past ten years, the library’s material budgets have not significantly increased. Library materials — books, periodicals, electronic resources, and operating utilities such as RLIN and OCLC — have consistently represented between 75 percent and 88 percent of the resource budget. Judicious management of the library’s material budget has minimized potential negative impacts on its resources and services.

Table 14. Library material budget as a percentage of total resource budget, 1991-98

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<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Books</td>
<td>17%</td>
<td>21%</td>
<td>21%</td>
<td>18%</td>
<td>27%</td>
<td>25%</td>
<td>28%</td>
<td>26%</td>
</tr>
<tr>
<td>Periodicals</td>
<td>59%</td>
<td>54%</td>
<td>47%</td>
<td>71%</td>
<td>61%</td>
<td>59%</td>
<td>58%</td>
<td>55%</td>
</tr>
<tr>
<td>Utilities</td>
<td>9%</td>
<td>6%</td>
<td>10%</td>
<td>9%</td>
<td>7%</td>
<td>5%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Electronic Resources</td>
<td>0%</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
<td>5%</td>
<td>11%</td>
<td>10%</td>
<td>16%</td>
</tr>
<tr>
<td>Mat % total</td>
<td>85%</td>
<td>81%</td>
<td>80%</td>
<td>77%</td>
<td>75%</td>
<td>81%</td>
<td>75%</td>
<td>88%</td>
</tr>
<tr>
<td><strong>Budget $K</strong></td>
<td>$861.5</td>
<td>$997.3</td>
<td>$1,044.2</td>
<td>$960.2</td>
<td>$1,048.2</td>
<td>$1,054.2</td>
<td>$1,176.2</td>
<td>$1,072.5</td>
</tr>
</tbody>
</table>

To maximize availability of resources, a paradigm shift in collection management was initiated in 1995, emphasizing electronic access to full-text documents over acquisition of print resources. This shift began with the purchase of indexing and abstracting tools using CD-ROMs and on-line databases, together with the expansion of World Wide Web Internet tools. The switch from NOTIS to the current client-server architecture also supported this changeover. With the exception of 1994, the portion of the library’s budget devoted to purchasing access to electronic resources has steadily increased, from virtually nothing in 1992 to over $100,000 in 1998.

When possible, the Provost has shielded the library from major budgetary cuts affecting the School. A full summary of the library operations (OPTAR) budget for 1991-98 is given in Table 15.

Table 15. NPS Knox Library operations (OPTAR) budget, 1991-98

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Books</td>
<td>144.4</td>
<td>214.4</td>
<td>218.5</td>
<td>136.4</td>
<td>209.7</td>
<td>215</td>
<td>200</td>
<td>225</td>
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<tr>
<td>Periodicals</td>
<td>509.8</td>
<td>539.3</td>
<td>487</td>
<td>524.5</td>
<td>478.9</td>
<td>500</td>
<td>520</td>
<td>520</td>
</tr>
<tr>
<td>Utilities</td>
<td>75</td>
<td>63</td>
<td>106.7</td>
<td>66.7</td>
<td>56.6</td>
<td>40</td>
<td>45</td>
<td>36</td>
</tr>
</tbody>
</table>
7. Of particular concern to the visiting team was the apparent lack of planning to cope with possibly dramatic changes in the level of federal funding for the School.

NPS has strengthened its planning processes considerably since the last visit by the WASC Accreditation team. Most notably, NPS has adopted a Strategic Plan that acknowledges that the federal funding for the School continues to fluctuate from year to year. The plan emphasizes the need for NPS to find resources through reinvention or reengineering of current processes, identifying new markets and developing new products, and sizing both the academic and the support structures according to the expected level of funding. NPS has also addressed such concerns with its new resource sponsor, the Director of Training, and with both the Graduate Education Review Board and Board of Advisors. NPS has worked with these groups to prioritize a spending plan and ensure such necessities as the library and laboratories receive sufficient funding. Additionally, the Academic Planning Office was formed to ensure that NPS is prepared to cope with actual and projected changes in mission funding. This office, working with the Academic Deans and Department and Group Chairs, is looking for ways to reduce the number of faculty and staff, prioritize funding, and develop efficiencies in the way NPS operates.

The 1990 WASC report to NPS recommended a careful examination of support functions and how procedures should be studied to find ways to decrease obstacles and manpower and thereby improve effectiveness and efficiency. The WASC commission also commented on how some departments have established

<table>
<thead>
<tr>
<th>Electronic Resources</th>
<th>0</th>
<th>0</th>
<th>21.4</th>
<th>14.3</th>
<th>38</th>
<th>92</th>
<th>110</th>
<th>113</th>
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</thead>
<tbody>
<tr>
<td>Interlibrary Loan</td>
<td>3.2</td>
<td>3.7</td>
<td>4.7</td>
<td>3.2</td>
<td>3.8</td>
<td>6</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Equipment Purchase</td>
<td>3.8</td>
<td>0.8</td>
<td>12</td>
<td>12.9</td>
<td>23</td>
<td>31</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>Rental</td>
<td>1</td>
<td>1.5</td>
<td>1</td>
<td>1.2</td>
<td>0.2</td>
<td>0.03</td>
<td>0</td>
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</tr>
<tr>
<td>Repair/Maintenance</td>
<td>22.1</td>
<td>25.5</td>
<td>17.2</td>
<td>18</td>
<td>69.4</td>
<td>15</td>
<td>40</td>
<td>17</td>
</tr>
<tr>
<td>Supplies</td>
<td>17.4</td>
<td>20.2</td>
<td>21.1</td>
<td>26.3</td>
<td>37</td>
<td>20</td>
<td>15</td>
<td>13.5</td>
</tr>
<tr>
<td>Travel</td>
<td>6.4</td>
<td>7.6</td>
<td>14.6</td>
<td>6</td>
<td>4.5</td>
<td>6</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Registration/Training</td>
<td>3</td>
<td>2.4</td>
<td>15.8</td>
<td>3.2</td>
<td>4.3</td>
<td>3</td>
<td>4</td>
<td>6.2</td>
</tr>
<tr>
<td>Moving</td>
<td>0</td>
<td>28.2</td>
<td>6.7</td>
<td>3</td>
<td>2.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1</td>
<td>0.2</td>
<td>2.1</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>9.1</td>
<td>12.9</td>
</tr>
<tr>
<td>FEDLINK Fees</td>
<td>25.9</td>
<td>38.1</td>
<td>44.1</td>
<td>76.2</td>
<td>55</td>
<td>54.7</td>
<td>53.2</td>
<td>47.3</td>
</tr>
<tr>
<td>Software Maintenance</td>
<td>44.2</td>
<td>47.4</td>
<td>42.3</td>
<td>43.9</td>
<td>43.3</td>
<td>57</td>
<td>55</td>
<td>44.1</td>
</tr>
<tr>
<td>Binding</td>
<td>4.3</td>
<td>5</td>
<td>29</td>
<td>14.4</td>
<td>21.7</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL BUDGET ($K)</td>
<td>861.5</td>
<td>997.3</td>
<td>1,044.2</td>
<td>960.2</td>
<td>1,048.2</td>
<td>1,047.7</td>
<td>1,084.3</td>
<td>1,072.0</td>
</tr>
</tbody>
</table>
positions devoted almost entirely to shepherding single matters through the system. They further stated that this procedure is highly duplicative, resulting in expenditures that could meet higher priority needs, and that a careful examination of some of these support functions could be undertaken to find ways to decrease bureaucratic and administrative impediments and improve effectiveness and efficiency of support functions.

As a way to examine support costs, NPS conducted the "Glasgow Experiment" in a single academic building. The Glasgow Support Center was established on November 9, 1997, to provide administrative and information technology support to the Mathematics, National Security Affairs, and Operations Research Departments. Prior to that date, Glasgow Hall staff were assigned to a specific department. With the reorganization, these staff were reassigned to the Glasgow Support Center.

The purpose of this consolidation was to improve cost effectiveness and reduce the duplication of work, and there has been progress in that direction. Initially three computer specialist billets were forfeited, resulting in an immediate savings of between $150,000 and $190,000. Through consolidation of travel, supply, and editorial duties, there is now better workload distribution, which has increased efficiency by reducing overlap. An expert performs each task. The customer has also been empowered since, for many of the departments, resources are now available that were not before. Any faculty, staff, or student can now go anywhere in Glasgow Hall to use a copier or get technical or clerical support. This change has also improved communication of support needs and allowed for further transition from three distinct departments to a support "center".

In addition, a further redistribution of accounting responsibilities will occur, so that department accounts are properly managed. This more managed accounting process will save both time and money. It is also expected that, with continuous evaluation of the consolidation, at least one administrative billet will be eliminated for a savings of approximately $45,000 annually.

Clearly, with the consolidation of the staff of Glasgow Hall, NPS has made significant strides towards the 1990 WASC recommendation to improve the efficiency and effectiveness of support functions.

**Concerns From The Summary And Recommendations In The WASC Team Visit Report**

The last report stated, "The team recognizes NPS as a unique and non-traditional institution trying to meet Navy needs for its officer corps by offering an array of graduate curricula as an accredited institution. To do so requires a complex
balancing act of Department of Navy leadership, NPS leadership and a highly qualified faculty able to deliver excellent graduate and research programs.

Currently, all three ingredients are present. The team was especially impressed with the caliber of the faculty. Overall, NPS has assembled a very capable faculty who are effective as graduate teachers, but who also maintain a significant program of scholarship and research consistent with the NPS mission of graduate education and research.

As the previous sections of this report discuss, there were a number of areas of concern and recommendation. These are listed herewith as a summary of items the institution should consider as it strives to improve. Clearly, some of these points are more significant than others, but no attempt has been made to prioritize them. They generally are in the order of appearance in the body of the report with those marked with an asterisk (*) deemed more important than the others."

1. * Increased efforts to improve the ethnic and gender diversity of the administration, staff, and faculty are required.

   See response to Issue 2 above.

2. The makeup of the Board of Advisors should be reconsidered as new appointments are made to reduce military officer dominance, add academic expertise (dean of science or engineering and/or provost), and add ethnic and gender diversity in the Board of Advisors.

   See response to Issue 1 above.

3. * A careful examination of support functions (including maintenance and repair of equipment) and procedures should be undertaken to find ways to reduce obstacles, reduce manpower resources of departments devoted to bureaucratic functions, and thereby improve the effectiveness and efficiency of NPS. To support this review, a comparison should be made of civilian, non-faculty staffing levels with other comparable educational institutions to assess significant inefficiencies due to cumbersome processes locally and in the federal government.

   This concern is reflected in the NPS Strategic Initiative on increasing efficiency and effectiveness of NPS. Reinvention/reengineering activities have addressed a number of management and support functions within NPS. Some of the areas addressed include travel, supply (credit card system), computer support, commercial activities/outsourcing, student academic support, financial management information system automation, the quality of NPS’ internal
communications system, public works project management and scheduling, electronic thesis publishing, and research materials support for faculty, staff and students.

The Institute for Defense Education and Analysis (IDEA) is essentially an experiment in the future of NPS. The funding for IDEA is entirely reimbursable. Its goal is to seek ways to make NPS increasingly effective and to expand the reach and impact of the School. One of IDEA’s major activities has been the pursuit of distance learning and ways to make the delivery of NPS educational materials more efficient than currently.

NPS is also currently involved with another overall government trend — the move to outsource and/or privatize appropriate functions. Portions of NPS and the supporting command operations are currently under review as possibilities.

4. **The substantial increase in the number of large classes and high student course loads should be addressed as to their impact on the quality of the programs offered at NPS. Inadequate numbers of faculty in some areas, e.g., Electrical and Computer Engineering, ought to be addressed in this connection.**

See responses to Issues 3 and 4 above.

5. **In the examination of incentives for faculty, participation in interdisciplinary efforts should be addressed.**

The Naval Postgraduate School is a unique institution, in that it must satisfy the needs of its students and Primary Consultants — Navy providers of money for specific curricula — in both conventional scholarship and military relevance. Therefore, NPS must have a faculty capable in both areas. For many years, NPS has articulated this requirement as the need for a portfolio of faculty members with varied skills. This portfolio view was explicitly endorsed in a 1987 Faculty committee report. A copy of that report, the "Final Report of the Ad Hoc Committee on Faculty Activities, Incentives, and Evaluations," is available to the Accreditation Team as Policy Item #49.

Ideally, every faculty member would be both a distinguished scholar and a military expert. While there are some who combine those two qualities, it is unrealistic to expect everyone to do so. Most faculty are recruited from the traditional scholarly community and so may know little or nothing about military matters upon arrival. All must develop sufficient knowledge of the military relevance of their disciplines to present their subjects in a way that makes students see the relation of their studies to their military careers. That level of knowledge, however, does not make faculty military experts. Thus, it is necessary to have some faculty members whose primary expertise is
in national defense, even though their scholarly backgrounds may not be comparable to those of conventional academics.

This need for a diverse faculty is reflected in the promotion and tenure process at NPS. While there may not be explicit incentives to become involved in inter-disciplinary activities, the overall incentive system tends to move faculty in that direction.

As part of the faculty development needed to keep faculty current in their research areas and support research of importance to the Navy, NPS does provide limited internal funding of faculty research. These funds have necessarily diminished while NPS protects teaching requirements, but they represent the School’s commitment to the future through faculty development. In FY99, approximately twenty work-years of research will be internally funded.

The central issue affecting institutionally supported incentives to increase efficiency and effectiveness of the School is resource availability. Currently, there are very limited resources available to fund incentives for faculty and staff to work toward increasing the efficiency and effectiveness of NPS. Nevertheless, there are a number of primary internal sources of funding for efforts to increase participation in interdisciplinary activities.

- The first is a resource pool controlled by the Provost. This pool is normally sufficient to fund two faculty work-years each year. In 1997, a typical year, faculty labor totaled 325 work years, of which 120 were reimbursable and 205 were paid for from the School’s operating budget. The two work-years allocated to the Provost’s resource pool therefore represent less than 1% of the total faculty labor executed.
- The second is funding from Congress for the Institute for Joint Warfare Analysis. The mission of the Institute for Joint Warfare Analysis is to promote and support research and instruction at NPS and to enhance the capabilities of the School’s faculty and staff to participate in Joint programs ("Joint" referring to the several military services). The Institute supports Joint related course development for all curricula on campus. The Congress has funded this effort at approximately $1.7 million dollars.
- The third is funding that can be brought together from various School funds to support the pursuit of new ideas, at the discretion of the Provost and Deans.

1. * Improve the direct funding system for research by establishing a better balance between direct funding levels and reimbursable funds; and re-visit the process for allocating direct funding. 
The Long-Range Mission Labor Plan provided as Table 6 earlier in this report shows the balance between direct and reimbursable funded workyears and highlights the trend away from direct toward reimbursable funding over the last several years.

All tenure-track faculty are expected to be active in both instruction and research. NPS has a policy that not more than 50% of a permanent faculty member’s academic session (10 months) can be spent on research. Approximately forty-two percent (42%) of tenure-track faculty time on a yearly basis is spent on research. Non tenure-track/research faculty are also an important part of the NPS research program; approximately one-third of our faculty are devoted entirely to research.

The NPS Institutionally Funded Research, formally the Direct Funded Research program continues to provide initial support to new faculty to help them establish their research programs. It now also provides support for major new interdisciplinary initiatives, enhances productive research that is reimbursably sponsored, contributes to the re-capitalization of major scientific research equipment, and cost-shares the support of a strong post-doctoral program. The Dean of Research along with the Research Board, consisting of representatives from each academic department and group, as well as a Faculty Council representative, evaluates all internally funded research to help ensure its quality.

2. **Reconsider the secret nature of the annual bonus system.**

There is no longer an annual faculty bonus system.

3. **Consideration needs to be given to increased support to the library in several areas: increased and upgrading of staffing to include a change of ratio and improved service during evening and weekend hours; increased space by the construction of long planned and funded addition; improved procurement procedures for greater manpower efficiency and more responsive processing of current requests; and funding for the completion of the new on-line system.**

See response to Issue 7 above.

4. **The assessment processes of English proficiency for international students and the implementation of instruction for those admitted without sufficient proficiency should be considered.**

International officers are now required to take two courses to assist in English proficiency and orientation to the United States. The courses are described below:
**IT1500 INFORMATION PROGRAM SEMINAR FOR INTERNATIONAL OFFICERS**

This course provides international students with an awareness and functional understanding of internationally recognized human rights and the American democratic way of life. Areas of emphasis introduced during the seminar include civil-military relations, human rights, relationships in a democratic society, and a comparative look at the U.S. free enterprise system.

**IT1600 COMMUNICATION SKILLS FOR INTERNATIONAL OFFICERS**

This course is designed to increase the student’s ability and comprehension in communicating effectively in written and spoken English through guided practice and individual exercises. Introduction to the core concepts of communication and to the difference between effective and ineffective writing. Primary emphasis is on improving the student’s functional writing skills, especially those that will help the student write reports, term papers, and a thesis.

5. As the administration establishes an Institutional Research Office, a standardized assessment of student learning outcomes ought to be considered; and redundancy in the student information system should be reduced.

The Institutional Research Office was absorbed by a combination of the Office of Education Analysis in the office of the Associate Provost for Instruction and the Academic Planning Office. The Office of Education Analysis has primarily concentrated on assessment of student satisfaction and teaching effectiveness as measured through the Student Opinion Forms. The Academic Planning Office has worked to develop a long range mission plan. NPS has also concentrated on the development of new curricula to meet the needs of the Navy and on the Navy’s measurement of effectiveness of its graduate programs, that is, retention and promotion of officers. This is still an area of concern for NPS and one that needs further development. It is hoped that some of the work of the Assessment Task Group can be used to this end. Additionally, NPS has re-developed an alumni survey that should provide some general feedback and guidance to further enhance the area of student learning outcome assessment.

The chief learning outcome for NPS is the Master’s thesis. All curricular programs — with the exception of Civil-Military Relations and International Security — require students to write an acceptable Master’s thesis. (A thesis is optional for Civil-Military Relations, as approved by the Academic Council.) The purpose of the thesis is for a student to demonstrate individual initiative and creativity in applying the skills and knowledge gained from his or her program.
Theses typically are highly Department of Defense relevant, and some carry a SECRET classification. The thesis topic is determined by the student working closely with his or her thesis advisor(s), usually one year prior to the expected graduation date.

6. * Comprehensive plans for physical and financial resources should be more extensively integrated with the academic goals and objectives of NPS.

See response to Issue 6 above.

7. * Routine financial reporting should be developed at an intermediate level of summarization to display the trend of expenditures by function (Handbook for Accreditation, pp. 86-87), to assist in planning and to permit comparisons with other educational institutions.

The report on Strategic Initiatives 5 and 6 provides some insight into expenditures at this level.

**FUTURE DIRECTIONS FOR NPS**

The twenty-first century promises to be an exciting and challenging one for the United States Navy. It will be dominated by their responsibilities as America’s principal forward-deployed force, and by the ever-increasing technological sophistication of the world environment.

The Navy is and will continue to be critically dependent on the quality of its people – on their knowledge and skills and on their ability to lead and to innovate in fulfilling their challenging and diverse missions. The Navy has an increasing need for officers who can comprehend the potential for warfighting that new technologies bring, understand both the opportunities and limitations of the new technologies, choose among competing technical avenues and critically assess and lead technological developments.

In 1997, the Naval Studies Board sponsored a study on Technology for the United States Navy 2000-2035. The section on Human Resources recommended that the United States Navy should make education for officers an essential part of career development, especially education in science and engineering. They noted that graduate education is a generator of future readiness with a high rate of return but that the Navy may not value sufficiently the problem-solving potential represented in substantive graduate programs in technology, engineering, and science. They also made the observation that courses of study available at US (civilian) universities are poorly matched with Navy needs as faculty and students tend toward the exotic and theoretical at the expense of the practical applied sciences needed for naval operations.
The Navy is responding to this challenge. It recognizes that the time to devote resources to obtaining graduate education is when the nation is at peace and is committed to providing its officers the opportunity to obtain graduate education. However, there are also many demands on the resources of the Navy, especially on its people, the most important resource. Officers are called upon to do more with less, to give of themselves and to strive for excellence in all that they do. They are needed to fill critical positions that support the primary missions of the service. They are also asked to meet many milestones as requirements for success and promotion as they progress through their careers.

This represents a unique challenge for the Naval Postgraduate School. NPS is at a critical point in its history and for its future. NPS must continue to define and refine the role that it will play for the United States Navy and the other military services and must figure out how to meet the needs of the Navy and our other customer in these times of change. In defining our role in the future, we must not only consider what is good for NPS, we must also consider what is right for our nation and our Navy.

The self-study that we have just completed is an invaluable part of this definition of our role for the future and was a valuable experience for NPS. We were able to evaluate our mission and the strategic initiatives that structure the way we are executing that mission. It provided for us a great number of insights into the perceptions of those who work and teach here on a day-to-day basis. It broadened our perspective on how each strategic initiative impacts the campus, and gave us some provocative ideas for changing both what we do and how we evaluate ourselves in terms of our mission.

The Strategic Planning process has continued at NPS even while the self-study was underway. Preliminary findings from the study have been incorporated into the process and into our actions and initiatives. We will continue to use the results of the Task Group reports and to focus on their results, observations and recommendations as we proceed with our Plan.

One of the key themes that emerged from the self-study was that our Strategic Planning Process needs improvement. This came as no great surprise to us, rather it was what we sensed prior to the self-study and what motivated us to center our study around the Strategic Plan. What we have concluded from the insights provided by the Task Groups is that the Plan itself is essentially sound, but it requires greater definition and better defined links to resources in order for it to become something that has large-scale acceptance by every member of the university. Thus, our first objective is to link resources to the plan. We have started that process on several levels. First, the Planning Board is in the process of developing performance measures and annual performance plans for each of the Strategic Initiatives. Secondly, we have looked at three areas that have significant impact on our ability to deliver graduate education and developed plans for ensuring that we have sufficient resources to sustain quality in those areas and
plans to effectively administer funding. The areas are the library, the laboratories and the facilities. Lastly, but perhaps most importantly, we are considering ways to partner with other universities, government organizations and industry to leverage our resources and to enhance the value of NPS and the education that we deliver.

Communication, both within NPS and to our customers, alumni and friends is also something that we are focusing on as a means to address the themes that emerged from the self-study. We are working on effective communication through attainment of better equipment and hardware to facilitate communications. We are also addressing effective communication by ensuring that people have the information that they need to work and thrive in the NPS environment, that our customers can reach us when they need to, and that we are listening and responding to their issues and concerns.

One area critical to effective communication is a local-area network that links all parts of the campus that is now in place at NPS. Internally, we have tried to make information about policies, procedures, events and issues of concern readily available to anyone who wants the information. We have done so through meetings with the faculty, staff and students, through an intra-campus web page that makes information available to all who want to read it, and from a concentrated effort to bring everyone into discussions about the direction in which the School is headed.

In order to meet our supporters, alumni and customers needs, NPS has embarked upon a strategy that takes the leadership of NPS to these people, rather than making them come to us. The Superintendent, along with the Academic Deans, has made several trips to areas where there are high concentrations of Navy officers working in their operational commands. We have both talked about the existing programs and new initiatives in education that NPS is involved with, and they have listened to the needs, concerns and issues of commanding officers in those areas.

Another key area of concern is the development and evaluation of different pedagogies for delivery of graduate education. This is clearly critical to meeting the needs of the Navy as it emphasizes education for its officers and critical to the success of NPS in meeting those needs. Thus, the NPS Planning Board has chosen to focus on the Strategic Initiative to make NPS the technologically-integrated DoD university of the future. The work of the Task Group that studied this initiative is being used extensively by the Planning Board as they develop performance measures and a resource plan. Additionally, many departments around campus continue to explore video-teleconferencing, internet-based courses, development of modular courses, and other means of delivering education. NPS has established a Distributed Learning Council to provide guidance, develop policies and procedures, and assist departments with evaluation of these different ways to enhance learning.
The results of the NPS self-study also highlight the need for both the Navy and NPS to invest in its intellectual capital in order to maintain quality. The Navy’s renewed interest and support for education is both a positive step in this direction and an impetus for NPS to re-double our efforts in this area. NPS must continue to provide high-quality education and must have the faculty, the resources and the initiative to do so. Our efforts in development and evaluation of different delivery methods will certainly contribute to this investment. So, too, does our development of two new curricula for Naval officers that are described in this report. We also again turn here to our initiatives in partnering with other universities and organizations in order to achieve this goal. We look to leverage our own capabilities and to work with others to enhance the value of NPS to the Navy. We also seek to enhance the value of our partners and to create better organizations achieved by sharing strengths and combining efforts to create efficiencies.

Assessment was also a key element of the Self-study. It is clear that we have many ways to assess our costs, contributions, and effectiveness as a university. It is also apparent that many of these assessments are driven by outside sources and as a result, are often ad-hoc and somewhat disjointed. NPS needs to develop a well-organized method for assessing its own performance and contribution to the Navy. The Planning Board’s efforts to develop institution-wide performance measures is critical to the development of such an effective assessment system.

NPS looks forward to the future with much anticipation. Our self-study has helped to focus us on what we need to do to meet that future and to continue to meet our mission and enhance the combat-effectiveness of the United States Navy and other services. The millenium will be an exciting one and NPS looks forward to helping to shape the future of the Navy and prepare its officers for the challenges that it will present to them.

LESSONS LEARNED FROM THIS SELF-STUDY

One of the key things that NPS hoped to achieve by centering its self-study around the NPS Strategic Plan was campus-wide involvement in the process. It is believed that we have accomplished this objective, along with the other objectives such as introspection and analysis. The following are some additional lessons learned from this self-study process.

- The clash of cultures is a very real phenomenon at NPS. It is not a battle of cultures, just a blending of different frames of reference. Overall NPS has
accommodated the blend exceptionally well and drawn from the strengths of each.

- It is clear to the Steering Committee, and probably to many of the Task Group members, that knowledge of NPS and perceptions about NPS differ widely among those who contributed to the self-study.
- It is difficult to get faculty and staff involved in a process such as a self-study unless the issues directly affect them. There is a perception that the Navy or the administration will make changes, or not make changes, regardless of the input of the faculty or staff.
- Communication is a big issue, even though NPS is not a large university. The rising use of the Web for minutes of meetings and for communication of other important issues is a positive trend.
- The self-study designed around the NPS Strategic Plan was helpful to NPS in revealing weakness in the Strategic Planning Process, in data consistency, and in wide variations in internal perceptions about NPS.
- A Self-Study based on the WASC Compliance Standards would probably be easier to do, but the thematic approach was helpful to NPS. One deficiency is that, by focusing on the Strategic Initiatives in the "thematic" approach, the report did not focus on what NPS already does well. There are many strengths of NPS that received too little attention in the report.
- There is a feeling that a small team could have written a better self-study. The distributed approach involved lots of individuals but made it difficult to bring the many contributions together into a coherent package. The value of the wider involvement is not questioned, but there is a frustration that it is an inefficient process.
- The reports produced by the Task Groups varied greatly in quality and timeliness. The self-study was a very time-consuming process, and it was difficult for the Task Groups to produce good products when members had competing tasks to accomplish.
- It was helpful to have an Assessment Task Group as it provided coordination with the other Task Groups and helped everyone to think more about assessment than might have otherwise been the case.

In summary, the Self-Study process was a valuable experience for NPS. We have many strengths as an institution. We provide high-quality military-relevant education to our students in support of the Navy and other defense organizations. Our Strategic Plan provides a clear direction for the future. It supports the purposes of the institution and focuses the efforts and energy of the faculty, staff, and administration on what we hope to accomplish as an institution. The Navy supports the mission and goals of NPS and will continue to provide valuable direction and insight as we move toward our objectives.

As a result of the Self-Study, we have greater campus participation in the Strategic Planning Process and now have solid recommendations for the next steps in the process.
One strength that NPS recognized during this Self-Study process is that there are many diverse individuals all working to accomplish a set of objectives in their own way. They all see the university and its mission in slightly different ways and, though they may not articulate it in the exact words of the Strategic Plan, they are all working toward the same general purpose -- to provide high quality, relevant education and research in support of the Navy and other defense organizations. We see this diversity not only as healthy but as critical to the success of NPS.
Position NPS to meet the challenges of the Revolution in Military Affairs (RMA)

STATEMENT OF INITIATIVE

Strategic Initiative #1:
Revolution in Military Affairs

There is an emerging consensus among military thinkers and planners that our forces will continue to get smaller, but will be highly dependent on information technologies. Our challenge here is to focus the many strengths of our faculty in the technology areas into coherent programs that can provide our students with the skills needed to understand and exploit developments in the information, communications, and precision weapons arenas, which combine to create a Revolution in Military Affairs. These programs will need to be very interdisciplinary, with a stress on systems integration and systems engineering. To properly respond to the Revolution in Military Affairs challenges, we will need to make sure our faculty is aware of the implications of the Revolution in Military Affairs, and familiar with Joint Vision 2010 and supporting service documents. Institutionally we must examine our departmental and divisional structure for responsiveness to these challenges.

The fact that this is the first initiative in the NPS Strategic Plan indicates the importance attached to it. Because of the nature of its customers, NPS must not only keep its programs abreast of current DoD technical and management issues, but also be continually preparing officers for the future. The Revolution in Military Affairs represents current DoD thinking and planning for the 21st century. Thus, it is important that NPS understand how its programs and the Revolution in Military Affairs relate to each other and what contributions the School is making to its implementation.

TEAM MEMBERS
**BACKGROUND**

Although currently called a Revolution in Military Affairs, such changes have been ongoing in the military forces for many years, so that in many respects the process is evolutionary. When the postgraduate department of the Naval Academy was first formed in 1909, it was because of a need for naval officers to be knowledgeable about steam propulsion and marine engineering, as well as have a scientific knowledge about ordnance, which were revolutionary topics at that time. Ever since, the Naval Postgraduate School has been supporting the constant evolution of war-making tools and strategy with fundamental graduate education in the underlying disciplines of engineering, science, management, operations and national security.

**DEFINITION OF REVOLUTION IN MILITARY AFFAIRS**

The history of warfare is filled with examples in which forces that appear by all usual measures to be inferior, win on the field of battle. While traditional characteristics of
military excellence, such as courage and charismatic leadership, are almost always present on the winning side, the explanation of what initially appear to be anomalies is frequently found in innovation, doctrine, organization, tactics, or technology, or, more commonly, a combination of all three.

In modern times, starting with the industrial revolution, the importance of technology has been steadily increasing. Military leaders have seen the emergence of, and exploited, innovations such as the machine gun, the airplane, wireless communications, the internal combustion engine, and nuclear power. The past fifty years have seen the development of computers, very wide band ubiquitous communications, lasers, highly accurate weapons capable of great range, satellites, and new materials with formerly unheard of properties not found in nature. And the pace of scientific discovery and invention continues to increase, as does the application of such innovations.

According to Andrew Marshall, Director of the Office of Net Assessment in the Office of the Secretary of Defense, "a Revolution in Military Affairs is a major change in the nature of warfare brought about by the innovative application of new technologies, which, combined with dramatic changes in military doctrine and operational and organizational concepts, fundamentally alter the character and conduct of military operations."

The backbone of the Revolution in Military Affairs today is information superiority, combined with precision weapons. Precision weapons, in turn, depend on skillful applications of an interdisciplinary set of engineering and scientific principles. Information superiority is dependent on advanced Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance.

The six principal components of the evolving Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance architecture for 2010 and beyond are:

1. A robust multi-sensor information grid providing complete awareness of the battlespace to U.S. commanders and forces.
2. Advanced battle-management capabilities that allow deployment of forces faster and more flexibly than can potential adversaries.
3. A sensor-to-shooter grid to enable dynamic targeting and cueing of precision-guided weapons, cooperative engagements, integrated air defense, and rapid battle damage assessment and re-strike.
4. An information operations capability to penetrate, manipulate, or deny an adversary’s battlespace awareness and unimpeded use of his own forces.
5. A joint communications grid with adequate capacity, resilience, and network management capabilities to support the above capabilities as well as the range of communications requirements among commanders and forces.
6. An information defense system to protect globally distributed communications and processing networks from interference or exploitation by an adversary.

As the revolution continues today, the joint service integration of new technologies will transform the nature of warfighting and enable the armed forces to pursue operational concepts such as: (1) Dominant Maneuver, (2) Precision Engagement, (3) Full-Dimensional Protection, and (4) Focused Logistics.

**NAVY VISION OF REVOLUTION IN MILITARY AFFAIRS**

The Navy’s vision of future warfare is delineated in a document entitled "Forward ... From the Sea." Derived from the new Navy operational concept are five fundamental and enduring roles: (1) Sea control and maritime supremacy, (2) Power projection from sea to land, (3) Strategic deterrence, (4) Strategic sea lift, and (5) Forward naval presence.

To implement these operational concepts, the Navy has embraced a Revolution in Military Affairs concept called network-centric warfare, which involves widely dispersed and robustly networked sensors, command centers, and battle forces to produce critically massed effects in combat power, reduced time lines, and increased influence of events.

**REVOLUTION IN MILITARY AFFAIRS INFLUENCE ON NPS PROGRAMS**

**NPS Role in Revolution in Military Affairs**

a. SECNAV Instruction 1524.2a

This instruction, issued on April 4, 1989, states the following purpose for NPS:

"The Naval Postgraduate School exists for the sole purpose of increasing the combat effectiveness of the Navy and Marine Corps. It accomplishes this by providing post-baccalaureate degree and non-degree programs in a variety of sub-specialty areas not available through other educational institutions. The NPS also supports the DoN through the continuing programs of naval and maritime research and through the maintenance of an expert faculty capable of working in, or as advisors to, operational commands, laboratories, System Commands, and headquarters activities of the Navy and Marine Corps."

b. NPS Mission Statement

"Increase the combat effectiveness of U.S. and Allied armed forces and enhance the security of the United States through advanced education and research programs
focused on the technical, analytical, and managerial tools needed to confront defense related challenges of the future."

It is clear from the above statements that NPS programs must be continually updated to prepare officers for the challenges of the next twenty years of their careers. Technology is always changing, and NPS has always been on the cutting edge of these changes, dealing interactively with Primary Consultants to insure that NPS education is both up to date and meeting requirements. A good example of responsiveness to sponsor needs is introduction of the Total Ship Systems Engineering and Acquisition Curriculum, created in direct response to the Naval Sea System Command’s needs. Responses to technology are exemplified by the Unmanned Air and the Unmanned Underwater Vehicles programs, and the Virtual Reality and Computer Graphics programs.

Existence of, or recognition of, Revolution in Military Affairs within DoD has had little effect on the rate of introduction of new material into NPS programs. (Individually and collectively NPS professors update their course material on a regular basis, however, this refers to their doing so in direct response to this Revolution). What it has done is to cause the School to recognize the need to coordinate the introduction of new materials across campus, and to coordinate academic content with the programs of those outside NPS who are leading the DoD Revolution in Military Affairs transition. This report is a step in increasing internal coordination. By introducing the measurement processes presented later in this report, and by tracking progress, we will help to insure an efficient and better coordinated innovation process.

Revolution in Military Affairs, and the NPS response to it, have encouraged a transition to increasingly applied programs directly responsive to the needs of operational commands and major DoD programs. Partnership with outside organizations will work in both directions. NPS will supply education and research that are immediately usable, and information from the partners will improve NPS education and research through enhancing relevance and timeliness.

**FIELDS OF STUDY AFFECTED**

To guide the ongoing development of NPS programs, it is necessary to broaden the description of Revolution in Military Affairs. The changing world within which the next generation of military operations will be carried out, the new fiscal environment within which the military finds itself, and the new nature of military operations all need to be addressed to enable the U.S. defense establishment to successfully meet these challenges.

At NPS, Revolution in Military Affairs influences efforts in instruction and research in the following five areas: (1) the geopolitical environment, such as implications of the Soviet Union’s collapse, the emergence of sub-states and terrorists as a major threat, and
proliferation of weapons of mass destruction; (2) changes in operations, such as coalition operations, humanitarian assistance and disaster relief, joint operations, and antiterrorism; (3) the domestic environment, such as declining budgets and increasing public scrutiny of military operations; (4) DoD management and operations structures, such as joint planning and acquisition, recapitalization, reductions in the shore establishment and rapid decision making processes; and (5) technological advances such as computers and information systems, communications, sensor systems including satellites; precision weapons, improved materials, and advanced computational software.

REVOLUTION IN MILITARY AFFAIRS IMPLEMENTATION STRATEGY

NPS implementation strategy has evolved into six components:

1. Introduce Revolution in Military Affairs instruction material into existing courses.
2. Develop new courses that cover specific Revolution in Military Affairs areas.
3. Focus faculty research and student thesis work on Revolution in Military Affairs subjects.
4. Sponsor Revolution in Military Affairs seminars to educate faculty in this new area.
5. Develop a Revolution in Military Affairs-specific curriculum.
6. Create an NPS institute to encourage interdisciplinary Revolution in Military Affairs research and aid the instruction program.

The following subsections present a summary of where we stand on the above elements.

Introduce Revolution in Military Affairs Materials into Existing Courses

There is a considerable amount of instruction and research performed across the campus in the area of Revolution in Military Affairs. The C3 Academic Group; the Information Systems Management Curriculum; the Computer Science Curriculum; and the Modeling, Virtual Environments and Simulation Curriculum all concentrate on the information area, which is an integral part of Revolution in Military Affairs. The Combat Systems Science and Technology curriculum and the several engineering curricula cover many aspects of weapon and sensor systems and the fundamental engineering principles from which they are developed.

The core instructional material for all management curricula has been modified in response to Revolution in Military Affairs and the pressure it produces for increasingly Joint operations and flat decision making structures. This core also stresses the use of information technology in decision making, work relationships, and organizational
structures. The important topics of decision making within an environment of increasing complexity, change, and uncertainty are covered as well. The Systems Management Department has focused its Revolution in Military Affairs-related instruction and research on four areas: (1) decision making in an information-rich environment, (2) multi-relationship organizations, (3) shore establishment structures, and (4) logistics.

The National Security Affairs department program is driven by the Joint Chiefs of Staff’s Professional Joint Education Program and the Chief of Naval Operation’s Professional Military Education Program. Learning Area 5 in the Joint Chiefs of Staff Officer Professional Military Education Policy directs that officers undertaking Professional Joint Education must "comprehend the relationship between the concepts of the Revolution in Military Affairs and the Military Technological Revolution." That NPS' Professional Joint Education program covers Revolution in Military Affairs was substantiated by the School being granted accreditation for three years after undergoing a June 1998 evaluation by the Process for Accreditation of Joint Education Team.

Significant amounts of graduate level material that establish a fundamental base for supporting military updating and modernization have been a part of the Naval Postgraduate School curricula since its inception. A steady evolution has taken place at NPS over the years as relevant developments and inventions have emerged and touched a variety of curricula. NPS is staying abreast of current advances and revolutions that affect military affairs as they occur, and connections and linkages are made to them through fundamental graduate level education in the basic disciplines pertinent to the revolution.

**Develop New Courses**

The structure of the shore establishment needed to manage current and emerging DoD operations and programs is the focus of a complete course of study developed at NPS in response to the needs of the Navy. This curriculum is called Shore Installation Management. Revolution in Military Affairs is used to provide the terms of reference within which these shore organizations must operate.

An important emerging Revolution in Military Affairs concept is that logistics are a very important element needed to support lean, mobile, and widely dispersed forces. Operational Logistics is a complete NPS curriculum with emphasis on logistics as an integral part of day-to-day military operations.

**Focus Research and Thesis Projects**

Three current department research projects directly support Revolution in Military Affairs needs. One study is directly evaluating the impact of Revolution in Military Affairs and technology on the policy concerning the Taiwan Straits. Another is directed
at investigating the impact of various enabling technologies in the area of Intelligence and Command and Control. One faculty member is currently spending a one-year tour as Special Assistant for Counter-proliferation Policy in the Office of the Secretary of Defense for Science and Technology, the office overseeing the Revolution in Military Affairs itself.

Educate Faculty

NPS faculty are participating in many games and studies of future operations. This participation is sufficient to inform the School’s knowledge base of current DoD thinking about future operations. However, NPS suffers from the same affliction as the rest of DoD: it is difficult to coordinate results from the various studies to produce a coherent, evolving picture.

The School’s participation in Fleet Battle Experiments is providing valuable knowledge about the performance of Network Centric systems in an operational environment. Up to this point, this work has been general support for the experiments. Expansion of the effort is needed to provide coupled experimental design, data collection, and analyses. There is also a need to couple the School’s modeling expertise to experiment planning and analysis.

Those faculty who participate in the various aspects of Operations Analysis are well aware of the need for a new generation of models and analysis techniques to deal with Revolution in Military Affairs and emerging Operations Other Than War. NPS has been a partner with Pacific Command in defining Operations Other Than War modeling needs. The School is bringing new models to the campus and doing research on new modeling techniques. This is a good beginning, but is not yet a coordinated effort, and there are not yet enough faculty working in this area to make the progress needed.

Develop a Curriculum & Degree for Warriors

NPS has been exploring the development of programs tailored specifically to officers’ operational careers. These curricula will focus on Revolution in Military Affairs issues. The range of subject matter appropriate to the study of operational Joint Warfare is very broad, ranging from political science to physics and engineering. Although it even includes the acquisition process, it is difficult to develop a curriculum that covers all aspects of RMA while maintaining the emphasis on warfighting. Thus, we are faced with the dilemma of whether to cover material in depth or in breadth. Our answer to this dilemma is to insist that in-depth study in some area must be undertaken to develop officers’ analytical skills, and that there is an irreducible set of subject material, spanning several disciplines, that every student must learn to be able to operate effectively in the joint arena.
Development of a Revolution in Military Affairs curriculum is not yet complete. It began with conceptual development of a Joint Warfare Analysis Curriculum, which was one of the initial activities of the Institute for Joint Warfare Analysis. It has since evolved into the curriculum called Systems Engineering Integration, based largely on the input from the Vice Chief of Naval Operations as to what Naval officers need to know and to be able to do to function effectively as warfighters. From this start, NPS will continue to debate and develop a curriculum of professional education for military officers, in the same sense that such education is provided for other professions.

Plans and discussions thus far have led to the definition of a set of Competency Areas and a Specialization Area.

a. Competency Areas

Operations Analysis Command, Control, and Communications

Computer and Telecommunication Systems

Information Warfare

Combat Systems

Systems Engineering

Students are required to study the first three areas because they are central to modern warfare. In addition, they will take two of the remaining three, for a total of five. Other options could be made available in the future. All students will take a two-course sequence in each of the five Competency Areas, with the course content being the same regardless of their Specialization area.

b. Specialization Area

Students will take four additional courses and do their thesis in one of the Competency Areas, which becomes their Specialization Area. It is expected that these courses will be heavily analytical in order to develop problem-solving skills.

c. Basic Background

Math: Calculus, and Probability and Statistics

Computer Science and Information Systems

d. Core Material
National and International Security (3 courses) Operational Logistics (1 course) Environmental Effects (1 course) Modeling and Simulation (emphasized throughout the curriculum)

The goal of this curriculum is to provide professional, graduate-level education for operational officers. The main thrust of the curriculum will be a study of the design and utilization of military systems. Systems design will be based on requirements generated by Revolution in Military Affairs operations. Thus, the curriculum will: (1) focus on operational capabilities for modern warfare; (2) utilize a systems engineering approach; and (3) concentrate on analysis of overall system effectiveness. As a result, the officer will obtain a detailed understanding of military systems, operational environments, financial and physical constraints, national and international political environments and operations analysis. Officers will emerge from the curriculum with the skills needed to make maximum use of various military systems and to participate in their design and operational introduction.

e. Systems Engineering Approach

A systems engineering approach will be used throughout the curriculum. Introductory material will include systems engineering methodology, case studies, basic mathematics, and basic technology. Following this preparatory material, an extensive system design project will be conducted by a team of students, which will last the full year and include individual study in a specialization area. An individual’s specialization expertise will be utilized in a specific area of the design project. Details of the introductory and design portions of the program are given below.

The topical areas that form the basis for the course of study are:

The national and international political environments
Operational scenario(s)
Mission needs
System requirements/capabilities
Technological constraints, management of technology
Tactical and doctrinal influences
Operational concepts, and
Acquisition and development strategies
f. Program Structure

As noted above, the curriculum is in two segments. The first two quarters are an introduction to Systems Technology/Engineering and Basic Technology of Military Systems. Each can be taken as a stand-alone, non-degree course of study. This material is the required introduction for four quarters of study leading to a Master of Science degree. This segment contains: (1) core material on modern military systems and management concepts; (2) specialization in a military technology area (see Joint Warfare Analysis curriculum above); and (3) a Systems Engineering project.

The first two quarters will include four two-course sequences in the following subject areas:

1. Command and control, information operations
2. Weapon systems and the fundamentals of military technology
3. Systems engineering methods, including case studies
4. Analytical techniques, including calculus, computer science, and decision analysis and gaming

Case studies will be used to illustrate how complex problems can be attacked using end-to-end systems engineering, from requirement statements to technical system capabilities. Operational needs and cost constraints are included conditions. Team teaching will be used extensively in these first two quarters.

The final four quarters are structured to build upon the breadth of understanding developed in the first two quarters by introducing students to additional material in a number of two-course sequence competency areas. This follows the methodology of the Joint Warfare Analysis curriculum, described in a former section. More extensive study in one of these areas will bring students to the Master’s level and allow them to make substantial contributions to the Systems Engineering project.

The Systems Engineering project will be worked on through all four quarters and will also be a guide for other topics studied. Course work will provide the background needed for successful completion of the project. Much of the homework will involve seeking out and utilizing material for the project. Faculty associated with the curriculum will be available to the students as consultants to help with project completion, resulting in a fair amount of just-in-time education. The aim is to have the students seek out needed information, in much the same way a person has to do in a real-world systems engineering project. The end result will be a formal project report that may replace the traditional master’s thesis.

EVALUATION OF PROGRESS
More than a dozen faculty and students are members of, or support, the CNO’s Strategic Studies Group. Its current work focuses on long range Navy support for troops ashore. This is one of the central components of Revolution in Military Affairs. Group members have asked NPS to become increasingly involved in analyses of their concepts, both while under consideration by them, as well as follow-on analyses. NPS participation in this activity is significant support for the Navy’s Revolution in Military Affairs program.

The total amounts of effort in information technology, information management, and command and control processes are adequate, but not sufficiently coupled to weapon systems characteristics. The coverage of weapon systems needs to be more extensive, and there are as yet insufficient faculty with expertise in this area.

The amount of progress already made in introducing Revolution in Military Affairs into NPS research and instruction is considerable. The quantity of material and amount of effort are all one could expect in the short time since the current Revolution in Military Affairs has been at the forefront of military thinking, and attest to the rapidity with which NPS programs can be modified. Even so, there are five factors that reduce the effectiveness of this implementation:

1. Revolution in Military Affairs has not benefited from a coordinated effort across campus.  
2. Some instruction and research programs, which have direct application to Revolution in Military Affairs, are conducted without note being made of the connection.  
3. There is insufficient interaction between technical and non-technical programs.  
4. There has been little effort to make the external DoD aware of the fact that NPS programs can be a major component in implementation of Revolution in Military Affairs within the military.  
5. In general, additional effort is needed in end-to-end systems engineering of the coupled weapon-information system. There is a tendency to present this material in its separate components rather than as an integrated whole.

**RECOMMENDATIONS**

The following recommendations are derived from the evaluations made in the previous section. These recommendations should in no way detract from recognition of the good progress that has already been made in Revolution in Military Affairs implementation.

**General Recommendations**
• Take steps to increase faculty expertise in the weapons area.
• Develop instructional material and research for end-to-end evaluation of the systems needed for Network Centric warfare.
• Develop a system for archiving war game results so they are available for instruction and research across campus.
• Implement a system to coordinate the activities and results from the various war games.
• Develop a methodology to share information on Revolution in Military Affairs implementation across campus, so that a shared vision is developed and the activities can be coordinated when this is possible and appropriate.
• Develop a means for technical and non-technical faculty to share Revolution in Military Affairs information and develop interdisciplinary instruction and research.
• Augment the current means at NPS for obtaining information about the national defense establishment, including Revolution in Military Affairs developments, and for providing results of NPS programs directly to DoD programs and commands.

**Mobilization of the School**

Because of the highly interdisciplinary nature of Revolution in Military Affairs, incorporating it into NPS programs to the extent needed will take effort and cooperation across the whole of the academic organization. The normal tendency of universities to manage programs within discipline-oriented "stove-pipes" makes achieving this level of cooperation a challenge.

NPS is similar to other universities in the way it manages the faculty reward process. Advancement is normally predicated on contributions made to one's discipline, which normally take the form of open literature, refereed publications. NPS has made good progress over the last several years in rewarding faculty who contribute to applied programs, like Revolution in Military Affairs applications, that often do not lead to a high publication rate; however, there is still a faculty perception that being involved in interdisciplinary work of this kind is risky.

Another factor that will affect success in incorporating Revolution in Military Affairs into NPS programs is funding methodology. The greatest portion of the NPS academic budget is given to academic departments, portions of which are expended on Revolution in Military Affairs activities. Though significant portions of the Academic Groups' budgets and almost all of the Institute for Joint Warfare Analysis budget are devoted to Revolution in Military Affairs, it has not been possible to determine what fraction of the overall budget is devoted to Revolution in Military Affairs, nor is there any information on what this portion should be.
With these factors as background, the following specific recommendations are made for administrative actions needed to more fully implement Revolution in Military Affairs at NPS. These recommendations are intentionally brief, as the Task Group does not believe it appropriate to suggest specifics of how they should be implemented.

a. Funding

1. Determine the fraction of academic resources that should be devoted to Revolution in Military Affairs.
2. Determine how those resources should be apportioned among the various academic units.
3. Develop a process to track use of Revolution in Military Affairs-targeted funds.
4. Utilize the measurement process defined in the preceding section of this report to determine if Revolution in Military Affairs funds are well utilized.

b. NPS Management Commitment

Commit the School to the success of the applied programs which emphasize Revolution in Military Affairs, including insuring that adequate resources are available, and publicize the importance of the Revolution in Military Affairs program and the commitment of the campus.

c. Rewards

1. Commit NPS to rewarding those who contribute to the success of the Revolution in Military Affairs program.
2. Design a modification of the current reward structure to ensure that this commitment is met.
3. Publicize the steering change in the reward structure in a fashion that will encourage faculty to participate in these interdisciplinary activities.

d. Communication

1. Set up a process for sharing Revolution in Military Affairs information across campus.
2. Set up a process for informing the appropriate DoD organizations of the NPS Revolution in Military Affairs program and its progress.

FUTURE MEASUREMENT PROCESS

Continuous measurement of NPS implementation of Strategic Initiative #1 will consist of information from four sources: (1) Target Programs, (2) Curricular Offices, (3) Academic Departments and Groups and (4) Institute for Joint Warfare Analysis Program Coordinators. Whether continuing to collect target program information is
useful is uncertain. If so, the questionnaire already utilized and shown in the analyses section will have to be revised to show continuing progress rather than collecting over again the current baseline information.

**Curricular Office Questionnaire**

We wish to track how well NPS is doing at meeting the strategic goal of including Revolution in Military Affairs-specific material in our instruction and research programs. Curricular Office information is important because of the unique relation you have with the curriculum sponsor and the responsibility you have for student programs. In the following questionnaire, we seek qualitative rather than quantitative information. Please respond for all curricula under your cognizance.

Curriculum _____________________________ Sponsor ___________________

Applicable Revolution in Military Affairs (RMA) Areas:

Degree to Which RMA is Included in Instruction Well ___ Fairly ___ Poorly ___

Comments: ______________________________

Degree to Which Students Understand RMA Well ___ Poorly ___ Poorly ___

Comments: ______________________________

Fraction of Students Doing RMA Related Theses Large ___ Med ___ Few ___

**Academic Department and Group Questionnaire**

We wish to track how well NPS is doing at meeting the strategic goal of including Revolution in Military Affairs-specific material in our instruction and research programs. The following questionnaire is to determine the extent to which Revolution in Military Affairs is included in your Departments/Group programs. It also attempts to determine to what extent Revolution in Military Affairs influences the philosophy of your organization.

Department/Group ___________________

**Part 1. RMA Impact on Instruction**

List the course number, briefly the types of Revolution in Military Affairs material included (can be multiple types for a given course), and the approximate fraction of the course time that is devoted to that material. We expect that the fraction of Revolution in Military Affairs material in your lower level courses will be very small, if any.
Number of courses offered: 2000 level _____ 3000 level _____ 4000 level _____

Course # RMA Topical Content Fraction

**Part 2. RMA Impact on Research and Theses**

List the title of those theses and research programs which deal in a fairly direct way with emerging military structures, doctrine, tactics, operations, and systems that have a direct relation to Revolution in Military Affairs.

Number of theses ________ research programs ________ in the past year.

**Project Title RMA Application Sponsor or Coordination**

**Narrative Comments**

We are interested in your assessment of the impact Revolution in Military Affairs has had on Department/Group planning and philosophy. Also, how have your programs contributed to DoD’s understanding and implementation of Revolution in Military Affairs concepts?

**Institute for Joint Warfare Analysis Program Coordinator Reports**

Each year, the Institute for Joint Warfare Analysis focus area Program Coordinators prepare a report. These reports provide a summary description of the work being done in their area. The focus areas have been established because of their direct relationship to Revolution in Military Affairs, so these reports will provide a direct determination of Revolution in Military Affairs implementation.
REPORT OF WASC TASK GROUP #2

Increase the efficiency and effectiveness of NPS

STATEMENT OF INITIATIVE

Strategic Initiative #2: NPS Will Become More Efficient and Effective

This Initiative discusses the very existence and organizational health of NPS. It states that NPS must depend on our ability to demonstrate effectiveness in achieving an academic mission which contributes to the broader effectiveness and readiness of both the Department of the Navy and Department of Defense. To thrive in a time of diminishing budgets and resources, it is imperative we execute our mission with increasing efficiency. This Initiative also discusses the concern that is prevalent in minds of many, that is that absent enhanced levels of both effectiveness and efficiency, NPS will be forced to accept fewer students and/or to cut academic programs, either of which would increase organizational vulnerability. We must inculcate in the entire NPS community and all major stakeholders the need, desirability, and feasibility of making major changes throughout NPS in pursuit of significant improvements in efficiency and effectiveness. This will require us to develop skills in leading and managing change, both with others and within ourselves.

Key elements of this initiative are to:

- Search for new markets
- Develop new products tailored to present and new customers
- Develop pedagogical and technical innovations to existing and new programs
- Realize organizational efficiencies through true reinvention, reengineering and Total Quality Leadership, including new incentive programs

Success will require new and innovative educational and research programs, which in turn will rely on our ability to dramatically improve our physical infrastructure and become a true "University of the Future." These efforts will likewise be significantly
supported by an increasingly robust distributed learning effort, with specific emphasis on network-based learning.

TEAM MEMBERS

The Self-study Task Group assigned to Strategic Initiative #2 was composed of eight members of the NPS community, six of whom are faculty and two staff (one military officer and one civilian). Task Group members were selected for their expertise in areas appropriate to the assessment of supply, travel, information systems, management incentives, staff restructuring, sponsor links, new markets, tailored products, distance learning, and non-degree education — all areas specifically identified in the Strategic Plan.

The members of the Task Group, their organizational affiliations, and assignments are given below.

Bob Ball Professor, Aero/Astro Engineering
Dale Courtney LCDR USN, Computer and Information Services
Alice Crawford Sr. Lecturer, Systems Management
Ken Euske Professor, Systems Management
Bill Gates Assoc. Professor, Systems Management
Jeff Knorr Professor, Electrical and Computer Engr.
OPERATIONAL DEFINITION OF INITIATIVE

The Task Group’s operational definition of Strategic Initiative #2 — what we mean when we say "NPS will become more efficient and effective" — is as follows:

NPS will offer educational programs that make a decisive difference in the effectiveness of our armed forces, and will operate NPS programs and processes in an increasingly efficient and businesslike way.

SCOPE OF SELF STUDY

The inherent breadth of Strategic Initiative #2 dictated that we limit the scope of this initiative’s Self-Study. A number of discussions led to the decision that efficiency and effectiveness should be evaluated relative to: (1) the NPS Educational Program, and (2) the NPS Management and Support Infrastructure. Our study of Initiative #2, accordingly, is divided into two parts. Specific programs and services become examples, which are placed in one or the other category.

SUMMARY OF NPS ACADEMIC PROGRAM

The Naval Postgraduate School specializes in education at the Master’s degree level, with a limited number of Ph.D. and Bachelor’s degrees awarded each year. The education is designed to meet the needs of the Navy; however, the educational programs are developed within a framework of classical academic degrees and, as such, are in keeping with the highest of academic standards. Officers attending NPS are practicing military professionals who are receiving a mid-career education directly relevant to the challenges and concerns of the military. The School’s curriculum is therefore focused on science, engineering, technology, policy and operations, management, and international relations as applied to the needs of the Navy and other military services.

NPS offers 47 different curricula in 28 Master’s degree programs. Curricula are designed to meet the specific requirements of the Navy and other military services.
while meeting the academic standards set by the NPS Academic Council. Completion of a curriculum results in both a degree and, for Naval officers, a Navy subspecialty code indicating that the officer has the education and skills required by particular jobs within the Navy. Other services have similar means of tracking their NPS graduates as well as those who complete other graduate programs. (A complete description of the Navy’s subspecialty system can be found in Background Item #25.)

Each curriculum has a Navy or other service sponsor, called a "primary consultant," generally a Navy flag officer. The primary consultants and NPS review their curriculum every two years. The review includes a look at the duties and responsibilities of the positions identified as requiring that subspecialty code. These duties and responsibilities are translated into Educational Skill Requirements. NPS then translates the skill requirements into courses and degree programs. During each curriculum review, an assessment is made as to whether the Educational Skill Requirements accurately reflect the skills required to perform in the designated positions, how well the courses meet the Educational Skill Requirements, the degree of military relevance required and offered in the curricula, and how effectively the Navy uses its officers in the designated positions.

Some of the most notable military-relevant curricula that the Naval Postgraduate School offers are:

- Command, Control, Communications and Intelligence
- Information Warfare/Operations
- Space Systems Operations/Engineering
- Undersea Warfare
- Special Operations
- Civil-Military Relations
- Meteorology-Oceanography

Most other curricula also contain a significant number of military-relevant courses. Some of these curricula are: Operations Analysis; Operational Logistics; Engineering Acoustics; Modeling, Virtual Environments and Simulation; Total Ship Systems Engineering; Combat Systems; Electronic Warfare Systems International; Leadership Education and Development; Defense Systems Analysis; and Scientific and Technical Intelligence. Some of these contain courses that are classified and thereby require SECRET clearance. Significant military applications appear in virtually every one of the School’s programs.

In general, students from these curricula receive traditional academic degrees. For example, students in the Information Warfare curricula are awarded a Masters in Systems Engineering while students in Space Systems Engineering can elect degree programs in such areas as Electrical Engineering, Physics or Computer Science. A
complete listing of curricula and their associated degrees is available on page 16 of the 1998 NPS catalog, or on-line at http://web.nps.navy.mil/~ofcinst/frame.htm. Degree requirements are determined by the Academic Department or Group with primary responsibility for the curriculum, and by the School’s Academic Council, which approves the requirements for each degree program and establishes school-wide minimum requirements for all degrees. With only a few exceptions, NPS students must complete a thesis as part of their degree program. Thesis topics are also military relevant and are chosen from a range of topics developed by faculty, often in support of research sponsored by military agencies. Primary consultants may also provide lists of potential thesis topics.

NPS has mastered the many challenges associated with providing adult learners with mid-career education. Since officer students have been away from an academic environment for many years, the School offers an efficient refresher program to help students readjust to academic life. In assigning officers to NPS, the Navy also considers its future manpower needs to ensure adequate numbers in each skill area. As a result, some officers are assigned to a graduate degree field completely different from that of their undergraduate studies. A mechanical engineer, for example, may transition to become a computer scientist; or a former music major may even be trained to become an astronautical engineer. A well-known example of the latter is NPS graduate and astronaut, Winston Scott. In most cases, NPS is able to efficiently provide for such educational transitions with minimal extra program time.

Naval officers are assigned to degree programs by the Bureau of Naval Personnel based on the needs of the Navy as well as desires of the individual officer. The Navy tries to ensure that there is a sufficient pool of officers with the requisite education to accomplish its mission.

At NPS, each curriculum has a Curriculum Officer as well as an Academic Associate. The Curriculum Officer is the officer to whom students report in the military chain of command. The Academic Associate serves as a student’s academic advisor, and is responsible for the academic integrity of the degree program. The Curriculum Officer and Academic Associate work together to ensure that the needs of the Navy sponsor are being met. There are ten Curriculum Offices, each headed by a Curricular Officer, typically a Navy Commander. Curricular Officers are assigned to the School by the Navy and report directly to the Dean of Students/Director of Programs. Many are former graduates of the programs they oversee. These Curricular Officers work closely with the Academic Associates. Academic Associates are NPS Professors appointed by the Department Chair to be responsible for a curriculum generally for a period of three to five years. Together, the Curricular Officer and Academic Associate are designated the CO/AA team. As such, they are the direct link between the School and the military sponsor of each program. Academic Associates are appointed upon the
recommendations of the Dean of Students and Associate Provost for Instruction and report to the Associate Provost for Instruction.

The CO/AA team, working closely with the faculty in pertinent departments, is largely responsible for ensuring that a curriculum meets the Educational Skill Requirements described above. The CO/AA team designs a "matrix" of courses (typically four courses per quarter, for six to eight quarters), structuring the program with both relevant academic topics and military applications. This process is particularly challenging for unique interdisciplinary programs, which often require the design of some new courses. Once set up, the CO/AA team monitors the program, as well as individual student progress through it, on a continual basis, possibly making minor modifications along the way. All programs, including distance learning programs as well as new courses, require approval by the Academic Council before they can be offered for School credit.

The CO/AA team acts as the individual student’s academic advisor, with the Academic Associate — a member of the faculty — taking the lead. Academic Associates are empowered to make minor changes in an approved program to suit the background and/or interests of an individual student, as long as the academic integrity and intent of the program, as approved by the Academic Council, is preserved.

Students report directly to their Curricular Officers on all military matters, the Curricular Officer being the student’s immediate commanding officer within his or her military hierarchy. Academic disciplinary matters are generally handled at the relevant Academic Department level in conjunction with the Curricular Officer.

In addition to its degree programs, NPS offers a number of non-degree programs or short courses. These programs contribute to the development of NPS as the technologically integrated Department of Defense University of the Future. Many of them are described in more detail in the Task Group report on Strategic Initiative 3. These courses are designed to provide proficiency training, continuing education, or career-focused education. They may consist of one or more courses varying in length from several hours or days (short courses) to those with an indefinite end date (individually paced instruction). They are taught on-site in Monterey, through traditional delivery methods at remote sites, and via various forms of distributed learning.

Both degree and non-degree educational programs have also been developed at NPS for non-Navy customers, and the process for these is similar to that described above for Navy degree programs. Faculty in the Academic Department or Group work with the customer to develop, offer, and review the programs. In many cases, the programs consist of specialized concentrations within existing degree programs. For example, there are several degree programs for international or other service officers which are modified versions of curricula designed for U.S. or U.S. Navy students. In Systems
Management, the Defense Systems Management curriculum allows officers from the Marine Corps and Coast Guard, as well as Department of Defense civilians and international officers to tailor their management degree to meet specific requirements. Similarly, there is an Electronic Warfare program designed for international officers.

Several methods are used to deliver both degree and non-degree courses. On-campus lecture and laboratory courses are delivered by one or more instructors to students in a classroom or laboratory setting on campus. The vast majority of NPS courses in support of degree programs are delivered in this manner. Off-campus lecture courses for both degree and non-degree programs are delivered by one or more instructors to students in a classroom or laboratory at a distant site.

Distance learning (DL) courses are delivered by one or more on-campus instructors using one- or two-way television and audio equipment, to students in a classroom at one or more distant sites; or via World Wide Web (WWW) courses consisting of live presentations and either prepared or live multimedia materials available at any time or at specific times, anywhere students have access. In 1994, NPS began delivering courses in both degree and non-degree programs by Distance Learning via interactive video and audio. Currently, NPS is preparing to deliver courses via the Internet. Two short courses have been developed for the Executive Management Education Program, for the Navy’s Bureau of Medicine and Surgery. Further, in the Academic Departments and Groups, some faculty are already using the Internet in various ways for portions of their courses, and it is reasonable to expect that more Internet courses will soon evolve.

**EFFICIENCY AND EFFECTIVENESS OF NPS’ EDUCATIONAL PROGRAM**

**Analysis and Evaluation**

The efficiency and effectiveness of NPS’ educational programs has been the subject of a number of studies, as the Navy and Congress have debated the question of whether to continue to educate officers in Monterey at NPS or at civilian institutions. The most recent study, "A Bottom-Up Assessment of Navy Flagship Schools," was published by the Center for Naval Analyses in January 1998. This study, as well as others, addresses the general question of how the Navy should educate its officers. Strategic Initiative #2 assumes NPS will continue as the Navy’s institution of choice and must execute its mission as efficiently and effectively as possible.

When evaluating the efficiency and effectiveness of NPS’ Educational Program, the interaction between these two attributes must be taken into account. Changing a process or requirement to increase efficiency may degrade its effectiveness. For example, doubling the number of students in a course increases efficiency (resulting in a larger student-to-faculty ratio) but may reduce effectiveness (leading to less individual time between student and instructor and/or less learned by each student, if class size
exceeds 15 to 20 students). Reducing the time each student spends on campus through preparatory courses using Web-based instruction will increase efficiency (less student hours on campus per degree), but may also decrease effectiveness (students may not be current if prerequisite courses must be taken over an extended period of time, and the value of highly interactive courses may be degraded without face-to-face instruction. With regard to Distance and Network Based Learning in particular, NPS faces new challenges in determining how to best use these innovative technologies to enhance the efficiency as well as the effectiveness of its Educational Program.

Effectiveness

NPS has a well-defined process for developing and evaluating its academic programs and courses. As noted above, educational programs are developed in response to customer requirements and, in the case of subspecialty curricula, satisfy a specific set of Educational Skill Requirements. Courses within a curriculum are taught to satisfy these Educational Skill Requirements, and are evaluated through the following mechanisms:

1. Student Opinion Forms are administered at the conclusion of each course. Students are asked to complete a scaled evaluation of various aspects of the course and the instructor, and then provide written remarks on anything about the course they care to address. The quantitative data are compiled quarterly for each department and for the School as a whole; and curricula-specific data may be extracted. These data are distributed School-wide for various uses. For example, the Systems Management Department has recently used the data for a series of faculty discussions on grading policies. The qualitative data are seen only by the faculty member who taught the course, and are intended for formative course evaluation — i.e., to provide specific feedback that can be used to develop on-going course changes. Recent Student Opinion Form data are available in the document library.

2. The Academic Associate and/or Curriculum Officer generally meet with their students at the conclusion of each quarter to discuss their experience with the courses, the curriculum as a whole, and on any administrative or quality of life matters that impact the student’s experience at NPS. These are generally informal discussions the results of which are used as appropriate by the Academic Associate and Curricular Officer in preparation for curricular reviews, to effect immediate change if necessary in administrative or quality of life issues, or to resolve issues of concern or interest.

3. An exit survey is conducted as graduates depart the School. The Library contains an analysis of exit survey data from 1993 to 1998. These surveys produce some interesting data on how students perceive their graduate education experience. Analysis reveals that there is a great deal of variance in how students judge the quality of their graduate education.
4. The curriculum review is an important and unique mechanism for evaluating effectiveness of academic programs. Curricula are reviewed by the Naval Postgraduate School and by the Primary Consultant every two years. In conjunction with this review, primary consultants are asked to review the billets that have been identified as requiring the skills acquired through the curriculum. These Primary Consultants evaluate whether the skill set is still current and whether any additional skills are required. They use this knowledge to evaluate the Educational Skill Requirements. NPS faculty also provide insight into the Educational Skill Requirements as they discuss with the Primary Consultant emerging technologies, new directions and significant advances in the field that the Primary Consultant may want to consider incorporating into the Educational Skill Requirements. Changes, additions or deletions to the Educational Skill Requirements may then result in changes to the courses and thereby also the curriculum. Further, graduates of a subspecialty curriculum are assigned to billets requiring the subspecialty education provided by the curriculum, and often continue to interact with faculty after leaving the School. This post-graduation interaction provides additional information about the quality of programs. Examples of the most recent curricula reviews are available as Assessment #8.

5. NPS graduates are required to remain in the service for a minimum of four years upon completion of their degree program. For most officers who attend NPS, the decision to attend a funded graduate education program and incur the additional obligation signifies their intent to complete a career in the Navy. Thus NPS has the unique opportunity of being able to follow the career progression of its graduates, at least Navy officers. This affords NPS the ability to use several assessment mechanisms to evaluate the effectiveness of its graduate degree programs.

Table 1. Observed continuation and promotion rates for unrestricted line officer communities by O4 through O6 selection boards for fiscal years 1986-1995

<table>
<thead>
<tr>
<th>GRADUATE SCHOOL STATUS</th>
<th>No Grad Ed</th>
<th>Part Funded Grad Ed</th>
<th>Fully Funded Grad Ed</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grad Ed</td>
<td>39.1</td>
<td>75.9</td>
<td>88.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Pct Stay to LCDR Board</td>
<td>72.7</td>
<td>71.0</td>
<td>93.8</td>
<td>83.6</td>
</tr>
<tr>
<td>Pct Promote to LCDR</td>
<td>64.7</td>
<td>91.9</td>
<td>85.9</td>
<td>89.8</td>
</tr>
<tr>
<td>Pct Stay to CDR Board</td>
<td>63.6</td>
<td>70.8</td>
<td>78.6</td>
<td>70.4</td>
</tr>
<tr>
<td>Pct Promote to CDR</td>
<td>56.9</td>
<td>73.7</td>
<td>83.6</td>
<td>73.4</td>
</tr>
</tbody>
</table>
Retention in the Navy and promotion to the next higher rank are both significant measures of success in a naval officer’s career. Graduates of NPS consistently stay in the service longer and promote to the next highest rank at a rate at or above the Navy average as shown in Table 1. (Source: Officer Promotion History Files, Bowman/Mehay)

As of September 1996, 80 percent of Flag rank officers held a Master’s degree or higher, and 28 percent of these received their Master’s degree from NPS (see Center for Naval Analyses Report, p. 64). These percentages are significantly higher than the percentage of graduate-educated officers in the officer corps as a whole, which demonstrates a correlation between graduate education and attainment of flag rank in the Navy. A long-term increase in the percentage of NPS-educated officers attaining flag rank would be an even clearer indicator of the effectiveness of the School’s educational programs.

After-graduation surveys could become systematic and useful indicators of how students apply their graduate educational experience on the job. A survey of graduates was conducted in 1990. Another has been initiated and will be delivered in 1999.

1. Similar to the degree programs, non-degree courses are evaluated through student feedback at the end of the course, and by sponsor input. For example, the Executive Management Education Program for the Navy’s Bureau of Medicine and Surgery changed its content as a direct result of input by a Tri-Service Medical group, of which the Sponsor and several NPS faculty are members, that conducts an on-going assessment of the educational competencies of medical executives. These competency levels are subject to change as a result of innovations in technology, changes in resources, etc.

2. As noted previously, the School’s operating budget covers the cost of providing in-residence programs for Navy students. In the case of non-Navy students, however, the School receives tuition to help cover the additional cost of accommodating those students in Navy programs, or creating new programs specifically for those students. Thus, non-Navy program costs are funded on a reimbursable basis, and there is a built-in mechanism for assessing customer satisfaction. The School’s non-Navy customers choose NPS over alternative institutions because they understand it is the most effective and efficient way their requirements can be met.

**Efficiency**

The NPS Academic Planning Office provides support to the Provost, Academic Deans, and Department and Group Chairs for the planning and execution of the academic
budget. It provides a number of reports and mechanisms to measure the efficiency of School operations. One of the key assessments is the Mission Long Range Labor Plan shown in Table 2. This planning document shows the history and future plan for the number of faculty and staff work years. It also includes the Average-On-Board (AOB) student count, which is simply the average over the period of interest of the number of students enrolled. Since nearly all students (with the exception of a few NPS staff) are full-time, and since very few students drop out, the Average on Board is an accurate reflection of NPS’ full-time student load. This long range plan allows the administration to evaluate critical decisions in terms of how they will impact the ratios listed above. Decisions involving faculty hiring, retirement planning, academic funding and allocation of resources among departments can be made. Their impact on such measures as staff-to-faculty ratios, student-to-faculty ratios, reimbursable-to-direct funded faculty can be assessed.

Table 2. Long-range labor plan for faculty and civilian staff (excludes IDEA, DRMI and CMR). Note: "Direct" funding includes foreign military tuition, non-Navy tuition, and Navy support [O&MN].

<table>
<thead>
<tr>
<th>MISSION LONG RANGE LABOR PLAN (excludes IDEA, CMR, DRMI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACULTY</td>
</tr>
<tr>
<td>FY91 FY92 FY93 FY94 FY95 FY96 FY97 FY98 Est&gt; FY99 FY00 FY01 FY02</td>
</tr>
<tr>
<td>AOB (students) 1867 1780 1797 1770 1643 1450 1320 1250 1300 1300 1300 1300</td>
</tr>
<tr>
<td>TT (count) 243 238 232 237 234 236 231 223 213 202 195 190</td>
</tr>
<tr>
<td>Direct WY 275 238 221 217 214 212 205 187 184 180 180 180</td>
</tr>
<tr>
<td>Reimb WY 53 81 96 97 109 111 120 120 120 120 120 120</td>
</tr>
<tr>
<td>Total WY 328 319 317 314 323 323 325 307 304 300 300 300</td>
</tr>
<tr>
<td>RATIOS</td>
</tr>
<tr>
<td>AOB/TT(count) 7.68 7.48 7.75 7.47 7.02 6.14 5.71 5.61 6.10 6.44 6.67 6.84</td>
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<tr>
<td>AOB/Direct WY 6.79 7.48 8.13 8.16 7.68 6.84 6.44 6.68 7.07 7.22 7.22 7.22</td>
</tr>
<tr>
<td>Direct WY/TT(count) 1.13 1.00 0.95 0.92 0.91 0.90 0.89 0.84 0.86 0.89 0.92 0.95</td>
</tr>
<tr>
<td>Reimb WY/Direct WY 0.34 0.43 0.43 0.45 0.51 0.52 0.59 0.64 0.65 0.67 0.67 0.67</td>
</tr>
<tr>
<td>Reimb WY/0.16 0.25 0.30 0.31 0.34 0.34 0.37 0.39 0.39 0.40 0.40 0.40</td>
</tr>
</tbody>
</table>

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Below is a brief description of some additional data and reports prepared by, or retained by, the Academic Planning Office. They are used either regularly or on an ad-hoc basis to monitor the allocation and use of resources and for general management of NPS, with primary focus on the School’s mission labor budget and are available for review.

1. **Labor Plans and Summaries.** Each mission activity is allocated a labor budget at the beginning of the fiscal year. Faculty and staff labor budgets are handled separately. Departments submit labor plans to the Academic Planning Office showing the expected expenditure by individual for each quarter of the year. Expenditures are indicated as being on the direct budget or reimbursable. The primary purpose of labor plans is to track direct budget expenditures. These plans are changed frequently by department chairs in response to changes in personnel teaching requirements and the availability of research funds.

2. **Bi-weekly Labor Tracking Reports.** As labor expenditures are made bi-weekly, the Academic Planning Office records all transactions, summarizes expenditures, and compares them to the labor plans submitted by the departments. Significant deviations are noted and, if appropriate, discussed with the line manager and/or department head.

3. **Annual Faculty Labor Summary.** At the conclusion of each fiscal year, a summary of labor expenditures by academic department is produced, showing work years expended by department in the major categories.

<table>
<thead>
<tr>
<th></th>
<th>Direct WY</th>
<th>Indirect WY</th>
<th>Reimb WY</th>
<th>TOT STF WY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STAFF</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td>296</td>
<td>315</td>
<td>334</td>
<td>335</td>
</tr>
<tr>
<td>Direct WY</td>
<td>265</td>
<td>273</td>
<td>277</td>
<td>271</td>
</tr>
<tr>
<td>Indirect WY</td>
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<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>Reimb WY</td>
<td>31</td>
<td>42</td>
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<td>64</td>
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<tr>
<td>TOT STF WY</td>
<td>290</td>
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<table>
<thead>
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<th></th>
<th>Direct-funded</th>
<th>Reimb</th>
<th>Total</th>
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<tr>
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<td></td>
<td>1.08</td>
<td>0.71</td>
<td>0.93</td>
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</tbody>
</table>

**RATIOS**
4. Historic Annual on Board Reports (1975-1998). Quarterly Average on Board data from the Registrar is retained and summarized by input source (i.e., Navy, Marine Corps, International, etc.)

5. Workload Reports. Almost every quarter, the Academic Planning Office prepares a report comparing faculty labor expended in each department to the number of courses taught. This comparison is done for each faculty member who was supported on direct budget, to verify that the budget is being used for teaching, and is done for every individual who taught to verify that reimbursable funds are not paying for instruction. These data are summarized for each department.

6. Teaching Loads. Summary data are maintained showing the number of sections taught by department, by quarter. Also included is information on class size, classes taught by military faculty, etc.

7. Faculty Pay Scatterplots. Charts are produced both annually and on an ad-hoc basis, as needed, showing faculty pay step versus number of years since the baccalaureate or terminal degree. These are produced for several categories of faculty (tenured, untenured tenure track, and non-tenure-track) and by faculty rank. The charts are used to determine the appropriate step for new faculty.

8. Faculty Data. In addition to standard personnel files retained for each faculty member, the Academic Planning Office maintains information relevant to the management of the Faculty. This includes data about retirement eligibility, age distribution by department, average age and salary by department, etc. Historical data are retained for each year showing the number of tenure-track hires, the number of tenure-track departures, and the reason for departure.

9. Mission Execution History. The Comptroller’s office annually produces a Mission Execution History that shows expenditures by category and funding source. Though some refinements in this report are desirable, it is a valuable reference for planning purposes.

10. Initial Budget Planning Document. This document allows comparison between the planned mission budget for the coming year and previous year budgets.

11. Research Documentation. Data are kept on both faculty and student (thesis) research.

12. The Academic Planning Office conducts numerous other analyses. The data provide feedback on efficiency to all levels of the NPS organization.

13. Additional organizational data relate to efficiency of operations. For example, NPS is unique in that it schedules all students for four quarters. Further, the NPS graduation rate is extremely high.

Recent research at NPS has also measured the efficiency of the School’s educational programs. The efficiency of its degree programs, as compared to those of other institutions, is analyzed in the School’s response to the Center for Naval Analyses report, "CNA’s ‘A Bottom-Up Assessment of Navy Flagship Schools’: The NPS Critique." The Center for Naval Analyses report itself uses self reported academic year 1993-94 data from the Integrated Postsecondary Education Data System to compare the annual per
The Center for Naval Analyses concluded, "... that in 1993-1994, NPS’s expenditures were in the top-quartile for total and educational expenditures per student." They found that NPS is the most expensive school when the comparison considered only tuition costs for the civilian schools. The NPS faculty response, in contrast, demonstrates that the Center for Naval Analyses’s cost comparison is misleading unless costs are normalized for differences in both student populations (i.e., graduate versus undergraduate students), course loads, and class contact hours. In addition, it is important to include the costs of the students’ salaries and housing if there are differences in program duration or housing costs across degree programs. These adjustments are made in Figure 1, which is reproduced from the NPS faculty response to the Center for Naval Analyses report.

Figure 1. Comparative Cost of NPS Graduate Military Education: Annual costs per student with adjustments for students’ salary/benefits, program duration, transition and refresher courses, course load, and contact hours.

Figure 1 shows that the $159 cost per contact hour of educating military officers at NPS favorably compares to the $318 average cost per contact hour of educating students at the 28 other leading institutions. In the figure, student population is defined as full-time equivalent students at NPS, fall enrollment elsewhere. Military salary and benefits are $63,300/year at NPS, $72,300 elsewhere, reflecting higher off-base housing costs. Program duration is 24 months at civilian universities versus 22.8 months at NPS,
including transition and refresher courses. NPS graduate program duration is 18 months, excluding transition and refresher courses. Civilian university programs include 972 class hours — a 24-month program of 13 class hours per week, 32 weeks per year during the normal academic year, plus 7 class hours per week, 10 weeks per year during the summer. The NPS program includes 1,152 class hours — an 18-month program with 16 class hours per week, 48 weeks per year. The NPS cost per class hour would be the same for the graduate program plus transition and refresher courses (class hours and program costs both increase proportionally).

Measures: Distance Learning

Because NPS competes in the open market for distance learning students, the growth in demand for remote-site courses is a good measure of both the effectiveness and efficiency of the School’s distance learning program. Table 3 below shows the number of NPS distance learning courses and students by academic year since the program’s inception in the summer of 1994.

Table 3. Growth in Distance Learning courses and students

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DL Courses</td>
<td>1</td>
<td>4</td>
<td>20</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>DL Students</td>
<td>17</td>
<td>48</td>
<td>407</td>
<td>352</td>
<td>306</td>
</tr>
</tbody>
</table>

* Data for Summer quarter 1994 only
** Data for Fall and Winter quarters 1998 only

Recommendations

The School’s progress in improving the efficiency and effectiveness of its educational programs can be enhanced by a process of reviewing existing assessments, making appropriate changes, and implementing data collection efforts. NPS should systematically define such measures and methodically collect the data necessary to develop an historical record that can be used to determine this progress. Data not currently collected, or collected but in an ad hoc manner, might include:

1. The number of NPS graduates promoted to the rank of captain or higher
2. Written statements from sponsors and alumni on the value of an NPS education
3. A periodic alumni survey
4. The record of demand by officers to attend NPS
5. The record of growth in Distance Learning courses, sites, and students
6. The record of growth in the Special Programs and associated courses
7. Written statements from Directors of Training and Distance Learning about the value of NPS courses
8. Program changes in response to sponsor needs
9. Feedback from curriculum reviews
10. The reimbursable student population
11. The number of endowed Chairs

A weighted average of some combination of the above measures is possible.

The use of new technologies such as Distance Learning and Network Based Learning present new challenges for evaluating efficiency and effectiveness of the School’s Education Program. The NPS community should have an ongoing, open discussion on the role of these technologies in its Educational Program, as well as how to best measure the efficiency and effectiveness of programs which employ them.

Infrastructure

The fourth key element of Strategic Initiative #2 is to "realize organizational efficiencies through efficiency and effectiveness of NPS management and support reinvention, reengineering, and Total Quality Leadership (TQL)." This all encompassing element has been applied most extensively to management and support functions at the School.

Office of Associate Provost for Innovation/Organizational Support Division

NPS actively promotes reinvention, reengineering and Total Quality Leadership efforts to improve organizational efficiencies and reduce its support costs. In fact, NPS was the first Naval installation designated as a Reinvention Laboratory under Vice-President Al Gore’s program to reinvent the federal government. Responsibility for these efforts is largely centralized in the Office of the Associate Provost for Innovation (OAPI). The internal mission of the Office of the Associate Provost for Innovation is "to catalyze, coordinate, and monitor execution of all NPS reinvention/continuous improvement initiatives, and to provide consultative services to management (mission and support) in these areas." (See NAVPGSCOL NOTICE 5224). The Organizational Support Division, within the Office of the Associate Provost for Innovation, executes this mission. The functions of this mission include to:

- Act as advisors/consultants
- Conduct analyses, audits, management control program (many audits are required by the Department of the Navy)
- Coordinate command performance measures
- Conduct staff training and development activities
- Conduct boundary spanning activities
A more detailed listing of these functions appears in Table 4.

**Table 4. Functions of the Office of the Associate Provost for Innovation (OAPI)**

Organizational Support Division (TQL=Total Quality Leadership, Reinv=Reinvention, CE=Command Evaluation, Oth=Other)

<table>
<thead>
<tr>
<th>OAPI Functions</th>
<th>Currently Resides With</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TQL</td>
</tr>
<tr>
<td>Act As Advisors/Consultants</td>
<td></td>
</tr>
<tr>
<td>Develop staffing impacts for NPS actions</td>
<td></td>
</tr>
<tr>
<td>Research &quot;best practices&quot; and make recommendations to line and other managers</td>
<td></td>
</tr>
<tr>
<td>Facilitate reengineering and improvement teams</td>
<td>*</td>
</tr>
<tr>
<td>Assist line managers/others in reengineering and continuous improvement activities</td>
<td>*</td>
</tr>
<tr>
<td>Propose lines of action, recommend solutions and referee across line manager actions</td>
<td></td>
</tr>
<tr>
<td>Advise and consult on change management strategies</td>
<td>*</td>
</tr>
<tr>
<td><strong>Conduct Analyses/Audits/Mgt Control Program</strong></td>
<td></td>
</tr>
<tr>
<td>Conduct analyses and make recommendations to the NEB for action</td>
<td></td>
</tr>
<tr>
<td>Conduct audits as required (MWR/BQ) and requested</td>
<td></td>
</tr>
<tr>
<td>Conduct, lead or assist with benchmarking studies</td>
<td></td>
</tr>
<tr>
<td>Gather and disseminate info on statutory and regulatory impacts on proposed NPS actions</td>
<td></td>
</tr>
<tr>
<td>Prepare waiver requests</td>
<td></td>
</tr>
<tr>
<td>Develop ROIs for NPS actions</td>
<td></td>
</tr>
<tr>
<td>Conduct Hotline &amp; FWA investigations</td>
<td></td>
</tr>
<tr>
<td>Conduct external Audit liaison/audit follow-up</td>
<td></td>
</tr>
<tr>
<td>Maintain Management Control Program</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>Coordinate Command Performance Measures</td>
<td></td>
</tr>
<tr>
<td>Coordinate Customer Feedback</td>
<td></td>
</tr>
<tr>
<td>Maintain Command-level performance measures</td>
<td></td>
</tr>
<tr>
<td>Maintain database and status of reinvention, reengineering and continuous improvement activity</td>
<td>*</td>
</tr>
<tr>
<td>Maintain coffee suggestion system</td>
<td>*</td>
</tr>
<tr>
<td><strong>Staff Training and Development</strong></td>
<td></td>
</tr>
<tr>
<td>Assist in developing retraining program</td>
<td></td>
</tr>
<tr>
<td>Assist in planning and managing leadership training for execs, mgt, faculty, staff and students</td>
<td>*</td>
</tr>
<tr>
<td>Conduct TQL Education</td>
<td>*</td>
</tr>
<tr>
<td>Maintain MOEs on staff training and development</td>
<td></td>
</tr>
<tr>
<td>Coordinate/conduct Seven Habits and PCL Seminars</td>
<td>*</td>
</tr>
<tr>
<td><strong>Conduct Boundary Spanning Activities</strong></td>
<td></td>
</tr>
<tr>
<td>Scan external environment, maintain info on opportunities and threats, and provide regular reports to the NEB.</td>
<td></td>
</tr>
<tr>
<td>Represent NPS interests to the external reinvention world</td>
<td></td>
</tr>
<tr>
<td>Represent NPS in terms of reinvention, reengineering, and continuous improvement to the community, Navy, DoD, etc.</td>
<td>*</td>
</tr>
</tbody>
</table>

**Audits**

The Bureau of Naval Personnel requires that the Organizational Support Division conduct nine annual audits on the Morale, Welfare, and Recreation (MWR) activities of Naval Support Activity-Monterey Bay. These audits are required for all activities using non-appropriated funds. The nine audits include: cash, cash in bank, sales, accounts receivable, procurement, accounts payable, fixed assets, and payroll merchandise and consumables inventory. In addition, Organizational Support Division supports a new Inspector General’s review every four to seven years and conducts annual follow-up audits for the subsequent three to four years.
Organizational Support Division also conducts audits as requested by NPS, Naval Support Activity-Monterey Bay or other activities. Recently, Organizational Support Division conducted audits on travel and blank purchase agreements. In the past, Organizational Support Division audited recycling, housing, timekeeping and the Comptroller’s office. These audits assess the School’s internal controls, determine compliance with the relevant rules and regulations, and identify possible areas of waste, fraud and abuse. Additionally, every three years Organizational Support Division will plan and lead command inspections of most areas and functions of NPS’ subordinate command, Naval Support Activity-Monterey Bay, starting in 1998. Finally, Organizational Support Division coordinates the campus-wide (NPS and Naval Support Activity-Monterey Bay) Management Control Program. As part of the Management Control Program, managers and process owners conduct an annual self-assessment/checklist of their areas. Managers report only "major problems" identified on their checklists, and Organizational Support Division performs quarterly follow-ups on any reported problems.

Education and Training

In the area of staff training and development, Organizational Support Division teaches three standard Total Quality Leadership/Management courses and offers customized Total Quality Leadership education and training, as requested. The standard classes and student loads for FY1993-FY1997 are shown in Table 5 below. The original Quickstart and Team Leader Courses were transitioned into the Customer Driven Quality series. In addition, Organizational Support Division spent approximately 500 hours providing customized education and training courses across campus during FY1997.

Table 5. Organizational Support Division education and training classes (1993-98)

<table>
<thead>
<tr>
<th>Course</th>
<th>FY93</th>
<th>FY94</th>
<th>FY95</th>
<th>FY96</th>
<th>FY97</th>
<th>FY98</th>
</tr>
</thead>
<tbody>
<tr>
<td>QuickStart</td>
<td>34</td>
<td>107</td>
<td>52</td>
<td>13</td>
<td>N/a</td>
<td>N/a</td>
</tr>
<tr>
<td>Team Leader</td>
<td>22</td>
<td>83</td>
<td>31</td>
<td>15</td>
<td>N/a</td>
<td>N/a</td>
</tr>
<tr>
<td>Customer Driven Quality for Managers</td>
<td></td>
<td>38</td>
<td>57</td>
<td>7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Customer Driven Quality for Employees</td>
<td></td>
<td>76</td>
<td>41</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seven Habits of Highly Effective People</td>
<td></td>
<td>44</td>
<td>100</td>
<td>23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Reinvention/Reengineering and Total Quality Management/Total Quality Leadership

Organizational Support Division is directly involved with reinvention/reengineering and Total Quality Management/Total Quality Leadership. Organizational Support Division’s activities include coordinating Process Action and Process Improvement Teams; facilitating strategic planning meetings and Quality Management Boards; managing NPS’ "suggestion box" system, including an electronic suggestion box on the NPS Home Page; conducting and analyzing focus groups; quality of service, including conducting customer satisfaction surveys; and teaching Total Quality Management/Total Quality Leadership classes. These activities all contribute to NPS’ reinvention, reengineering, and Total Quality Leadership processes.

NPS has used several mechanisms to identify potential reinvention/reengineering candidates. One of the School’s first initiatives was a 1993-94 effort to identify and eliminate "silly rules." Everyone on campus was asked to identify at least two rules, regulations, or directives that hindered them and their co-workers in performing their jobs efficiently and effectively. This effort netted over 800 nominations. In response, as of December 1994, 12 rules, policies and instructions had been eliminated; 186 nominations were deemed completed (e.g., the rule was clarified, modified or deemed appropriate as is); and 24 waiver/pilot program requests were submitted for approval by the chain of command.

More recently, NPS has conducted periodic surveys to gather data from faculty, students and staff on both the value and quality of service of organizational support activities. Activities with a high service value but low customer satisfaction become the strongest candidates for reinvention/reengineering efforts. NPS also collects suggestions for process improvements as part of its annual faculty appraisal process. Faculty are encouraged to suggest areas where NPS can improve its performance. These suggestions are forwarded, anonymously if requested, to the appropriate cognizant individual. Finally, the leadership of NPS and/or Naval Support Activity-Monterey Bay may identify targets of opportunity for reinvention/reengineering, with individual managers responsible for identifying candidates for improved efficiency and effectiveness within their scope of responsibility.

Once identified, reinvention/reengineering candidates typically proceed through a reinvention/reengineering process: Process Action Teams, Process Improvement Teams, and Quality Management Boards are established, as appropriate; recommendations are provided; and process improvements are implemented as appropriate. This process is described in more detail below, using travel reinvention as an example.
Follow-up — i.e., documentation, assessment and feedback — is a weakness in NPS’ reinvention/reengineering process. In theory, reinvention/reengineering results should be documented using quantifiable measures of effectiveness and indicators of progress, which form the basis for continuing assessment and improvement. However, within NPS there is as yet no systematic process for such documentation, assessment and feedback. The School could improve its reinvention/reengineering process and better document improvements in efficiency, quality of service and customer satisfaction if it systematically included a feedback loop.

Reinvention/reengineering activities have addressed a number of management and support functions within NPS. Some of the areas addressed with Organizational Support Division assistance include: travel, supply process improvement (credit card system), computer support, commercial activities/outsourcing, student academic support, financial management information system automation, the quality of NPS’ internal communications system, public works project management and scheduling, electronic thesis publishing, and research materials support for faculty, staff and students. During FY1997, Organizational Support Division staff spent approximately 1,000 hours providing consultation services. Approximately 40% of this time involved facilitating Process Action Teams, Process Action Teams and Quality Management Boards; approximately 20% involved other internal advising and consulting projects; and the remaining 40% involved the travel reinvention process.

**Analysis and Evaluation**

NPS’ progress toward improving efficiency and effectiveness in the area of management and support infrastructure, using the reinvention/reengineering process, can be best evaluated using specific examples. Several are provided below.

**Travel**

Travel is one area that has received significant attention within NPS, the Department of Defense and the Federal Government. The NPS Organizational Support Division has devoted a substantial portion of its resources to this effort, and its activities have been supported by the research of two NPS student theses ("Business Process Reengineering of the Department of Defense Travel System," by William R. Tate and Gregory M. Tharpe, September 1995; and "Cost Benefit Analysis of the NPS Automated Travel System," by Keri Ghros and Lance Theby, September 1996).

NPS’ efforts to reinvent/reengineer travel stemmed from at least two influences: the School’s designation as a Defense Performance Review Reinvention Laboratory, and a customer survey by NPS’ reinvention office (Organizational Support Division’s predecessor). Travel had been identified as a candidate for reinvention through Vice-President Gore’s initiative to reinvent the federal government, and NPS became a part
of this process when it was designated as a Department of Navy Reinvention Laboratory. NPS initially purchased Travel Manager Plus, Version 4.0 (Financial) to automate its then current travel system. (The previous system had been referred to as the "sneaker net" because so many travel requests and claims had to be physically walked through the system). This effort was supplemented by a student thesis (Tate and Tharpe, 1995) and by a customer survey that identified several concerns with regard to the travel system. As a result of these actions, the automation effort was expanded into a reengineering process.

A travel reengineering team was formed in March 1995, including a travel clerk and representatives from the Comptroller’s office, the Personnel Support Detachment, the commercial travel office, and other supporting members. This team designed a new travel system using Business Process Reengineering principles. They also developed a five-step implementation plan, including marketing; contracting (network infrastructure software, interfaces, training, and technical support); installation; testing and rollout.

Following this plan, the system was tested by three academic departments (Electrical and Computer Engineering, Mechanical Engineering, and Systems Management) and two organizational support activities (the Comptroller’s office and the Personnel Support Detachment). Data were collected during 1995 and 1996 to evaluate the costs and effectiveness of this new system. An NPS student thesis analyzed the costs and benefits of fully implementing the re-engineered travel system, suggesting measures of effectiveness to monitor progress (Ghros and Theby, 1996). After reviewing preliminary results from this test case, NPS has implemented Travel Manager throughout the institution. In some instances, Travel Manager is used by travel clerks who process requests and claims for individual travelers. Alternately, individual travelers directly interface with the new travel system, significantly reducing the travel clerk’s role. To date, Organizational Support Division has trained 72 staff members, 77 faculty members, and two students in using the Travel Manager software. The potential improvement in efficiency and effectiveness was estimated in the September 1996 thesis by Ghros and Theby (pg. 58). The results are summarized in Table 6, below.

Table 6. Benefits of the NPS Automated Travel System

<table>
<thead>
<tr>
<th></th>
<th>Manual Processing</th>
<th>Automated Processing (Partial Implementation*)</th>
<th>Automated Processing (School-wide Implementation**)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steps per Voucher</td>
<td>56</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Admin. Cost per</td>
<td>$67.11</td>
<td>$42.59</td>
<td>$33.74</td>
</tr>
</tbody>
</table>
It is clear from Table 6 that the cost and processing time for travel vouchers could be reduced by a factor of two through a campus-wide implementation of the automated travel system.

The travel reinvention/reengineering process illustrates many aspects of NPS’ reinvention/reengineering process, including the role of Organizational Support Division and student theses in supporting such efforts. Whereas travel represents one of NPS’ most extensive reinvention/reengineering activities, others follow this same pattern but on a smaller scale. One way NPS might improve this process is to systematically collect and analyze data using defined measures of effectiveness after implementing new processes. This would provide the quantitative feedback currently lacking in most of NPS’ reinvention/reengineering efforts.

Credit Card Procurement

A second area to which Total Quality Leadership principles have been successfully applied is procurement. Until recently, the process of procurement, particularly of items required for research, was frustrating to faculty due to the paperwork and long delays experienced. However, a Process Action Team was formed, and in 1994 a credit card system was implemented. Subsequently, supply clerks across campus were trained on the system, so that it is now possible to purchase items under $2,500 using this significantly more efficient method. Time required to process orders has been reduced by ten days, and delivery is now directly to department supply technicians, resulting in another 14-day reduction in turnaround time for the customer.

<table>
<thead>
<tr>
<th>Position</th>
<th>Grade</th>
<th>Salary</th>
<th>Acceleration</th>
<th>Total</th>
<th>Action</th>
</tr>
</thead>
</table>

Table 7. Savings realized from credit card purchasing
<table>
<thead>
<tr>
<th>Warehouse</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WG-6</td>
<td>29,300</td>
<td>6,739</td>
<td>36,039</td>
</tr>
<tr>
<td></td>
<td>WG-8</td>
<td>32,200</td>
<td>7,406</td>
<td>39,606</td>
</tr>
<tr>
<td>Purchasing</td>
<td>GS-6</td>
<td>24,600</td>
<td>5,658</td>
<td>30,258</td>
</tr>
<tr>
<td></td>
<td>GS-6</td>
<td>24,600</td>
<td>5,658</td>
<td>30,258</td>
</tr>
<tr>
<td></td>
<td>GS-7</td>
<td>29,500</td>
<td>6,785</td>
<td>36,285</td>
</tr>
<tr>
<td></td>
<td>GS-8</td>
<td>32,700</td>
<td>7,521</td>
<td>40,221</td>
</tr>
<tr>
<td></td>
<td>GS-9</td>
<td>36,200</td>
<td>8,326</td>
<td>44,526</td>
</tr>
<tr>
<td></td>
<td>GS-12 to 11</td>
<td>8,700</td>
<td>2,001</td>
<td>10,701</td>
</tr>
<tr>
<td>Total Yearly Savings</td>
<td>$267,894</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Intangibles: Receipt of products in 24 fewer days; no additional personnel hired.

The implementation of a credit card purchasing system at NPS has resulted in significant savings for the School. Table 7 above and Figure 2 below show the positions that have been eliminated and the cost savings achieved as a result of the improved efficiency of this system. Yearly savings total $267,894. NPS has proposed to the Dept. of the Navy that it raise the $2,500 ceiling to $25,000. If approved, the demonstrated savings and benefits of the credit card purchasing system could be extended even further.
Figure 2. Overall NPS cumulative savings from supply reorganization

Information Systems

Technology is and will continue to result in major changes in educational paradigms at NPS. Strategic Initiative #2 thus calls for both "technical innovation" and the use of "new information systems," both of which are essential to the future of the School. A third and important area of NPS’ current reinvention/reengineering focus is therefore management of information systems.

It is clear that NPS must stay abreast of educational technology, both to be able to best serve the Navy and to maintain its current stature as an educational leader. Yet it is also clear that the School will face significant resource restrictions in the near future, and that most if not all cost savings will have to come from internal initiatives. As one of the principal cost-saving options open to NPS is reducing labor costs, which can only come
from increased productivity, Management Information Systems improvements — a key source of productivity gains — will be an increasingly essential element.

Several internal studies conducted over the past several years have concluded that the current status of Management Information Systems support at NPS has both positive and negative aspects. On the positive side, NPS students are, in general, already reasonably computer literate when they first arrive on campus. In addition, NPS has a large inventory of reasonably modern computer systems and, as shown in Figure 3 below, supports these systems with a computer support staff effort that is fairly generous compared with published industry figures.

Figure 3. Computer systems per support person: Best practice and NPS

In addition, Figure 4 below shows the School’s overall cumulative savings from proposed computer administrator reorganization.
On the negative side, the present largely decentralized Management Information Systems structure has resulted in a lack of standardization that negatively affects student, faculty, and staff productivity. Multiple user accounts must be created and maintained for students on different systems in each department in which they take courses. Students cannot always easily access their own files in another department which they need to complete course assignments in their home department. Document interchange often requires time-consuming manual conversion between incompatible formats. Maintenance costs rise as staff must learn and remain current on multiple hardware platforms and operating systems. Most automated applications are "stovepipes" — that is, they are developed to satisfy only the requirements of the developing department or the requirements of some mandating Navy office. Consequently, most applications cannot exchange identical data (e.g. student names)
with applications developed by other departments, and sometimes not even with other applications in the same department. As a result, students have to separately register — i.e., fill out a form with their name and other relevant demographic data — with the Registrar, their Curricular Officer, the Computer Center, the Library, the Base Police, the Chaplain, etc. Budget analysts in the Comptroller’s office must print out fiscal data from one reporting system and manually re-enter that same data, including fifty-plus-character accounting codes, to a different one. Furthermore, the current campus local area network (LAN) is composed primarily of aging, overloaded "thin" 1980s Ethernet technology, installed by numerous different individuals and of widely-varying standards of quality. Because of all these factors, the current LAN experiences widely varying and often unsatisfactory performance, and finding and correcting problems can be very time-consuming and labor intensive. Fortunately the LAN is currently being updated, and this will facilitate the solution to the above problems.

Lastly, there is a down side to the earlier noted fact that NPS supports its systems quite generously in terms of computer support staff. As indicated in Figure 3, NPS support may be only a quarter to half as efficient as "best practice." If this is true, NPS could realize significant gains in efficiency by an appropriate combination of standardizing, centralizing, and downsizing. As one example, preliminary studies have suggested that NPS expends over fifty work-years in PC and work station operating system support. A reduction of just ten work-years in this area would translate into an annual savings of over a half million dollars in labor costs.

NPS has already begun to take action to rectify many of these problems. During late FY1997, the School obtained approximately $5 million in funds to install a state-of-the-art network infrastructure. Installation of new cabling commenced in March 1998, and current estimates are that this build-out should be completed by late November 1998. A single integrated database architecture based on Microsoft’s SQL Server has been selected as the vehicle for all future internally-developed campus-wide data bases, and a fledgling applications development group has been created under the Associate Provost for Computer and Information Systems to migrate appropriate current applications to this standard. Unfortunately, this group’s first major project — conversion of a current "stovepipe" time-keeping and payroll system to a modern client-server architecture — was canceled when almost completed due to interface issues with a Navy-mandated PC DOS-based accounting package.

In April 1998, the newly-arrived NPS Superintendent, RADM Robert Chaplin, issued an "Information Technology Statement of Directions" clearly establishing certain standards, including Microsoft Office as the School’s administrative desktop standard. This put in motion the processes for establishing other standards, and for creating a more efficient overall computer support structure. It is still too early to tell how successful these initiatives will be, and NPS has as at best minimal information systems performance
measurement tools. Therefore, reaching objectively sustainable conclusions about performance gains will have to await these improvements.

It is also unclear what mechanisms currently exist for making changes in computing and information systems policies and processes at NPS. Organizationally, several exist on paper. A Computer Users’ Council, currently attended primarily by technical support staff, does meet regularly, and the Associate Provost for Computer and Information Systems and most of his staff attend those meetings. However, because of its membership, the recommendations of this group are generally limited to technical, rather than strategic or policy issues. A Computing Advisory Board, which is supposed to provide a mechanism for broad input, including from faculty, into the planning and policy process (see the NPS Faculty Handbook, p. III-13) has not met for several years, and there are no stated current plans to reestablish it. In addition, the Faculty Council frequently discusses computing-related issues informally, and does have a representative to the effectively defunct Computing Advisory Board. But, in practice, the Council often finds out about changes in computing-related policies only after they are announced. Further, the NPS Executive Board (NEB), which was composed of the senior line managers including deans, did studies which included strategic computing and information systems questions.

Summary of Infrastructure Findings

We have examined the NPS travel, credit card procurement system, and information services to determine the School’s progress toward increasing the efficiency and effectiveness of its management and support infrastructure. The data show that the travel and procurement processes have been made more efficient and effective, but that much still remains to be accomplished with regard to information systems.

Recommendations

- In theory, reinvention/reengineering results should be documented using quantifiable measures of effectiveness and indicators of progress. These measures form the basis for continuing assessment and improvement. Within NPS, there is as yet no systematic process for documentation, assessment and feedback. NPS could improve its reinvention/reengineering process, and better document improvements in efficiency, quality of service and customer satisfaction, if it systematically included a feedback loop.
- NPS needs to move as quickly as possible to establish a standardized, modern, campus-wide administrative information system. Concurrently, as indicated in the Strategic Plan, NPS needs to "develop a set of metrics to … measure our improvement and demonstrate it to those outside NPS." In addition, NPS should ensure that decision and policymaking processes explicitly identified in such official NPS publications as the Faculty Handbook are, in fact, being followed.
- Consideration should be given to raising the $2,500 limit currently imposed on purchases using the credit card purchasing system, to extend the demonstrated savings and benefits of this innovation even further.

Measures

Student theses represent an important reinvention/reengineering resource. NPS students, with rare exceptions, must complete a Master’s thesis as part of their educational requirements. Some of these theses, particularly those in the Systems Management Department which grants a Master’s of Science in Management, address organizational support issues within NPS. Some theses identify problems and recommend solutions, while others provide analysis for a particular stage of an ongoing reinvention/reengineering effort. In either case, student theses provide a valuable resource, which augments Organizational Support Division efforts. This resource could help in documenting and assessing the School’s improvement processes. A list of relevant student theses is included in Table 8 below.

Table 8. Student theses related to NPS reinvention/reengineering efforts

<table>
<thead>
<tr>
<th>1. The NPS Public Works Department Maintenance Request Process Analysis, by Hui Pak and Bob Ware, June 1997.</th>
</tr>
</thead>
</table>

Management Incentives

The last issue we will discuss is management incentives, recognizing that real progress toward improvements in efficiency and effectiveness will likely be slow without them. The Strategic Plan, in its discussion of key elements for Initiative #2, refers to "development and adoption of new incentive programs."
Incentives are a key to increasing the efficiency and effectiveness of NPS; and the central issue of institutionally supported incentives to increase efficiency and effectiveness of the School is resource availability. Currently, there are very limited resources to fund incentives for faculty and staff to work toward increasing the efficiency and effectiveness of NPS. However, there are three primary internal sources of funding for efforts to increase effectiveness. These are shown in Table 9, below.

Table 9. Sources of funding for management incentive programs at NPS

<table>
<thead>
<tr>
<th>Source of Funding</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provost's pool</td>
<td>Normally sufficient to fund two faculty work-years each year. In 1997, a typical year, faculty labor totaled 325 work years, of which 120 were reimbursable and 205 were paid for from the School’s operating budget. The 2 work years allocated to the Provost’s resource pool therefore represent less than 1% of the total faculty labor executed.</td>
</tr>
<tr>
<td>2. Institute for Joint Warfare Analysis</td>
<td>Funding from Congress for the Institute for Joint Warfare Analysis. The mission of the Institute for Joint Warfare Analysis is to promote and support research and instruction at NPS and to enhance the capabilities of our faculty and staff to participate in Joint programs. The Institute supports Joint related course development for all curricula on campus. The Congress has funded this effort at approximately $1.7 million dollars.</td>
</tr>
<tr>
<td>3. School funds for interesting ideas</td>
<td></td>
</tr>
</tbody>
</table>

One possible plan for increasing efficiency is to give back one half of savings over more than one year to the organizational element that achieved the efficiency. Given current resource constraints, that plan, however, has not been executed.

Analysis and Evaluation

Although the Strategic Plan states that increasing efficiency and effectiveness of the School is critical to its survival, the resources allocated to rewarding such efforts are currently minimal. The Institute for Joint Warfare Analysis’ funding is an exception. However, that funding is restricted to use for programs or research in support of joint objectives, that is, those that involve more than a single military service.

RECOMMENDATIONS

- More resources should be allocated to fund efforts at the departmental and individual level to increase the efficiency and effectiveness of NPS. Funds could
be generated by raising the minimum funded class size from five to ten students. The funds made available by increasing the minimum funded class size could then be used to provide resources for additional efforts to increase the efficiency and effectiveness of NPS. To facilitate the transition to a larger class size, the School should continue funding classes with five students for two years.

- A second source of funds at the department level would be to fund departments on the basis of full-time-equivalent students. Passing the funds to the departments would provide greater flexibility for the department chair and faculty to use resources in the most efficient and effective way to serve their students.

**MEASURES**

One of the simplest and probably most valid measures of the impact of incentives would be a survey of the faculty and staff. If they do not believe the present incentives are sufficient, it matters little what the administration believes.

**LIST OF ACRONYMS**

BUMED Bureau of Medicine and Surgery

CE Command Evaluation

CNA Center for Naval Analyses

DL Distance Learning

DoN Department of the Navy

ESR Educational Skill Requirement

LAN Local Area Network

MCP Management Control Program

NBL Network Based Learning

NEB Naval Postgraduate School Executive Board

NPS Naval Postgraduate School

NSAMBE Naval Support Activity Monterey Bay

OAPI Office of the Associate Provost for Innovation
OSD Organizational Support Division

PAT Process Action Team

PIT Process Improvement Team

SOF Student Opinion Form

TQL Total Quality Leadership

TQM Total Quality Management
"The academic world is very actively examining how best to exploit developments in information and communications technologies. The key issue is the use of technology in the delivery of instructional processes, both synchronously and asynchronously. This includes smart classrooms using networked computers and high-quality projection systems, distance learning centers, distributed learning, multimedia materials, computer laboratories, just-in-time learning systems, and entire supporting activities. We face a number of potentially very serious challenges here unless we address the issue vigorously and with focused attention.

"We need to recognize that the entry price in terms of infrastructure investment is very high. Nevertheless, we must invest in developing a base-wide broadband network system. We must establish the capability of students to access our courses, particularly those in the refresher quarters, from their many different work environments in order to reduce the total time spent in residence at NPS. We need to determine the feasibility of offering complete graduate-degree programs to government employees using distributed learning. We must market our well-honed ability to create militarily relevant, technical and interdisciplinary programs that cannot be duplicated elsewhere. We must capitalize on our distinguished faculty who are equipped with appropriate DoD knowledge skills. We must invest in the hardware and software to support the delivery of intellectual content, and to provide the scholarly information resources necessary for the NPS teaching and research programs wherever they are delivered.

"We must explore the already introduced concept of a virtual Naval university linking DoD education and training institutions including: NPS, the Service Academies, the
War Colleges, and the Chief of Naval Education and Training. By creating a virtual DoD university that links us electronically with other DoD institutions, we will be able to exploit the unique strengths of each, and avoid expensive duplications.

"Initiatives such as the Navy Virtual Library Project, coordinated by the Librarian of the Navy, and the Military Education Research Library Network project of the Military Education Coordinating Committee Library Working Group are creating virtual information resources accessible across Navy commands and other DoD institutions. NPS is an active partner in these initiatives. Digitization of information created by NPS students and faculty, such as distribution of NPS theses in electronic format, offers potential cost savings, and more rapid and broader access to information." [NPS Strategic Plan, 1998. Database #xx.]

INTRODUCTION

The key issues of this initiative are:

- The use of technology in the delivery of instructional processes, both synchronously and asynchronously. Such technologies as "smart" classrooms using networked computers and high-quality projection systems, distance learning centers, distributed learning, multimedia materials, computer laboratories, and just-in-time learning systems are changing the design of courses and their delivery. Like other universities, NPS needs to address the revolution in the delivery of education vigorously and with focused attention, but it also needs to recognize that the entry price in terms of infrastructure investment is very high.
- The use of information technology resources for information acquisition, retention, and delivery. At NPS, we have organizationally divided this category into:
  - Information Technology in the classroom
  - The NPS network and its interconnects, and
  - Library services and the delivery of scholarly information resources to the NPS community

In this study, the Task Group sought to assess outside influences on NPS’ building and future pedagogy, to provide an assessment of the current and near-term planned state of the School’s technology infrastructure and library information resources, to make a critical assessment of future needs, and to make recommendations that will further the accomplishment of the goals of this Initiative.

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Max Woods
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Maury Weir Liaison
with the Planning
VISION OF THE DEPARTMENT OF DEFENSE "UNIVERSITY OF THE FUTURE"

As competition for scarce Department of Defense (DoD) resources increases, the Naval Postgraduate School is challenged to re-envision and re-invent itself as "The Department of Defense University of the Future" and as a "Defense Brain Trust."

The first step in becoming this "DoD University of the Future" is to articulate its vision. The key elements of that vision are "taking learning to the learner" and linking the resources of NPS and other institutions to provide an educational synergy not yet available today.

But vision alone is not enough. Vision must be backed by well defined processes, and a clear articulation of the steps NPS administration, faculty and staff must take to achieve it. To become the "Technologically-Integrated DoD University of the Future" requires, first and foremost, a connectivity with customers in both the Fleet and the field — students and sponsors alike — that currently can only be found via the Internet. To succeed, NPS must capitalize on its ability to quickly address real world problems by expanding accessibility to its faculty through this instant form of communication. Every Division, every Department and every faculty member should be using the Internet to inquire, "What do you, our customers, need us to be working on?" and to report on their current research. Marketing this call to identify education and research needs should be a coordinated institutional, if not Navy-wide, effort. The School’s recent investment in a network upgrade is major step toward achieving this goal.

We feel that NPS does not yet lead the military world in distributed education. Our evolution into distributed education has been piecemeal and disjoint, much like the on-campus network that was developed when NPS was pioneering networks. The School must therefore make a strategic commitment to establishing a leadership role in this area, not only in the courses it offers, but in using the technology of the "DoD
University of the Future" to solicit research. NPS must become first in the minds of DoD and Service leadership whenever problems arise that need study and analysis.

**Future Technologies of the "DoD University of the Future"**

Following is the Task Group’s prognostication of the future enabling technologies that will contribute to the development of the "University of the Future," and how they might affect NPS.

As the rapid and apparently inevitable transition of information sources from paper to electronic forms continues, the major role of NPS as a university will continue to be to connect professors to students and students to one another. Technology in all its forms must support this role, both to maximize learning while students are in residence and to upgrade pre-arrival learning and life-long, post-graduation education. Personnel responsible for this transition must be cognizant of the standards which have emerged for almost every type of media.

In the vision of the technologically integrated "University of the Future," Internet delivery is the norm, with Internet Protocol the baseline for connectivity over all networked data links, including Ethernet, Fast Ethernet, FDDI, ATM, satellite, cable, and other media. Network-centric graduate education is the paradigm which will provide a sensible framework for integrating high-technology education with demanding students and sponsors. The transition from paper to electronic information resources requires that NPS students and faculty become familiar with formats compatible with World Wide Web practices, to ensure continued access and retention of information.

Printed NPS research products — papers, theses and reports — will need to be archived online, as well as in other media. (The School’s current Hyperion Project, coordinated between the Dean of Research, Computer and Information Services, and the Library, is a first step in this transition.) Other information media such as audio, video, interactive 2D/3D graphics, simulations, etc. should be stored, streamed and shared electronically.

In many respects, our institutional strategy will mirror network-centric warfare principles being applied to Fleet challenges. In the U.S., we already live in an environment where research, education and commerce are highly inter-networked. Similarly, the Navy is inter-networking the Fleet through its "IT-21" ("Information Technology for the 21st Century") program, showing that inter-networking is feasible globally, despite dispersed forces and disparate communication links. Alternatively, the information technology challenges faced and overcome by NPS will inevitably appear at other commands. The shipboard command and control centers of tomorrow will share many of the same problems we are solving in our laboratories today. NPS must
therefore be an exemplar and expert resource in helping other commands overcome these identical and similar challenges. If we do not provide such technical assistance when needed, we will become isolated from customers, students, and sponsors, and disengaged from the very problems that need our expertise the most.

In the new Information Age, accessibility is crucially important. With an online information ecology widening conventional perception of what a useful reference is, things that are easy to access get used, while things that are hard to access are ignored. Electronic ease of use increases student accessibility, which in turn determines what products students use, both at NPS and after graduation.

Research as well as teaching is integral to the "University of the Future." A unique strength of the NPS learning experience is thesis research, where new concepts must pass the hard questions and common-sense tests of students who enthusiastically attempt to "solve the unsolvable" through fresh ideas and new technology. The School’s research products keep postgraduate education relevant to current DoD/Navy technical challenges, enabling it to establish and nurture collaborative partnerships with Navy commands and research centers, operational forces, and other national and international research institutions. This synergy provides an excellent research and experimentation environment for students working on problems of vital interest and relevance to the Navy. And with an outstanding research program, NPS can attract outstanding faculty and staff.

Finally, research links NPS thesis efforts to commands throughout the Navy, closing the loop to ensure relevance to and engagement with its most important challenges. For example, the identical tools used to deliver asynchronous on-line distance learning materials can be used to connect the NPS Research Office to Fleet customers and sponsors to solicit study and thesis topics and to disseminate student and faculty research findings.

Task Group members reviewed those technological innovations that will be critical to NPS’ being able to implement its strategic vision. They agreed that integrating the following innovations into the NPS infrastructure will be vital to fulfilling Strategic Initiative #3:

- Augmentation of distance-learning video teleconferencing facilities to be Internet-compatible, for delivery, archiving and asynchronous access
- Electronic thesis publication and distribution (in combination with printed theses), ubiquitously available to students and faculty
- Easy, inexpensive digital disk/CD production for off-line archiving, efficient delivery of voluminous materials to Fleet sponsors/customers, and rapid product development to apply NPS research results quickly when and where needed
- Portable "IT-21"-compatible computers for all students
- Wireless campus access or wired cable access in all classrooms and thesis spaces
- Internet access in Navy housing via cable TV modems (set-top boxes)
- Internet access, web browsers, and digital projectors in all classrooms
- Classrooms augmented with audio/video recording capability so that recording classroom presentations is trivially simple, facilitating delivery of educational materials
- Inter-networked 3D graphics for distributed simulation and scientific visualization of land/ocean/atmospheric processes
- Use of Java and Virtual Reality Modeling Language for course development and delivery
- Continued upgrading of the campus network to increase bandwidth and ubiquity
- Continued upgrading of connections with Defense Research and Engineering Network and other DoD organizations
- Multicast networking to reduce bandwidth and enable sharing of information streams
- Automated delivery of research projects and working code through the use of agent and smart-client technologies. (NPS will be a knowledge exporter and an essential information service for intermittently connected ships, submarines, aircraft, and even spacecraft)
- Increased support for network administration and monitoring
- Maintenance of the network just as phone/mail/electric service must be maintained for the School to perform its educational and research missions
- Easily accessible remote sensing of the atmosphere and ocean (yet another Internet application). The sensors, robots and sonar arrays in Monterey Bay are good examples of how Fleet assets will control and interrogate devices at sea, in the air, and in space.
- CAVE spaces (four-wall projected video/graphics) for multiple-person, fully immersed virtual reality interactions, aggregating nearly all computer technologies with highly demanding performance requirements for participants. NPS' utilization of such devices will enable the transition to the Fleet of broad and powerful new applications, including tactical visualization of the environment, sonar modeling, telemedicine, telepresence, specialized training, emergency repair supervision, mission rehearsal, damage assessment, virtual engine room mockups, collaborative ship design, and even 3D object "faxing" to low-cost, small-footprint milling machines.

NPS faculty and staff have the expertise to integrate these and other future technological developments into the School’s baseline business of graduate education.

**ASSESSMENT OF CURRENT STATUS**
NPS is positioning itself to continue to its mission of "...increasing the combat effectiveness of U.S. and allied armed forces and enhancing the security of the United States through the design and delivery of advanced educational and research programs." To accomplish this mission and to become the "DoD University of the Future," the School must rapidly and appropriately respond to changes in the requirements of the Department of Defense and its international markets and must focus on the development of nontraditional educational programs, delivered both on and off campus. Across the board, NPS must also incorporate the technological advances to allow it to more effectively design and deliver a growing variety and complexity of educational programs.

As the Navy rethinks its officer military education and training, the implications for advanced graduate-level education in general, and for NPS in particular, are numerous. These include:

- Decreasing the length of residence programs by compacting material and/or presenting some of the material at a distance
- Executing off-site refresher and transition courses through distance and/or distributed learning systems
- Interfacing and coordinating off-site programs with on-site continuations
- Meeting Joint Professional Military Education and Professional Military Education requirements for educational "one-stop shopping"
- Updating officers’ knowledge of current technology through short courses
- Mixing and balancing traditional and nontraditional delivery systems, and developing measures of effectiveness and efficiency
  - Incorporating appropriate technology into the classroom
  - Using off-the-shelf, Internet-based courseware and modularized instructional components and systems
  - Providing faculty, student, and staff training in the use and development of technology-based courseware and software
  - Improving campus-wide access to scholarly electronic information resources

Using New Technology to Deliver NPS Programs

Becoming the technologically integrated "University of the Future" requires that NPS adapt to the rapidly changing environment of educational technology. Following are goals for NPS competence in the near future:

1. Video-teleconferencing

NPS has been using video-teleconferencing for the past four years to deliver master-level programs and individual courses to DoD sites across the country.
The Aeronautical Engineering Department, in conjunction with Admiral Bowes in command of the Naval Air Systems Command, established Distance Learning at NPS in July 1994. Naval Air Systems Command provided the initial funding and NPS provided additional money to construct and equip Distance Learning classrooms and initiate the program.

NPS has made substantial progress in equipping classrooms to support the Distance Learning programs developed in four departments of the School. As a result of increased use, NPS built a third distance-learning classroom, using equipment purchased with the original funding investment returns. Use of these classrooms has been growing, as the number of courses delivered via video teleconferencing increased from one or two classes per quarter to eleven or twelve in some quarters.

During Summer Quarter 1998, the courses shown in Table 1 were offered through video tele-conferencing, with several supplemented by instructor visits with students at the distant site or by bringing students onto campus one week per quarter to fulfill their laboratory requirements. In many cases, the NPS department pays the salary for an on-site coordinator to provide student support at the remote site. In others, the NPS faculty member spends a week at the remote site providing additional assistance to the students there.

<table>
<thead>
<tr>
<th>Professors</th>
<th>Course #</th>
<th>Location</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. Shing</td>
<td>CS4580</td>
<td>SPAWAR, San Diego</td>
<td>24</td>
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<tr>
<td>Prof. Berzins</td>
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<td>Prof. Marvel</td>
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<td>NSWC, Dahlgren VA</td>
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<td>Prof. Pawlowski</td>
<td>MN3221</td>
<td>MCTSSA, Camp Pendleton CA</td>
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<td>Prof. Tummala</td>
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<td>Prof. Pace</td>
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<td>AFIWC, San Antonio TX</td>
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<tr>
<td>Prof. Garcia</td>
<td>EC4750</td>
<td>NSA, MD</td>
<td>12</td>
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</tbody>
</table>

NPS offers distance learning Masters degree programs in Software Engineering, Aeronautical Engineering, and Electrical Engineering. The Master of Science in Software Engineering is offered at SPAWAR [NRaD] in San Diego by the School’s Computer Science Department. This program successfully graduated its first students in December.
1997, with four additional students graduating in Spring 1998. Since its inception in 1994, Distance Learning programs at the School have resulted in remote-site students earning 20 degrees — two Master of Science degrees in Aeronautical Engineering and eighteen Master of Science degrees in Software Engineering.

In addition to the program at SPAWAR, there are Distance Learning courses in Aeronautical Engineering at Naval Air Systems Command at Patuxent River, Maryland; and in Electronic Systems Engineering at Dahlgren, Virginia, and at the National Security Agency in Maryland. A summary description of the Naval Postgraduate School’s Distance Learning Program, including course descriptions and Points of Contact, has been prepared by the NPS Office of the Associate Provost for Instruction [Database #xx].

Tables 2, 3 and 4 below include a summary of the Distance Learning courses offered at NPS by academic year, from their inception through Spring Quarter 1998.

**Table 2. Distance learning enrollments in Aeronautics/Astronautics and Electrical and Computer Engineering courses for MS degrees**

<table>
<thead>
<tr>
<th>Curriculum</th>
<th>Qtr</th>
<th>Class</th>
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<th>Curriculum</th>
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Table 3. Distance Learning enrollments in Computer Science courses for MS degrees

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Table 4. Total distance learning enrollments (degree and non-degree)

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2. Remote-Site Courses Using Traditional Course Delivery Methods

A number of the academic departments and tenant commands at NPS are involved in instruction at remote sites using largely traditional methods of delivery. Except for the
Leadership Development Program, these courses are nondegree programs providing "just-in-time" education.

a. NPS/U.S. Naval Academy Leadership Development Programs

The Systems Management Department has a Leadership Development Program for squadron leaders, delivered both by video-teleconferencing and on-site in classrooms at the United States Naval Academy in Annapolis. Now beginning its second year, the Leadership Development Program graduated eleven students in its first masters degree class in August 1998. In addition, fourteen students have enrolled for the coming year. Professor Rueben Harris, Systems Management Department Chair, sees this program evolving over time, possibly using Internet-based Instruction or videoconferencing to deliver classroom instruction. At the present time, e-mail is used for the submission of papers and video-teleconferences for faculty-student consultations.

b. Defense Resources Management Institute courses

The Defense Resources Management Institute (DRMI), an NPS tenant command, offers short courses in Herrmann Hall to U.S.-allied defense partners at the O4 (lieutenant commander) to O6 (captain) officer level, and to civilians at the GS-11 level and above. Three residence courses are taught:

- Defense Resources Management, a four-week class given five times a year;
- International Defense Management Course, an eleven-week class taught twice a year; and
- Senior International Defense Management Course, a four-week course taught once a year.

In 1997, 173 American and 263 International students participated in these classes and enrollment for 1998 is expected to be similar. These courses are team-taught, with lecture components and discussion groups organized around specific issues and problems. In addition, the Defense Resource Management Institute’s faculty travels to various foreign locations to offer a two-week Mobile International Defense Management Course ten times a year. In 1997, this program served 348 students from 22 nations.

Defense Resource Management Institute is planning to expand the use of software to support its courses and is already using electronic spreadsheets and other software in some of its training exercises. The need to prepare students, and the lack of availability of hardware at the remote sites, however, still pose challenges to redesigning courses to include the new technology.

c. Comptroller short courses
The NPS Comptroller Short Course is sponsored by the Navy Financial Management Center in Pensacola, Florida. It is offered six times a year — five times on campus and once in Pensacola. There are approximately 35 to 40 students in each class at NPS, and up to 70 students take the Florida course.

d. Courses for Senior Navy Leadership

The Center for Executive Education provides two programs, each of which will be offered two times a year. The program is headed by Professor Barry Frew and was recently developed in the Systems Management Department. It is a unique residential curriculum for flag officers and Senior Executive Service decision-makers, designed to educate them on key issues, including the use of new information technologies.

The pilot Center for Executive Education course, "Leading Change in the Information Age," was completed in March 1998 and had 13 students. A second course, offered in July 1998 in a three-week format, had similar enrollment. The second program, "Revolution in Business Practices: Vision, Strategy, and Best Practices in the Information Age," was provided to three-star admirals and their civilian equivalents in October 1998 and ran for three weeks. In each of these programs, approximately six NPS faculty are involved, plus faculty from other institutions and leaders from the technology industry.

e. Executive Education for Health Care Professionals

The Institute for Defense Education and Analysis (IDEA) provides executive education for the DoD health care community through 58 modules, taught in two phases during FY1998. Phase one had 22 students and phase two 10 students.

f. Defense Acquisition University Courses

The Defense Acquisition University provides short courses in acquisition and procurement, both NPS-resident and at remote sites. The course helps its students meet the requirements of the Defense Acquisition Workforce Improvement Act, which requires courses to achieve certifications. These courses are taught by NPS faculty and by personnel from the Naval Center for Acquisitions Training. Approximately 30 to 45 classes a year are taught by approximately eight NPS faculty. The courses last from one to four weeks, average two weeks in duration, and have 30 students per class.

3. Asynchronous Multimedia Courseware Development

New asynchronous courseware needs to be developed or acquired to respond to new markets and to DoN mandates to reduce the costs to the Navy of education received in residence. To meet this challenge, well-designed multimedia courseware is leading the way at NPS.
As a pilot study, a mediated Interactive Mathematics software package (a computer-based, highly mediated set of beginning, intermediate and college algebra courses) was purchased from Academic Systems of Mountain View, California, and installed on all 28 PC stations in the Learning Resource Center in Glasgow Hall (Room 128) in February 1998. The instructional design quality of these materials has been recognized in recent years as ranking among the top mediated learning materials by faculty who use them at over 100 colleges and universities. Studies have been performed at some of the user colleges demonstrating measurable improvements in student completion rates, test scores, and facilitation with learned concepts in follow-on courses.

Interactive algebra materials became an integral part of an ongoing algebra course taught in the Department of Mathematics for a group of five SEAL students undergoing a Congressionally approved program of undergraduate study (the Seaman-to-Admiral program) at NPS. These materials are now available to all NPS students, as a refresher course in algebra topics of their choosing with minimal instruction from a professor. Plans are also being developed to make the materials available to NPS students over the Internet so they can perform their studies from their residences in the Monterey area. Students at any other remote site with appropriate PC capability, Internet access and the set of course CD-ROMs will also be able to take this class in the near future.

Even with these more effective learning materials, it will still be a time challenge for officers to complete their refresher/transition courses before entering NPS so they can be relatively current once they arrive on campus. Mediated materials in calculus and physics, designed similar to the Academic Systems Interactive Algebra courses, and the use of technologies such as asynchronous network-based instruction courseware products, may help address this challenge.

In collaboration with senior military and civilian staff of N7 and N8, the Institute for Defense Educational Analysis has defined a timeline, actions, and the associated costs for the conversion of these calculus and physics refresher courses to asynchronous network-based instruction courseware products. These asynchronous network-based instruction course modules will be field-tested and learning outcomes will be quantified. Based on the results of this assessment of learning effectiveness, other refresher courses (or components of courses) — including Thermodynamics/Fluid Mechanics, Solid Mechanics, Beginning Programming, Laboratory Systems, Introduction to Finite Mathematics, Introduction to Meteorology, and Computational Methods for Operations Research — will also be converted to asynchronous network-based instruction courseware. Additionally, a second phase of this project will involve asynchronous network-based instruction courseware development for selected courses from five Systems Management Department curricula. Some preliminary work has begun involving identification of Math and Physics Department faculty interested in serving as Subject Matter Experts for initial review of commercially available asynchronous network-based instruction Calculus and Physics courseware. Upon
receipt of funding from N7, additional content review and course conversion activities will occur according to the timeline outlined in the "Refresher Course Conversion POA&M," with scheduled delivery of these courses on the Internet in FY00.

Other asynchronous network-based instruction efforts to date by the Institute for Defense Educational Analysis include the conversion to asynchronous network-based instruction courseware products of three modules of instruction associated with the Navy’s Executive Management (Medical) Education program: "Concepts of Managed Care," "Military Medical Readiness," and "Budgeting for Defense Health." These courseware products will be alpha/beta-tested in early FY99 and distributed over the Internet for Navy Healthcare Executives in mid FY99. The Institute for Defense Educational Analysis is also creating a "Financial Management" asynchronous network-based instruction course for Internet distribution to a variety of customers in FY99. Other asynchronous network-based instruction project opportunities currently being explored include developing courseware to support a Navy Medicine requirement to develop medically-focused education and training in the Chemical-Biological-Radiological-Environmental threat arena. The Institute for Defense Educational Analysis also anticipates potential asynchronous network-based instruction applications in support of its International (Health and Acquisition) education programs.

The perceived advantages of Internet-based instruction for the Navy are that they:

- Provide the opportunity for "anytime, anywhere" education on demand in both synchronous and asynchronous environments, so that officers at duty stations around the world can access the materials
- Combine the strength of computer-based educational methods with web-based communication technologies
- Blend the best features of multimedia technology, video teleconferencing and the World Wide Web, enhancing the presentation of material in novel ways
- Incorporate collaborative technologies for maximum interaction among faculty and students, as well as between students
- Promote the most cost-effective educational solution for the time-constrained professional Naval officer

**NPS RESOURCES FOR THE UNIVERSITY OF THE FUTURE**

A key element in being able to achieve the goals of this Strategic Initiative is the availability of resources. This section addresses the current status of the information resources available to the School, as well as near-term plans to improve them.

**Information Technology Resources**
A first-class communications network is an essential part of the Information Technology infrastructure NPS requires to become the "DoD University of the Future." In fact, almost none of the School’s forward-looking plans would even be possible without reliable, high-performance communication links throughout campus and with external sites. Increasingly, teaching and research will require multimedia capabilities and other prodigious uses of bandwidth.

a. Present Information Technology

Recognizing this, NPS is positioning itself to support such demands with a new, robust Information Technology architecture and state-of-the-art communications technology. In the summer and fall of 1998, the School’s cable network was upgraded to ensure that it can meet users’ communication requirements well into the next century. This AIMnet installation project will increase bandwidth and network reliability, improve Internet access, and substantially increase the number of network connections in both classrooms and the Library. When completed in November or December 1998, it will provide PC users with a bandwidth of 100 Mbps at each workstation — a network capacity well above current requirements for almost all users. Many of the School’s strategic directions — including "smart" classrooms, distributed learning, group teaching and research, and simulation modeling — will depend heavily on this added capability.

NPS currently has a mainframe computer, which is used mostly for administrative applications. Its primary academic use will be to support an automatic, highly reliable data backup for all campus computers, virtually all of which will be connected to the campus network. Most teaching and research will rely on distributed local computers. Currently, the School has a balanced mix of UNIX-based and PC-based (i.e., "Wintel") computers, but the Information Technology plan to is migrate many of the UNIX applications to Windows NT. Increased standardization around the Navy’s "IT-21" ("Information Technology for the 21st Century") standard will permit NPS to provide higher-quality support for standard applications.

Classrooms in Glasgow and the Mechanical Engineering Building have networked access to the Internet. In Glasgow, hardware to connect to the Internet must be brought into the classroom for lectures supplemented by Internet resources. In addition, there are two Learning Resource Centers with large overhead projectors for display on a computer screen. In the Mechanical Engineering Building, every classroom and office has Internet access, as does the building’s Auditorium, for a total of 300 Internet connections. Approximately 120 are actually connected to computers, with the rest available for use as needed. Room 138 alone, a large laboratory, has 40 Internet connections.
Faculty in National Security Affairs, Systems Management, Mechanical Engineering, Electrical and Computer Engineering, and other departments are using the Web to facilitate student learning by putting references to required course materials — and sometimes full course readings themselves — on web pages, as well as using computers networked to departmental servers to solve math problems in the classroom and to teach the use of mathematical and statistical packages such as MATLAB and MAPLE.

In many cases, departmental funds have been the source of capital required to purchase needed computers, software and servers. The Mechanical Engineering Department was able to use collateral equipment monies from the funding for its new building to enhance its computer resources. The loss of Other Procurement Navy funds after 1995 and the decline in funding for faculty development have combined to reduce the support available to train faculty in the use of the new technologies, such as web authoring, development of courseware for delivery to remote sites via video teleconferencing, and converting existing courses to asynchronous learning modules. Money recaptured from the efficiencies described in Initiatives 5 and 6 may help to alleviate this current shortage of development funds.

**b. Plans for Future Information Technology**

As for the future, the campus information services and delivery infrastructure at NPS must continue to be enhanced, and the projection, computing and networking capabilities in its classrooms and laboratories expanded yet further. In addition, Library resources in both traditional and electronic formats must be expanded, both to support these new Information Technology initiatives and to better prepare students for the information requirements of their academic work and Fleet responsibilities.

**Library Information Resources**

With its Web-based catalog, BOSUN, and professional Library staff trained to identify, retrieve and prepare hyper-links to militarily-relevant documents and other materials on the Web, the NPS Dudley Knox Library is well-positioned to take a broader role in providing electronic information Navy-wide. Already, a large number of information resources are available to the campus electronically. As noted in Table 5, the Library has committed about 16 percent of its budget to the purchase of research materials in electronic, rather than traditional print format.

**Table 5. Percentage of NPS library resources by format type**

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Library budget projections call for its electronic resources to steadily migrate into an ever-increasing percentage of total materials spending. NPS has also requested additional funding for the Library’s Operating Target budget, as part of the emphasis on recapitalizing the School’s Laboratories, LAN and Libraries. This additional request of $1 million for FY1998 is included in Table 6 on the following page. Although it is important to note that these funds have of yet only been requested, similar shifts in spending from print to electronic formats will be made with current Operating Target funds executed by the Library each year. If the current projections summarized in this table hold, a full half of the Library’s materials budget will go to the purchase of electronic information products by FY2005.

Table 6. Projected NPS library material budget ($k) by year and category

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NPS continues to actively work with the libraries of the Military Education Coordination Committee to develop a linked online catalog capability. This catalog, called the Military Education Research Library Network, uses OCLC Site Search software, which not only allows the NPS community to simultaneously search the catalogs of other DoD schools offering Joint Professional Military Education programs, but also enhances delivery of materials from other Military Education Coordination Committee libraries through expedited interlibrary loan arrangements. It is noteworthy that these Military Education Coordination Committee libraries have requested e-mail updates on information resources added to NPS web pages, because they are recognized within the military library community as being both easy to use and often-
updated, having the most current information. The Military Education Coordination Committee has also negotiated at a substantially reduced cost the purchase of a consortia-based licensing agreement for OCLC Firstsearch, thus enhancing the range of index and full-text electronic products accessible to the NPS academic community.

The Naval Postgraduate School Library has been an active participant in the development of an intra-Navy library structure, called the Consortium of Navy Libraries. This consortium has as its mission "...to facilitate effective access to complete library and information services into the 21st century using traditional and evolving technology." Its goal is to deliver information from the Navy laboratory, hospital, academic and law libraries "...wherever, whenever, and in the format the situation requires." One objective of the consortium is to create a virtual Navy library with access to electronic resources negotiated across groups of libraries at lower cost than would be available to any single Navy library. The first set of these consortia-negotiated resources is currently available only to Navy Laboratory libraries; but, if the summer 1998 pilot succeeds, NPS’ Library anticipates having the potential to obtain additional networked electronic resources at a lower cost than could it could negotiate separately.

Because use of Internet/World Wide Web (WWW) technologies provides NPS with an efficient means of distributing and collecting information via the Internet and via virtual web-based networks, such as extranets and intranets, these technologies are becoming the primary information system used at NPS. Also, because content management of the Internet and related networks such as intranets and extranets is distributed — as opposed to centrally controlled as in a traditional information system — guidance is required to coordinate resources to provide maximum functionality and efficiency. NPS, therefore, has established a Web Committee, which has three representatives from the Library and Information Technology, as well as representatives from students and faculty. Additionally, in 1997 the School also established an NPS Webmaster position, reporting to the Associate Provost for Computer and Information Services. The Webmaster works with the Director of the Libraries, who is responsible for setting standards relating to content and structure of organizational home pages and, with the NPS Web Committee, developing and monitoring policies for use of Intranet and Internet resources. The campus Webmaster also teaches courses in developing web pages and provides assistance to webmasters in academic and administrative departments throughout the School.

In many courses, such as CS 3460, instructors have developed web pages with hyperlinks to relevant course materials, exploiting newly developing web technologies in support of instruction both on and off campus. The Library also plays an active role in setting the School’s policy for providing information on the NPS Intranet and World Wide Web.
The Library’s home page [http:\web.nps.navy.mil\~library] and pages linked to it receive approximately 651 hits each day from approximately 75 countries around the world, as analyzed in June 1998 statistics.

The Associate Provost for Information Technology, the Library Director, and the Dean of Research are working to provide NPS thesis abstracts via a campus server, and are using this pilot project to test the feasibility of providing full-text NPS theses via the same server. In fall 1998, the Library procured a digital document management system, called Hyperion, that will allow it to test a pilot database of digitized NPS theses. Theses converted to a PDF format will be transferred to the Hyperion server, enhanced with metadata elements, and linked to records in the Library’s BOSUN catalog.

**Activities within the Department of the Navy or with other Department of Defense Institutions**

The Military Educational Coordination Committee, composed of representatives at the flag rank from the educational institutions within the Department of Defense that provide professional military education, meets twice a year. NPS faculty serve as members of the Military Education Coordination Committee’s Educational Technology Working Group, Distance Learning Working Group, Research Collaboration Working Group, and Library Working Group.

Initiatives such as the Navy Virtual Library Project (coordinated by the Librarian of the Navy) and the Military Education Research Library Network project of the Military Education Coordination Committee Library Working Group are creating virtual information resources accessible across Navy commands and other DoD institutions. NPS is an active partner in these initiatives. Digitization of information created by NPS students and faculty, such as distribution of NPS theses in electronic format, offers more rapid and broader access to information.

NPS needs to further explore the already introduced concept of a virtual Naval university linking Department of Defense education and training institutions, including NPS, the Service Academies, the War Colleges, and the Chief of Naval Education and Training. By creating a virtual DoD university that links the School electronically with other DoD institutions, NPS will be able to exploit the unique strengths of each while avoiding expensive duplication of effort.

Another step in creating NPS as "The DoD University of the Future" is to collaborate with the Naval War College to create an on-line program of Professional Military Education that capitalizes on each institution’s respective strengths. These efforts then need to be expanded into the Joint arena with the creation of an on-line Program for Joint Education, again drawing from each of the Service and DoD institutions’
respective strengths. NPS and the Naval War College need to move out together if they are to establish a leadership role in this area.

ASSESSMENT AND EVALUATION

As NPS develops alternate methods of course and information delivery, evaluation techniques must be concomitantly developed to assess quality of the delivery and ensure that the delivery method does not degrade the level of student understanding.

Course Delivery Methods

*Distance Education Courses*

At the end of each distance learning course, both on-site and off-site students complete Student Opinion Forms [Database #xx] to evaluate the course and its instruction. In particular, NPS administrators are interested in monitoring any perceived differences in the off-site programs relative to their resident versions. In most cases, there are no statistically significant differences between the responses of the two student groups. However, some resident NPS students have stated that they prefer a regular NPS resident course over taking the same course in a distance learning mode because they can receive 100 percent of the course instructor’s attention when in the same room.

The analysis and evaluation of Student Opinion Form scores for distance learning programs is undertaken by individual departments. For example, in Computer Science, Student Opinion Forms are collected by the sponsor’s coordinator. The results of these evaluations have already led to changes in some course requirements — to include more electives, and more flexibility. In the Electrical and Computer Engineering Department, Student Opinion Forms are summarized for the entire department but are not analyzed by individual class. The ECE distance learning coordinator is in constant contact with the sponsor’s coordinator and visits with students annually. Most problems have been associated with the interpretation of degree requirements (e.g., the School’s engineering accreditation requires that students must have a BSEE or its equivalent before they can receive an MSEE). Student comments have also been helpful in smoothing out administrative procedures for the distance learning students.

*Digital classrooms*

The Laboratory Plan for Ingersoll Hall has line item entries for outfitting a few classrooms with digital overhead projectors and permanent PCs or X-terminals that can link to computers in the laboratories and Learning Resource Centers in Ingersoll Hall. The improvements proposed in these plans are a good first step. Glasgow Support Center personnel should be commended for their foresight in recognizing that classrooms in their building are an extension of the Learning Resource Centers.
The Spanagel Hall plan for classroom modernization is available for viewing on the web, at http://www.oc.nps.navy.mil/~garwood/classroom/. This plan includes projection equipment; Ethernet and ISDN nodes at every seat; and a server and a projection system with RGB interfaces, switches and decoders to function with UNIX workstations, PCs and Macs.

Most department chairs interviewed by the Task Group Chair mentioned the need for Information Technology-upgrades, digital projection equipment, and Internet connections in their classrooms. In general, NPS still needs to develop a comprehensive Information Technology plan for all of its classrooms and determine what technological improvements are needed, including links with all NPS laboratories and Internet educational resources. Arriving at this comprehensive plan must be a team effort, including people knowledgeable in instructional design and course content as well as library and computer support staff. Such an effort should also be by direction from the top levels of NPS administration, to ensure that the support for resources needed to implement plans is forthcoming.

Asynchronous Instruction

NPS should make effective use of all available external and internal talent and appropriate technology to develop high-quality instructional materials. These materials must then be delivered to Naval officers at many remote sites in a manner that assures a significant return on the School’s investment.

Large dollar savings can be potentially realized by reducing residency time for fully-funded graduate education. Because of these potential cost savings, the Navy wants to reduce the time in residence of its fully-funded officer students. One way to begin this is for students to be required to complete their refresher/transition courses before arriving at NPS.

All entering NPS officers should be current in single-variable calculus and basic physics, among other skills, when they enter NPS. From 1974 to 1990, NPS ran a distance learning Continuing Education Program designed to ensure they had these skills. Program personnel at NPS developed self-study courses following the principles of the Personalized System of Instruction in calculus, linear algebra, differential equations, physics and numerous other disciplines, which were sent to officers to complete at their duty stations. Numerous studies had been done to evaluate the effectiveness of courses following Personalized System of Instruction principles designed and delivered on college campuses, including Massachusetts Institute of Technology, the University of Michigan and the University of Texas.

During its peak years, this NPS distance learning program had several thousand students enrolled in its one-credit hour courses. Students had a textbook, study guide...
with learning objectives, reading and problem assignments, detailed solutions to assigned problems, a self-test for each unit of study (five units per credit hour) with detailed solutions, and a local tutor with a similar set of materials (a fellow officer who was usually an NPS graduate). Many officers completed more than one of these one-credit hour courses, but only a few completed five or six of the ten one-credit courses needed to validate the complete program of study.

The biggest reported problem for most distance learning students was a lack of time. Other factors also influenced officers’ decisions not to complete more self-study courses; and some were a result of non-supportive counseling by NPS staff. But the major hurdle for the large majority of officers was finding the time needed to finish a sufficient number of courses.

Even with the more effective learning materials of today, it may still be a major challenge for officers to complete their refresher/transition courses in a timely manner prior to entering NPS. Mediated materials in calculus and physics similar to the Academic Systems Interactive Algebra courses will help address these problems. In the end, however, no one can predict the degree of success of the best-mediated, computer-based, interactive courseware delivered in the best way from the individual military officer’s point of view. Only time and additional experience with these new Information Technologies and instructional methods will tell.

**Interactive Algebra Courses**

More recently, late Professor W. M. Woods evaluated the Interactive Algebra course through interviews with students who used these materials in the MA1010 Algebra and Trigonometry course he taught. He also examined student performance through on-line quizzes and other information recorded by the course management software which is part of the course materials. All five students were pleased with their experience using Interactive Algebra on their computers. They liked the explanations, the practice, the immediate feedback, and immediately knowing the results of quizzes. They also wanted to have been able to use it from their homes at night, rather than having to use a computer in the on campus Learning Resource Center. Plans are now being completed to make this same material available via the Internet, with no modifications needed to the existing license agreement with Academic Systems.

A June 1998 thesis by Brian Sorenson of the Systems Management Department undertook an evaluation of the costs and benefits associated with converting, administering and maintaining a traditionally taught course using Network Based Instruction at NPS. Entitled "Costs and Benefits of Network-Based Instruction at the Naval Postgraduate School" [Database #xx], Sorenson’s thesis included a benefit analysis summing the gains to be had from reduced NPS residency, career learning
Continuums, the availability of online reference, and savings from short courses, and found Network Based Instruction to be a viable option for future learning at the School.

Some asynchronous-based curricula software programs have internal assessment programs built in. Criteria used in selecting such software for School use should include the usefulness of this assessment module.

**Information Technology**

Much has been accomplished in meeting the goals outlined in the 1995 NPS Information Technology Strategic Plan, with the largest remaining gap being in administrative applications. Because the School’s current applications are antiquated, fragmented, labor-intensive and error-prone, the Dean of Computer and Information Services (Code 05), later renamed to the Dean of Information Technology, is currently in the process of developing an architecture for long-term application development. The first steps in this process are centered on the integration of student-related applications.

The 1997 Strategic Plan for Computing, Computing and Information Services developed a long-term network architecture designed to provide the capabilities needed to meet the School’s needs for at least the next fifteen years. This architecture includes major improvements to the network’s performance and reliability, which will be essential for virtually all of the School’s future information-based activities. The 1997 Strategic Plan was based on a set of technological assumptions and an Information Technology Vision, which articulates the view of technological change driving the plan’s requirements. (More information is available on the NPS web site.) These assumptions and vision parallel, though do not look as far ahead as, the description of Future Technology given earlier in this Task Group Report.

The School’s current capacity to support high-performance computing and visualization is at best adequate. Now five years in use, its medium-size "supercomputer," a CRAY J-90, is heavily loaded and feeling its age. Much of the large-scale computing required to support teaching and research is done remotely at major national computing laboratories, necessitating reliable, high-performance communication links to transmit inputs and receive outputs from these remote sites.

The NPS Visualization Laboratory has recently augmented its computing capacity with a Silicon Graphics 2000 computer with two CPUs, which should meet its requirements for a few years without the need for major additional upgrades.

The accomplishments of the Information Technology organization also include installation of a new IBM mainframe processor and disk storage unit, purchased with funding from the Defense Manpower Data Center, one of the School’s tenant commands. A DEC Alpha computer was installed to support the new NPS accounting system. A network monitor system was acquired to identify and diagnose problems on
the network. With Falcon Cable TV and International Automation Associates, cable was installed to connect La Mesa housing with cable TV services and provide a link to the School's data network. A help desk system was acquired and became operational in July 1997. (See the Strategic Plan for Computing at the Naval Postgraduate School, Database #xx).

**Library Services**

Benchmark data from four university libraries with high percentages of graduate students and strong programs in science and engineering indicates that the budget for the NPS Dudley Knox Library is approximately half that of these other institutions. For example, 1996/97 data from the Association of Research Libraries, comparing NPS with four peer academic libraries supporting universities with a large percentage of graduate students, shows an average of 63 students per librarian at the peer institutions versus 100 per librarian at NPS; average book expenditures of $386 per student at peer institutions versus $167 per student at NPS; and an average 16 volumes per year for peer institutions versus only five per year at NPS.

NPS has placed, in the POM 2000 budget request, an additional $1 million for Library resources, equipment, and training budget. This request has been endorsed by the NPS Board of Advisors and was transmitted to the Graduate Education Review Board with the concurrence of the Training Resources Board. If the School receives these additional funds, the ability of the Library to provide broader and more in-depth scholarly resources to the campus community will increase significantly, placing NPS more in line with comparable academic libraries.

The budget for Library materials has essentially remained flat since the time of the 1988 Self-Assessment. The number of staff positions has declined by approximately 10 percent, from 35 to 32. Library management's ability to manage its labor budget to payroll and avail itself of delegated classification authority has given it more flexibility to shift funds between labor and resources, both traditional and electronic.

The number of electronic resources has increased dramatically. In 1993, there was one CD ROM product available in the Library, and the searching of electronic databases through Dialog was available on a mediated basis solely to faculty and thesis students. Today, there are literally hundreds of electronic resources available in the Library and on the Web through links from the Library’s web pages. Most notable among these are the Joint Issues resources pages; the government document pages (such as Government, Government Documents, and GPO & GAO); and the links to Uncover, Periodical Abstracts: Research II, and the IE Engineering Village. The key goal of delivering information to the desktop is being accomplished and support for reference, circulation, book ordering and reserve services from the desktop is steadily increasing.
Data from a user survey in the fall of 1994 indicates a high level of user satisfaction with NPS Library services. Theses by Systems Management and National Security Affairs students often cite assistance by Library reference staff in locating resources for background sections. In 1998, class instruction was offered to 99 students and NEXIS/LEXIS training to 91. In September 1998, orientations to the Library’s electronic services and resources were given to six section of the IS2900 introductory course in information technology management. During this same period, over 90,000 individuals entered through the Library’s security gate.

In April 1998, an information needs assessment survey was conducted using 20 focus groups. Participants included four groups of teaching and research faculty; nine of students, including one for foreign students and one for doctoral students; one of curricular officers; one of senior administrative officers; and three of staff. There were an additional two groups limited to Library staff. Analysis of the results is underway and will provide insight for assessing the adequacy of communication and information services at the School. From the initial analysis of faculty focus group data, it is apparent that the scope of the Library’s print collections are considered inadequate to support the School’s many curricula. Interlibrary loan services are generally praised, especially by student focus group participants, but the continued need to resort to this service for many basic books and journal articles presents problems for supporting both classroom instruction and thesis research.

RECOMMENDATIONS FOR MAKING THE "DOD UNIVERSITY OF THE FUTURE" A REALITY

Transition from Ad Hoc Pilot Projects to NPS-wide Planned, Funded Effort

The innovations listed below are just beginning to be envisioned. The Strategic Initiative reviewed here — to position NPS to become the "Technologically-Integrated DoD University of the Future" — is defined in the 1998 Strategic Plan as a set of relatively modest, individual goals, rather than a broad, far-reaching strategy. This approach has resulted in the pursuit of a small-scale, experimental, sponsor-driven developmental effort to introduce new distance-learning technologies to NPS. For instance, funding for the purchase of the first video teleconferencing equipment was provided through allocations from the then Dean of Faculty and from distance learning curricula sponsors. As another example, the recent network improvements that are so vital to a technologically integrated campus came into reality through one-time, end-of-the-year funding. The changeover to the electronic information resources needed to deliver over this network has been a matter of migration, funded from efficiencies within the Library organization. This migration has resulted in a modest transition, however, rather than an aggressive leap to delivery of the broad spectrum of electronic resources and services desirable to fully support NPS curricula and research programs.
Driving this incremental evolutionary approach has been the reality of limited resources. To date, the approach has been able to succeed because of sponsor demand for distance education products and the willingness of innovative administrators and faculty to identify markets, target resources and learn the skills needed to deliver using the new technologies. However, the Task Group believes that the next phase — seriously addressing the question "How do we create the technologically-integrated ‘DoD University of the Future’?" — will require a more revolutionary approach, a significant increase in and intensity of effort, campus-wide involvement, and proactive, committed leadership.

In fact, it appears to our Task Group that the present, decentralized NPS strategy of incremental change through _ad hoc_ experiments is already beginning to shift to one that is more centralized and larger in scale. A new, bolder strategy is already beginning to bubble up from the grass roots of the innovative organization that is NPS. It is emerging from areas of expertise within the organization and from faculty and students using the new technologies, evaluating their appropriate use, and envisioning their incorporation into the School’s core mission.

If our assessment is correct, the NPS Mission Planning Board needs to make this shift explicit and signal its implications for all stakeholders — NPS sponsors, faculty, students and staff. More aggressive, revolutionary and cost effective strategies will be needed to realize this vision, including new business management practices, requirements analyses, definitions of technological infrastructure, recommendations for content development and conversion, educational program implementation and management, assessment and evaluation, accreditation and validation, and life cycle management.

For NPS to successfully work toward realizing a vision of preparing educated warriors of the future through curricula emphasizing technology, synthesis, and analysis; containing the certified elements of professional military education; and utilizing asynchronous learning methods will require a coordinated planning effort involving senior NPS leadership. The newly emerging strategy also needs to be articulated through a thoughtful, campus-wide iterative process. In doing so, it is important that the School’s senior leadership become actively involved, provide clear guidance, and set the parameters for action so that NPS can move in a rational direction. Such guidance should force laboratory and capital investments, contracts, and acquisition of technology in a way that ensures a successful outcome. This top-level guidance should also be coupled with a comprehensive assessment methodology that allows progress to be measured against defined assessment measures.

The Task Group recommends that the NPS Mission Planning Board (successor body to the NPS Executive Board which developed the 1998 Strategic Plan) and the Distributed Learning Council (co-chaired by the Associate Provost for Innovation and Associate
Provost for Instruction with representatives from the academic departments, the library and the Institute for Defense Educational Analysis) both be involved in defining the new strategy.

**Develop an Information Technology Plan for NPS Classrooms**

NPS has no overall plan for systematically upgrading its classrooms. The needed plan would be similar to the existing Lab Plan, or it could be incorporated into the Lab plan. NPS needs to develop a comprehensive Information Technology plan for all of its classrooms and determine what technological improvements are needed, including links with all NPS laboratories and Internet educational resources.

This comprehensive plan must be a team effort including people knowledgeable in instructional design and course content, as well as library and computer support staff. Such an effort should be also be under the direction of the top levels of NPS administration, to ensure that support for the resources needed to implement the plans the group develops is forthcoming.

**Develop Assessment Measures of Effectiveness**

The NPS Planning Board and Distributed Learning Council should also participate in identifying output and outcome performance indicators for the newly defined strategic issue. Data are being collected now, as indicated in the Evaluation section above. However, this data collection has been limited and on an *ad hoc basis* by individuals involved in various experiments. Attention has focused been on particular courses and programs (e.g., on how many students are receiving math courses through asynchronous learning) or on Student Opinion Form scores on faculty delivering distance learning courses. Evaluations have not yet focused on how well NPS activities are supporting the strategic issue or how well that strategy is faring across campus. Only the NPS Mission Planning Board is in a position to determine whether the strategy is working in an integrated, comprehensive way based on the performance indicators they have established.

**Clarify and Refine the Initiative**

The first step in planning for this more aggressive implementation of School strategy is to clarify and refine it. The Task Group encourages the Mission Planning Board to develop a short definition and description of the new strategy that can be disseminated throughout the campus. Having a dialog on this important issue involving the entire NPS community is vital to ensure that everyone has the same understanding of the new concept and its meaning.
Under the guidance of the Mission Planning Board, the Task Group believes that a combination of vision and campus-wide discussions and interactions will result in decisions to:

- Launch a full-scale **distributed learning initiative** at NPS for the DoD, through collaboration with other DoD institutions delivering graduate education
- Determine the **market segment** for NPS, vis-à-vis other DoD institutions, for the delivery of specific distributed education courses
- Create a **capital investment fund** to develop the required curriculum development, software tools, and Internet laboratories. This fund must include monies for training so that faculty and staff can educate themselves in the skills necessary to use the new technologies to migrate courses for distributed delivery. Similar skills are also necessary to assist students in locating and evaluating information and other resources necessary to support instruction using the new pedagogy.
- Clearly articulate **follow-on projects** with timelines, assignment of responsibility, and identification of funding sources for the specific goals identified with these more aggressive strategies.
- Proactively develop **new pedagogical methods** fully utilizing the widespread availability of defense-related, government-produced, and commercially-available information resources, which will tend to shift instruction from professorially-delivered to student-constructed learning.
- Comprehensively **measure NPS’ progress** toward achievement of these revolutionary strategies. Such measurement will benefit from a more comprehensive assessment model, following the assessment methods proposed for self-assessment of a Technologically Integrated DoD University. Assessment mechanisms to measure the success of these initiatives should include:

1. Monies utilized to improve the campus network infrastructure; to convert curricula to new delivery methods such as Internet-based Instruction and to integrate new pedagogical techniques into the delivery of NPS courses; and to purchase web-based and other networked scholarly information resources for faculty, student, and staff training in utilizing the new technologies.
2. Development of further strategies to link NPS curricula to Fleet and DoD problems and research needs, and to develop curricula and short courses integrating the requirements for Professional Military Education, Joint Professional Military Education, and other changing DoD needs.
3. Student, faculty and staff evaluation of library and information technology services, as well of courses delivered on and off campus, through surveys, Student Opinion Forms and focus groups.
4. Measurement of learning outcomes through Internet-based Instruction-managed performance tracking, achievement tests and other testing
mechanisms, such as improvement in the ability to identify and evaluate information resources and effectively utilize new software.

5. Ability to adhere to DoN and DoD standards (e.g., "IT-21" standards as they evolve).

6. Ability of NPS to maintain state-of-the-art equipment in its laboratories and Library.

Review Strategic Plan to Interrelate Strategic Initiatives

Our Task Group also recommends a high-level review of the other issues in the School’s Strategic Plan in light of Strategic Issue #3. We think this issue is central and that it is possible to consider it as the driver for all other strategic issues. In other words, we believe there may be a hierarchy of strategic issues and that Strategic Issue #3 may be at the top of this hierarchy, with the other issues supporting it.
Develop a consensus within each Service on the importance of graduate education as an investment in human capital

STATEMENT OF INITIATIVE

It is clear from *Joint Vision 2010* and a recently released report of the National Defense Panel that future warfare will be significantly different from the warfare we have known in even the recent past. Change will happen faster than ever before, requiring our officer corps to quickly anticipate and react to it. Military officers will increasingly need a solid understanding of uncertainty, sophisticated information systems and technology, and how to manage socio-technological change. They must be able to exploit this knowledge to the fullest advantage for our nation’s security and prosperity.

If the services are to realize the goals imbedded in *Joint Vision 2010*, they will need a significant percentage of officers possessing a graduate level understanding of science, technology, management, and systems engineering and integration. On-the-job training and a "can do" attitude will not suffice. The world of 2010 will no longer support heart and spirit without a knowledge of technology and analysis within a strategic and operational framework. While training is valuable in preparing officers to deal with known challenges, only advanced education gives them the ability to deal with the uncertain and create imaginative solutions in unforeseen circumstances.

In today’s environment, it is clear that the culture of the Armed Forces must be transformed to strongly and vocally value advanced education and career-long learning.
from the highest levels of leadership on down. To accomplish this requirement, leaders must forcefully embrace and reinforce the need for graduate education, life-long learning and intellectual growth for our nation’s military personnel. Graduate education for the members of our Armed Services and allies is an investment in the nation’s future, an investment that must be made today if the United States is to remain the preeminent force demanded by a rapidly changing and increasingly threatening world. Unlike other investments, an under-investment in today’s junior officers cannot be remedied by investing more in the junior officers of tomorrow. Today’s junior officers are the commanding officers and senior leaders of 2010. If we do not invest in their required education now, they will not have the knowledge required to sustain and advance our nation’s military objectives in 2010. The Task Group believes that implementing Strategic Initiative #4 accomplishes this all-important requirement.

NPS has identified three critical factors which are necessary to ensure that the Armed Services continue to have the educated human capital required for their Officer Corps:

- Officers themselves must understand the need and value of education in the areas of technology, analysis, strategy, information, and the operational sciences. They, as well as those who influence their career paths, must believe that advanced education is not only necessary, but critical to career success.
- Officers should have the opportunity to pursue advanced education that realizes a return on investment in both selected, primary shore duty billets as well as in career-developing operational war-fighting assignments.
- Stable and adequate financial support must be provided for graduate education of the Officer Corps.

To effect these changes, the NPS Executive Board identified the FY 1998 objectives listed below:

- Research and implement ways to use Internet/web-based technology to enhance efficient and effective ways to deliver education to our Officer Corps
- Obtain consensus in military leadership of the importance of technical graduate education as a strategic investment for the future security and prosperity of the nation.
- Continue to monitor student’s perception of the value of their NPS tour, and work to increase quality across the spectrum — from the classroom, to housing and all other "quality of life" factors
- Investigate reducing the mathematics requirement for Army Officers in order to create a larger pool of graduate education candidates
- Establish ongoing or continuing educational programs for alumni, and monitor their success and value-added return on investment
- Expand the School’s marketing efforts for officer awareness of graduate education opportunities
• Aggressively prepare for the WASC accreditation process as an important element in maintaining the stature of NPS as a graduate/research institution and, therefore, its desirability for attendance by junior officers.

**TEAM MEMBERS**

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THE NAVY'S CURRENT POLICY ON GRADUATE EDUCATION

Former Chief of Naval Operations, Admiral Jeremy M. Boorda, promulgated the Navy’s current Graduate Education Policy. That policy states, "Future Naval Officers will face increased challenges: a growing technological complexity in weapons, communications and electronics systems; the increased importance of joint and coalition operations; heightened public and Congressional scrutiny of procurement and management practices; continuing threats to U.S. interests; political and economic instability in regions important to the U.S. and its allies; and fewer resources with which to meet these challenges. Innovation is the key to the well being of tomorrow’s military force. Our 21st century Naval leaders must be readied now through professional experience and formal graduate education. Investment in graduate education provides the Naval Services with a comparative advantage over potential adversaries."

This policy was reaffirmed by Vice Admiral Daniel T. Oliver, Deputy Chief of Naval Operations, when he stated that "Postgraduate education is an important investment in the future of the Navy. We must continue to take full advantage of this valuable resource to remain at the forefront of technology and knowledge."

Such policy statements show the commitment to graduate education at the highest levels of Navy leadership.

It is important to note in this discussion that the Navy’s Graduate Education policy was stated by the previous CNO; the current CNO, Admiral Johnson, has not published a policy to date. Nevertheless, he has initiated a review of graduate education, and a policy is expected to be announced in the near future.

As can be seen in Table 1 below, the Navy does lag other U.S. military services in the percentage of its high ranking officers (O6 and higher) with graduate-level schooling. From this, one might conclude that Navy decision-makers place insufficient emphasis on graduate education. However, a clear measure of the importance the Department of the Navy places on graduate education for its officers is the high level of DoN-sponsored (i.e., Navy and Marine Corps) officer enrollment at NPS – nearly three quarters of the total NPS enrollment.

Table 1. Education levels by service (O6 and higher)

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<th>Marine</th>
<th>Navy</th>
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CURRENT GRADUATE EDUCATION POLICY OF THE OTHER U.S. MILITARY SERVICES

Other U.S. military services also place importance on graduate education. The Commandant of the Marine Corps, General Charles C. Krulak, has issued "The Commandant’s Planning Guidance," which outlines his vision as to how subordinate commanders are to implement Marine Corps policy. With regard to "preparing the force," General Krulak states, "History has shown that even in an era of diminishing resources, if we stay highly trained and ready, we can survive both as individuals and as an institution. It is imperative that we never be found lacking in our capability or ability to do what is expected or asked. During previous times of fiscal constraint, the Marine Corps has always turned to its training and education systems to keep its warfighting edge. We must do that today. The use of simulation, virtual reality, models, and various warfighting games can make subsequent field training more effective. We will pursue that kind of technology. In the same vein, education must become central to all Marines … Education is the foundation for a Marine Corps that can anticipate and adapt to the changing world that we are entering."

The Task Group was unable to find a written policy regarding graduate education for the Army. That service has, however, established certain educational goals as delineated in Army Regulation 621-1. The pertinent one states that selected officers will be educated on a full-time basis to pursue an advanced degree to meet needs validated by the Army Educational Requirements Board. The Army Educational Requirements Board identifies those positions within the Army structure which require an advanced degree for the individuals who fill them.

NPS CURRICULA PROACTIVELY MEET NAVY NEEDS

NPS has been very proactive in its efforts to develop graduate curricula directly supportive of new Navy directions and requirements. A significant and unique ability of NPS is to tailor its graduate programs to directly support operational forces. Two recent curricula of particular note are the School’s Modeling, Virtual Environments and Simulation, and Special Operations programs.

Modeling, Virtual Environments and Simulation is a new program created at the specific request of the U.S. Navy Modeling and Simulation Management Office (N6M), which literally defines the skill requirements for Naval officers within that specialty. The Army’s Simulation, Training and Instrumentation Command co-sponsors the
program. The curriculum provides both master’s level and Ph.D. programs in applied visual simulation technology, and the application of quantitative analyses to human/computer interactions in simulation technology.

The Modeling, Virtual Environments and Simulation master’s program is an eight-quarter program whose core courses cover object-oriented programming, artificial intelligence, software methodology, computer communications and networks, computer graphics, virtual worlds and simulation systems, probability, statistics, stochastic modeling, data analysis, and human performance evaluation. In this program, the Navy has a quota of ten officers per year, and the Army sends an additional four officers. On the international front, the Turkish Navy is planning an input of four officers per year. It is projected that in the near future there will be more than 30 students in the curriculum. The first Modeling, Virtual Environments and Simulation students graduated in September 1998.

Developed specifically to support the Services’ special operations capabilities, the Special Operations curriculum is designed to provide a course of study focused on the conflict spectrum below general conventional warfare. Graduates of this curriculum will possess knowledge of the broad range of factors involved in planning and conducting these forms of conflict, and a detailed understanding of the role of special and related operations in U.S. foreign and defense policy. The curriculum also examines the sources and dynamics of inter- and intra-state conflict, the challenges these types of conflict have posed and are increasingly likely to pose for U.S. security planning, the doctrinal and institutional evolution of the U.S. Special Operations community, and contemporary perspectives on low-intensity conflict resolution.

Now entering its third year after being re-designed at the Sponsor’s request, the Special Operations program was originally sponsored by the U.S. Navy’s Special Warfare Command, but currently receives sponsorship from the U.S. Special Operations Command. Yearly input is approximately 15 students from the Navy, Army and Air Force. The program has been an outstanding success from the perspective of Special Operations’ senior leadership. General Henry H. Shelton, while then-Commander of U.S. Special Operations Command and now Chairman of the Joint Chiefs of Staff, wrote the following letter to then NPS Superintendent Rear Admiral Marsha Evans following a 1997 visit to the School:

"...I was most impressed with this first class educational establishment. By any standard, NPS is at the cutting edge of professional military education and is a vital national asset. I am also most appreciative of the support NPS gives to our Special Operations Forces students in the Special Operations/Low-Intensity Conflict curriculum. These Navy, Army and Air Force officers come away from this experience much better prepared to face the challenges of the 21st century. And I maintain a
personal interest in ensuring that we make the maximum use of what they have learned."

**MILITARY-RELEVANT RESEARCH - INSTRUCTION SYNERGY**

Another important component of the School’s graduate education is its combined research effort. In conjunction with graduate-level instruction, a lively research program provides all U.S. military services with vital capabilities at a time of diminishing research dollars. In particular, NPS has established a number of research partnerships, where the collaborative effort has been of benefit to both parties. These efforts include association with the Naval Research Laboratory- Marine Meteorology Division, Training and Doctrine Command Analysis Center- Monterey, Fleet Numerical Meteorology and Oceanography Center, and Lawrence Livermore National Laboratory. (See also Assessment #19, Research Summaries, and Assessment #25, Research Plan).

Curricula program sponsors’ requirements for student theses are a major contribution to the Services’ overall research effort. The vast majority of NPS students must complete a thesis as part of their graduate program. Both the experience and personal interests of students and their thesis advisors overwhelming lead to defense-related topics. NPS students also have a long history of briefing their theses at the highest levels of command because the thesis provides an independent view of difficult military problems and gives the Services fresh insights into a rapidly changing military environment. (See also Assessment #14, Thesis Quality Committee).

**ANALYSIS AND EVALUATION**

**Appropriateness of the Initiative**

The Task Group found the Initiative as written somewhat vague and difficult to quantitatively measure. Specifically, the Task Group found the term "develop a consensus" to be unclear. What constitutes a consensus? The initiative also states that this consensus lies "within each service." Does this mean the leadership of a service, and/or its rank and file? The Task Group feels that the object of this effort should be more clearly stated. The initiative goes on to use the term "importance." How is importance defined? Again, the Task Group feels that "importance" should be clearly defined, so as to produce a supportable budget to NPS.

Whereas the Initiative also uses the generic term "graduate education," the Task Group believes it should instead specifically indicate a "technical graduate education." Without this addition, the Services might simply encourage officers to go to night school on their own time, as specified in Army Regulation 621-1 (See Footnote 4). Night school programs tend to be nontechnical in nature.

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To the Task Group, the NPS Executive Board’s FY1998 Objectives, stated above, seemed unrelated to the accomplishment of this Strategic Initiative, in that their focus is on NPS enrollments rather than the broader and more important issue of convincing the Services’ senior leadership of the importance of graduate education per se. However, this focus seems to be changing with recent visits by the new NPS superintendent and deans to Fleet commands for the purpose of creating awareness of the School’s capabilities to meet military graduate education requirements.

**NPS STUDENT ENROLLMENT MEASURES**

**Average on Board (AOB) Trends by Student Groups**

A well-accepted measure of student enrollment is the Average on Board measure collected and maintained at NPS by the Office of the Associate Provost for Instruction. This measure, which takes the quarterly full-time student enrollment averaged over four quarters, is the most widely used indicator of student enrollment at the School.

In this report, Average on Board trends are discussed in the following sections for 1) DoN (i.e., U.S. Navy (USN) and U.S. Marine Corps (USMC) combined), 2) U.S. Army, and 3) International students. At this point, U.S. Air Force (USAF), U.S. Coast Guard (USCG), and Department of Defense (DoD) civilians are not discussed, because their student enrollments are small in comparison to those evaluated here. USAF graduate is done primarily at the Air Force Institute of Technology.

**Department of the Navy (DoN)**

Over the past decade, DoN (USN and USMC) student enrollments have comprised about 70% of the NPS student population. Consequently, trends in this population have important implications for School planning.

Figure 1 on the following page shows the DoN enrollment trends in terms of student average-on-board. The Navy student population is divided into three officer categories: Unrestricted Line, Restricted Line, and Staff Officers. It is the Unrestricted Line (the Navy "warriors" — aviators, surface, and submarine officers) which has declined dramatically.
As shown in Figure 1, the overall NPS student population was at an all-time high in 1991, as was the DoN component. Since then, the 33% drop in Navy student enrollments between 1991 and 1997 is partially explained by an overall 23% drop in Navy officer end-strength over that same period. The additional 10% drop is discussed below. On the other hand, the 41% increase in, and still growing numbers of, Marine Corps students reflects a conscious decision at the highest levels of the Marine Corps to increase the advanced technical education of officers in the somewhat scaled down Marine Corps of the future.

Historically, Unrestricted Line officers have been the major component of NPS’ Navy student population, reflecting the Schools’ original roots. However, between 1991 and 1997, the Unrestricted Line officer percentage of Navy enrollment has declined from 70% to 55%. From an overall enrollment perspective, the Unrestricted Line trend is a major factor in projections of student population. The reasons offered at headquarter levels for this decline in Unrestricted Line officer inputs to NPS have been varied include:

- Budgetary shortfalls in the budget year’s manpower account.
- Insufficient time in a Unrestricted Line officer’s career to fit in an 18- to 24-month full-time program and still meet the operational and other Professional Military Education and Joint Professional Military Education requirements of the Goldwater-Nichols law. (See also Assessment #9, Joint Professional Military Education Accreditation Self-Study).
- Underutilization of subspecialty education for Unrestricted Line officers.
U.S. Army

The preponderance of Army Civil Schooling dollars are spent satisfying the Army requirements for officers with advanced degrees. The Army Civil Schooling budget is centrally prepared and monitored within the Army Civil Schooling Office at U.S. Army Personnel Command. The execution of the Army Civil Schooling program essentially occurs on a decentralized basis. The Army uses these dollars to educate officers in preparation for follow-on assignments within functional areas, or to serve as members of the faculty at the U.S. Military Academy. The U.S. Military Academy Academic Departments direct candidate instructors to apply to selected graduate programs. Likewise, functional area managers provide their graduate candidates guidance regarding programs they should consider.

The FY 1998 Army Civil Schooling quotas are shown in Table 2 on the following page. One point to note is the significant number of clusters within the 427 total quota (e.g. AAC Acquisition Corp, 65; U.S. Military Academy, 137; FA, 48; Foreign Area Officers, 90; FA, 49; and Operations Research, 24). NPS directly supports all of these major groupings in addition to many of the smaller quota groups. For example, NPS is a major supplier of the AAC allocations (24 Army students as of the April 1998 Average on Board Report) and Foreign Area Studies (23 Army students as of the April 1998 Average on Board Report). In the Operations Analysis curriculum, of the 14 Army students enrolled, 12 will be utilized as Operations Research analysts in their following assignments, and two will serve as instructors at the U.S. Military Academy. The NPS Mathematics Department is one of three "foundation" schools supplying instructors to the Department of Mathematical Sciences at the U.S. Military Academy, along with Rensselaer Polytechnic Institute and Georgia Tech.

Management of the Army Civil Schooling program is problematic due to several considerations. As indicated in Figure 2, the number of newly enrolled students varies from year to year. Using 1991 as the base year, the trend has been downward, perhaps reflecting the decreased manpower pool and shrinking Army Civil Schooling budget. Moreover, the number of new students as well as the costs vary widely among functional areas.

Table 2. FY1998 Army Civil Schooling Quota Plan
<table>
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<th>Functional Area Quotas</th>
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<tr>
<td>91</td>
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<td>54 (North Western/Lvn)</td>
</tr>
<tr>
<td>92</td>
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GRAND TOTAL: 427
OPMD Funding Reqmt: 359
Over the last ten years, international student enrollment at NPS has constituted 12% to 15% of the overall student body. This enrollment has generated tuition monies (Foreign Military Training) between $3 and $5 million annually. In 1991, NPS established a recruitment goal of fifty countries and an international student Average on Board of 300 officers. Due to several factors discussed below, this Average on Board of 300 has proven to be unrealistic. In fact, the School works hard to maintain a threshold of 200 students (after sinking to an all-time low of 163 in 1996). Nevertheless, the fifty-country target is proving to be attainable. Forty-five countries are currently sending students, with five to six additional nations expressing interest in sending officers to NPS over the next year or so. While increased total numbers of international students enhance the School’s Average on Board, the added diversity to the student body is a more positive (albeit subjective) influence on its mission.

Factors Affecting International Student Recruitment

International student recruitment initiatives are influenced by several external factors of varied weight and importance beyond NPS’ control. Still, the very fact that the School is well represented at conferences and on boards demonstrates its sustained commitment to raising the level of awareness of its educational and research programs.
The factors affecting NPS international student recruitment efforts and success are:

- Foreign training and education budget reductions implemented because of internal country priorities (e.g., in Taiwan, Korea, Israel, and Argentina).
- U.S. foreign policy political decisions that affect the flow of students from several traditional customers (e.g. Indonesia, Malaysia, Colombia, Pakistan, Thailand, Peru, and Ecuador).
- International Military Education and Training Program policy decisions — a Congressionally funded, State Dept. owned, and DoD executed grant program.

Among the key factors affecting international student enrollment are:

- Funding suspension of all U.S. graduate education programs in 1993. In this one year, the percentage of International Military Education and Training-funded students at NPS was reduced from 40% to 7%. The School now has 14 curricula certified for International Military Education and Training funding, and the percentage of International Military Education and Training-funded students is currently slightly more than 30%.
- Non-International Military Education and Training certified curricula require a waiver from the Defense Security Assistance Agency and the Unified Commander.
- In 1994 Congress slashed the International Military Education and Training budget in half (from $42 million to $21.5 million). Over the past four years, that number has incrementally increased to $50 million for FY 1998.
- NPS is designated as high-cost education for internationals, which discourages some countries from requesting quotas.

Ongoing marketing and recruitment initiatives to attract international students to NPS include:

- Annual mailings to all past, present and potential customer countries.
- Hosting of all international visitors to NPS. This includes interfacing with targets of opportunity generated by other staff and faculty, with presentations tailored to the particular audience.
Networking with the staffs at the Defense Security Assistance Agency, Navy International Programs Office, and others.
- Responding to all international queries about NPS (verbal, fax, e-mail)
- Coordination with country attaches in Washington, D.C.
- Briefings to resident Defense Resource Management Institute international classes (three times a year)
- Individual opportunity briefings to staff and faculty designated for overseas travel on school business

Initiatives to enhance the School’s existing International program will require a commitment of additional resources. At present, recruitment occupies approximately 50% of the International Programs Director’s attention. Moving to the next higher level would necessitate another full-time employee with an expanded travel budget who would be chartered to capitalize on individual countries of opportunity (dealing directly with their education and training representatives). The present system of dealing through the U.S. training representatives in our embassies worldwide is a filtered process at best, and may not happen at worst.

Anecdotally, the importance of the School’s "braggingly happy alumni" cannot be dismissed (see Student Perceptions below). It has NPS Alumni Associations in several countries (i.e., Greece, Singapore, and Indonesia) and over 3,200 graduates positioned in 68 countries who could assist with networking.

Quality of life support for international students needs to be maintained at least at present standards to include ready access to government housing and furniture, as well as English as a Second Language support for both students and their family members. The high cost of living in Monterey, and the limited dependent military medical and dental services available, continue to seriously detract from their experience at NPS. One statistic available is the 60- to 120-day waiting period of international students for military housing. Most international students are reluctant to verbalize their dissatisfaction with quality of life issues because, despite the shortcomings, they still view their tours here as extremely valuable and worthwhile to themselves and to their countries.

**STUDENT PERCEPTIONS**

The NPS Executive Board has indicated that an important component influencing this Strategic Initiative is the student’s perception of his or her NPS education. Since the School’s student base represents the future leadership of the Navy and other military services, a positive experience here will pay dividends in future decisions as to NPS’ importance to the military professional. The phrase used by the NPS Executive Board to embrace this objective is to produce "braggingly happy" graduates.
This Task Group used two measures to try to quantify "student satisfaction": the Graduating Student Survey and Student Evaluation Forms. Both of these documents and their historical compilations are maintained by the office of the Associate Provost for Instruction.

**Graduating Student Survey**

The Graduating Student Survey is completed by students as part of their outprocessing procedure. Graduates complete 28 questions by scoring their responses on a scale from "Strongly Agree" to "Strong Disagree." These questions fall into four categories: General, DoD Uniqueness, Quality, and DoD Relevance. (More information concerning this survey can be found in Assessment #16.) There is very little quarterly change in the survey results. A graph of the combined results since the survey was initiated is shown in Figure 3 on the following page.

As can be seen from Figure 3, almost all questions score well above the neutral evaluation and appear to have a mean value close to the "Agree" response. The categories of "DoD Uniqueness" and "DoD Relevance" garner even higher responses. One of the highest scores was for Question 24: "NPS provides an education which benefits an officer for the remainder of his/her military service." In essence, graduating students feel that NPS gives them an education uniquely beneficial to their military career paths. The traditionally lowest score, although still above the "neutral" level, is for Question 23: "Support for quality of student life (e.g. exchanges, gym)." However, this area only tangentially affects the broader issue of students' perception of their education. Based on the results of the Graduating Student Survey survey, the Task Group concludes that NPS students are "walking out the door" feeling good about their education and its potential to make them more successful in their careers.
Figure 3. Results of Graduating Student Survey for Fall Quarter 1998

In addition to the Graduating Student Survey, individual curricula conduct student surveys as part of the outprocessing process. These surveys provide Curricular Officers and associated teaching departments with information specific to those students' opinions. A wide range of topic areas is covered by these surveys, much of which is sensitive due to the mention of particular professors. Two Curricular Officers did offer the generalization that, from their surveys, students were very satisfied with their educational experience at NPS (which is consistent with our conclusions from the Graduating Student Survey).

It is the opinion of this Task Group that the data from individual department surveys would lack consistency of measurement and contain because they reflect only a small portion of the NPS student population. The Graduating Student Survey is, therefore, a much better measure of student perception of their NPS experience. (See also Assessment #10, Curriculum Reviews; and Assessment #16, Student Exit Interviews).

Student Opinion Forms

The second group of data evaluated by the Task Group was from Student Opinion Form evaluations conducted each quarter. The completion of this form is required of each student at the end of every course. Similar to the Graduating Student Survey, students score 16 questions with numerical values from 1 (strongly disagree) to 5
(strongly agree); 5 is the most positive and 1 is the most negative evaluation. Again, there is remarkable consistency in the quarter-to-quarter data. (See also Assessment #17, Student Opinion Form). A mean is calculated for Questions 1 through 11; this number tends to evaluate instructor teaching characteristics. Question 12 specifically asks students to rate the instructor overall. The remaining four questions relate to evaluating the course.

Results data show that the Questions 1 through 11 mean is consistently in the low 4s range (4.36 for Academic Year 1998, Quarter 1), indicating student opinion of instructor characteristics is very favorable. Instructor ratings (Question 12) are again in the low 4s (4.26 for Academic Year 1998, Quarter 1), corresponding to a student evaluation between Excellent and Outstanding. Course ratings appear to be in the high 3s, indicating an evaluation between Average and Excellent, with a strong leaning towards Excellent. Lowest ratings tend to focus on the textbooks, which may have to do with unique or militarily relevant aspects of NPS courses.

These ratings all tend to indicate that student perceptions of their professors and the courses they take are positive.

**STUDIES ACCOMPLISHED AND PROCESSES IMPLEMENTED**

This section focuses solely on U.S. Navy initiatives at NPS. (Initiatives for International students have already been discussed above.)

As the principal administrator of the Navy’s fully-funded graduate programs, the NPS Superintendent is in a unique position to offer important insights to the Navy as it comes to closure on its long-range plans for graduate education. Working through meetings with the Graduate Education Review Board, the Training Resources Board, and the Secretary of the Navy-appointed Board of Advisors, the Superintendent plays an active participatory role in the decisionmaking structure at the highest levels of Department of the Navy leadership. The process of staffing for and responding to these groups forms a substantial part of the Superintendent’s external activities. (See also Assessment #7, Graduate Education Review Board; and Assessment #32, Graduate Education Review Group).

Several initiatives are underway that collectively hold promise for reversing the downward trend in Unrestricted Line enrollments and clarifying the Navy’s policies on advanced education:

- Upon the urging of the NPS Board of Advisors, a Chief of Naval Operations (CNO) Executive Panel Task Group was formed to address "Navy Line Officer Advanced Education Requirements for the 21st Century." Among other things, this group was to:

2. Review the current Navy graduate education, Professional Military Education and Joint Professional Military Education programs and make recommendations for changes based on the above vision.

(See also Assessment #6, Board of Advisor Reports; Assessment #8, Center for Naval Analyses Study; and Assessment # 9, Joint Professional Military Education Accreditation Self-Study).

- Within NPS, a Deans/Faculty review group is reviewing NPS Unrestricted Line academic programs using curricula ideas developed by other faculty committees over the past few years. Their goal is to provide curricula options to shorten the resident requirements for Unrestricted Line officers while meeting the requirements of the individual warfare community sponsors (Surface, Submarine and Aviation) and maintaining high academic standards. The goal is to have warfare community sponsors, who have a career perspective on their officers, actively involved in defining curricula requirements. In the past, these Unrestricted Line community sponsors have not been involved, as have been their Restricted Line and Staff counterparts. These curricula options will subsequently be briefed to the Training Resources Board to ensure that appropriate long-term resource allocations are made for the options approved.

- Discussions are underway within the Training Resources Board framework to re-examine the Unrestricted Line graduate education requirements process. Currently, the subspecialty requirements system is based on filling the needs of shore-based billets. Moving to a system that recognizes the value of graduate education in all career assignments, particularly at sea, would significantly enhance Unrestricted Line utilization, as about half their time is spent in sea assignments. Consideration is being given to defining Unrestricted Line fully-funded graduate education requirement goals as a percent of each successive year group. By moving away from being tied to specific billets, this percentage approach would enable crediting utilization in sea assignments for officers having operationally-oriented graduate education meeting the requirements of their warfare community sponsors.

- Over the past few years, the School has been active in having some of its programs certified for the Joint Professional Military Education Phase I requirements of the Congressional Goldwater/Nichols legislation. This, in effect, provides NPS students with two qualifications — graduate education and Joint Professional Military Education — within one education tour. This "two-for-one" touring saves time and significantly eases the career "time-crunch" for
Unrestricted Line officers. (See also Assessment #9, Joint Professional Military Education Accreditation Self-Study).

- Through the active encouragement of Congressman Ike Skelton, NPS, in sponsorship with the Office of Naval Research, conducted a major seminar in January 1998 entitled "Military Education for the 21st Century Warrior." Congressman Skelton’s motivation was concern over balancing technologically-oriented graduate education and professional military education focused on the art, theory and doctrine of warfare. He felt that the necessary personnel investments were not being made to support Joint Vision 2010, the Joint Chiefs of Staff document addressing warfare into the 21st century, particularly in the area of technical and analytic subject material. Attendees at the seminar included representatives from Congress, the Office of Secretary of Defense, Defense Agencies, the Joint Chiefs of Staff, and all of the U.S. military services. As a result of this seminar, action agendas were formulated that will have legislative and administrative impacts on the future educational processes of the military services. In particular, it should expand the opportunities for Unrestricted Line officers to receive Joint Professional Military Education I qualifications as a result of their studies at NPS.

- The School has been developing a distance learning capability since 1994. This technology is being exploited to make NPS graduate education available to a wider DoD audience than our resident students, and thinking toward a continuum of "life-long learning" (e.g., updating officers who graduated from NPS a number of years ago on the latest technical advances). Developments are also in progress to attempt to make available through the Internet preparatory material for most graduate programs to help reduce students’ time in residence.

- The Alumni Relations Office has initiated several projects with the purpose of providing timely information to the NPS graduate population. The Alumni Relations Office produces a quarterly newsletter circulated via bulk mail to over 17,000 NPS alumni. In addition, the Alumni Relations Office has established a web page containing, among other items, a sign-in page where graduates can communicate changes of address and other information to the School. The web page has seen a dramatic increase in usage from 334 visitors in November 1997 to 1,691 visitors in March 1998. The Alumni Relations Office also offers opportunities for continuing education, providing regional seminars on a variety of topical issues affecting the Navy and Department of Defense. In this manner, it is hoped to keep graduates tied to the School as they progress through the Navy’s rank structure. (See also Assessment #26, Alumni Surveys).

Upon arriving at NPS, the new Superintendent, Rear Admiral Robert Chaplin, solicited recommendations from the Navy’s Flag officers regarding the very heart of this Initiative. Specifically, he asked for the perception among the Navy’s senior leadership whether 1) NPS has outlived its usefulness (i.e., that the Navy’s educational requirements should be satisfied by the private sector); 2) NPS is not responsive enough
to satisfy Fleet needs; and 3) postgraduate education takes too much time from officers’ careers. Although the responses are not yet available for review as of the publication date of this report, this input will provide useful insight into the Navy’s high-level view of graduate education for its officer corps. This information should also provide a useful starting point in building the consensus called for in this Strategic Initiative.

**RECOMMENDATIONS**

- The Task Group evaluating Strategic Initiative #4 feels that the following restatement of that Initiative better captures its spirit and intent than the current wording. This proposed restatement clarifies the type of education conducted at NPS to emphasize the importance of technical graduate education versus simply graduate education, as the Task Group believes no one will deny the importance of graduate education. The Task Group’s suggested restatement is:

  Strategic Initiative #4: Convince decisionmakers that DoD-unique subspecialty technical graduate education at the Naval Postgraduate School is an *immediate* need for the Services to be able to meet their present and long-term operational requirements.

- The NPS proponent for this Strategic Initiative should revert back to the Dean of Students (Code O3), who is better positioned to affect and monitor this Strategic Initiative.

- The DoN is currently defining its long-range advanced education requirements in the face of major structural changes following the end of the Cold War. From an historic perspective, this is similar to the adjustments that were made during the post-Vietnam drawdown, which, as the Historic Average on Board graph (Appendix A) shows, included a drop in DoN students followed by a subsequent increase in students from 1977 to 1991. It is highly probable that the current Navy downtrend will also be adjusted as the requirements of a smaller, more technology dependent Navy are realized. The Marine experience could well be emulated by the Navy.

- In terms of the NPS Strategic Plan’s initiative to develop and sustain a "healthy" DoN enrollment, it would appear that the NPS initiatives noted above are on the mark. Proactive participation in decisionmaking forums within the Navy is the best way to make NPS’ case for the future of advanced technical education in that Service.

- The Army provides a sizable input to the NPS enrollment. Attention should be placed on those high-concentration groupings on the Army Civil Schooling quota plan (See Table 2 and Appendix B). Much closer coordination with the U.S. Military Academy should also be initiated. Each NPS Department with a U.S. Military Academy Academic Department equivalent should engage in discussions to have NPS help to provide future U.S. Military Academy
instructors. Those NPS curricula that support large Army functional area and acquisition Corp programs (NSA, OR and MS) should continue to seek Army input. Army proponents should be included in curriculum reviews, and points of contact between the NPS Departments and Army agencies should be established and maintained.

- While it is difficult to quantify the overall success of the international student program at NPS, it is clear that it supports the School’s mission and is in keeping with the goals of the nation’s national security objectives. It makes sense and is in the best interest of the United States to expose our military officers to the cultures and viewpoints of our allies and friends from around the world while promoting standardization and interoperability of cooperating militaries through graduate education.

- In an earlier progress report to the WASC Steering Committee, this Task Group expressed concern regarding the FY 1998 goal to expand NPS’ marketing effort. It was felt that marketing across a broad spectrum would result in an unproductive effort, and that the effort should be focused instead upon those issues NPS sponsors would like to see in the School’s graduate program. This seems to be even more important as there is as yet no written marketing plan. The NPS Marketing Quality Management Board ended operations with the departure of Rear Admiral Evans. Certainly, a written plan needs to be produced prior to vigorous implementation of this FY1998 goal.

**MEASURES**

In this very subjective area dealing with the value placed upon graduate education, quantitative measures are difficult to define. It seems appropriate, therefore, to consider how each Service defines positions which require graduate education as one measure of the importance of higher-level education to that Service. Therefore, the types of measures considered by this Task Group are:

- Number of positions within the Service that require graduate education. As of June 15, 1998, the Navy has approximately 4,000 billets requiring graduate education out of an officer population of approximately 55,000 (7.3%). The Marine Corps has approximately 400 positions requiring graduate education out of an officer population of approximately 18,000 (2.2%). And the Army has approximately 3,400 positions requiring graduate education out of an officer population of approximately 67,000 (5.1%).

- Percentage of those positions that are currently filled. Of those positions identified in the above paragraph, the Navy has about a 65% fill, the Marine Corps a 80% fill, and the Army a 60% fill.

- Budget allocated by each Service for graduate education. (See also Assessment #27, Budget Plan).
It is very difficult to obtain a precise number for the first two measures. This difficulty is because there are multiple accounting systems within each Services’ personnel commands. Furthermore, existing values represent only snapshots in time, with great fluctuations, depending upon the time of year. The budget question is the subject of an entire Task Group dealing with Strategic Initiative #5 and is discussed in greater detail in the next chapter of this report. The above measures are only marginally useful, but until a more precise definition is provided, such a comparison between Services and time trends will have to suffice.

The primary measures used by NPS to evaluate enrollment and student "happiness" are the Average on Board data, Graduating Student Survey, and the Student Opinion Forms. All of these measures were used in the preparation of this report. Our Task Group recommends continuing NPS use of these measures, with no changes. There may be considerable benefits to having these measures standardized, placing all who use them in a common framework.

**USING ASSESSMENT MEASURES TO CHANGE THE PROCESS**

There would be some utility in collecting data on the number of positions within a Service that require graduate education, the percentage of those positions currently filled, the budget allocated by each Service for graduate education, and observing the trend over time. Declining measures might indicate a reduced emphasis placed upon graduate education by the respective Service. As pointed out above, this measure needs a clearer definition to be of optimal use.

In considering the enrollment issues, all the initiatives discussed above use the measures described as an integral part of their analyses. In particular, Average on Board is the well-established and clearly-defined enrollment benchmark. It provides a common descriptor in tracking enrollment.
NPS will obtain the resources needed to accomplish its mission

NPS will create the correct balance between current operations and reinvestment

STATEMENT OF INITIATIVES

Strategic Initiative #5: NPS Will Obtain the Resources Needed to Accomplish Its Mission

As stated in Strategic Initiative 5, NPS has a clearly articulated mission. To execute this mission, the School must obtain adequate resources and use those resources as efficiently as possible. Given today’s budgetary realities, NPS must be able to demonstrate that investing in quality, focused educational programs produces a tangible Navy-wide benefit. It is also essential that NPS provide the Navy leadership with well-defined, prioritized requirements that can be defended throughout the entire budgetary process. New resources will have to be linked to new requirements, which, in turn, must be linked to clearly defined Fleet needs.

The Initiative further notes that NPS needs to explore savings in faculty and staff labor that may become possible by investing in new educational technology. NPS must determine whether it can afford to service all of the curricula it now supports; perhaps efficiencies can be generated by consolidating closely related sub-specialties. A comprehensive study may identify areas of opportunity that will allow NPS to free up dollars for reinvestment in its infrastructure.

The Department of Defense budget is very tight, and promises to be so for many years to come. To compete successfully for resources in this climate, the School must have a clear commitment to providing the nation with the very best, most efficient graduate programs tailored to meet the unique needs of our armed forces. The Strategic Plan reflects this commitment.
Strategic Initiative #6: NPS Will Create the Correct Balance Between Current Operations and Reinvestment

Strategic Initiative 6 observes that organizational effectiveness depends on resources being devoted to both current operations and investment/reinvestment. However, due to funding uncertainties and last-minute budget reductions that have become the norm in recent years, NPS has supported current operations at the expense of long-term investment. These budget reductions are often taken in non-labor accounts, which has resulted in unacceptably low non-labor expenditures and an inability to support faculty and course development as the labor account is consumed for current instruction rather than personnel recapitalization.

The Initiative asserts that as budgets have declined, NPS has continued to support a relatively stable number of staff and faculty billets by significantly cutting the amount of Operating Target Funds available for laboratory, library and network upgrades, and often recapitalization expenditures. The School has thus maintained a stable level of teaching support, but has neglected faculty and staff development investments. It has, however, recently created a small reinvestment fund of savings from efficiencies.

NPS needs to determine the true cost of each of its educational programs, consider competing only in areas where it has a clear comparative advantage, and sponsor support to guarantee adequate funding for operations as well as investment. The School also needs to evaluate the return on investment of its support activities, and determine the optimal way to obtain needed support.

NPS needs to strategically evaluate its programs and functions, and focus its resources on programs most critical to combat effectiveness. Additionally, the School needs to examine its labor costs with an eye to producing savings for redistribution among programs.

TEAM MEMBERS

Matthew Kelleher
(Chair) Professor, Mechanical Engineering Dept.

Megan Reilly
Comptroller

George Conner
Assistant Provost
INTRODUCTION

Strategic Initiatives #5 and #6 are addressed together because they are intimately connected, in that they both are concerned with resources. However, in addressing these two Initiatives, it is important to realize that the definition of resources is somewhat different in the two contexts.

In the context of Strategic Initiative #5, "resources" is narrowly defined as the dollar amount of NPS' yearly budget as legislated by Congress in the Defense Department Appropriation and Authorization Bills, plus the tuition paid by Department of Defense students other than Navy and foreign students.

Within the context of Strategic Initiative #6, the resources for which the correct balances are being sought are the School's faculty and staff labor, capital plant, library, and the laboratories and administrative infrastructure needed to carry out its educational mission.

One observation made while examining the Strategic Plan and preparing this Self-Study was that there are significantly different perceptions of the NPS budget. The Strategic Plan states that "... NPS has continued to fund a relatively stable number of faculty and
staff billets by cutting significantly the amount ... available for laboratory, library ... " However, this conclusion is not supported by the Mission Long-Range Labor Plan, which shows that the number of faculty work-years funded by NPS direct funds (including Foreign Military Training and tuition) has in fact declined from 275 in FY91 to 187 in FY98. The number of staff work-years funded by NPS has also declined over the same period, from 265 to 215, and continues to decline.

While funds for laboratories, library and other areas have failed to keep up with NPS’ needs, what has happened is that, as direct funds have become more difficult to obtain, faculty have increased their efforts to obtain reimbursable research funds. As a result, the number of faculty and staff work-years funded by reimbursable sources has risen dramatically since 1991.

This chapter discusses the general budgeting context in which NPS operates, portrays the overall level of financial resources available in recent years, presents the current funding view for the next few years, and discusses the balance between consumption and investment at NPS. It concludes with some recommendations.

**STATUS OF NPS FUNDING**

**Context**

Procedures for distributing Navy resources are the purview of the service’s Planning, Programming and Budgeting System. All organizations within the Navy, including NPS, are required to follow these procedures. The Planning, Programming and Budgeting System translates national security interests developed by strategic planners into military requirements, and subsequently into budgetary requirements which are presented to Congress for funding consideration. The Planning, Programming and Budgeting System process is continuous, moving from broad planning considerations to more definitive program objectives and specific budget estimates for specific programs.

**Planning**

The NPS planning process begins with the definition of requirements for a period extending seven to eight years into the future. This process is continuous and interacts with the processes of programming and budgeting. The Provost, Deans, Department Chairs, and others play key roles in this process. Tradeoffs are continually made between requirements and fiscal reality. The goal of the process is to develop a budget which will support essential mission needs, allow for institutional reinvestment, and remain within the fiscal constraints that exist during this time of declining defense spending.

**Programming**
Programming is the process by which NPS transmits its desired funding levels — tempered by projected fiscal forecasts — to the Navy, Department of Defense, President and Congress. Within the Navy, the School transmits its desired funding levels to its resource sponsor, the Director of Naval Education and Training (N7) in the Office of the Chief of Naval Operations. The Director of Naval Education and Training must balance NPS funding requests with funding requests from other Navy training and educational activities. The Director’s funding requests, in turn, are balanced against other Navy and Department of Defense requirements. The President, through the Office of Management and Budget, and the Congress determine the requirements of the entire federal government. At all levels, tradeoffs are made between requirements and fiscal reality.

Conflicts that have arisen as a result of this multi-layered process include:

1. The Navy’s “Program Objectives Memorandum for FY98” (POM98) was not adjusted to available funding levels. NPS had been programmed to receive an increase under POM98, but this was subject to a severe cut to bring the budget into balance. New start programs such as “Seaman to Admiral” had been authorized and funding allocated during the POM process, but as the budget was balanced, such programs were mandated to be taken "out of hide" with no net dollar growth to support them.

2. The Program Review for 1999, (PR99) programmed increase for academic infrastructure (i.e., new technology for laboratories and library resources) was offset by a reduction in budgeted labor dollars and work-years, leading to a reduction of 58 personnel from the School, and a cut in real-property maintenance programs.

3. Navy-wide horizontal cuts are distributed to Navy Comptroller, resource sponsors and major claimants during the programming phase. Funding reductions are currently being distributed based on as yet unproven "outsourcing" initiatives.

These and other similar examples illustrate the funding difficulties experienced by DoD/Navy activities, including NPS, in recent years.

**Budgeting**

The first two years of the Navy’s Program Objectives Memorandum (POM) translate into the NPS budget, and the budgeting process executes to the funding levels passed to the School by Congress and the Navy. This process is one of incremental budgeting, reviewing only changes to the programmed funding baseline. It is also one of balancing funded requirements against requirements that were not programmed for but have since moved up in priority; new requirements; adjustments for pricing; and underfunding of stated requirements.
The budgetary process must also balance funding from other sources, such as tuition paid by other government agencies for their officers and civilians to attend NPS; tuition paid by foreign governments; and reimbursable funding for research, short courses, and other activities NPS engages in. Problems arise when an unplanned reduction to any of the funding sources occurs in the year of execution.

Figure 1 below is included to illustrate the changes that can occur in the budgeting process. It shows for the years 1990 through 1996 the planned funding WASC would have seen in its last visit. The actual funding also shown was less, particularly for the period 1994 through 1996.

**Projected vs. Actual Funding**

*FY96 Dollars ($000)*

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**Figure 1. Projected vs. actual funding**

Operations and Maintenance Navy (O&MN) funding is the basic budget of NPS. Other Procurement Navy is for the purchase of large items. These two categories are the appropriations that NPS receives (i.e. direct funding).

The next section provides more detail about past funding at NPS.

**Past NPS Funding**

An overview of the financial resources available to NPS since FY88 is presented in the NPS Expenditure History, in Table 1. These data are extracted from a document produced by the NPS Comptroller. More detail is available in the original document.
The Expenditure History has three main categories: Mission, referring to academic mission activities; Base Operations Support, referring to expenditures of what is now the Naval Support Activity Monterey Bay; and Tenants/Misc. The last of these categories includes the costs of some related activities not directly associated with the School’s graduate education mission.

The categories of funds are: 1) DIRECT, referring to appropriated Operations and Maintenance Navy funds, Operations and Maintenance Navy; 2) REIMB, referring to reimbursable funds received by NPS outside the School’s normal operating budget in exchange for goods or services. This includes Foreign Military Training funds for foreign students and tuition for other U.S. students. Operating Target/Trav refers to "operating target" and travel funds, which are the budgeted Operations and Maintenance Navy funds available in the budget. Under the tenants section are the Defense Resource Management Institute, the Naval Center for Acquisition Training, the Defense Manpower Data Center, and the Army Training and Doctrine Command’s Research and Analysis Center.

Table 1. NPS expenditure history
These data should be used to understand the overall size of the NPS budget. Detailed observations or conclusions about increases or decreases in a particular year can be misleading. One reason for this is that sometimes changes — either cuts or increases — come late in the year, and the benefit of an increase is lessened by the inability to plan in advance for the best use of the funds. Likewise, the impact of a cut late in the year is much more dramatic than it would have been earlier in that same year. For each significant change in the numbers there is an associated story. For example, late in FY97, NPS received approximately $5 million for a network upgrade.

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The NPS Expenditure History reveals significant fluctuations. In FY88, when direct funding of NPS research was initiated, the funding for high-cost (capital equipment) items, namely Other Procurement Navy, was not programmed into the NPS budget. This problem persisted for two years and then was fixed in FY90. The Other Procurement Navy numbers were erratic thereafter, until they finally stabilized (at zero). Beginning in FY96, the Operating Target was increased somewhat to compensate for the lack of Other Procurement Navy.

An important point about the figures in the NPS Expenditure History is that the "direct" funds do not include Foreign Military Training and tuition. Those funds are reimbursable. Nevertheless, they are an essential part of the School’s budget and are used directly to fund instructional programs. Within the Academic Planning Office and throughout the mission organization, Foreign Military Training and tuition are therefore treated as direct funds. The budgets provided to the academic departments and other mission activities do not distinguish the Foreign Military Training and tuition funds, but include them in the overall direct labor controls.

The amounts of Foreign Military Training and tuition received each year varies with the number of non-Navy students. In 1997, the amounts available to NPS’ mission were Foreign Military Training $2,080,000 and tuition $1,298,000. In FY98 there was an increase, and another is expected for FY99. These funds, although "officially" reimbursable, are very different from other reimbursable funds that are received by a specific faculty member for a specific research project. If research funds do not arrive as expected, a problem is created for the individual faculty member that affects the department’s planning and execution, but those funds are not part of the overall NPS mission budget.

In recent years, NPS has expanded its programs in several ways. These new programs include the Navy Center for Acquisition Training, the Center for Civil Military Relations, the Institute for Defense Educational Analysis, and the new Executive Education Center. These activities, while important and mostly growing, are not a core part of the School’s on-going in-residence graduate education programs. Funds for these activities are included in the Expenditure History.

**NPS Funding Outlook**

Although the budget climate remains unfavorable for any significant increases, NPS continues to position itself to offer quality programs. How NPS is accomplishing this is discussed later in this chapter. First, the budgets for the next few years will be addressed. NPS’ expectations for future years’ budgets are given in Table 2, excerpted from its DoN Budget Submission. The budget category shown, 3K, is Professional Development and Education. Table 2 shows only NPS’ portion.
The dollars shown here are Operations and Maintenance Navy (direct) and are comparable to the "direct" numbers in the Expenditure History. One observation from this table is that numbers are erratic with no rhyme and only the vaguest of reason. Among the reasons stated in the DoN Budget Submission for the significant declines from FY2000 onward is the "outsourcing distribution." This is the NPS share of the planned savings the Navy intends to make service-wide by contracting out various functions that are not inherently governmental. Another significant impact is from withdrawal of funding for the (previously unfunded) "Seaman to Admiral" program.

Too much reliance should not be placed on these numbers at this point, since changes are almost certain to occur between now and the execution year.

**ANALYSIS**

**Balancing Competing Requirements**

There are several aspects to how NPS has balanced expenditures between current operations and future investment. Choices about current staffing levels, training budgets, internally funded faculty research, faculty size, sabbaticals, laboratory recapitalization, etc. all relate to this balance. Here we will discuss a number of decisions and actions that address that balance.
(The question of balance between NPS and the separate command created in FY97, Naval Support Activity Monterey Bay, will not be addressed in any detail here. Within Naval Support Activity-Monterey Bay, which encompasses the Public Works and Supply departments and several other departments not directly related to the School’s academic mission, there also exists a significant issue of balance between current operations and infrastructure investment. It should be noted that Naval Support Activity-Monterey Bay has recently increased its emphasis on infrastructure, having experienced several notable problems including leaking gas and steam lines, among others. The support command is also in the process of creating a long-range infrastructure management plan; and in August 1998, the Superintendent endorsed its general plan, including an increased commitment of resources to infrastructure needs. While this will temporarily draw funds from current operations, it is a wise course. Recent tight funding has resulted in too little emphasis being placed on long-term needs.)

Several of the items to be discussed with respect to NPS can be better understood in the context of the School’s Mission Long Range Labor Plan, shown in Table 3 below.

The Mission Long Range Labor Plan was created in FY95 to help guide NPS through a difficult period in which substantial labor reductions were required. It has been revised several times since then in response to budget cuts or "end strength" reductions, but the current plan has not been changed for approximately one year.

The Mission Long Range Labor Plan provides a clear picture of both past and planned levels of mission faculty and staff labor. In the Mission Long Range Labor Plan, unlike the Expenditure History, "direct" includes Foreign Military Training and tuition. For this reason, attempts to compare them directly may lead to slight discrepancies. There will also be some differences due to the fact that the Expenditure History includes miscellaneous categories not considered in the Mission Long Range Labor Plan numbers. For example, some command-wide labor in the Total Quality Leadership, Hazmat, Alumni Relations, and Patent Attorney offices is reported in the Expenditure History document but not included in this mission summary.

Table 3. Mission Long Range Labor Plan
The Mission Long Range Labor Plan is divided into sections for faculty and staff. The faculty section, for reference, shows the Average on Board (AOB) student count. Also shown are the declining count of tenure-track (TT) faculty, the number of direct work-

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DIRECT includes FMT, TUITON, O&MN

The Mission Long Range Labor Plan is divided into sections for faculty and staff. The faculty section, for reference, shows the Average on Board (AOB) student count. Also shown are the declining count of tenure-track (TT) faculty, the number of direct work-
years funded (DIR WY), the number of research reimbursable work-years (RR WY), and the total work-years. These data are followed by some derived ratios. For staff, the Mission Long Range Labor Plan shows the number of work-years funded by direct, reimbursable and indirect funds along with the total number of work-years funded. Again, some derived ratios are also presented.

Among the most significant observations on the Mission Long Range Labor Plan are the two lines showing faculty DIR WY funded and staff DIR WY funded since FY91. In both cases there has been a dramatic decline.

It should be noted that the Navy phased out its "direct funded research" program for NPS beginning in FY91 when NPS was, after a three-year hiatus, again allowed to begin accepting reimbursable research from Navy sources. This is partially responsible for the decline in "direct" labor support, particularly in FY92 and FY93.

Although the Average on Board figure has also decreased during the period shown in the Mission Long Range Labor Plan, the declines in direct-funded faculty and staff labor have been significant. Reducing the Average on Board by some percentage does not imply that faculty and staff should be reduced by that same percentage. NPS does not directly control the programs into which students are enrolled; and, even if enrollment drops, the School still needs to offer the programs. Classes will be smaller, but they must still be taught. Recall that NPS does not simply offer a list of classes and ask students to enroll in the ones they like. NPS curricula are carefully designed to allow students to finish in the time available. All required classes are offered when needed. Enrollment is not on a first-come, first-served basis.

Maintaining A Strong Position

NPS is continuously adjusting to new Navy requirements and has made many changes in its curricula to meet emerging needs. These adaptations include changes within existing curricula, preparing for the "Seaman to Admiral" program, developing a new information warfare curriculum, initiating the Leadership Education and Development program at Annapolis, and in FY98 beginning the very successful program in Executive Education for senior Navy leaders.

Thesis issues are discussed more fully in the report of Task Group 3. The changes discussed in this section are of a different nature — changes not to curricula, but the NPS structure, workforce and budget required to position the School for the future.

a. Faculty and staff work-year reductions (Mission Long Range Labor Plan)

Throughout the ‘90s rising labor costs and limited budgets combined to force reductions in both faculty and staff work-years funded. The coincident difficulties in funding laboratories, library, and the network, led NPS to a plan to decrease labor even
more with the specific intent of making funds available for these competing needs. This reduction is clearly seen on the Mission Long Range Labor Plan. This was marginally successful since the funds were removed from the NPS budget as fast as they could be saved. Fortunately, in FY97 and FY98 some unexpected year-end funds were made available for laboratory equipment. Laboratory re-capitalization is a major concern and is discussed more fully below.

b. The number of tenure track faculty is being decreased substantially

NPS is in the process of making significant reductions in the number of tenure-track faculty. This action will lessen the permanent labor bill and make the School more able to respond to changing DoD/Navy requirements (Revolution in Military Affairs, for example). The reductions have come from normal attrition, retirement and death, and from a careful scrutiny of tenure-track candidates early in their terms at NPS.

The School is concerned about falling too low in certain technical areas, and has therefore hired selectively to maintain the required faculty capabilities. NPS monitors both the experience distribution by department and years to retirement eligibility for its tenure-track faculty.

c. Faculty/staff ratio

Early in this decade it was felt that the staff/faculty ratio was too low. To address this situation, two actions were initiated in 1991. The first was a reduction in faculty work-years funded. Secondly and simultaneously, the number of staff work-years funded was increased slightly. This trend to increase the staff/faculty ratio continued through FY94. Since that time, the plan has been reflected in the Mission Long Range Labor Plan.

d. Indirect cost

In anticipation of an expected, and actual, budget decrease in FY94, NPS re-instituted its indirect cost assessment on reimbursable research. This charge had been dropped in FY88 with the beginning of direct-funded research. Re-instituting this source of funding prevented substantial reductions in the staff labor force, but resulted in an increased cost to the reimbursable efforts of the faculty.

e. The Institute for Defense Educational Analysis

The Institute for Defense Educational Analysis is essentially an experiment in NPS’ future. The funding for the Institute for Defense Educational Analysis is entirely reimbursable. Its goal is to seek ways to make NPS more effective and to expand the reach and impact of the School. One of the major activities of the Institute for Defense Educational Analysis has been the pursuit of Distance Learning, and seeking ways to make the delivery of NPS materials more efficient.
The Institute for Defense Educational Analysis is but one experiment in preparing NPS for the future. The next section discusses other areas in which NPS invests in its future.

**Investing in the Future**

### a. Internally funded faculty research

As part of the faculty development needed to keep faculty current in their research areas and support research of importance to the Navy, NPS does provide limited internal funding of faculty research. These funds have necessarily diminished while NPS protects teaching requirements, but they represent the School’s commitment to the future through faculty development. In FY99, approximately twenty work-years of research will be internally funded.

### b. Sabbaticals

NPS supports a limited number of faculty sabbaticals each year, usually about six. While this is fewer than needed to allow all tenure track-faculty to have sabbaticals on a regular basis, NPS faculty do have opportunities to work at Navy laboratories and other defense installations. To some extent this compensates for the limited sabbaticals. Sabbatical requests are screened by a faculty committee based on the value to professional development of the individual and the potential contribution of the work performed while on sabbatical to NPS.

### c. Institute for Joint Warfare Analysis funding

In its budget, NPS has funds for approximately ten work-years to support research and course development in Joint Warfare Analysis. This directly supports the School’s ability to be responsive to the Revolution in Military Affairs.

### d. Training Budgets

The NPS budget for staff training is not clearly visible. Training is funded from several sources. One is the "training" budget of approximately $35,000. This limited amount is used primarily to provide staff and faculty training on the use of new software and for required Navy training, such as courses on Equal Employment Opportunity, supervisor training, Navy Occupational Safety and Health, etc. Other staff training is sometimes funded by individual departments to match their own needs, and individual faculty investigators will fund training for their staff when needed to support specific research requirements. No figures are readily available on the amounts of funding used for these purposes, though the report on Strategic Initiative 7 contains additional information.

### e. Provost’s Discretionary Funding
Each year a small amount of faculty labor is set aside for the Provost’s use to fund specific activities that he feels are important to the School and for which funding is not otherwise available. Past projects have included funding for faculty to develop a course on how to create web-based instructional materials, development of a comprehensive laboratory investment plan, a faculty response to an external study of NPS, and others. The amount is typically about two work-years.

Recapitalizing the Laboratories

As part of its long-range planning process, projecting seven to eight years into the future, NPS determines the requirements for laboratory upgrades and new laboratory development. This process, while not new, is still not well understood by faculty. The Navy insists on well-defined requirements before committing any funding for laboratories, a requirement that extends throughout the service’s own seven- to eight-year planning horizon. And because requirements for some NPS labs are not well defined, the labs do not compete well in the overall funding of the federal government. To address this problem, the School needs to clarify and clearly define the requirements for each of its laboratories, eliminating functional redundancies where appropriate.

In recent years, as funding levels were transitioned from one account (Other Procurement, Navy) to another (Operation and Maintenance, Navy, the Navy failed to also migrate funding for laboratories. Today, the NPS requirements have been reinstated and funding for labs has been partially restored. But because of the reduced level of funding and the need to maximize savings, major laboratory-related funding decisions are made on a campus-wide basis. This leads to conflict, with some departments maintaining these decisions should be made at the individual department level.

Efforts are ongoing to identify new methods of upgrading, combining or eliminating labs. In some cases, support for labs has been consolidated, resulting in savings. Other efforts include increasing the joint use of research and instructional laboratory equipment, and seeking help from the NPS Foundation to obtain funding and equipment donations from industry and other government agencies.

The question is, how does the School establish criteria to prioritize competing departmental laboratory plans, especially when the traditional laboratory budget planning process typically lacks clear and measurable criteria? Because of the lack of such criteria, some potential advantages of School-wide planning have not yet been realized, and some economies of scale have been difficult to visualize and achieve.

Given that credible final priorities are difficult to determine and justify, the School’s actual laboratory plan is traditionally determined through negotiations between Division Deans and Department Chairs. Typically, the Departmental Operating Target
budget for current operations is released for expenditure at the beginning of the fiscal year, while funds are withheld for new initiatives and laboratory investment. After School-wide requirements have been considered, these funds are released to department chairs who arbitrate the competing faculty needs and interests.

In recent years, due to an increased emphasis on campus-wide laboratory planning, more and more accurate Laboratory Development Plans have been communicated to NPS decision makers. The latest of these plans, the FY2000-05 Lab Plan (see Database Item #), includes a new laboratory classification based on the level of support a lab provides to a specific curriculum and to students’ coursework. Armed with comparative information about its labs, NPS is able to rank requirements in terms of "most impact to curriculum and students" with a higher degree of certainty than ever before. Funding priorities can also now be established on a campus-wide basis with a new degree of confidence.

**MEASURES OF EFFECTIVENESS**

There are many dimensions in which to measure performance of an organization as complex as NPS. The present section will deal only with those measures which are directly related to the budget, efficient use of resources, and ability to invest in the future of NPS.

**Budget**

**Average-On-Board**

While there is no direct relationship between Average on Board and the funding that NPS receives, the Navy Average on Board is one direct measure of the health of the School. A further division of Average on Board to distinguish Unrestricted Line officers reveals the extent to which NPS is influencing the future Navy leadership. Though NPS does currently retain and track this information, consideration should be given to refinements which compare Average on Board to the size of the eligible pool of officers, thereby making the performance measure independent of Navy size.

**Operations and Maintenance Navy funding**

The most direct measure of NPS’ fiscal status is the level of Operations and Maintenance Navy funding available. This measure should focus on the resources that are known to be available on, say, January 1 and remain available throughout the fiscal year. The purpose is to avoid creating a measure that values last-minute resources as highly as those provided early in the year.

**Efficiency**
**Instructional costs**

The largest portion of NPS funding goes to pay faculty and staff salaries. Faculty consume approximately two-thirds of the labor budget and, of that portion, instructional costs are, again, two-thirds. NPS needs to continue to monitor the cost of instruction, in terms of dollars per student credit hour of instruction.

**Administrative costs**

The fraction of total labor costs devoted to administrative functions should be made more visible.

**Staff support costs**

This is adequately reflected by two measures: the average staff salary, and the faculty/staff ratio.

**INVESTMENT IN THE FUTURE**

**Investment vs. Consumption**

No clear measure of investment versus consumption is currently available. One measure could be derived by designating all expenditures as being in one category or the other, and then summing the costs. Practically, this can only be done for major expenditure categories, but the result would be useful to document the decreasing portion of funds available for investment.

**Other**

A separate measure for laboratory recapitalization is needed. One view values the School’s laboratory equipment at approximately $50 million and assumes an average life of N (say ten) years. This leads to the conclusion that, in steady state, NPS needs $5 million per year for this purpose. A more refined inventory of equipment, noting its useful life, would support improved analysis.

**SUMMARY**

Although faced with a challenging fiscal environment in the 1990s, NPS has met the challenge by obtaining increased amounts of reimbursable research funding and by making significant reductions in faculty and staff. It has developed new curricula, and has initiated new programs in executive education and leadership development. It has continued to increase its delivery of distance learning programs and continues to seek new and innovative ways to meet the educational needs of the Navy and the Department of Defense.
RECOMMENDATIONS

NPS must:

- Carefully monitor the Average on Board with attention to its components.
- Continue to closely monitor issues of faculty vitality, including faculty size, experience distribution and opportunities for faculty development.
- Diligently pursue laboratory funding and the effective use of available funding.
- Investigate additional areas of endeavor, being cautious not to lose focus on the primary business of graduate education.
- Continue to develop and track meaningful measures of effectiveness which reveal NPS performance.
NPS will recruit, develop and retain high-quality staff

STATEMENT OF INITIATIVE

"The human resource systems for recruiting, developing and retaining high quality staff must be linked and aligned with the overall business strategy for the School. The present civil service system for General Service (GS) and Wage Grade (WG) has been cumbersome for hiring and rewarding, especially for high quality technical staff. Many of these systems will be regionalized in FY99 creating additional challenges. Improving the skills of our workforce is of paramount importance to the future of NPS due to reduced employee numbers, decreased mobility opportunities, and decreased new-hire opportunities, yet budgetary constraints have restricted monetary awards for outstanding performance and allowed for limited training opportunities.

"To cope with these constraints and to make progress in this initiative, we must design processes, within our control, that will enable managers to identify career paths, redesign jobs to fit new organizational structures, improve the skills of the current workforce, distinguish high performers from low performers, provide equal opportunities to all employees, and identify the best qualified applicants for critical vacancies. We must focus on leadership development for staff supervisors/ managers at all levels, including department chairs. They must be given the opportunity to enhance their management skills and learn new skills to keep pace with increasingly complex job demands, and be creative personnel managers. We should review staff positions for career ladder designation where appropriate and design an awards program consistent with our budget and mission. We should examine the use of graduate education opportunities as a hiring and retention device. We must also improve the two-way communications between staff and the administration." [NPS Strategic Plan, 1998. Database #xx]
Strategic Initiative #7 of the Naval Postgraduate Strategic Plan states that NPS supports the recruitment, development and retention of high-quality staff as an important, ongoing goal of the School. It is not really an initiative, since it has always been a goal of the School’s activities.

Standard Five of the WASC Handbook of Accreditation addresses staff (as well as faculty). The information contained in this Self Study links the NPS Strategic Initiative on recruiting, developing and retaining high-quality staff to WASC Standard Five.

TEAM MEMBERS

The members of the WASC Self-Study Task Group for Strategic Initiative #7 are:

- Layne Huseth, Chair Library
- Mary Aguilar, Human Resources Office
- Helen Davis, Computer Information Systems
- Jennifer Duncan, SOLIC Curriculum Office
- Tracy Hammond, Registrar
- Mark Magallanes, Union Representative

DEFINITION OF NPS STAFF

Until 1995, the NPS staff included both staff members who supported the academic mission (e.g., clerical workers, computer programmers, computer systems administrators, lab technicians, the library staff, etc.); the staff who supported the business operation of the school (e.g., the Comptroller staff, the Human resources Office staff, supply and travel clerks, etc.); the workers who supported the Public Works
In 1994, the Public Works organization at NPS assumed support of all military activities in the Monterey Bay region (i.e., NPS, the Presidio of Monterey, the Defense Language Institute, the Presidio of Monterey Annex [former Fort Ord], and other tenant activities) in response to a recommendation of the Base Realignment and Closing Commission to achieve efficiencies of scale in the support activities. This assumption of support duties created an increase in the number of term and temporary employees at NPS employed to meet the demands of this increased support role.

In 1996, the Public Works organization and the military staff organization were reorganized into a separate military command, the Naval Support Activity-Monterey Bay, independent of NPS. NPS became a consumer of Naval Support Activity-Monterey Bay services, along with the other military activities in the area. The transfer of staff to this new command reduced the apparent the number of the staff members at NPS. The demographic numbers reported below reflect the transients caused by this reorganization.

The current definition of NPS "staff" includes:

- Personnel working in academic departments, such as lab managers and teaching assistants who provide direct support to teaching and research faculty
- Personnel in the Human Resources Office and the Office of the Comptroller
- Administrative personnel (Academic Departments, Registrar, Academic Planning, etc.)
- Library personnel, and
- Computer and network support personnel

Not included as part of NPS staff are facility support personnel such as public works employees (e.g., plumbers, painters, carpenters, etc.); police, firefighters and safety personnel; and military staff, because these categories of personnel are assigned to Naval Support Activity-Monterey Bay.

For the purposes of this study, "high quality" staff are defined as those workers whose skills and performance support the mission and goals of the Naval Postgraduate School and are aligned with the employee’s specific job requirements.

**STATUS AND ANALYSIS**

**Demographics of NPS Staff**

Demographic information about an institution of higher education’s staff and their relationships to the institution is fundamental to WASC Standard Five. Table 1
compares NPS' staff demographics with those of the United States Naval Academy (Annapolis) and the Federal Civilian workforce as documented in the Federal Employees Handbook, 1997. (In Table 1 below, NPS data for 1991 combine personnel from both NPS and Naval Support Activity-Monterey Bay (NSAMB).)

Table 1. NPS staff characteristics and other benchmarks

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<td>Female</td>
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<td>Asian/Pacific Islander</td>
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<td>8%</td>
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<td>2 (0.4%)</td>
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<tr>
<td>Disabled</td>
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<td>62 (11%)</td>
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The only notable difference in staff demographics between 1991 and 1997 is the increased percentage of female employees. This is due, in part, to the higher percentage of males employed by Public Works, which became part of Naval Support Activity-Monterey Bay in 1997, and who are therefore no longer reported in the NPS staff numbers.

Whereas the relative ethnic mix has not changed, it should be noted, as shown in Figure 1, that NPS hires a significantly greater number of Asian/Pacific Islanders and disabled
employees than either the U.S. Naval Academy or the national average. Overall, the ethnic mix of staff at the Naval Postgraduate School is comparable to national norms.

Hiring practices defined by federal regulations mandate equal consideration in the selection of new employees regardless of race, age or gender. These regulations are in compliance with federal law and are fully described in the Code of Federal Regulations and Title 5 of the U.S. Code. NPS has an active EEO program under the direction of the EEO officer, Ms. Deborah Baity.

Figure 1. NPS staff demographics by race

Staff Population Trends

Table 2 contains information about NPS staff population trends. The numbers indicate the workyears executed (or planned) for each fiscal year. The "DIR WY" are workyears paid for by NPS using its education mission funds, "INDIRECT WY" indicates labor paid for by the indirect cost surcharge applied to reimbursable projects, and "RR WY" is labor paid for by reimbursable project funds.

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<td>RR WY</td>
<td>31</td>
<td>42</td>
<td>57</td>
<td>64</td>
<td>63</td>
<td>72</td>
<td>80</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>TOT STAFF WY</td>
<td>316</td>
<td>315</td>
<td>334</td>
<td>335</td>
<td>341</td>
<td>333</td>
<td>317</td>
<td>300</td>
<td>290</td>
<td>290</td>
<td>290</td>
<td>290</td>
</tr>
</tbody>
</table>

Table 2. Staff workyears. ("DIR" is direct-funded by NPS, "INDIRECT" are funded by indirect cost charges on reimbursable projects, and "RR" are funded by reimbursable) projects.)
As indicated in Table 2 and Figure 2, the number of NPS staff increased until 1995 and then began a decline. Analysis of the subcategories indicates that the direct-funded labor peaked in 1993 and declined thereafter. Indirect costs were re-established in 1995 to provide a funding mechanism for the support of reimbursable costs across the campus, including staff labor. Additionally, the return to reimbursable-funded research also provided funds for the support of staff.

Figure 2. NPS staff workyears by year and funding source [reimbursable projects (RR), indirect costs (INDIRECT) and NPS mission funds (DIR)].

This redistribution of funding sources and the resulting effort is also shown in Figure 3.

Figure 3. Distribution of staff labor between reimbursable projects (RR), indirect costs (INDIRECT) and NPS mission funds (DIR).
Table 3 summarizes the number of staff, faculty and students for the years 1991 through 1998. The table includes all NPS and Naval Support Activity-Monterey Bay staff. The difficulty with the data here is that many of the Naval Support Activity-Monterey Bay staff have nothing to do with NPS support; they work at he former Fort Ord or the Presidio of Monterey. Table 3 also gives the staff-to-faculty and student-to-staff ratios for the years 1991 to 1998.

For information reflecting NPS staff only, see the report from Task Groups 5 & 6, in which the Mission Long-Range Labor Plan shows staff-to-faculty ratios.

The staff-to-faculty ratios shown in Table 3 include staff providing direct support to teaching and research faculty, as well as overhead personnel in the Comptroller and Human Resources Offices. Direct support staff include laboratory and teaching assistants, network and computer support personnel, library staff, and academic departmental staff. For years preceding 1997, Naval Support Activity-Monterey Bay (NSAMB) staff are included. Military support staffs at NPS are not included in these ratios. The student-to-staff ratio is also included. The increased staff-to-faculty ratio was the result of administrative decisions to increase the number of staff per faculty member. The ratio in the early 1990s was perceived to be low for a graduate institution with a large laboratory component in its program, and incentives were offered to increase the staff support.

Table 3. NPS/NSAMB staff, faculty and student populations; staff-to-faculty ratios; and students-to-staff ratios for the years 1991 through 1998
(See also the report from Task Groups 5&6.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Staff</th>
<th>Faculty</th>
<th>Students</th>
<th>Staff to Faculty</th>
<th>Students to Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>387</td>
<td>309</td>
<td>1867</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>340</td>
<td>319</td>
<td>1780</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>404</td>
<td>322</td>
<td>1797</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>490</td>
<td>319</td>
<td>1809</td>
<td>1.54</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>494</td>
<td>336</td>
<td>1639</td>
<td>1.48</td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>566</td>
<td>355</td>
<td>1589</td>
<td>1.59</td>
<td></td>
</tr>
</tbody>
</table>
Hiring at NPS has fluctuated somewhat from 1991 to the present, as shown in Table 4. Data provided by the Human Resources Office for this table combines the number of permanent Full-Time-Equivalent staff with the number of personnel hired into temporary and term positions. (Temporary employees are hired for a period not to exceed one year, and these appointments can be extended only once; however, temporary employees can be terminated at any time. Term employees, on the other hand, may be hired for a period not to exceed four years; receive most benefits; and are entitled to employment for the full duration of their appointment.)

In 1994, the number of staff increased significantly at the same time that the number of students was higher than it had been at any time since 1991. It is our assumption that staff numbers are so high in 1994 due to an above-normal increase in the number of temporary and term employees included in the count for that year because of NPS’s assumption of support of the former Fort Ord. Staff numbers increase significantly again in 1996 due to the expanded mission for Naval Support Activity-Monterey Bay staff. The numbers then drop in 1997 and 1998, primarily due to budget reductions, a drop in the number of students, and Department of the Navy-directed downsizing efforts affecting the whole School.

### Table 4. Permanent/term and temporary NPS/NSAMB staff comparison

<table>
<thead>
<tr>
<th>Year</th>
<th>Permanent/term</th>
<th>Temporary</th>
<th>Total</th>
<th>Temporary as % of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>370</td>
<td>17</td>
<td>387</td>
<td>4.4%</td>
</tr>
<tr>
<td>1992</td>
<td>381</td>
<td>19</td>
<td>400</td>
<td>4.7%</td>
</tr>
<tr>
<td>1993</td>
<td>384</td>
<td>20</td>
<td>404</td>
<td>4.9%</td>
</tr>
<tr>
<td>1994</td>
<td>442</td>
<td>48</td>
<td>490</td>
<td>9.8%</td>
</tr>
<tr>
<td>1995</td>
<td>469</td>
<td>25</td>
<td>494</td>
<td>3.6%</td>
</tr>
<tr>
<td>1996</td>
<td>535</td>
<td>31</td>
<td>566</td>
<td>5.5%</td>
</tr>
</tbody>
</table>
Promotional opportunities for NPS staff are both competitive and non-competitive, and are regulated by federal procedures documented in the *Code of Federal Regulations* and *Title 5 of the U.S. Code*. As shown in Table 4, rates of promotion have remained fairly constant since 1992.

Table 5 shows that the average grade level for General Schedule (GS) NPS employees has remained basically stable over the past ten years. The data may indicate a recent drop in the average General Service grade level, but this won’t be fully known until the end of Fiscal Year 1998.

### Table 5. NPS staff promotions and grade levels

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Staff</th>
<th>% increase decrease</th>
<th>Promotions Competitive</th>
<th>Promotions Noncompet.</th>
<th>Promotions As % staff</th>
<th>Average GS level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>387</td>
<td>—</td>
<td>2%</td>
<td>6%</td>
<td>2%</td>
<td>GS-08</td>
</tr>
<tr>
<td>1992</td>
<td>400</td>
<td>3%</td>
<td>2%</td>
<td>12%</td>
<td>14%</td>
<td>GS-09</td>
</tr>
<tr>
<td>1993</td>
<td>404</td>
<td>1%</td>
<td>4%</td>
<td>14%</td>
<td>18%</td>
<td>GS-09</td>
</tr>
<tr>
<td>1994</td>
<td>490</td>
<td>12%</td>
<td>4%</td>
<td>12%</td>
<td>15%</td>
<td>GS-09</td>
</tr>
<tr>
<td>1995</td>
<td>494</td>
<td>0.8%</td>
<td>4%</td>
<td>14%</td>
<td>18%</td>
<td>GS-09</td>
</tr>
<tr>
<td>1996</td>
<td>566</td>
<td>15%</td>
<td>5%</td>
<td>11%</td>
<td>16%</td>
<td>GS-09</td>
</tr>
<tr>
<td>1997</td>
<td>529</td>
<td>-6%</td>
<td>3%</td>
<td>13%</td>
<td>16%</td>
<td>GS-09</td>
</tr>
<tr>
<td>1998 to date</td>
<td>485</td>
<td>-8%</td>
<td>2%</td>
<td>4%</td>
<td>6%</td>
<td>GS-08</td>
</tr>
</tbody>
</table>
Staff development and training opportunities at NPS exist on a number of different levels. As reflected in Table 5 below, training is grouped into seven categories:

- Administrative (e.g., Covey principled leadership, safety)
- Technical (e.g., test equipment maintenance)
- Computer (e.g., computer hardware and software)
- Management (e.g., new supervisor training)
- Retirement
- EEO (e.g., sexual harassment), and
- Other

Some of this training is mandatory, and some elective. Funds for training are limited and somewhat regulated by external guidelines. For example, EEO, Sexual Harassment, and certain types of safety training are mandatory for all civilian staff and faculty. The School centrally funds these types of training. Other kinds of training specifically related to job skills are funded at the department level.

Still other training is available within the School. For example, Total Quality Management courses and Steven Covey’s "Seven Habits of Highly Effective People" classes, as well as supervisory training for new supervisors, are taught by NPS staff. Each quarter, Information Technology Services staff teach basic computer software skills to students, and staff are encouraged to attend as well. Training needs are agreed upon between the supervisor and employee based upon the employee’s job requirements.

Table 6. NPS staff training in dollars spent, 1995 to 1998

<table>
<thead>
<tr>
<th>FY</th>
<th>Individual Departments</th>
<th>Human Resources</th>
<th>TQL/Covey</th>
<th>EEO</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>$105,924</td>
<td>$35,871</td>
<td>$30,640</td>
<td>$5,000</td>
<td>$177,435</td>
</tr>
<tr>
<td>1996</td>
<td>$134,554</td>
<td>$37,834</td>
<td>$33,858</td>
<td>$6,000</td>
<td>$212,246</td>
</tr>
<tr>
<td>1997</td>
<td>$107,704</td>
<td>$36,115</td>
<td>$34,015</td>
<td>$6,000</td>
<td>$183,834</td>
</tr>
<tr>
<td>1998 (to date)</td>
<td>$106,617</td>
<td>$36,000</td>
<td>$30,194</td>
<td>$6,250</td>
<td>$179,061</td>
</tr>
</tbody>
</table>
They are formally documented in an Individual Development Plan, which has been identified as an implementation strategy for this Initiative.

Figures 4 and 5 show the type of NPS staff training dollars expended by year, and the percentage of total training dollars spent on each type of training. They reflect officially scheduled training tracked by the Human Resources Office. Data on training that is not officially scheduled — i.e., usually job-specific training coordinated at the department level and training in conjunction with conferences and workshops — was not available.

![Type of Training: Dollars Spent](image)

**Figure 4. Type of Training by percent of dollars spent.**

A voluntary mentoring program is also available at NPS for supervisors to improve their leadership and coaching skills, enhance organizational communications, and foster employees’ responsibility for their personal development. This mentoring program was also identified as an implementation strategy for this Initiative.

In addition, staff have the opportunity to take classes and even complete graduate degree programs tuition-free at NPS if they meet the criteria for acceptance and go through the formal application process. Local guidance for application and admission are documented in NAVPSCOLINST 12000, Civilian Academic Development Program. This opportunity is frequently mentioned in recruiting announcements as an enticement for applicants to accept employment at NPS. Based on data provided by the Registrar’s Officer, over 1,152 courses have been taken by staff over the past ten years, and 58 employees have completed NPS graduate degrees during that same period of time. This opportunity has been a powerful incentive for many NPS employees.
Figure 5. Percentage of total training dollars spent on each type of training

Processes for hiring, training, promotions and other Human Resources functions will significantly change before the end of calendar year 1998. In December, these functions will be realigned to the regional Department of Navy Human Resource Service Center in San Diego. This Navy-mandated reorganization affects all Navy activities worldwide. In addition to the above-named functions, benefits processing, official record-keeping and personnel action processes will be accomplished by Human Resources specialists located at the Human Resource Service Center. Although a smaller on-site Human Resources consultant staff will remain at NPS, the full impact of this regionalization is not yet known.

MEASURES

As indicated in the status and analysis sections, the current measures are based on workyears, population (i.e., headcount), EEO demographics, and various ratios that can be generated from these and other data (e.g., staff per tenure-track faculty member, students per staff member, etc.). The data regularly collected seems appropriate for management of staff issues. One exception is information on the amount of training received. Since various sources can be used to fund training, e.g., department funds or reimbursable project funds, not all training activity data are collected at a central location.

RECOMMENDATIONS
The WASC Self-Study Group for NPS Strategic Initiative #7 recommends that the School:

- Develop a mechanism or process for funding continuous staff development and training. Detailed recommendations are documented in the April 1997 *Final Report of the Employee Development Process Action Team*. [Database #xx]
- Establish mechanisms for monitoring the quality and timeliness of personnel actions following HRO regionalization to insure the timely implementation of personnel management decisions. Measures could include "time to fill a position" and "time to process personnel actions."
- Ensure that supervisors and employees understand the importance of Individual Development Plans. The Task Group recommends that Human Resources staff take a more active role in monitoring Individual Development Plan processes.
- Include staff representation on all official NPS policy-making boards. As demonstrated by the staff-to-faculty ratio, although staff represent a slightly higher percentage of the School’s total workforce, they are not represented on any of its management decision-making bodies. The Task Group recommends that staff membership be added to the Planning Board and the weekly Input/Output Meetings. Staff needs should also be addressed whenever new boards are established. In addition, civilian management, as well as Union representation, should be considered to ensure balance.
Recruit, develop and retain high quality faculty

STATEMENT OF INITIATIVE

Strategic Initiative #8: NPS Will Recruit, Develop and Retain High-Quality Faculty

The Naval Postgraduate School has a proud tradition of recruiting and retaining faculty of high quality in both promise and performance. Since the end of the Cold War, the NPS leadership has devoted increasing attention to problems of declining budgets and rapidly changing military needs. The purpose of this Strategic Initiative is to ensure that concerns about faculty quality remain prominent in this challenging environment.

NPS requires a unique faculty combining both scholarly and military expertise to support its mission. The basic job of recruiting and developing faculty largely belongs to the academic departments, who tend to recruit faculty for their disciplinary expertise. This focus on disciplinary expertise is almost inevitable for young (i.e., recently graduated) faculty, since they are usually recruited directly from the top academic programs in the country. NPS has typically recruited its senior faculty directly from the academic world. The School has generally recruited excellent faculty, though often lacking any real exposure to military challenges. This lack of military experience has sometimes led to problems when the School needs faculty to participate in interdisciplinary activities, focused on military problems. As the size of the tenure track faculty is reduced in response to declining budgets, NPS needs to formulate a carefully articulated hiring strategy that will continue to balance hiring between disciplinary and interdisciplinary requirements.

NPS must also provide its faculty with an effective orientation and professional development program that includes exposure to the important ideas informing the military forces of tomorrow.

TEAM MEMBERS AND STRATEGY
As a graduate school for mid-career military officers, the Naval Postgraduate School is unique among universities. To meet its unique mission of teaching and research in areas related to national defense, NPS requires a unique faculty combining both military and scholarly expertise. As a result, issues of recruitment, development, and retention of quality faculty at NPS are considerably different from such issues at civilian institutions.

The Task Group began by identifying criteria reflecting the success of faculty recruitment, development, and retention in this unique military/academic environment. Some of these criteria are quantitative measures of actual and/or potential relevance. Others are judgmental assessments of what has been and can be done at the School. The Task Group then sought to collect data and/or opinions on each of these criteria. A survey was sent to each of the thirteen department and group chairmen to obtain information about the status of faculty in their departments and
their policies on faculty development. A copy of that survey, with summaries of responses, is included in the data portfolio. One aspect of faculty development is mentoring of junior faculty. The chairmen were asked to identify junior faculty members with senior mentors, and those junior members were then sent questionnaires asking for their assessment of the effectiveness of that process. Responses to both surveys are discussed in this report.

**CURRENT STATUS OF NPS FACULTY**

NPS now has a high-quality faculty, reflected in the generally high degree of satisfaction with instruction reported by students and in the significant volume of faculty research and publishing.

In addition to high quality faculty, the faculty mix in NPS departments is unique, combining both scholarly and military expertise. Ideally, each faculty member would combine both qualities. In reality, most faculty members are either scholars in the traditional sense or military experts. While this mixture of specialties within departments does not appear to have caused major problems, a potential exists for ambivalence or conflict, particularly in the area of faculty performance evaluations and rewards.

The consensus of NPS department chairmen is that the School has strong recruiting potential for both scholars and military experts. Most stated that they already had adequate faculty, or that they were successfully recruiting in that direction.

Faculty retention at NPS is also good, as demonstrated by the School’s relatively low faculty turnover rate.

At present, faculty development is a largely informal and individual process. Recently the orientation process for new faculty and continuing career development for existing faculty has been sporadic, consisting of occasional faculty orientation programs. Some faculty hired as traditional scholars have redirected their careers into military-related activities, but this redirection has been on an individual basis as needs and opportunities arose. Many, however, have continued to pursue conventional academic careers. As a result, the majority of faculty military experts have been hired from the defense community rather than developed internally.

At present, the School is pursuing a goal of reducing its tenured and tenure-track faculty from approximately 230 to 195 by the year 2000. At the reduced number, the current faculty budget would be adequate to pay all tenure-track faculty for ten months each year, which is the School’s contractual obligation to its tenure-track faculty. As most faculty can be expected to continue to bring in independent research funds for part of those ten months, this is a conservative policy. While it reflects very real current resource constraints, it also has the potential to complicate faculty recruitment and retention in the future.

**Analysis and Evaluation**

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Faculty Adequacy

The chairmen of the thirteen academic departments and groups were asked whether they had adequate faculty, both overall and by critical disciplines. Five of twelve responding said they did; the other seven did not. Of this seven, four were recruiting for new faculty, and three were not. In each of these latter cases, lack of hiring authority and/or money was the reason cited for not recruiting, despite acknowledged faculty inadequacy.

All but one of the twelve responding chairmen said they believed their departments and programs were sufficiently attractive to both conventional scholars from the academic community and to experts from the defense community to permit them to recruit and retain faculty of the desired quality. The only department not considered so attractive is primarily a service department, with only a very few students in its curriculum.

Faculty Recruitment and Retention

Recruiting at NPS is based on several considerations which may vary from division to division. Primary considerations are present and future teaching requirements, projected student inputs, and faculty turnover. Once the need to recruit for a faculty position is established, candidates are found through advertising in professional journals, by making use of professional contacts, and, more recently, by both passive and active use of the Internet.

Obviously, an important factor in recruiting and retaining good faculty is salary. The 1990 WASC accreditation team noted in its report that, to be competitive at the full and associate professor levels, NPS might need to increase faculty salaries by 10 to 20 percent in the near term. Actual annual increases in the faculty salary schedule since 1990, compared to increases in the Consumer Price Index (CPI) for those years for which they are available, are shown in Table 1. These figures reflect only increases in the pay scale, excluding merit increases in individual professors’ salaries.

Table 1. Faculty salary schedule increases, 1990-98

<table>
<thead>
<tr>
<th>Year</th>
<th>% Increase</th>
<th>CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>3.6%</td>
<td>5.4%</td>
</tr>
<tr>
<td>1991</td>
<td>4.1%</td>
<td>4.2%</td>
</tr>
<tr>
<td>1992</td>
<td>4.2%</td>
<td>3.0%</td>
</tr>
</tbody>
</table>
The average ten-month salaries of NPS faculty as of January 1998 are shown in Table 2, below. Separate data are presented for tenure-track and nontenure-track faculty, as salaries for the latter tend to be lower. Both are compared to average salaries in other California Category I institutions for 1997-98. Details by departments are provided in the data portfolio. Nontenure-track faculty actually also have different titles: senior lecturer, lecturer, visiting professor, and research associate or assistant. However, the salary for each is identified with one of the four conventional academic ranks in the salary schedule.

Table 2. Average ten-month NPS salaries, 1998

<table>
<thead>
<tr>
<th></th>
<th>Tenure Track</th>
<th>Nontenure Track</th>
<th>California Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>$91,869</td>
<td>$84,141</td>
<td>$85,320</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>73,544</td>
<td>64,853</td>
<td>59,850</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>63,191</td>
<td>58,620</td>
<td>49,890</td>
</tr>
<tr>
<td>Instructor</td>
<td>39,550</td>
<td>41,950</td>
<td></td>
</tr>
</tbody>
</table>

A rather sound measure of faculty satisfaction is the number of voluntary resignations from the faculty. Some attrition of this type is inevitable, as people move for personal reasons, for more attractive positions at other institutions, and into nonacademic jobs. The numbers of resignations over the five most recent fiscal years are presented in Table 3. Details by departments are provided in the data portfolio. The totals do not seem unduly large for a faculty of well over 300, and there is no obvious trend over these five years. The somewhat higher incidence of resignation among nontenure track faculty is not surprising, as they would be expected to seek more secure employment.
Table 3. Faculty resignations, 1993-97

<table>
<thead>
<tr>
<th>Year</th>
<th>Tenure Track</th>
<th>Nontenure Track</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>8</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>1994</td>
<td>1</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>1995</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>1996</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>1997</td>
<td>7</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>37</td>
<td>63</td>
</tr>
</tbody>
</table>

Teaching Effectiveness

The quality of teaching at NPS is assessed each quarter for every class by means of a Student Opinion Form. This form asks eleven questions about specific aspects of instruction and then asks for overall assessments of the instructor, course, textbook(s), exams, and laboratories. Possible scores range from 1 to 5, with 5 being the most favorable evaluation. (A copy of the form is included in the data portfolio.) Of course, the Student Opinion Form captures only the students’ reactions to the instructor and the course.

School-wide mean scores for the overall assessments of instructor and course for the past six and one-half years are presented in Table 4, below. Details by departments are provided in the data portfolio.

Table 4. Overall assessments of instruction, 1992-98

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Mean Score for Instructor</th>
<th>Mean Score for Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>1</td>
<td>4.05</td>
<td>3.68</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.26</td>
<td>3.95</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4.17</td>
<td>3.88</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4.14</td>
<td>3.81</td>
</tr>
<tr>
<td>Year</td>
<td>Month</td>
<td>Value1</td>
<td>Value2</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>1993</td>
<td>1</td>
<td>4.12</td>
<td>3.80</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.18</td>
<td>3.86</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4.10</td>
<td>3.84</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4.18</td>
<td>3.83</td>
</tr>
<tr>
<td>1994</td>
<td>1</td>
<td>4.11</td>
<td>3.85</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.24</td>
<td>3.94</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4.12</td>
<td>3.78</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4.16</td>
<td>3.88</td>
</tr>
<tr>
<td>1995</td>
<td>1</td>
<td>4.13</td>
<td>3.85</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.18</td>
<td>3.84</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4.26</td>
<td>3.92</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4.16</td>
<td>3.86</td>
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<tr>
<td>1996</td>
<td>1</td>
<td>4.18</td>
<td>3.83</td>
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<tr>
<td></td>
<td>2</td>
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<td>4.08</td>
<td>3.72</td>
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<td></td>
<td>4</td>
<td>4.24</td>
<td>3.97</td>
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<td>1997</td>
<td>1</td>
<td>4.16</td>
<td>3.83</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.16</td>
<td>3.82</td>
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<tr>
<td></td>
<td>3</td>
<td>4.19</td>
<td>3.84</td>
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<td></td>
<td>4</td>
<td>4.19</td>
<td>3.87</td>
</tr>
<tr>
<td>1998</td>
<td>1</td>
<td>4.25</td>
<td>3.94</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.17</td>
<td>3.91</td>
</tr>
</tbody>
</table>
The Evaluation Report of the 1990 WASC Accreditation Team observed that heavy reliance on the Student Opinion Form for assessment of teaching effectiveness was a concern of faculty. Since that time, the School has given considerable attention to alternative methods of teaching evaluation. Every department reported the use of at least one additional method of instructional evaluation other than the Student Opinion Form. Some used these additional methods only when evaluating candidates for promotion or tenure. Others used them for that purpose and also regularly, either quarterly or annually. Use of these alternative methods is summarized in Table 5 below, which lists the methods, together with the number of departments that use them regularly or for promotion and tenure (P&T) evaluation, or both.

### Table 5. Alternative methods of evaluating instruction at NPS

<table>
<thead>
<tr>
<th>Method</th>
<th>Regularly</th>
<th>P&amp;T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom visitation</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Review of course journals</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Surveys of graduating students</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Interviews and rap sessions with students</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Input from student section leaders</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Input from curricular officers</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Review of theses advised</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

In 1987, the Associate Provost for Instruction initiated an Advanced Instructional Workshop. Its principal, though not sole, objective was to introduce and orient new faculty to the unique aspects of teaching the School’s military officer students, both U.S. and foreign. The workshop promoted teaching techniques that had proved successful at NPS. It explained the use of course learning objectives and the value of fully documented course journals. Testing and grading policies were also covered. The workshop provided a nonthreatening setting in which participants could present a brief video-taped lecture and then evaluate it with workshop leaders. Over the years, 153 civilian and military faculty members have participated in this workshop. Several participants have reported substantial improvements in their student evaluations as a result of adopting techniques learned in the workshop. No workshops have been conducted in the past two years, however, as the three faculty members who facilitated them have taken on substantial administrative duties. There has been some consideration of reviving the workshop with new facilitators.
Research Productivity

The research productivity of faculties is customarily measured by inputs in the form of research projects and dollars and outputs in the form of publications and other products. Table 6 below summarizes these inputs and outputs for the entire NPS faculty over the most recent six-year period. The unfunded research projects are those reported annually by the departments to the Dean of Research. The members of the Task Group believe these numbers are understated significantly. Some faculty members who do unfunded research simply report their outputs, but not the projects as such. Faculty size by year is provided as a point of reference against which to measure projects and publications. These numbers include some visiting and part-time faculty whose only responsibilities are teaching. They also include some research faculty who do no teaching. Details by department are provided in the data portfolio.

Table 6. NPS research activity, 1992-97

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of research projects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funded by sponsors</td>
<td>222</td>
<td>262</td>
<td>265</td>
<td>296</td>
<td>323</td>
<td>475</td>
</tr>
<tr>
<td>Funded by NPS</td>
<td>114</td>
<td>73</td>
<td>78</td>
<td>67</td>
<td>69</td>
<td>55</td>
</tr>
<tr>
<td>Unfunded</td>
<td>12</td>
<td>19</td>
<td>18</td>
<td>30</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Amounts of research funding:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>By sponsors (millions)</td>
<td>$12.5</td>
<td>$16.8</td>
<td>$19.9</td>
<td>$21.7</td>
<td>$25.2</td>
<td>$27.1</td>
</tr>
<tr>
<td>By NPS (millions)</td>
<td>$9.5</td>
<td>$7.5</td>
<td>$6.7</td>
<td>$5.9</td>
<td>$6.3</td>
<td>$5.5</td>
</tr>
<tr>
<td>Publications:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Journal articles</td>
<td>222</td>
<td>200</td>
<td>195</td>
<td>192</td>
<td>207</td>
<td></td>
</tr>
<tr>
<td>Conference proceedings</td>
<td>174</td>
<td>217</td>
<td>207</td>
<td>241</td>
<td>279</td>
<td></td>
</tr>
<tr>
<td>Conference presentations</td>
<td>414</td>
<td>427</td>
<td>385</td>
<td>486</td>
<td>458</td>
<td></td>
</tr>
<tr>
<td>Books</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>9</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Chapters in books</td>
<td>42</td>
<td>41</td>
<td>33</td>
<td>28</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>
Faculty Diversity

Strategic Initiative #8 states that our recruitment policy must continue to be responsive to faculty diversity issues. The evaluation report of the 1990 WASC accreditation team noted that the ethnic composition of the faculty did not reflect the composition of the student body. (Distribution by gender was not available at that time.) A 2 percent increase in each ethnic category was recommended as a goal.

The ethnic and gender composition of NPS faculty as of February 1998 is summarized and compared to that in 1990, in Table 7 below.

<table>
<thead>
<tr>
<th>Ethnic Category</th>
<th>1998 Male</th>
<th>1998 Female</th>
<th>1990 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>295</td>
<td>33</td>
<td>328 (85.0%)</td>
</tr>
<tr>
<td>Black</td>
<td>1</td>
<td>0</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5</td>
<td>2</td>
<td>7 (1.8%)</td>
</tr>
<tr>
<td>American Indian</td>
<td>1</td>
<td>0</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>44</td>
<td>3</td>
<td>47 (12.2%)</td>
</tr>
<tr>
<td>Unspecified</td>
<td>2</td>
<td></td>
<td>2 (0.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>348</td>
<td>38</td>
<td>386</td>
</tr>
</tbody>
</table>

Clearly, the 2 percent goal has not been reached.

Faculty Orientation and Development

Orientation
Currently, NPS does not have a systematic faculty orientation and development program. A proposal for such an orientation program was made by the Faculty Chairman in September 1997. Little support for the proposal was evidenced, and only one department indicated that it had new faculty members who would benefit from such a program. Thus, that particular proposal died at birth. Though both an initial orientation for new faculty and a career-long program of faculty development would be beneficial to both the School and individual faculty members, there is no evidence that the lack of such a formal program has had a significant adverse impact upon either party.

**Career plans**

The Naval Postgraduate School is a unique institution, in that it must satisfy the needs of its students and sponsors – Navy providers of money for specific curricula – in both conventional scholarship and military relevance. Therefore, NPS must have a faculty capable in both areas. For many years, NPS has articulated this requirement as the need for a portfolio of faculty members with varied skills. This portfolio view was explicitly endorsed in a 1987 Faculty Committee report. (A copy of that report, the "Final Report of the Ad Hoc Committee on Faculty Activities, Incentives, and Evaluations," is available to the Accreditation Team.)

Ideally, every faculty member would be both a distinguished scholar and a military expert. While there are some who combine those two qualities, it is unrealistic to expect everyone to do so. Most faculty are recruited from the traditional scholarly community and so may know little or nothing about military matters upon arrival. All must develop sufficient knowledge of the military relevance of their disciplines to present their subjects in a way that makes students see the relation of their studies to their military careers. That level of knowledge, however, does not make faculty military experts. Thus, it is necessary to have some faculty members whose primary expertise is in national defense, even though their scholarly backgrounds may not be comparable to those of conventional academics.

In 1996, a faculty committee recommended, among other things, that “the career path for each individual faculty member should be mutually agreed upon by the individual and the School (including senior colleagues in the department, the department chairman, the dean, and the Provost).” An individual's professional performance would then be evaluated against that agreed-upon path. Over time, an individual's path may appropriately change; but that change, too, should be agreed upon. Such an agreement might be viewed as a "career contract," binding upon both parties. (A copy of this report – the "Faculty Career Development Committee Report" – is available to the accreditation team.)
Of the twelve departments and groups responding to a question about such a "contract," only three said their faculty had formal, mutually agreed-upon career plans. Four others said that such plans were informal, and the other five reported having no plans.

While formal, written career plans may seem unnecessary for most academic institutions, such plans would serve two very useful purposes at NPS. First, they would make the School explicitly recognize what it wanted in the way of faculty skills and why it was hiring each individual. Second, it would provide specific guidance for a faculty member as well as specific criteria for those who would later evaluate him or her for promotion and tenure.

**Mentoring**

Eleven of the twelve responding departments indicated that they had formal programs of senior faculty mentoring junior faculty members. Nine of the eleven said that having mentors was mandatory, at least for tenure-track faculty.

There is no question that having an experienced mentor is potentially beneficial to a new faculty member. The more relevant issue is whether junior faculty members actually perceive the mentoring relationship as helpful to them. To ascertain their perceptions, a questionnaire was sent to every faculty member identified by his or her chairman as having a mentor. Questionnaires were sent to forty-eight junior faculty members who, according to their chairmen, had mentors. Twenty-seven were returned. Of those 27, 19 said that they had mentors; six said that they did not; and two were unsure. Clearly there are some gaps in the mentoring system. Department chairmen apparently thought that eight people had mentors, but those individuals responded that they either did not have mentors or were unsure whether they did.

Of those new and junior faculty who said they had mentors, five met with them often; three, occasionally; five, as needed; and the rest rarely or never. Such meetings were most often initiated by either party, as seemed most appropriate. However, four said that they always initiated the contact, while two said that the mentor did.

The most important question asked the junior faculty members was how effective they thought their mentoring relationship was. Ten said they considered it very beneficial to their progress on the faculty. Four said it was somewhat beneficial, but not very important. The others considered it of no significant benefit.

Questionnaire respondents also had an opportunity to provide further comments, and seventeen did. Many of those comments addressed the School’s expectations for junior faculty rather than the mentoring process itself. Those that addressed the process were equally divided as to its usefulness.
The School recently adopted a policy of formal annual reviews of untenured faculty by their tenured colleagues, with feedback as to progress toward promotion and tenure. One respondent said that this feedback was more valuable than the occasional advice of a mentor. Two others, however, viewed the annual review with some concern. They believed it had become combined with an evaluation for reappointment and viewed that as being inconsistent. Unquestionably, the annual review does provide input into the decision as to whether to continue one's appointment. It is not clear that that this function is inconsistent with mentoring advice to the individual, however. Indeed, the purpose of the annual review is to provide untenured individuals with senior faculty about their progress toward tenure. And it is the very senior faculty providing the review who will subsequently vote on the tenure cases.

**Faculty Data Base**

The School maintains a detailed database of information about its faculty, including dates of initial appointments, promotions and tenure awards; rank and salary; schools awarding baccalaureate and highest earned degrees; and age. This information is used for a variety of planning purposes. For example, age distributions by department help in predicting retirement and replacement requirements. A sample of the data available is provided in the data portfolio.

**ASSESSMENT AND RECOMMENDATIONS**

As NPS moves toward its goal of 195 tenure track faculty by the year 2000, down from 230 at present, a School-wide recruiting strategy must be implemented. As faculty retire or otherwise leave, replacements must be recruited with this 195 numerical goal firmly in mind and in a manner responsive to both faculty diversity issues and the changing needs of the School's curricula. To find candidates for positions in more nontraditional fields with military relevance, recruitment will have to be extended to military installations and commands, government laboratories, and industries that work for the military. In addition, the School's recruiting strategy must support the military's Joint Vision 2010, described in the chapter on the Revolution in Military Affairs.

Once hired, tenure-track faculty members should begin to take part in an effective orientation and professional-development program, which should be continuous throughout their professional life at NPS. Today, however, the School does not have a systematic faculty development program, and it is important that one be developed.

To continue to have "braggingly happy" faculty, it is also important for NPS to improve its teaching and research environments. One issue that must be addressed is the current mix of faculty teaching and research. Of late, there has been much concern among faculty about the amount of reimbursable support they must raise. Although existing tenure-track contracts promise ten months of direct NPS support, this level is not
currently being realized. As the School approaches its goal of 195 tenure track faculty by the year 2000, it should be able to keep its commitments to support all of its tenure-track faculty for the full ten months while assuring that workloads are commensurate with such support.

**Fiscal Year 1998 Objectives**

- Establish faculty recruiting guidelines to support the goals of 195 faculty, diversity, and meeting future academic and military needs. The action officer for this objective is the Provost.
- Orient potential new hires to the School’s organizational strategy, including faculty participation in distributed learning, solving military-relevant problems, being academically flexible, and working interdependently. The action officers for this objective are the three division deans and department chairs.
- Design an orientation program for new faculty. The action officers for this objective are the three division deans and faculty chairman, led by the Associate Provost for Instruction.
- Establish a colloquium series to educate faculty, students, and staff on the implications of Joint Vision 2010 and related guidelines as part of the Faculty Development Program. The action officers for this objective are the three division deans.
- Develop and conduct a training program for Academic Associates and Curricular Officers. The action officers for this objective are the Associate Provost for Instruction and the Director of Programs.
- Resume the Advanced Instructional Workshops for faculty. The action officer for this objective is the Associate Provost for Instruction.
- Conduct distance/distributed learning orientations and practicums for faculty. The action officer for this objective is the Associate Provost for Instruction.

**General Objectives**

Recruit and Hire to Support Multiple, Changing Goals

The Naval Postgraduate School is not the only university facing diminishing resources. It is, however, one of the very few faced with recurring and well publicized threats of closure. The Base Realignment and Closure process, a report by the Center for Naval Analyses, and occasional remarks by senior Navy leaders have contributed to uncertainty about the School’s future. Even if NPS is not closed outright, it may become a very different kind of institution from what it has been in the past, and such uncertainties cannot help but cause prospective new faculty to question whether to accept offers here. Current faculty, especially the younger ones, may also wonder if they should look elsewhere for more stable employment. In this climate, the School must continue to be willing to recruit and hire new faculty to support multiple and changing goals.

The recruiting objectives of reducing the tenure-track faculty to 195 by the year 2000, achieving diversity, and meeting current and future military requirements are consistent with these realities of shrinking enrollments and resources, the need to reflect
the mix of American society in our faculty, and the unique mission of the School. They may not all be consistent with each other, however.

In order to reduce the size of its tenure-track faculty, the School has pursued a policy of hiring an increased number of new faculty in nontenure-track positions, and a decreased number in tenure-track, although that policy may make it difficult to compete for the best people available. The current softness in the market for faculty may mitigate this difficulty to some extent. Nevertheless, the uncertainty associated with a nontenure-track offer may induce a candidate to choose another offer. This problem may be particularly acute in hiring women and minorities, who are in relatively greater demand than others in the academic marketplace.

Maintain a Record of Faculty Offerings, Dispositions, and Reasons Given

The School should maintain a record of faculty appointments offered, whether formally or orally, with indications of acceptance or rejection. This record should be kept by departments and specific disciplines. When offers are rejected, the candidates should be asked the reason(s). If it is found that departments are unable to hire their first choices because tenure-track is not offered, the current policy should be reconsidered.

Require Formal Career Plans for Military Faculty

Meeting the professional requirements of military students requires a faculty with considerable expertise in military matters. Conventional scholars, particularly those just completing doctoral programs, are unlikely to have that expertise. Moreover, new faculty need to establish their professional reputations by traditional research and publication. Thus, in the best of circumstances, they are unlikely to commit themselves to military-oriented work that may not be transferrable to other institutions. The uncertainties associated with nontenure-track appointments and threats of closure make it even more risky to take such a specialized path. As a consequence, the School has hired some people with military expertise but not necessarily conventional academic credentials and interests in order to meet military requirements. This practice has lead to a bifurcated faculty, with conventional scholars usually in tenure-track and military experts more often in nontenure-track positions.

This may be a sustainable arrangement, but it may also cause problems. Nontenure-track military experts may feel they are viewed as "second class citizens," and some tenure-track faculty may, indeed, so regard them. Because the tenured faculty evaluate candidates for promotion and tenure, they may be inclined to oppose advancement of nontraditional military expertssimply because they are different.

To address this concern, formal career plans should be agreed upon by all parties, including the tenured faculty of a department, when military experts are hired. Then
their performances and qualifications for promotion should be evaluated in relation to these specific career plans. If they have effectively met the expectations outlined in their plans, they should be eligible for advancement and tenure. Over time, the tenured "core" of the faculty would then tend to improve its mix of both types of expertise.

**Provide Formal Faculty Orientation and Career Development Programs**

A formal program of orientation for new faculty members and career-long development of all faculty should be implemented as soon as practicable. The guidelines for such programs presented in the 1996 Faculty Career Development Committee report are still appropriate.

**Provide Training Programs for Academic Associates and Department Chairmen**

Each curriculum at NPS has both a faculty member and a military officer directly responsible for it. The faculty member is called an Academic Associate; the military officer, a Curricular Officer. An Academic Associate holds a unique and very important position at NPS. He or she provides essential academic liaison with the Curricular Officer and with the military sponsor of the curriculum. Thus, an Academic Associate must have a thorough knowledge both of the academic content of the program and of the military requirements which students are being prepared to meet. Unquestionably, the Academic Associate needs special training to fulfill the duties of the office. That need might suggest that an Academic Associate should serve in that position for an indefinite period of time. However, it is important that all of the faculty understand not only their own particular areas of expertise but also all of the scholarly content and military requirements of the curricula in which their students are enrolled.

Thus a key recommendation is that NPS continue to rotate the Academic Associate’s duties among the faculty to provide a cadre of faculty qualified for further administrative responsibilities. Obviously, junior faculty should not be assigned such administrative duties, certainly not before they have been granted tenure.

Some of the department chairmen have suggested that there should also be a training program for new chairmen. Chairmen at NPS must deal not only with academic policies and conventions but also with government policies and regulations. While most professors are familiar with the former, most are not with the latter. Thus, a training program for department chairmen should be instituted. Some of this program could probably be coordinated with the training program for Academic Associates.

**Provide Instructional Orientations for Faculty**
Renewal of the previously successful Advanced Instructional Workshop should be undertaken as soon as possible. This program requires minimal resources and offers the potential for great benefits to individual faculty members and to the School.

Programs designed to prepare faculty for new instructional technologies, such as distance/distributed learning, should be pursued. These may require increased commitments of resources, including release time for both those training and those being trained. Nevertheless, if these new technologies are to be important in the School’s future, they must be used properly. The initial investment of resources in both equipment and training is essential to future academic success.

**MEASURES**

Various measures of the School’s success in fulfilling this Strategic Initiative – regarding recruiting, developing and retaining quality faculty – have been presented above. Some are true quantitative measures, while others are essentially opinions. Some are collected and reported routinely; others are not. These measures are summarized in the following listing:

**Recruitment and Retention**

- Recruiting success. This is now a matter of opinion. It would be useful to collect annual information on offers made and their order of preference, together with acceptances and rejections.
- Retention. The School maintains statistics on resignations, nonreappointments, and denials of tenure.
- Salaries and annual pay increases. These data are routinely maintained and reported.

**Faculty Quality**

- Research funding and publications. These data are collected and reported annually.
- Adequacy of faculty, in total and by disciplines. This is inevitably a matter of opinion. Data on useful courses not offered because of a lack of qualified faculty would be only a partial indicator. Courses may be offered by faculty members whose qualifications to teach them may be marginal.
- Ratio of tenure-track to nontenure-track faculty. This ratio is readily available in the faculty database. Some would consider it an indicator of faculty quality, while others might not.

**Faculty Development**

- Orientation. Data on the frequency of orientation programs and the numbers of faculty participating should be collected and reported at least annually.
- Career plans. Few now exist, and data on them are not regularly maintained.
- Mentoring. Data on junior faculty members with mentors should be collected and maintained. Periodic surveys should be conducted to obtain opinions regarding the effectiveness of the process.
### Table 8-2 (Details)

#### Average 10-Month Salaries, 1998, by Departments

<table>
<thead>
<tr>
<th>Tenure</th>
<th>Track Averages</th>
<th>Nontenure</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aeronautics and Astronautics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professor</td>
<td>$96,819</td>
<td>$83,959</td>
<td></td>
</tr>
<tr>
<td>Associate professor</td>
<td>74,418</td>
<td>70,841</td>
<td></td>
</tr>
<tr>
<td>Assistant professor</td>
<td>63,685</td>
<td>63,684</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computer Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professor</td>
<td>$95,267</td>
<td>$90,087*</td>
<td></td>
</tr>
<tr>
<td>Associate professor</td>
<td>74,153</td>
<td>$58,914</td>
<td>66,385</td>
</tr>
<tr>
<td>Assistant professor</td>
<td>68,455</td>
<td>67,263</td>
<td>57,615</td>
</tr>
<tr>
<td>Instructor</td>
<td>44,782</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1996-97 averages inflated to 1997-98 by average annual salary increases in 1998 [data not yet available].

|        | Electrical and Computer Engineering |         |           |
| Professor | $91,108 | $83,363 |
| Associate professor | 76,803 | 69,847 |
| Assistant professor | 65,175 | 64,878 |
Instructor 43,967

**Mathematics**

Professor $89,518 $81,574
Associate professor 72,431 60,107
Assistant professor 64,878

**Mechanical Engineering**

Professor $94,844 $88,332
Associate professor 73,942 60,443
Assistant professor 64,878 53,951
Instructor 39,447

**Tenure Nontenure National**

<table>
<thead>
<tr>
<th>Track</th>
<th>Track</th>
<th>Averages</th>
</tr>
</thead>
</table>

**Meteorology**

Professor $87,698 $73,327*
Associate professor 66,070 $60,902 48,626
Assistant professor 61,299 43,610 41,202
Instructor 35,840


**National Security Affairs**

Professor $83,005 $89,054
Associate professor 64,661 57,721
Assistant professor 56,529 55,405
Oceanography

Professor $95,143 $85,550 $67,596*  
Associate professor 72,272 70,244 47,628  
Assistant professor 61,299 55,395 39,133  
Instructor 30,732  

Operations Research

Professor $92,876 $76,208  
Associate professor 76,208 72,033  
Assistant professor 60,107 61,948  

Physics

Professor $90,502 $80,978  
Associate professor 75,828 68,456  
Assistant professor 61,299  

Systems Management

Professor $90,744 $82,767 $88,100  
Associate professor 78,965 67,587 69,300  
Assistant professor 69,383 58,845 65,200  
Instructor 44,289 41,500  

Tenure Nontenure National

Track Track Averages

- 232 -
### Groups

Professor $94,904 $89,326  
Associate professor 89,326 73,822  
Assistant professor 61,299 61,221 

---

#### Table 8-3 (Details)

**Faculty Resignations, 1993-97, By Departments**

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
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- Defense Resource 
- Mgt. Institute .... 1 1 1 1 
- Electrical and 
- Computer Engrg. ... 1 2 2 
- Mathematics ............ 1 1 1 2 1 
- Mechanical Engrg. ... 1 4 1 1 1 
- Meteorology ............ 2 1 2 

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Operations Research . 1 1 1 1 1
Physics ............. 1 1 1
Systems Management .. 1 2 1 1 1 1 1
Groups .............. 1
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*TT = tenure-track; NTT = nontenure-track.

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Books ...................... 2 1
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Total number of faculty ..... 20 29 19 23 22

Meteorology


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- 1995: 24
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- 1997: 25

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**Operations Research**


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OVERVIEW

A "culture of evidence" requires both the ready availability and systematic use of relevant institutional information. Every functioning organization exists to at least some extent within such a culture. The Naval Postgraduate School is no exception. Most organizations can no doubt improve the availability and use of information to facilitate administrative decision-making. The purpose here is to describe the existing culture of evidence at NPS and to provide guidelines for its improvement.

A number of years ago, NPS instituted a Total Quality Leadership program in accordance with the federal policy on government "re-invention." This program requires periodic measurement to ascertain progress toward the achievement of goals set by administrators informed by student, faculty and staff concerns, as well as by Department of Defense requirements. One major effect of involvement by administrators, faculty, staff and students in this Total Quality Leadership process has been a heightened awareness in the NPS community that it exists within a "culture of evidence."

Building on current practice, this chapter provides a framework for the systematic quantitative self-assessment of NPS, "assessment" here being understood as "the collection and analysis of evidence of effectiveness for parts of the institution, including but not limited to evidence of student learning and achievement." (WASC, as quoted by California State University, Chico, 1997).

Six sections follow: 1) Task Group Membership, 2) Task Group Purpose, 3) Definitions of Terms, 4) NPS Assessment Framework, 5) Curriculum Review Process, and 6) Conclusions and Recommendations. The Task Group has also prepared a separate compilation of existing NPS assessments and a description of an Assessment Model that may prove useful to stimulate discussion of NPS performance, as well as evaluations of the School’s component organizational functions.

TASK GROUP MEMBERS
TASK GROUP PURPOSE
The goal of the Assessment Task Group is to improve the efficiency and effectiveness of the current assessment system at the Naval Postgraduate School (NPS WASC Plan, 1997).

To achieve this goal, the Task Group established the following objectives:

1. Define appropriate terms for use in the discussion of assessment.
2. Examine current NPS assessments from a systems perspective.
3. Identify assessment overlaps and gaps at NPS.
4. Evaluate the overall NPS assessment process.
5. Help other Task Groups identify existing assessments pertinent to their concerns.

**DEFINITION OF TERMS**

Definitions of technical terms differ across disciplines. Following are the definitions of technical terms applicable to assessment used by the Task Group:

- **Individual**: unit of interest, such as a person, activity or system
- **Variable**: an attribute with respect to which individuals vary, such as height or income
- **Criterion**: a variable important for evaluating individuals
- **Measure**: how much of a variable an individual possesses (e.g., $45,000 for the variable annual income) or an individual’s status with respect to a variable (e.g., male for the variable gender)
- **Measurement Method**: a procedure for determining measurements, such as a survey
- **Assessment**: the process of obtaining and combining measures for comparison with a standard
- **Assessment Framework**: an organizational structure linking organizational goals and objectives with criteria, standards and measures
- **Assessment Model**: a quantitative model that combines criterion measurements to produce an overall institutional evaluation with respect to institutional goals and objectives
- **Value**: normally, a possible measurement, but here specifically a transformation of a criterion measurement into a unit interval for use in an assessment model (i.e., 1 indicating best, 0 worst)
The last two definitions are applicable to the NPS Assessment Model devised by the Assessment Task Group. Description of that model is under separate cover.

**NPS ASSESSMENT FRAMEWORK**

After considering the background and context of institutional assessment at NPS, this section will describe a formal assessment framework linking existing NPS criteria, objectives and measurements.

**Background and Context**

The mission of the Naval Postgraduate School is to "increase the combat effectiveness of United States and allied armed forces while enhancing the security of the United States through advanced education and research programs focused on the technical, analytical, and managerial tools needed to confront defense-related challenges." NPS has embarked on a new plan, involving eight Strategic Initiatives, to achieve this mission. This plan, influenced by the Chief of Naval Operations' *Joint Vision 2010*, pursues the development of United States military officers through high-quality graduate education designed to meet, as well as to exploit, ever-evolving technical and administrative challenges.

NPS is currently actively engaged in the management of change across the broad spectrum of its operations to both meet and take advantage of these challenges, including technical advances and developing opportunities of the 21st century. The assessment framework described in this section has been developed within the context of these challenges and opportunities, as well as the NPS mission and vision. This vision, particularly, sees NPS as the world’s leader in defense-related graduate programs and as the Department of Defense "University of the Future" preparing the intellectual leaders of tomorrow’s military forces.

The assessment framework described here thus uses as its foundation the goals and functions of NPS. Key documents that establish these goals and functions include the *Naval Postgraduate School Strategic Plan* (1998), the NPS Superintendent’s *Educational Pillars for the Warrior of the Future* (Chaplin, 1998), and *A Bottom-up Review of Navy Flagship Schools* (Center for Naval Analyses, 1997), as well as *Joint Vision 2010* (Chief of Naval Operations, 1997). Together, these documents set forth the goals and functions of NPS in the context of its mission, its vision, and changing educational requirements that reflect evolving warfare conditions and technologies.

Excluding the Center for Naval Analyses *Bottom-up Review*, for which a separate NPS study has been prepared, a brief overview of these documents with respect to their implications for NPS follows:
Joint Vision 2010 identifies the following as six critical elements underlying United States military strategy in the 21st century: people, leadership, doctrine, education and training, organizational structure, and materiel (p. 2). Graduate education is certainly important in maintaining cutting-edge levels of each of these elements (p. 6).

The NPS Strategic Plan, consisting of eight Strategic Initiatives, focuses on a "Revolution in Military Affairs" reflecting rapid advances in information technology and precision weaponry amidst worldwide political and social changes, such as the collapse of the Soviet Union. Operations Other Than War thus become increasingly important functions of United States military forces. The challenges created by these changes are exacerbated by an accompanying decline in federal sponsorship of national defense.

Contemporaneous with this military revolution is a corresponding revolution in academic processes — in teaching and research — that results at least in part from the current rapid advances in information technology, as well as from declining budgets. NPS must not only keep abreast, but also provide leadership in the development of technologies such as broadband communications for video teleconferencing, as well as interactive computer courseware and Internet instructional opportunities, to improve the cost-effectiveness of its educational processes.

The Educational Pillars for the Warrior of the Future at NPS include a new Warrior Curriculum (for Unrestricted Line Officers), Professional Military Education, and Distributed Learning (distance or off-site instruction). The Warrior Curriculum develops interdisciplinary technical skills focusing on advances in information technology. Professional Military Education concentrates on military leadership in areas of national security as well as military strategy in a culture promoting values of integrity, honor and duty to country. NPS has established a Distributed Learning Center that aims at the development of high-quality course materials for electronic delivery to remote locations, including aboard ship, for the purpose of providing a continuum of educational opportunities for officers throughout their careers.

While meeting these challenges, NPS continues to review its current practices in budget management, curriculum structure, and mission fulfillment to meet additional challenges in its operating environment: continued School downsizing with associated budget shortages, declining School enrollments, under-utilization of School graduates, external perceptions of high per-student educational costs, and perhaps excessively lengthy programs for some NPS curricula.

The Assessment Framework described below accommodates all these challenges and opportunities.

Assessment Framework
The Assessment Framework developed by the Assessment Task Group is a hierarchical structure that identifies the major and minor organizational functions of NPS, together with corresponding criteria, standards and measurement methods. Figure 1 and Table 1 present this framework, which focuses on the eight Strategic Initiatives that form the basis of the current WASC Self-study.

The numerical identifications of these Initiatives on the following page refer to their positions in the Assessment Framework, with the digit following the decimal point being the numeral used to identify the Initiative in the NPS Strategic Plan:

3.1 Position NPS to meet the challenges of Revolution in Military Affairs

3.2 Increase efficiency and effectiveness of NPS

3.3 Develop a technologically integrated university

3.4 Develop a DoD consensus on the importance of graduate education

3.5 Obtain the resources needed to accomplish NPS’ mission

3.6 Correct the balance between current operations and re-investment

3.7 Recruit, develop and retain high-quality staff

3.8 Recruit, develop and retain high-quality faculty
Assessment Task Group members attended meetings of other Task Groups to improve their understanding of each Strategic Initiative and to inform themselves about the existing measurement methods and assessments used for it.

Elaborating on Figure 1, Table 1 presents detailed information on criteria, standards and measurement methods, together with existing assessments identified by their document identification numbers in the compilation of NPS assessments prepared by the Assessment Task Group, under separate cover.

Table 1. Framework for NPS self-assessment

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Criteria</th>
<th>Standards</th>
<th>Measurement</th>
<th>Existing</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>Section</th>
<th>Methods</th>
<th>(Document ID#)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Overall</td>
<td>• Global rating or composite score • Acceptable value on global rating or on composite score</td>
<td>• Customer Survey (job performance questionnaire and interview)</td>
</tr>
<tr>
<td></td>
<td>• Benchmarking (multiple criteria) • Placement among comparable schools</td>
<td>• Educational Audit (audit by professional assessment agency)</td>
</tr>
<tr>
<td>2.0 Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Financial</td>
<td>• Budget Adequacy (supports mission and quality goals) • Budget matches financial goals mission needs</td>
<td>• Financial Audit</td>
</tr>
<tr>
<td>2.2 Physical Plant</td>
<td>• Physical space and facility adequacy (Teaching and research facilities) • Meets requirements to support student load and educational goals</td>
<td>• Student population density and facility utilization metrics</td>
</tr>
<tr>
<td>3.0 Strategic Goals</td>
<td>• Progress meeting planned goals and milestones • Satisfactory progress or completion of goals and scheduled events</td>
<td>• Program management control process and tracking system • Documented Results • Customer Survey</td>
</tr>
<tr>
<td>3.1 Position NPS to meet the challenges of the Revolution in Military Affairs (RMA)</td>
<td>• Progress meeting requirements (JPME) • New Curriculum Development • JPME Phase Advances (Continued Certification) • New Curricula meet RMA needs</td>
<td>• Documented Results</td>
</tr>
<tr>
<td>3.2 Increase Efficiency and Effectiveness of NPS</td>
<td>• Form Institutional Partnerships • Develop new Markets • Re-engineer NPS processes • Innovate and Re-invent • Partnerships formed • Added market (s) • New Process and • New Pedagogical methods • Documented new processes and results • Evidence of cost-efficiencies and/or performance gains.</td>
<td></td>
</tr>
<tr>
<td>3.3 Develop technologically integrated University</td>
<td>• Technology Utilization • Technology State of Art (SOA) • Dissemination of multimedia and internet technology • Adequate SOA • Favorable User • Industry reviews and published benchmarks • User surveys</td>
<td></td>
</tr>
</tbody>
</table>
| 3.4 Develop a consensus within DoD on the importance of graduate education | • Support for *Joint Vision 2010*  
• Adaptation to change in educational needs  
• Curricula meets educational needs for *Joint Vision 2010*  
• Strong demand for NPS graduates | • Needs Analysis  
• New Curricula  
• DoD management  
• Survey Results  
• Utilization rates for NPS graduates | • 7, 10 |
<table>
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<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 Obtain the resources to accomplish the mission</td>
<td>See Above (Resources)</td>
<td>See Above (Resources)</td>
<td>See Above (Resources)</td>
</tr>
</tbody>
</table>
| 3.6 Create the correct balance between current operations and reinvestment | • Establish long-range budget planning process  
• Improve funding  
• Invest in future  
• New budget process  
• Increased funds  
• Balanced current spending and future investment | • Documented Process  
• Budget Report | • 2, 7, 8, 19, 27, 28, 41 |
| 3.7 Recruit, develop, and retain high-quality staff | See Below (Personnel, Staff) | See Below (Personnel, Staff) | See Below (Personnel, Staff) |
| 3.8 Recruit, develop, and retain high-quality faculty | See Below (Personnel, faculty) | See Below (Personnel, faculty) | See Below (Personnel, faculty) |
| 4.0 Personnel | | | |
| 4.1 Management | • Leadership and Organizational Effectiveness  
• Progress toward strategic goals  
• Institutional ranking system  
• Favorable ratings by faculty and staff  
• Customer Satisfaction (Students, Navy or other agency sponsors)  
• Evidence of goal attainment  
• Favorable reputation as institution  
• Organizational Survey  
• Individual Interviews  
• Focus Groups  
• Management control and tracking process  
• Outside agency institutional reviews |  
| 4.2 Faculty | • Academic Credentials  
• Key faculty  
• Number of faculty from noteworthy institutions  
• High percentage  
• Curricula vitae  
• Percent faculty with doctorate  
• Documented |  

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| 4.3 Support Staff | • Education levels  
• Job performance  
• Customer satisfaction  
• Product or service quality  
• Productivity | • Years of schooling  
• Meets or exceeds job requirements  
• Favorable ratings from customer survey  
• Meets product or service quality goals  
• Meets or exceeds productivity goals | • Education records  
• Performance review process and outcomes  
• Customer survey  
• Service quality audit  
• Management process control and tracking | • 11, 23, 33 |
<table>
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<tr>
<th></th>
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<tbody>
<tr>
<td>5.0 Education Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 5.1 Student Population | • Qualification Guidelines  
• Curriculum Prerequisites  
• Diversity  
• Motivation | • Meets published attendance guidelines  
• Meets prerequisites (accepts/completes remedial program)  
• Meets Minority Group representation goals | • Registrar screening process  
• Department screening process | |
| 5.2 Instructional Quality | • Instruction Design guidelines  
• Student course evaluations  
• Learning outcomes  
• Job performance | • Complies with instructional quality design guide  
• Acceptable student course evaluations  
• Acceptable scores on achievement tests  
• Satisfactory job performance | • Instruction Design review  
• Statistical Analysis of student course ratings  
• Standardized tests  
• Student and Sponsor surveys | • 8, 13, 14, 21 |
| 5.3 Military culture and socialization | • Military Protocol  
• Social Affairs  
• Peer Discussions | • Mandatory attendance at formal ceremonies  
• Mandatory attendance at Superintendents  
• Guest Lecture Program  
• Emphasizes classroom discussion and study groups  
• Encourages attendance at informal social events | • Attendance records  
• Record of Planned curriculum events  
• Record of Planned social events | • 17 |
| 5.4 Faculty Development | • Continued Education | • Support provided for faculty development | • Faculty program list  
• Attendance | • 8, 13, 14, 21 |
The Framework for NPS Self-Assessment provides an overview of assessment and its use in decision-making at NPS. In both Figure 1 and Table 1, two-digit numbers identify different areas of assessment. A decimal point separates the two digits of each identification number. The first digit indicates the general area, the second a limited region of that area.

To illustrate an important assessment process in systematic operation at NPS, this section will focus on a specific region, identified by the number 5.5. The first digit refers to Educational Environment, the second specifically to Curriculum Design and Review. The particular process described here is illustrative of the culture of evidence that exists at NPS.

This process is the periodic review of curricula. A formal NPS instruction issued by the Superintendent (Instruction 1550.1A) provides guidance on how curriculum reviews are to proceed. NPS currently has 34 different curricula. Each curriculum has a sponsor called a Primary Consultant. Curriculum sponsors, typically two-star admirals, not only provide financial support for their curricula but also oversee the billets where graduates of their curricula are expected to work. Curriculum sponsors are remote from NPS, usually in Washington, DC. Each curriculum has two on-campus representatives, one a faculty member called an Academic Associate and the other a military officer called a Curricular Officer. The Academic Associate heads a faculty group called a Curriculum

<table>
<thead>
<tr>
<th>5.5 Curriculum Design and Development</th>
<th>5.6 Improvement Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Motivation</td>
<td>• Graduate cycle</td>
</tr>
<tr>
<td>• Advancement</td>
<td>time &amp; efficiency</td>
</tr>
<tr>
<td>• Retention</td>
<td>• Quality control</td>
</tr>
<tr>
<td>• Evidence of faculty involvement</td>
<td>• Advanced plans</td>
</tr>
<tr>
<td>in extra-curricular events</td>
<td>and change adaptation</td>
</tr>
<tr>
<td>• Satisfaction of faculty</td>
<td>• Meets acceptable</td>
</tr>
<tr>
<td>promotion/retention goals</td>
<td>student flow cycle</td>
</tr>
<tr>
<td>• Evidence of</td>
<td>• Meets quality standards</td>
</tr>
<tr>
<td>faculty involvement in</td>
<td>• Has flexible</td>
</tr>
<tr>
<td>extra-curricular events</td>
<td>budget and</td>
</tr>
<tr>
<td>• Evidence of</td>
<td>institutional change</td>
</tr>
<tr>
<td>faculty promotion/retention goals</td>
<td>process in place</td>
</tr>
<tr>
<td>• Records</td>
<td>• Periodic management</td>
</tr>
<tr>
<td>• Tenure/promotion</td>
<td>process auditing</td>
</tr>
<tr>
<td>outcome reports</td>
<td>• Quality assessments</td>
</tr>
<tr>
<td>• Computation of faculty</td>
<td>• Published Strategic</td>
</tr>
<tr>
<td>retention rates</td>
<td>plan and</td>
</tr>
<tr>
<td>• Evidence of</td>
<td>defined planning</td>
</tr>
<tr>
<td>defined development process</td>
<td>process</td>
</tr>
<tr>
<td>• Documented</td>
<td></td>
</tr>
<tr>
<td>Instructor training program</td>
<td></td>
</tr>
<tr>
<td>• Periodic process</td>
<td></td>
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<tr>
<td>audit of standards</td>
<td></td>
</tr>
<tr>
<td>• Reviews of sample instruction</td>
<td></td>
</tr>
<tr>
<td>• Reviews of instructor training</td>
<td></td>
</tr>
<tr>
<td>program</td>
<td></td>
</tr>
<tr>
<td>• Instructor surveys</td>
<td></td>
</tr>
<tr>
<td>• 3, 4</td>
<td></td>
</tr>
</tbody>
</table>

• 8, 21

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Committee responsible for the educational content of the curriculum; the Curricular Officer serves as both an academic advisor to students in the curriculum and an on-campus advocate for the Curriculum Sponsor. Each curriculum is subject to review every two years.

Curriculum review participants include the Primary Consultant, the Academic Associate together with the Curriculum Committee, and the Curricular Officer, who is responsible for the logistics of the review process. The Dean of Students, usually a Navy captain, has overall campus responsibility for all curriculum reviews. Central to each curriculum review is a list of skills, called Educational Skill Requirements, developed and amended over time by the review group as educational requirements for personnel filling the billets covered by the curriculum. The Primary Consultant takes the lead in this process, but every Educational Skill Requirement requires final approval by the Director of Naval Training, a three-star admiral.

The Educational Skill Requirements for a curriculum take operational form as a course matrix in which each row represents a separate academic quarter and each column typically a sequence of related courses that may require courses above them in the column as prerequisites. The Mechanical Engineering Course Matrix, for example, contains four columns and nine rows, representing the nine quarters of the curriculum. The first three rows of this matrix contain upper-division so-called transition courses, required to ready students, who often have non-engineering undergraduate majors, for the graduate courses to come.

The biennial review process, which occurs during a site visit by the Primary Consultant, is an assessment procedure involving a give-and-take informational exchange between the Primary Consultant and the Curricular Officer on the one side, and the Academic Associate and the Curriculum Committee on the other. While the one side seeks to assure the fulfillment of Navy needs, the other seeks to assure educational integrity. In this process, often members of one side take positions representing the other. Everyone is concerned about appropriate utilization of curriculum graduates who, upon graduation, are awarded a Primary Code that identifies their curriculum and defines their subsequent work subspecialty. Results of the review, which includes the status of old and new action items, are forwarded to the Director of Naval Training via the Curriculum Sponsor. The process typically proceeds smoothly.

**CONCLUSIONS AND RECOMMENDATIONS**

While indicating a number of possible assessment gaps, Table 1 strongly supports the existence of a culture of evidence at NPS. The gaps shown in this table may, in fact, be the result of lack of knowledge on the part of Task Group members rather than gaps in fact. The first recommendation is therefore that all members of the NPS community
scrutinize Table 1 and provide or develop the information required to fill the gaps identified there.

In view of the ongoing concern with appropriate utilization of graduates, the Task Group’s second recommendation is that the current Primary Code system be changed to facilitate officer assignment making optimal use of graduate education.

The third, and final, recommendation is that NPS decision-makers apply the NPS Assessment Model developed by the Assessment Task Group to demonstrate the progress of the School in meeting its goals over time. Description of this model is under separate cover.

REFERENCES


A NAVAL POSTGRADUATE SCHOOL ASSESSMENT MODEL

The Assessment Task Group developed an Assessment Model to show how well NPS is achieving its goals and objectives as reflected in the School’s eight Strategic Initiatives. Each of these Initiatives focuses on a different aspect of NPS. To provide an aggregate measure of the School’s progress towards achieving its goals and objectives, therefore, the model must combine multiple measures into a single score. One way to meet this challenge is to build a hierarchical model based on an additive value function. (Keeney and Raiffa, 1993; Winterfeldt and Edwards, 1986; Clemen, 1992). This is the kind of model developed here.

This Assessment Model is presented with some rigor and some aura of validity. However, it is not the Task Group’s intention to propose it as the only or correct way to assess the performance of a complex organization. Rather, this Assessment Model
should be viewed as a possible approach which may be helpful in stimulating
discussion about the relative importance of various Initiatives and performance
measures.

The section below may be skipped by the reader with no loss in continuity.

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Anthony ciavarelli
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Jim Esary Professor
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Operations
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James Felli
Assistant Professor
of Decision Science

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Commander,
United States Navy

Kip Krebs Assistant
Professor of
Operations
Research

Joe Welch
Commander,
United States Navy
AN ADDITIVE VALUE FUNCTION $v(x)$

Criteria for different School operations vary considerably in their measurement scales. Some scales involve dollars, others simple counts. To combine measurements on such criteria meaningfully, the measurements must all be on a common scale. The scale chosen here is the unit interval extending from 0 for the worst end of the scale to 1 for the best. The function transforming a criterion measurement $x$ to a value $v$ on this scale — $v(x)$ — may take any of a number of forms. One of these forms is a logistic function. Perhaps the simplest form makes $v$ equal to the ratio of the distance between $x$ and its lowest observed value to the range of $x$ (the distance between its highest and lowest observed values). The result will be a value, $v$, between 0 and 1. Whatever form is used, the result must ensure that high measurements mean better performance than low measurements.

MODEL ASSUMPTIONS

Being additive, the NPS Assessment Model is based on three assumptions:

1. The eight NPS Strategic Initiatives are an exhaustive representation of the School’s goals and objectives, either directly or as proxies.
2. The one or more criteria used to measure progress toward the achievement of each Strategic Initiative are likewise an exhaustive representation of measures of that achievement.
3. Criterion measurements for each Strategic Initiative are mutually independent and are subject to linear trade-offs so that high measurements on one criterion may compensate for low measurements on another.

MODEL COMPONENT

The NPS Assessment Model has three main components: structure, values, and weights. The structure organizes criteria into groups within which the criteria are subject to mutual trade-offs. The values are criterion measurements transformed to a 0-1 scale, as indicated earlier. The weights are subjective evaluations indicating the relative importance of different criteria to the measurement of a Strategic Initiative (double-subscripted weights, such as $w_{23}$ for the importance of Criterion 3 to Strategic Initiative 2) or the relative importance of the eight Strategic Initiatives to the overall evaluation of
NPS (single-suscripted weights, such as $w_4$ for the importance of Strategic Initiative 4). Like values, weights must be numbers between 0 and 1, inclusive. Unlike values, however, the double-subscripted weights applicable to the criteria for a single Strategic Initiative must sum to one, as must the single-subscripted weights for all eight Strategic Initiatives.

Figure 2 on the following page shows these components in the hierarchical organization comprising the Assessment Model for NPS.

![Figure 2. An Assessment Model Hierarchy](image)

The two top levels of Figure 2 reflect Assumption 1 of the NPS Assessment Model, that the eight Strategic Initiatives comprise an exhaustive representation of the objectives and goals of NPS. The Assessment Framework presented in the Assessment Task Group chapter identifies the criteria shown on the bottom level of Figure 2. The three criteria shown for Strategic Initiative 4 are subject to mutual trade-off. Reflective of Assumptions 2 and 3, not only must these criteria afford an exhaustive measurement of progress toward the achievement of Strategic Initiative 4, but also, to permit mutual trade-offs, their measurements must be mutually independent.

The terms parent, child, and sibling help distinguish the different levels of the hierarchy shown in Figure 2. $C_{43}$, for example, is the child of (Strategic Initiative 4), its parent, while $C_{42}$ and $C_{41}$ are siblings of $C_{43}$. Only criterion measurements for siblings are subject to mutual trade-off.
The top level in Figure 2 shows the overall assessment of NPS as a weighted additive function of the single-subscripted values determined for the eight Strategic Initiatives from measurements of the criteria shown below, while the double-subscripted values \( v_{4i} \) shown in the formula between the bottom two levels are determined as functions of criterion measurements, as indicated previously.

**USE OF THE OVERALL ASSESSMENT OF NPS**

The value \( V_{NPS} \) shown near the top of Figure 2 is interpretable as an overall measure of the fulfillment of the goals and objectives of NPS, at least on an ordinal scale, so that a high \( V_{NPS} \) value means greater fulfillment than a low value of \( V_{NPS} \). Being subjective, the weights used in the model are subject to change over time, as they are to variation over policy makers; however, if the model is used to determine progress, the weights used over time must remain unchanged. Constraining the weights for the sibling criteria for each Strategic Initiative to be equal makes all the sibling criteria equally important. While having the advantage of minimizing subjectivity in the use of the model, such constraint may also have little substantial effect on the value of \( V_{NPS} \). Research on additive models of regression analysis has shown that results obtained from the use of unit regression weights differ little from results obtained from the use of optimal regression weights. Though model values are on the same 0-1 scale as proportions, caution must be exercised in the interpretation of any of the model values as proportions, the question always being kept in mind, "a proportion of what?"

**REFERENCES**


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Volume III - Compliance

Submitted to the
Western Association of
Schools and Colleges
December 1998

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**Introduction to Volume III**

This is the third of three volumes comprising the Naval Postgraduate School’s Self-Study for 1999 reaffirmation of accreditation by the Western Association of Schools and Colleges.

NPS has adopted a thematic approach to its Self-Study. Volume II describes this approach which is output- rather than input-oriented. WASC currently allows, even encourages, this approach, and NPS has seized this opportunity. Previously, WASC required evidence of compliance with specified standards and sub-standards.

This volume was prepared by a Task Group whose goal was to review the WASC Compliance Standards and verify that NPS meets those standards. It was not their objective to do a full compliance report.

This report of the WASC Compliance Task Group lists in sequence each Accreditation Standard in **bold**, followed by a statement of how the Naval Postgraduate School meets or exceeds that standard, in regular-face type.

The entire Self-Study is reported in three volumes:

**Volume I** Overview (Introduction, Past Issues, Lessons Learned)

**Volume II** Task Group Reports (Examination of Strategic Initiatives)

**Volume III** Compliance (NPS’ compliance with WASC Standards)
STANDARD ONE:

INSTITUTIONAL INTEGRITY

Standard 1.A: Integrity in Pursuit of Truth

Institutional integrity forms the foundation for achieving the academic excellence required of all graduate-level programs at the Naval Postgraduate School, which provides advanced educational programs to officers of every U.S. military service, U.S. civilian federal employees, and military officers and civilian personnel from other nations. The search for truth is manifested in all courses taught and all research undertaken at the School.

Standard 1.A.1: The Institution has a widely disseminated, written statement of commitment to academic freedom.

Academic freedom at NPS is widely advocated through a clear mandate placed on faculty to engage in quality teaching which encourages the free pursuit of learning and, in the case of tenure-track faculty, to engage in intense, open scholarly research and external professional activities. (This policy of academic freedom is clearly enunciated in the NPS Faculty Handbook sections on "Professional Responsibilities" and "Integrity in Research," pp. VI-14 and IV-15, respectively). The Evaluation Criteria for deciding faculty promotion and tenure clearly itemize the types of activities that are expected of faculty to achieve success at NPS (see NPS Faculty Handbook, pp. IV-5 to IV-7).

In addition, faculty and students are actively encouraged to seek the truth by performing research and instruction, conditioned only by requirements of "quality" and, where possible, relevance to the NPS mission. In addition, students are strongly encouraged to arrive at the truth through the independent pursuit of knowledge.

Standard 1.A.2: Trustees and administrators protect faculty and students from harassment in their exercise of academic freedom.
Protection of faculty from harassment is provided through adjudication of grievances and ethics issues by the Professional Practices Committee, an independent faculty committee with an elected membership (see page C-8 of the Faculty Handbook). NPS students are mature adults and are treated as professionals. Any problems not resolved at the individual department level are handled through the Curricular Officer and/or Dean of Students. This is not a significant issue at NPS.

**Standard 1.A.3: The faculty protects the academic freedom of its members. Faculty distinguish between personal conviction and proven conclusions and present relevant data fairly and objectively.**

See response to 1.A.2 above.

**Standard 1.A.4: Students are encouraged to sift, to question, and to become involved as learners.**

See paragraph 2 of the "Professional Responsibilities" section of the NPS Faculty Handbook, page IV-14.

**Standard 1.A.5: Institutions that strive to instill specific beliefs or worldviews or to impose codes of conduct on faculty, staff, or students give prior notice of such policies. Such policies state the conditions clearly, ensure these conditions are consistent with academic freedom, and have in place due process procedures whereby faculty and students are protected in their quest for truth.**

Codes of conduct are established for faculty in several sections of the Faculty Handbook:

- Professional Responsibilities (page IV-14)
- Integrity of Research (page IV-15)
- On-campus Attendance (page IV-15)
- Extended Work Off-campus (page IV-16)
- Commencement Exercises (page IV-19)
- Ethics and Standards of Conduct (pages IV-19 to IV-20)
- Consulting and Other Employment (page IV-20)
- Political Activities (pages IV-21 to IV-22)
- Travel (pages IV-22 to IV-23)
In addition, all new faculty and staff are provided with an Orientation Program (see [http://web.nps.navy.mil/~hro/orient.htm](http://web.nps.navy.mil/~hro/orient.htm)) and are assigned mentors from the senior faculty.

Students are provided with written guidance from their associated curricula and are given orientation by their respective Curricular Officer and Academic Associate. Further codes of conduct are promulgated at [http://web.nps.navy.mil/~osac/interest.htm](http://web.nps.navy.mil/~osac/interest.htm) by the Associated Student Advisory Committee, composed of elected student representatives. Student administration is detailed in Standard 7 of this report.

**Standard 1.B: Integrity in Respect for Persons**

Through its policies and practices, the institution encourages individual autonomy and fosters educational diversity. Adequate provision is made to ensure academic honesty and to protect basic due process and privacy rights for students, faculty and staff.

**Standard 1.B.1: Sufficient resources are provided to address the academic needs of accepted students.**

NPS is especially sensitive to the needs of its students and provides incoming students with a six-week Refresher Course which reviews essential knowledge in mathematics and the physical sciences. Extensive resources including laboratories, library and computational facilities are made available, as described in the sections of this report devoted to Standards 6 and 8. Future efforts are detailed in the Report on Strategic Initiative #3.

**Standard 1.B.2: The institution provides students and faculty with clear expectations concerning the principles of academic honesty and the sanctions for violations.**

See Faculty Handbook sections on Integrity of Research (page IV-15) and Ethics and Standards of Conduct (pages IV-19 to IV-20). Students are provided with clear expectations of academic honesty from their military chain of command via their Curricular Officers. See also Federal Employee rules on ethics at [http://web.nps.navy.mil/~sjanps/ethics.html](http://web.nps.navy.mil/~sjanps/ethics.html).

**Standard 1.B.3: The institution demonstrates its commitment to the increasingly significant educational role played by diversity of ethnic, social, and economic**
backgrounds among its members by making positive efforts to foster such diversity.

Faculty recruiting is conducted under Federal Government policy regarding affirmative action, equal opportunity and diversity. This policy is provided by the NPS Human Resources Office at http://web.nps.navy.mil/~hro/Eeopolic.htm. The diversity of the NPS student body reflects that of the military services from which they are selected to attend the School. Selection is based primarily upon performance and quotas for subspecialty skills, with a blind eye towards ethnicity and gender.

Standard 1.B.4: The institution provides a clear statement of institutional policies, requirements, and expectations to current and prospective employees.

These clear statements are provided to new employees as part of their orientation (see http://web.nps.navy.mil/~hro/orient.htm and http://web.nps.navy.mil/~hro/conddisc.htm) and are kept in hard copy form in each administrative office down to the department level.

Standard 1.B.5: The institution provides written policies on due process and grievance procedures to faculty, staff and students.

See http://web.nps.navy.mil/~hro/perffdbk.htm section on grievances and appeals. Hard copy versions are maintained in administrative offices.

Standard 1.B.6: The institution selects students, faculty, administration, and staff according to institutionally developed and published nondiscrimination, equal opportunity, and affirmative action policies.

See response to 1.B.3 above.

Standard 1.B.7: Adequate provision is made for the confidentiality and privacy of student and employee records.

Federally mandated standards of privacy for student and employee records are practiced at all levels. Personnel records are kept in secure filing facilities, and student grades are not made public.

Standard 1.B.8: The institution establishes policies covering human subjects in research.

NPS is obligated to follow Federal policy standards covering human research subjects, but this is not an issue of any significance at NPS.

Standard 1.C: Integrity in Institutional Relations
Representations about the institution to prospective students and to the general public are accurate and consistent with institutional publications and practices.

1.C.1: Precise, accurate, and current information is provided in printed material regarding (a) educational purposes; (b) degrees, curricular programs, educational resources, and course offerings; (c) student charges and other financial obligations, student financial aid, and fee refund policies; (d) requirements for admission and for achievement of degrees; and (e) the names of the administration, faculty and governing board.

All such information is provided in the School’s current on-line catalog (http://web.nps.navy.mil/~ofcinst/catalog.htm), any or all of which can be printed to a hard copy or ordered for delivery as a hard copy.

Standard 1.C.2: Institutions make every effort to ensure that oral communications are as accurate and current as written or published materials.

Oral communications are as accurate as written or published materials and may be even more current.

Standard 1.C.3: Statements and promises can be documented, especially those regarding excellence of program, success in placement, and achievements of graduates or faculty.

Documentation and data are available to support claims of this type. Placement success of graduates is not an issue, since they are assigned to their next duty station by military personnel offices. Claims of program excellence are further supported by specific external accreditations, such as by ABET.

Standard 1.C.4: Academic advisement is provided to ensure that student educational goals are correlated with the curricula offered.

NPS is particularly diligent in providing academic advisement to students. Each curriculum has one or more faculty assigned as "Academic Advisors" who meet with students to advise and approve their programs of study.

Standard 1.C.5: In its publications, the institution makes clear the status (e.g., full-time, part-time, adjunct) of each faculty member.

Faculty status in publications such as the on-line catalog and NPS web pages reflects academic rank, including that of non-tenure track and whether civilian or military. However, full- or part-time status is not indicated, as virtually all faculty are employed
full-time during the quarters in which they provide instruction and/or perform research.

**Standard 1.C.6: In fundraising activities and grant proposals, the institution provides complete and accurate information regarding available resources and realistic performance expectations.**

There are no fundraising activities by NPS in the traditional sense of public or private universities soliciting alumni and other donors for contributions. There is an active NPS Alumni Association http://web.nps.navy.mil/~alumni/ which sponsors events for prior graduates and raises minor amounts of funding to assist with activities at NPS. These funds are not, however, part of the NPS budget. For instance, private funding from TRW Corp. has been donated to initiate a Chaired Faculty position in Signals Intelligence. Private funding has also been provided to fund specific research by faculty based on a memorandum of agreement regarding intellectual rights. These are exceptions, however, to the usual mechanism of faculty obtaining their research funding from other government organizations, primarily the Department of Defense. Accuracy and completeness of research proposal budgets is checked by the Research Office, while truthfulness in performance of research falls under the auspices of faculty ethics and is covered in the response to 1.B.2, above.

**Standard 1.D: Integrity in Institutional Operations**

*The institution manages its administrative operations, including all of its finances, with honesty and integrity.*

Honesty and integrity are a hallmark of administrative operations and financial accounting at NPS. As cited above, there are stringent Federal guidelines on ethics for federal employees, and supervisors are provided with mandatory training in ethics and in honest and fair personnel management. Fiscal accounting is subject to Federal audits.

**Standard 1.D.1: Fiscal integrity is demonstrated by adequate institutional control mechanisms and by conformity with generally accepted programs.**

Fiscal allocation at NPS is performed by a demand-based system, whereby participant departments and other administrative units justify their yearly budget requests. Negotiation ensues, and budgets are allocated and then often adjusted with changing fiscal resources and observed budget executions throughout the year. There are many checks and balances in this system, one of which is that NPS cannot spend funds which does not have. Details of fiscal planning and management are provided in the section below addressing Standard 9.

**Standard 1.D.2: The institution demonstrates honesty and integrity in its athletic programs. (See policy on Collegiate Athletics, pages 71-2.)**

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As NPS has no official athletic programs, this standard is not applicable to this compliance assessment.

**Standard 1.D.3: Clearly written policies on conflict of interest for board, administration, faculty, and staff are enunciated. These policies include appropriate limitations on the relations of business, industry, government and private donors to research in the institution.**

Conflict of interest policies are clearly enunciated for administration, faculty and staff in both the Faculty Handbook (see 1.B.2) and in the Code of Conduct applicable to all Federal employees (see [http://web.nps.navy.mil/~sjanps/ethics.html](http://web.nps.navy.mil/~sjanps/ethics.html)). The Board of Advisors must also adhere to standards applicable to public members of government boards.

**Standard 1.D.4: Fundraising activities are governed by institutional policies that are consistent with the educational objectives of the institution.**

See the response to Standard 1.C.6 above.

**Standard 1.E: Integrity in Relationships with the Commission**

*In its relationships with the Commission, the Institution demonstrates honesty and integrity, and agrees to comply with Commission standards, policies, guidelines and self-study requirements. The institution is responsive to Commission decisions and requests.*

**Standard 1.E.1: The Institution is completely candid, providing all pertinent information whether complimentary or otherwise. With due regard for the rights of individual privacy, every institution applying for candidacy, extension of candidacy, accreditation, or reaffirmation of accreditation, as well as every candidate and accredited institution, provides the Commission with access to all parts of its operations, and with complete and accurate information about the Institution's affairs, including reports of other accrediting, licensing, and auditing agencies.*

The honest and forthright investigation of WASC compliance standards reported herein has been conducted by an independent faculty committee, without interference or influence by the School’s administration. This Committee was tasked with providing a factual and honest assessment of compliance, reporting marginal or failed compliance wherever found.

Further, access to all parts of NPS operations, aside from those limited areas and records devoted to classified intelligence, will be provided to the WASC Visiting Team.
Standard 1.E.2: The Institution cooperates with the Commission in preparation for visits, and complies with the Commission’s requests for acceptable reports and self studies.

Compliance with this standard is self-evident from ongoing performance in this and previous WASC reviews and visits.

Standard 1.E.3: The institution refrains from making substantive changes, including the initiation of new programs or sites outside the region, or new sites within the region, except in accordance with the Commission policy on Substantive Change (page 152).

NPS has not engaged in any of the five substantive changes listed on page 152 since its previous WASC accreditation.

Standard 1.E.4: The institution reports accurately to the public its status and relationship with the Commission. In catalogs, brochures, and advertisements, an institution describes its relationship with the Commission according to the statements on pages 179 and 180-81.

A minor oversight occurred in this regard in the preparation of the current catalog, where it is stated, "The Naval Postgraduate School is accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges." Per pages 180 and 181, this statement will be amended to include the words: "...an institutional accrediting body recognized by the Council on Postsecondary Accreditation and the U.S. Department of Education."

Standard 1.E.5: The institution participates in providing counsel and advice to the Commission, and agrees to have its faculty and administrators serve, within reason, on visiting teams and on Commission committees.

Faculty are strongly encouraged to participate in external professional activities, such as membership on accreditation agencies. NPS administration welcomes involvement of its faculty in their professional communities.

Standard 1.E.6: The institution acknowledges the right of the Commission to implement its procedures in matters of unethical institutional conduct (page 163).

NPS adheres to the highest possible ethical standards and would work closely with WASC to address any challenge to its conduct.
STANDARD TWO:

INSTITUTIONAL PURPOSES, PLANNING, AND EFFECTIVENESS

Standard 2.A: Clarity of Purposes

The institution is guided by clearly stated purposes that define its character, are appropriate for higher education, and are consistent with Commission standards.

Standard 2.A.1: The statement of purposes identifies the broadly based educational objectives the institution seeks to fulfill. In implementing its purposes, the institution has defined the constituencies it intends to serve as well as the parameters under which educational programs can be offered and resources allocated.

The Mission statement of the Naval Postgraduate School is clearly stated in numerous publications, including the catalog, and posted widely across campus:

"The Naval Postgraduate School was created as the Navy’s primary source for graduate education. Its mission is to increase the combat effectiveness of the U.S. and allied armed forces and to enhance the security of the United States through advanced education and research programs focused on the technical, analytical, and managerial tools needed to confront defense related challenges."

The School’s vision (mission statement, guiding principles, and strategic plan) is crafted by the Planning Board of NPS (formerly the NPS Executive Board) with inputs from the faculty, department chairs, administrators, and staff members. It was widely promulgated in draft form and revised over a six-month period.

The vision has been shared with the Secretary of the Navy, the Chief of Naval Operations, and the Navy’s Graduate Education Review Board. As an evolving, living
document, the Superintendent and Provost may interpret it and amplify or modify concepts within it to respond to contingencies and requirements of the times.

The School’s Statement of Purpose is clearly stated in many publications, including the hardcopy NPS Catalog and documents available on the NPS Home Page:

- NPS Strategic Plan (1997/98) [Database #xx]
- Center for Analyses Report and NPS Response to the Report (1998) [Database #xx]
- Navy Long-Range Planning Objective (1998) [Database #xx]
- Admiral’s Vision Statement (1998) [Database #xx]
- SECNAV Instruction (March 1998) [Database #xx]
- Public Law 303 (Federal Law) [Database #xx]

The constituencies served (the Navy, the other military services of the United States, and the services of allied nations) are clearly identified in the NPS mission. Interactions with these entities are prescribed in myriad NPS, Navy, and DoD instructions and policy statements. These documents also address procedures and funding allocation mechanisms.

**Standard 2.A.2: The statement of purposes derives from, or is at least understood by, the campus community; is adopted by the governing board; and is periodically reexamined.**

The School’s Statement of Purpose (i.e., its mission statement) has been written and revised over time by the NPS Planning Board (formerly the NPS Executive Board) with inputs from the NPS community. The goal of the Planning Board is to have the NPS strategic plan (including the vision and guiding principles) permeate the culture of the campus. To this end, a variety of dissemination mechanisms have been used, including printed media, the NPS website, briefings, etc.

The Strategic Plan has been presented to the governing board of NPS (i.e., the Navy’s Graduate Education Review Board). The revisions are discussed in that forum with resulting refinement.

The Strategic Plan has been revisited and revised annually since its first writing. Wording of enduring issues and bedrock principles has been refined, and initiatives have been revised to reflect changing priorities.

**Standard 2.A.3: The descriptive title of the institution is appropriate to its purposes, size, and complexity.**

The title of the Naval Postgraduate School has had a long, enduring history. From time to time, consideration is given to changing the "School" part of the name to reflect its
level of education as a graduate institution, or to broaden the name beyond the Navy to reflect the military diversity of the student body. These discussions ended with the observation that the advantages of the current name and its recognition outweigh the disadvantages.

**Standard 2.A.4: Educational programs are demonstrably related to the purposes of the Institution. Financial and physical resources are clearly related to its purposes.**

NPS educational programs are specifically designed to fulfill the School’s mission and purposes as set by law and by Department of the Navy and Department of Defense directives. Faculty committees, Curricula Officers, Academic Associates, Curriculum Sponsors, and the Academic Council continually review and update the curricula to add program changes that address current issues of concern.

The School’s financial resources are determined by Congressional action on annual budgets proposed by the Department of the Navy/DoD to specifically carry out the purposes of the School (i.e., NPS is a line item in the Navy’s professional education budget). In addition, reimbursable research funds made a no-cost contribution to instruction and research at NPS. Some of these funds are used to purchase equipment that can be used in laboratory teaching and thesis research (see CNA Report on Funding Costs, 1998, p. 64). The faculty budget is based on the teaching load required to support the curricula and number of students. Support staff levels are set via the annual Departmental planning process. This combination of annual funding via the federal budget cycle and reimbursable research funds has made NPS the eighth least expensive institution of higher education out of the 29 universities reviewed by the Center for Naval Analyses.

The School’s physical resources, including its many laboratories, are also clearly related to its purposes. In response to the previous WASC Accreditation Team’s finding that not enough funding was going to labs, the School has made recapitalization of its laboratory facilities (including Library and IT resources) a major priority. NPS has developed a comprehensive lab plan (see NPS Six-Year Laboratory Plan for FY2000-2005 [Database #xx]), submitted and defended budget requests for lab facilities to the Navy, and has received some recapitalization funding for its labs from the Navy and other sponsors. In addition, NPS has made efforts to achieve internal efficiencies by consolidating labs, by eliminating laboratories with low utilization, and by encouraging the sharing of laboratories.

**Standard 2.B: Institutional Planning**

The Institution is engaged in ongoing planning to achieve its avowed purposes. Through the planning process, the Institution frames
questions, seeks answers, analyzes itself, and revises its purposes, policies, and procedures accordingly.

As an organization, NPS is fully planned at many institutional levels, over both the long and the short term. Through this multi-layered process, the School analyzes its functions across the board, revising its purposes, policies and procedures as appropriate.

The Chief of Naval Operations sets the Navy’s long-range planning objectives, which include "ensuring the (Navy) officer corps has the educational opportunities necessary to develop the competence, leadership and character needed to succeed in joint warfighting and to employ the technological advances of the 21st century" (Long-Range Planning Objective, March 12, 1998 [Database #xx]), with the Naval Postgraduate School the Navy’s premier source for this officer graduate education. Billets for officer students are forecast in "subspecialty codes" as the needs of the Navy evolve, and academic planning is focused on fulfilling Educational Skill Requirements set by the School’s military sponsors.

Planning objectives for military higher education in general, and the Naval Postgraduate School in particular, are contained in the following documents, among others:

- Joint Vision 2010, Joint Chiefs of Staff [Database #xx]
- The Cebrowski Initiative, N6 [Database #xx]
- NPS Strategic Plan [Database #xx]
- NPS Superintendent’s Vision Statement [Database #xx]
- Educational Skill Requirements [see NPS Catalog Database #xx]
- Marto/Powers Reports [Database #xx]

In addition, NPS involves its entire community in vital planning issues, through such mechanisms as WASC Self-Study Task Groups; Process Action Teams (PIT/PATs); Combined Military/Civilian Command Assessment Teams (CATs); open "Coffee on the Quad" sessions where any faculty, staff or student can raise and discuss issues with top administration officials; and numerous retreats for deans, departments and other groups. In general, the Marto/Powers study (1995) concluded that the NPS "planning process is participatory."

**Standard 2.B.1: The Institution uses the results of ongoing planning processes in further planning and evaluation. (See Supporting Documentation at the end of this section for a list of studies undertaken).**

A major focus of NPS planning is mid-range planning related to future programs and initiatives the School will undertake. The School is constantly conducting self
evaluation, and its plans are constantly being subjected to external evaluations. Thus, the NPS planning process must adapt accordingly.

**Standard 2.B.2: In the planning process, internal and external environmental factors are taken into consideration, institutional data are integrated, and the collection of new data is stimulated.**

NPS is extremely responsive to the internal and external environment. As a "corporate" university in a military chain-of-command, we maintain close contact with the Navy and DoD command structure in establishing the desires and goals of the School. The NPS Planning Board, consisting of the top NPS administrators (both military and academic) is the focus of the planning efforts. Data is collected by various studies within the pertinent NPS units and brought forth to the Planning board for consolidation with decision-making process.

**Standard 2.B.3: The planning process identifies issues and establishes priorities in addressing them.**

As described above, the NPS Planning Board is the instrument used to identify issues and establish priorities. Issues are brought forward by the participants from all corners of the School, discussed, placed in context, and prioritized by this Board. Resourcing and implementation strategies are decided and assigned for execution.

**Standard 2.B.4: The planning process is participatory, involving, as appropriate, the Board, administration, faculty and students.**

The members of the NPS Planning Board rely on members of the NPS community to provide information for planning initiatives, to staff the studies required, and to act as experts in the subject areas under consideration. The membership of the Planning Board is carefully drawn up to include administrators representing faculty, students, staff, and the military.

**Standard 2.B.5: The human, financial and physical resources of the Institution are integrated in the planning process.**

The NPS Planning Board serves in an advisory role to the Superintendent, who has the final decision in all matters relating to human, financial and physical resources at NPS. The Superintendent is advised in these matters by the Planning Board and the Director of Resource Management (a Navy captain).

**Standard 2.B.6: Appropriate evaluation mechanisms for all major components of the Institution are utilized in planning.**
Most major planning decisions involve a study before the final decision is made. A Committee of relevant individuals is assembled to perform the analyses and evaluations of the topic. Results of these studies are briefed to Planning Board members by the Committee as part of the Board’s deliberations.

**Standard 2.C: Institutional Effectiveness**

*The Institution has developed the means for evaluating how well, and in what ways, it is accomplishing its purposes as the basis for broad-based, continuous planning and evaluation.*

For a detailed review of how NPS measures the efficiency and effectiveness of both its educational programs and business practices, see the Task Group #2 Report on increasing the School’s efficiency and effectiveness.

In general, as measured by Curriculum Sponsor satisfaction and Research Sponsor satisfaction, NPS is a very effective institution. Programs and curricula which do not satisfy their military Sponsor are eliminated or modified, and the significant majority of NPS students are directly employed by these Sponsors (or by a federal government, either U.S. or foreign). Intensive curricular reviews are conducted every two years with each Sponsor, and the Educational Skill Requirements incorporated into courses amended as necessary.

Student satisfaction is also repeatedly measured, through instruments such as Student Opinion Forms, exit interviews, rap sessions, alumni surveys, formal graduate surveys by select curricular criteria, as well as by Department, Faculty Council, PJE, Command Assessment Team, and Joint Professional Military Education surveys. Regarding the latter, see http://web.nps.navy.mil/~nsa/jpme/survey. Additional Navy-related reviews are performed by the Graduate Education Review Board, Board of Trustees, and Board of Advisors.

In addition to WASC, a number of independent outside organizations regularly review and monitor NPS, including the Accreditation Board for Engineering and Technology (ABET) for the School’s four engineering programs; and the National Association of Schools of Public Affairs and Administration (NASPAA) on the management side. There are also ad hoc reviews chartered for a specific purpose, such as the Base Realignment and Closure Commission and Center for Naval Analyses’ Bottom-up Assessment of Navy Flagship Schools, usually to evaluate the excess capacity and/or cost effectiveness of the institution. No other college or university in the nation, except for others directly sponsored by the federal government such as the Air Force Institute of Technology, can be subject to Base Realignment and Closure reviews.
STANDARD THREE:

GOVERNANCE AND ADMINISTRATION

Standard 3.A: The Governing Board

The Governing Board is ultimately responsible for the quality and integrity of the Institution. It selects a chief executive officer, approves the purposes of the institution, and concerns itself with the provision of adequate funds. It establishes broad Institutional policies, and delegates to the faculty and administration responsibility to administer and implement these policies. The board protects the institution from external pressures antithetical to academic freedom, to institutional autonomy, or to integrity. It differentiates among roles and responsibilities of various persons or bodies, and provides stability and continuity to the institution through an organized system of Institutional planning and evaluation.

The Board of Trustees’ functions and responsibilities have in fact been carried out by the Graduate Education Review Board in concert with the Board of Advisors. Each of these bodies has met in formal session annually as provided by instruction of the Secretary of the Navy and the Chief of Naval Operations. To clarify the relation of the activities of these two bodies to the functions and responsibilities of a Board of Trustees as delineated in the WASC Handbook, each of the fourteen elements under Standard 3.A is discussed in detail below.

Standard 3.A.1: The Board includes adequate representation of the public interest and/or the diverse elements of the constituency and does not include predominant representation by the employees of the institution. The president may be an ex officio member of the board, but is not the chair. Arrangements provide for continuity of board membership and staggered terms of adequate length.
The Graduate Education Review Board includes the Vice Chief of Naval Operations (Chair), the Chief of Naval Personnel, Director of Naval Training, the President of the NPS Board of Advisors and an Admiral from a major Systems Command. The NPS Superintendent attends ex officio. Together with the Board of Advisors, these two groups have the ultimate responsibility for the quality and integrity of the Institution. Their terms are staggered and are typically from three to four years in length. Neither the Graduate Education Review Board or Board of Advisors contains any employee of the School although the Superintendent is, by law or by regulation, required to be involved with both. For the current membership of the NPS Board of Advisers, see Table 1, on the following page.

**Table 1. Current Members of the NPS Board of Advisors**

<table>
<thead>
<tr>
<th>Board Member</th>
<th>Title</th>
<th>Company</th>
<th>Term/ Expires</th>
</tr>
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<tr>
<td>Walter Anderson</td>
<td>Editor</td>
<td>Parade Publications</td>
<td>4 years/ 30 Sep 2000</td>
</tr>
<tr>
<td>Dr. Jack Borsting</td>
<td>Executive Director</td>
<td>University of Southern California</td>
<td>4 years/ 30 June 2002</td>
</tr>
<tr>
<td>Gen. Michael Carns, (USAF Ret)</td>
<td>Executive Director</td>
<td>Center For International Political Economy</td>
<td>4 years/ 31 Jan 2002</td>
</tr>
<tr>
<td>Lawrence Cavaiola</td>
<td>Vice President</td>
<td>Ingalls Shipbuilding</td>
<td>4 years/ 31 Jan 1999</td>
</tr>
<tr>
<td>Dr. Evan Dobelle</td>
<td>President</td>
<td>Trinity College</td>
<td>4 years/ 30 Sep 2000</td>
</tr>
<tr>
<td>RADM Paul Gaffney, USN</td>
<td>Chief of Naval Research</td>
<td>Office of Naval Research</td>
<td>*</td>
</tr>
<tr>
<td>T. Morris Hackney</td>
<td>Chairman</td>
<td>Citation Corporation</td>
<td>4 years/</td>
</tr>
<tr>
<td>Name</td>
<td>Position</td>
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<td>Term Dates</td>
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<td>-----------------------------</td>
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<tr>
<td>Ronnie Liebowitz</td>
<td>Partner</td>
<td>Hellring Lindeman Goldstein &amp; Siegal</td>
<td>3 years/ 30 Sep 1999</td>
</tr>
<tr>
<td>Prof Carolyn Staton</td>
<td>Associate Provost and Associate Vice Chancellor for Academic Affairs</td>
<td>University of Mississippi</td>
<td>4 years/ 30 Sep 2000</td>
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<tr>
<td>VADM Jerry Tuttle (USN Ret)</td>
<td>Vice President</td>
<td>Management Technology</td>
<td>4 years/ 30 Sep 2000</td>
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<tr>
<td>VADM Patricia A. Tracey, USN</td>
<td>Chief of Naval Education and Training</td>
<td>Naval Education and Training</td>
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<tr>
<td>Dr. William Vega</td>
<td>Chancellor</td>
<td>Coast Community College District</td>
<td>4 years/ 30 Sep 2000</td>
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<tr>
<td>G. Kim Wincup</td>
<td>Vice President</td>
<td>Science Applications International Corp</td>
<td>4 years/ 31 Jan 2002</td>
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<tr>
<td>Nomination Pending:</td>
<td>Professor and Chair</td>
<td>Stanford University</td>
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<td>Dr. Elisabeth Paté-Cornell</td>
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**Standard 3.A.2: The board acts as a group; no member or committee acts in place of the board except by formal delegation of authority.**

The Graduate Education Review Board and Board of Advisors, acts as a group in overseeing the interests of the School. The Graduate Education Review Board delegates formally the responsibility of taking actions on issues and policies considered by it. There is a formal follow-up process of reporting back to the Graduate Education Review Board and Board of Advisors on actions and results taken on previous occasions.
**Standard 3.A.3:** The duties and responsibilities of the governing board are clearly defined in an official document. This document specifies the number of members, length of service, rotation policies, organization and committee structure, and frequency of meetings.

The duties and responsibilities of the Governing Board (Graduate Education Review Board and the Board of Advisors) have been defined. Pertinent documents include: OPNAVINST 5450.210A, OPNAVINST 1520.23A, and SECNAVINST 1524.2A. A copy of these instructions is available.

**Standard 3.A.4:** After appropriate consultation, the board selects and regularly evaluates the institution’s chief executive officer.

The Superintendent (Chief Executive Officer) is selected by the Chief of Naval Operations, for a term of approximately three years. This appointment is usually non-renewable. The Superintendent is formally evaluated annually through a hierarchical chain that includes the members of the Board.

**Standard 3.A.5:** The responsibilities of the Governing Board include securing financial resources to support adequately the institutional goals.

A major function of Graduate Education Review Board proceedings is to provide visibility to the Chief of Naval Operations that adequate resources have been provided to support the School’s mission/goals. By virtue of their positions of authority and control over budgetary matters, Graduate Education Review Board members directly influence the Navy’s financial decisions. In particular, the School is responsible directly to the Vice Chief of Operations, through a Director of Navy Training.

The Board of Advisors also is required to report annually to the Secretary of the Navy on, among other things, the financial well-being of the School. Copies of its reports can be found at in the WASC library.

**Standard 3.A.6:** The Board approves and ensures compliance with basic institutional policies, including personnel policies. It approves substantive changes in institutional purposes, policies, and programs.

Basic institutional policies, for example personnel policies, are covered by federal civil service regulations. The Board reviews and influences all major institutional changes, policies and programs.

**Standard 3.A.7:** The Board approves an academic and administrative structure or organization which serves institutional purposes. Implementation and administration of policies are the responsibility not of the Board, but of bodies within this structure.
The School’s general academic and administrative structure is approved by the Chief of Naval Operations with advice from the Board of Trustees (Graduate Education Review Board and the BOA). The mission and functions of the School are delineated in OPNAVINST 5450.210A.

The NPS Superintendent is charged with the implementation and administration of approved policies. Toward this end, the Superintendent approves the working organization of the School to ensure the effective functioning of academic and administrative sub-groups within that organization to meet institutional goals.

**Standard 3.A.8: The Board ensures that the number, type, and level of degrees offered are of a satisfactory quality and are consistent with institutional purposes.**

The Graduate Education Review Board ensures that the number, type and level of degrees offered adequately meet the needs of the Navy. The quality of the degrees is regularly assessed in the feedback loop based on the performance of graduates. Every 18-24 months, each program is reviewed by the appropriate curriculum sponsor/GERG member(s). A major consideration in this review concerns the quality of the education received and the subsequent performance of graduates in their assigned responsibilities.

The Board of Advisors independently assesses the quality of NPS educational programs in its annual report to the Secretary of the Navy.

**Standard 3.A.9: The Board reviews and approves the educational and facility plans and ensures that they are consistent with institutional purposes.**

Annually, the Superintendent presents a formal report to the Graduate Education Review Board and the Board of Advisors on the state of the School. This report includes educational and facility plans for the express purpose of soliciting approval and to ensure that they are consistent with institutional purposes. Furthermore, biennially the School must prepare a Program Objectives Memorandum (POM) which details the future years plans and requirements for review by the staff of the Chief of Naval Operations. These plans look ahead six years. There is also a regular military construction plan which places a priority on needed future construction for the next eight years or so.

**Standard 3.A.10: The Board approves both the long-range financial plan and the annual budget, and reviews the periodic fiscal audits.**

The Graduate Education Review Board, through appropriate staffing mechanisms, approves both the long-range financial plan (Six-Year Defense Plan) and the annual budget. Periodic fiscal audits are carried out through agencies of the Graduate
Education Review Board who report back their findings. Financial audit requirements and Management Control Audits far exceed those in place at most other academic institutions.

**Standard 3.A.11:** When an institution depends for its general support on an external agency — governmental or private — the external agency determines the amount of support it provides and may appropriately indicate in broad terms the categories for which support is provided and the amounts. The Board approves specific allocations by means of the budget. If subsequent developments necessitate reduction of the allocation, the Governing Board and the institution’s officers determine how and where the reductions are to be made.

The Graduate Education Review Board members are active members in the Department of Defense Program Objectives Memoranda (POM) process and in the budget allocation process. As such, the Graduate Education Review Board has oversight over the School’s allocations. In the event of subsequent reductions of allocations due to external causes, the Board, through its staff, works with the School’s officials to determine how and where reductions are to be made. The School is given wide latitude in establishing the priority of direction of available resources.

**Standard 3.A.12:** Board policy precludes participation of any of its members in actions involving possible conflict of interest. The Board has approved a policy regarding conflict of interest of administration, faculty, and staff.

Graduate Education Review Board members come under explicit Department of Defense and Secretary of the Navy policies regarding conflict of interest. In turn, the Graduate Education Review Board Chair, through the Chief of Naval Operations, has issued specific policy concerning potential conflict of interest of administration, faculty, and staff. Specific policies are covered in Department of Defense Directive 5500.7 "Standards of Conduct and Government Ethics" and in SECNAVINST 5370.2 (series) and NAVPGSCOL INST 5370.2 (series).

**Standard 3.A.13:** The Board is informed about and involved in the accrediting process.

The Graduate Education Review Board is explicitly advised about all phases of the accreditation process. Its members are actively involved in ensuring appropriate follow-up on the WASC Report. The status of accreditation is a regular part of the reporting process since the School is permitted by law to grant degrees only if accreditation is secured.

The Board of Advisors also makes specific comments/recommendations on the School’s accreditation.
Standard 3.A.14: In proprietary institutions, the Governing Board, in addition to demonstrating compliance with the other components of this standard, avoids compromises with the institution’s primary commitment to education (See also 9.C.4 and the Supporting Documentation Section, #11, page 85, for additional financial reporting requirements for proprietary institutions.)

This standard is not applicable, as the School is owned by the U.S. Government.

**Standard 3.B: Administration**

The administration is organized to serve institutional purposes effectively by providing educational leadership through an environment conducive to learning and high morale. The administration focuses all the resources of the Institution on accomplishment of its purposes, and fosters candid communication among the governing board, administrators, faculty, staff, and students.

The NPS Planning Board is the principal decision-making body for the School. The NPS Planning Board developed the NPS Strategic Plan and, as part of the continuing strategic planning process, monitors progress on the Strategic Initiatives. The NPS Planning Board also modifies and updates the Strategic Plan as the opportunities and threats facing the School change over time. The School functions under the highest standards of professional conduct and morale, as outlined in the Standards of Conduct NAVPGSCOLINST 5230.4A.

**Standard 3.B.1: The administration is organized and staffed to reflect institutional purposes, size, and complexity, and to provide economical and efficient management. Administrative organization roles and responsibilities are defined clearly. The chief executive officer’s full-time responsibility is to the institution.**

The CEO’s full-time responsibility is to NPS. The School is organized to meet the academic and support needs of the institution and is staffed to meet institutional purposes and provide efficient support within the available resources. Administrative roles are well defined.

**Standard 3.B.2: Administrators are qualified to provide effective educational leadership and management. Access is provided for professional development. The institution determines and implements specific ways to evaluate its administrators.**

NPS administrators are well qualified for the positions in which they serve. Opportunities for professional development are available.
Standard 3.B.3: The administration assures that resources are allocated to reflect institutional priorities.

Every effort is made to do so.

Standard 3.B.4: In multi-campus systems, division of responsibility and authority between the system office and the institution is clear: system policies and procedures are clearly defined and equitably administered.

This standard is not applicable to NPS.

Standard 3.C: Faculty

The role of faculty in institutional governance is both substantial and clearly defined.

The Faculty Council functions as the primary vehicle for input of faculty advice to the Superintendent and Provost. The Council’s membership includes representatives from the School’s administration, as well as representatives from each academic activity on campus. The faculty is organized into three elected representative bodies: the Faculty Council, the Faculty Executive Board, and Faculty Standing Committees. The Faculty Executive Board meets weekly; Faculty Council meetings are held monthly; and the Faculty as a whole meets twice a year. The guidance for the Council is outlined in The Academic Policy Council Manual (Feb 16, 1996).

Standard 3.C.1: The role of the faculty in various policy-making, planning, budgeting, and special purpose activities is clearly and publicly stated.

The Naval Postgraduate School Standard Organizations and Regulations Manual provides the roles and responsibilities of the various functional areas and committees of NPS, including the Faculty. This manual is available on the NPS internal home page.

Standard 3.C.2: Faculty have and exercise a substantial and independent voice in matters of educational program, faculty personnel, and other matters of institutional policy that relate to their areas of responsibility and expertise.

The Faculty Council and the Joint Governing Board assure that this standard is met.

Standard 3.D: Students

The role of students in institutional governance is clearly stated and publicized.
The Officer Student Advisory Committee represents the student body by reviewing student concerns and making recommendations to the NPS Superintendent. Officers are selected for this body based on the number of students in each curriculum. Meetings are held on a monthly basis. The Committee is comprised of an administrative committee and an ad hoc committee, and is governed by a Constitution and Bylaws (as amended May 21, 1991). The roles and responsibilities of the Officer Student Advisory Committee are listed in the NPS Standard Organization and Regulations Manual available on the NPS internal home page.

**Standard 3.D.1: A student governing body, if established, has well defined responsibilities and functions.**

The roles and responsibilities of the Officer Student Advisory Committee are listed in the NPS Standard Organization and Regulations Manual available on the NPS internal home page.

**Standard 3.D.2: The role of students in various governing, planning, budgeting, and policy-making bodies is made clear and public.**

The roles and responsibilities of the Officer Student Advisory Committee are listed in the NPS Standard Organization and Regulations Manual available on the NPS internal home page.

**Standard 3.D.3: Students are provided support to fulfill effectively their institutional responsibilities in governance.**

The President of the Officer Student Advisory Committee has regularly scheduled meetings with the Superintendent. The Curricular Offices also assure that students are provided with the necessary support. The Officer Student Advisory Committee has a representative on the Faculty Council.

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**STANDARD FOUR:**

**EDUCATIONAL PROGRAMS**

- 285 -
Standard 4.A: General Requirements

The achievement and maintenance of quality programs is the primary responsibility of every accredited institution; hence, the evaluation of educational programs and their continuous improvement is an ongoing responsibility. As it analyzes its goals and discovers how conditions and needs change, the institution continually redefines for itself the elements that will result in programs of high quality.

Standard 4.A.1: The institution demonstrates its commitment to high standards of teaching and scholarship. Adequate procedures and resources exist to evaluate and improve the quality of instruction.

Evaluation of quality of instruction is based heavily on Student Opinion Forms. Both teaching ability and scholarly activity are important considerations for tenure and/or promotion. Quality teaching is a necessary, but not sufficient, condition for tenure; and no successful candidate for tenure will have inadequate teaching evaluations. It is expected that all candidates for promotion or tenure will have at least adequate teaching and research and be very good at one or the other.


Study areas are available to students both in the various departments and at the library. Computing facilities are also provided.

Standard 4.A.3: The structure and goals of all educational programs (including special programs and courses as defined in 4.E below) are consistent with institutional purposes; they are developed, approved, administered, and periodically reviewed under established institutional policies and procedures through a clearly defined process.

All programs undergo multiple reviews to ensure that they are consistent with stated institutional purposes and adequately meet the needs of Navy Sponsors, who re-review their curricula on a biannual basis. Engineering programs are reviewed by the Accrediting Board for Engineering and Technology (ABET), and administrative sciences curricula are reviewed by the National Association of Schools of Public Affairs and Administration (NASPAA).

Standard 4.A.4: Degree programs have a coherent design and are characterized by continuity, sequential progression, and a synthesis of learning.

Degree programs have a coherent design and are characterized by continuity, sequential progression, and a synthesis of learning. (See the NPS Course Catalog).
Standard 4.A.5: In each field of study, degree objectives are clearly specified: the subject matter to be covered; the intellectual skills and learning methods to be acquired; the affective and creative capabilities to be developed; and, if relevant, the specific career-preparation practices to be mastered.

Underlying each degree are general educational goals — Educational Skills Requirements — developed jointly by NPS and the appropriate Navy Sponsor. These Educational Skill Requirements clearly define the above-noted requirements.

Standard 4.A.6: Efforts are undertaken to develop and implement ways to measure the educational effectiveness of programs.

The educational effectiveness of NPS programs is evaluated through biannual curriculum reviews, external accrediting agencies (ABET and NASPAA), and by department/group self-evaluation.

Standard 4.A.7: Whenever the institution admits groups of students with special needs (e.g., international students, disabled students, re-entry students) or identifies a group which may have unique needs (i.e., honor students), there are adequate academic support and enrichment services to meet the special needs of these students.

International students are supported by the International Office, which provides them with a full spectrum of support and social opportunities. International students are also required to take a course in U.S. history and English composition. When necessary, students have the opportunity to take review courses before beginning graduate work.

NPS offers a sequence of six-week courses specifically designed to provide a refresher on the subject matter pertinent to the curriculum to be studied. The number and types of courses which comprise this refresher series are developed by the Curricular Officer and Academic Associate for the students’ primary curriculum. The purpose of the technical refresher is to reacquaint students with technical material and, at the same time, help them build good study habits.

Standard 4.A.8: Courses and programs are planned both for optimal learning and accessible scheduling. Programs offered in concentrated or abbreviated time frames are designed to ensure that courses requiring development of analytical skills allow sufficient time to permit reflective analysis of the material. Where such instructional formats are employed, the institution is under a particular obligation to meet the expectations of 4.A.6 above.

Programs are designed to allow for review, when necessary, and are sequenced so that entering students can complete the program without significant scheduling problems. From the point of view of some students, insufficient time is allowed for thesis work, and indications are that less rather than more time is becoming standard. Programs that
previously allowed six thesis slots now allow only four, and some curricula have been approved with only a single thesis slot.

See also the response to 4.A.7 above, on refresher courses.

**Standard 4.A.9: Programs and courses are offered in a manner that ensures students the opportunity to complete the entire program as announced.**

Courses are scheduled such that all students can take their required courses in the correct sequence. Except for NS3252, which has multiple sections each quarter, students generally are not denied enrollment in a class because too many students are already in it.

**Standard 4.A.10: Each student is taught by a sufficient number of different faculty to ensure diversity of instruction and exposure to different viewpoints.**

The number of faculty serving each curriculum is sufficient to ensure diversity of instruction and exposure to different viewpoints.

**Standard 4.B: Undergraduate Programs**

*This standard is not applicable to NPS, which specializes in master’s level education while also granting some doctoral degrees.*

**Standard 4.C: Graduate Degrees**

**Standard 4.C.1: Programs of study at the master’s level are guided by well defined and appropriate educational objectives.**

Programs of study at the master’s level are organized around well-defined Educational Skill Requirements appropriate to the curriculum and, where applicable, guided by the appropriate accrediting agency (ABET or NASPAA). Master’s level programs at NPS are disciplinary and carry the M.S. designation.

**Standard 4.C.2: Doctoral programs of study are guided by well defined and appropriate educational objectives and differ from Master’s level programs by greater depth of study and increased demands on student intellectual or creative capacity.**

Doctoral programs are guided by well-defined and appropriate educational objectives and differ from Master’s level programs by greater depth of study and increased demands on student intellectual and creative capacity. Doctoral-level programs are research-oriented, designed to prepare students for scholarly careers, emphasize the discovery and dissemination of new knowledge, and lead to the Ph.D. degree.
Standard 4.C.3: Faculty and students in Ph.D. programs are actively involved in original research contributing to generalizable new knowledge. Such involvement is also present to a significant extent in disciplinary Master's degree programs.

Faculty and students in both Master’s level and Ph.D. programs are actively involved in original research. Publication of student dissertation/thesis research in appropriate refereed journals is also a significant factor for faculty tenure and promotion.

Standard 4.C.4: Admission to both Master’s and doctoral programs involves special screening, with higher eligibility requirements in the latter case. Admitted students have a baccalaureate degree and evidence of capacity for graduate work. Professional schools, while customarily requiring the baccalaureate degree for admission, may, in some fields, accept undergraduates with advanced standing. Exceptions are fully justified and documented.

All students admitted to Master’s programs are required to have a baccalaureate degree and must satisfy certain minimum criteria. Non-Navy student transcripts are examined to determine suitability, while Navy students must meet the appropriate Academic Profile Code, though the Academic Profile Code may not be the best measure of a potential student’s capacity for graduate work. Admission to Doctoral programs involves special screening and higher eligibility requirements.

Standard 4.C.5: Graduate programs are not offered unless resources are available beyond those expected for undergraduate programs. In the case of Doctoral programs, adequate provision is made for the significantly greater resources needed beyond those in the Master's level programs.

At NPS, the graduate degree is the primary degree, and adequate resources are available for all graduate programs.

Standard 4.C.6: The addition of Master’s and/or Doctoral programs does not impair the quality of undergraduate programs.

Master’s programs are the primary programs at NPS. The Doctoral programs do not impair the quality of Master’s programs.

Standard 4.C.7: Institutions offering graduate degrees have an appropriate staff of full-time faculty (as defined in 5.A.2 below) in areas appropriate to the degree offered. Such faculty are related by training and research to the subject fields in which they teach and supervise research. These full-time faculty are adequate in number and sufficiently diversified in discipline so as to provide effective teaching, advising and scholarly or creative activity; as well as to participate appropriately in curriculum development, policy making, institutional planning, and governance. Institutions offering Master’s degrees have a core of full-time faculty at the home campus or base facility. In the delivery of each off-campus
program, full-time faculty are involved, including providing physical presence and participating in instruction, in a manner determined by the institution. Institutions offering Doctoral degree programs have a core of full-time faculty at the home campus or base facility, and at each off-campus location where Doctoral programs are offered. Given the faculty responsibilities described above, even small graduate programs ordinarily demand the participation of several full-time faculty. In the case of institutions offering more than one Master’s or Doctoral degree program, individual programs leading to the Master’s or Doctoral degrees are staffed by a core of full-time faculty as well.

Each NPS program has an adequate number of full-time faculty whose training and research is in the field in which they teach and supervise research.

Overall, NPS has approximately 225 tenure-track faculty, 140 non-tenure-track faculty, and 50 military instructors. Approximately 99 percent of the tenure-track faculty hold the Ph.D. (or other terminal degree).

Standard 4.C.8: Graduate programs are staffed with highly qualified faculty whose education, experience, and competence are appropriate to the type of degree offered. Research-oriented graduate programs have a preponderance of active research scholars on their faculties. They provide readily available faculty role models who are experienced and active researchers contributing to the generation of new knowledge. Professionally-oriented programs include on the faculty readily available faculty role models who are experienced professionals contributing to the development of the field. Programs which emphasize both research and professional training provide readily available faculty role models of both types as identified above. Faculty also model the integration of research and practice.

Each NPS program has an adequate number of highly qualified, full-time faculty whose training and research is in the field in which they teach and supervise research. All faculty are encouraged to obtain reimbursable research and to publish the results of their research in appropriate refereed journals.

Faculty are recognized as role models in numerous ways, including through special research recognition and separate teaching recognition events. A limited number of faculty are selected as distinguished faculty. Special recognition is also made at graduation of outstanding teaching and research faculty. NPS makes a special effort to publicize within its community, and more broadly where appropriate, any special faculty recognitions. The campus newspaper and the Research Office newsletter are two vehicles often used for such publicity. Select articles in the former are re-marketed outside the School.

Standard 4.C.9: Graduate programs provide carefully designed and sensitively monitored curricula and educational experiences appropriate to the level and
orientation of the degree. Research-oriented programs, whether at the Master’s or Doctoral level, have a curriculum which enables both the scholarly mastery of a field of learning and a sequential development of research skills. Library, computing and other learning resources necessary to support the extensive and in-depth research activities of faculty and students are provided. Research training and activity bear a clear and necessary relationship to the theoretical and other conceptual aspects of the Doctoral program. Professionally oriented programs have curricula which build upon the foundation of basic theory and/or science appropriate to that profession, prepare students to be critical consumers of the research relevant to the profession, and provide for the sequential development of professional skills. These programs have the resources to support both the learning of the scholarly foundations of the discipline and the extensive professional training of students. Field study, training programs, and other practica bear a clear and necessary relationship to the theoretical and other conceptual aspects of the Doctoral program. Programs emphasizing both research and professional training define their relative stress on research or professional training, and provide the resources and curricula to achieve their dual objectives. Faculty evaluation of student learning focuses proportionately on the research and professional emphases as defined by the program.

Graduate programs at both the Master’s and Doctoral level enable the scholarly mastery of a field of learning via carefully designed sequences of courses. At the Master’s level, the development of research skills is restrained by limited time that can be devoted by the student solely to research. Library, computing, and other learning resources necessary to support the extensive and in-depth research activities of faculty and students are provided.

**Standard 4.C.10:** Research and professional training experiences are fully integrated into the educational program, both conceptually and by virtue of faculty coordination of these activities.

Research experiences are fully integrated into the educational program.

**Standard 4.C.11:** Course requirements call for heavy use of primary sources, current periodicals, and other literature appropriate to the research and professional education objectives of the program.

Appropriate use is made of primary sources, current periodicals, and other literature as required in each program.

**Standard 4.C.12:** Doctoral dissertations require a substantial depth of understanding in a major field or professional area, a sophistication of concept, and an illumination of the essential nature of the field of knowledge.
Doctoral dissertations at NPS require a substantial and sophisticated depth of understanding in a major field of knowledge. (See listings of and full texts of student theses available in the Library).

**Standard 4.C.13:** Institutions that offer graduate degrees but are not part of a general college or university (sometimes called free-standing institutions) demonstrate strategies and mechanisms, such as external advisory boards or periodic external reviews, for providing the enrichment, check and balances, and quality deemed necessary in a general college or university.

Programs of study at the Master’s level are guided by the appropriate Educational Skill Requirements and, where applicable, the appropriate accrediting agency (ABET or NASPAA). For a summary of the many reviewing bodies, see 4.A.3 above.

**Standard 4.D: Research**

Research and scholarship are present in the work of faculty and students at all institutions and are particularly evident in institutions granting graduate degrees; research, scholarship and instruction are integrated and regarded as mutually supportive.

The Naval Postgraduate School was established to serve the advanced educational and research needs of the Navy. The critical role of research in the NPS graduate education process is clearly presented in the School’s mission statement, to:

"Increase the combat effectiveness of U.S. and allied armed forces and enhance the security of the United States through advanced education and research programs focused on the technical, analytical and managerial tools needed to confront defense related challenges of the future."

Research at NPS remains an integral part of its faculty’s professional activity and continues to serve to maintain the currency that is crucial to graduate-level education. Research not only challenges students with creative problem-solving experiences, it also maintains upper division course content and programs at the cutting edge, attracts and retains quality faculty, advances Department of the Navy/Department of Defense technology, and solves warfare problems.

The importance of thesis research to a students’ overall graduate education at NPS cannot be overemphasized. Almost all thesis topics derive from faculty research projects. The thesis allows students the opportunity to work on realistic, meaningful problems where rigid rules cannot be routinely applied. This capability is especially important at the present time when technology in general, and information operations in particular, are rapidly changing. Our students must be able to think innovatively and
have the knowledge and skills that will let them apply technologies that are being rapidly developed in both the commercial and military sectors.

The School’s research program provides militarily relevant thesis topics that address issues from the current needs of the Fleet and Joint Forces to the science and technology required to sustain the long-term superiority of the Navy/DoD. Our students, having come to NPS after active duty, and have a unique knowledge of the environment to which they will return after graduation. This, coupled with a challenging thesis project which requires them to apply their focused graduate education, is one of the most effective methods for solving problems in their work environment and instilling the life-long capability for applying basic principles to the creative solution of complex problems.

NPS faculty undertake a wide range of research, from the most basic to that which applies directly to DoN/DoD needs. Because of the School’s unique relationship to DoN/DoD and the natural interest of our students, research tends to lean towards the applied end of the spectrum. A small, but growing percentage of NPS research is classified. All tenure-track faculty are expected to be active in both instruction and research. NPS has a policy that not more than half of a permanent faculty member’s academic session (of 10 months) can be spent on research. On average on a yearly basis, 42 percent of tenure-track faculty time is spent on research.

Non tenure-track faculty are also an important part of the NPS research program, as are post-doctoral fellows. Nineteen active chair professorships bring faculty to the School who have special expertise needed for program enhancement. The majority of these chair professorships are sponsored by an outside agency, with the only cost to NPS being office space and administrative support. NPS participates in post-doctoral programs sponsored by the National Research Council and the American Society for Engineering Education. Approximately ten post-doctoral associates are in residence each year.

In 1990, a Dean of Research position was re-established at NPS. This position has evolved over the past eight years from the principal administrative officer supporting the School’s research program to the focal point for research policy, its integration into NPS mission and curricula, and the catalyst for establishing research relationships with other organizations. Today, the internal focus for the Associate Provost and Dean of Research is coordinating an overall NPS Research Plan. Externally, the Associate Provost and Dean of Research is establishing relationships for collaborative and sponsored programs. The Dean relies on a Research Board, consisting of representatives from each academic department and group and a faculty council representative, to keep him apprised of the research environments within the respective departments and to advise him on research policy. Internal management of the research processes — i.e.,
proposal processing, budgets, supporting services — are delegated to an Assistant Dean of Research.

In 1995, the Office of General Counsel also transferred a billet for an attorney to NPS. This position handles intellectual property issues and patents, and reviews Cooperative Research and Development Agreements. In addition, a position for Director of Technology Transfer was established, but has since been dissolved. Because Cooperative Research and Development Agreements are less than one percent of the School’s Sponsored Research Program, and the number of patents with commercial potential which require marketing is still very small, it was decided that the work could be absorbed by other personnel in the Research Office.

The ratio between sponsored and institutionally supported research has changed dramatically over the past several years. In FY1997, approximately 80% of NPS’ Research Program was externally sponsored. Sponsorship is primarily from DoD, but also includes the National Science Foundation, other government agencies, industry, and other universities. The NPS Institutionally Funded Research Program, formerly the Direct Funded Research Program, has been completely revamped. This program provides initial support to new faculty to establish a research program, provides support for major new interdisciplinary initiatives, enhances productive research that is reimbursably sponsored, contributes to the recapitalization of major scientific research equipment, and cost-shares the support of a strong post-doctoral program. The allocation process for NPS Institutionally Funded Research funding is driven by requirements, quality and realizing the maximum return on investment. NPS Institutionally Funded Research funding is limited, however, and the priorities for investment are disclosed each year in an Investment Strategy provided by the Dean of Research after in-depth discussions with the Research Board.

The Department/Group Chair reviews all research proposals. The Division Dean also reviews proposals for NPS Institutionally Funded Research funding. The Dean of Research has final approval of proposals submitted for sponsored research or NPS Institutionally Funded Research funding. This review and approval process assures that the work proposed is suitable for the investigator, the department/group, and falls within the School’s overall Research Plan. Proposals submitted for sponsored research are reviewed by the external sponsor. Funding of the proposed work signifies approval. Several processes have been tested to evaluate the NPS Institutionally Funded Research proposals. Initially, the proposals were sent outside the School for evaluation. As the program has evolved and the overall size diminished, the evaluation process is now being done internally.

A final report is required for all approved NPS Institutionally Funded Research projects. This report summarizes the work accomplished, the deliverables (publications, thesis), student involvement, etc. The Research Board then evaluates the merits of the
work. This review aids the Dean of Research in directing the NPS Institutionally Funded Research Program and assures that the investment is yielding quality research.

A major assessment of results by the School’s research program is the publication record of its faculty. This is also a key element used by both Chairs and Deans in assessing scholarly productivity. Some applied research does not lend itself to open literature publication. In such cases, research quality is measured by the extent to which the results of the research are used outside the School. Other crucial tests of the School’s quality research program are its uniqueness and creativity of work.

**Current Research Issues**

The greatest strength of the NPS Research Program, which has more than doubled over the past ten years, continues to be the dedication of its faculty. Still, the advent of Direct Funded Research brought with it many hurdles which had to be overcome, the most severe probably being the estrangement of NPS faculty from their reimbursable sponsors. Those ties have now been reinstated. The Dean of Research is also vigorously pursuing collaborative research that involves faculty across disciplines and is directed at current warfighter needs. The sponsored program is healthy and growing, and the institutionally funded program is being fine-tuned to achieve maximum benefits.

With the decline in budgets resulting in a reduction in School-supported support staff, NPS reinstated indirect costs on sponsored research in 1994. Whereas indirect costs are "the cost of doing research" at an academic institution, NPS faculty investigators were concerned about the additional funding they would have to "bring in" to cover their research along with this added cost, and with their being able to stay cost competitive in the research arena.

The implementation of indirect costs as well as current oversight is handled by the Dean of Research. NPS does not fall under the provisions of OMB Circular A-21. Rather, the authority to collect indirect costs and the basis for that collection is contained in the NAVCOMPT Manual. NPS’ indirect cost rate is relatively low — 23% — but the burden on salary is higher than average, at 43%. Indirect costs are assessed against direct labor only, and NPS proposals, due to the lack of graduate students, carry a high level of faculty salary. Faculty are concerned that they will price themselves out of the competition. This additional cost for doing research has also come at a time when there have been declining internal resources available for research equipment recapitalization. The Dean of Research is addressing both these concerns by keeping the faculty involved in the indirect cost process, as well as by utilizing NPS Institutionally Funded Research funds to recapitalize research laboratory equipment.

**Standard 4.D.1:** Scholarship, research productivity, and service to the academic or professional communities are among criteria used for evaluating faculty for appointment, promotion, and tenure. In Ph.D.-granting institutions, these criteria...
take cognizance of the extent to which each faculty member’s productivity and service are recognized by peers outside the institution.

These are essential criteria used by the NPS promotion council. NPS also believes strongly in the importance of teaching skills for its tenure-track faculty. Other criteria also are considered in the promotion and tenure process. (See also the Marto report and the Powers report).

**Standard 4.D.2: Physical and administrative resources together with academic services are adequate to support the institution’s research commitment.**

NPS has sufficient physical and support resources to conduct the research to which it is committed.

**Standard 4.D.3: The institution has established policies specifically addressing such matters as classified research, the use of human and animal subjects, patent provisions, cooperative research relations with industry, and other similar issues related to the integrity and independence of the research enterprise. Institutions that support applied research having the potential for producing significant revenue have clear policies on how faculty responsible for such research share revenue from patents, licenses, and sales. Institutions supporting entrepreneurial activity of faculty or institutionally sponsored research parks have clear policies covering the involvement of faculty in such ventures, the protection of basic research, and the publication of research results.**

NPS has clear procedures in place for classified research. The ability to conduct classified research is a strength of NPS. The Library has a large collection of classified materials and, of course, all students who require them (nearly all) have security clearances.

Research on human or animal subjects is a minor or non-existent issue at NPS.

Since the last WASC visit, NPS has ventured into Cooperative Research and Development Agreements with private industry, and has strengthened its position with respect to intellectual property rights, patents, etc. For more detail, see the response to 4D, Research, above.

**Standard 4.D.4: Research policies and practices are developed and administered cooperatively by faculty and administration. These policies are clearly communicated throughout the institution.**

The Dean of Research relies heavily on a Research Advisory Board composed of faculty to establish research policy.

This Sub-Standard is not applicable to NPS. Research on animal, as well as on human, subjects is a minor or non-existent issue at the School.

Standard 4.D.6: The computing and data communication services adequately ensure security and privacy of data developed by faculty and students. (See 6.F.5.)

Adequate safeguards exist at NPS.

**Standard 4.E: Special Programs and Courses for Credit**

All off-campus and other special programs providing academic credit are integral parts of the institution and maintain the same academic standards as regular campus programs. Their functions, goals and objectives are consonant with those of the institution and lead to academic accomplishments at least equal to those attained by traditional practices. The institution maintains direct quality and fiscal control on all aspects of all programs, and provides adequate resources to maintain this quality. The institution follows the Commission’s special requirements for institutional reporting. The provisions of this Standard apply to 1) all off-campus programs and courses for credit, including those at centers or satellite sites, certificate programs, external degree programs, and military base programs; 2) courses taught exclusively by special delivery systems, such as computerized learning, newspaper, correspondence, television, video or audio tape, both on and off campus; 3) all practices providing credit for prior experiential learning; and 4) all travel/study and study abroad programs.

Standard 4.E.1: The institution is solely responsible for the academic and fiscal elements of all instructional programs and courses which bear the institution’s name. The institution conforms to the policy on Contracts With Unaccredited Organizations.

NPS is solely responsible for the academic and fiscal elements of all the instructional programs and courses that bear its name. The School conforms to the policy on Contracts With Unaccredited Organizations.

Standard 4.E.2: All programs and courses taught by special delivery systems provide appropriate time for students to question and discuss academic concepts with faculty, and ready access to appropriate learning resources. Full-
time faculty are involved in the planning, delivery and evaluation of these programs.

The School’s distance learning programs provide appropriate time for students to question and discuss academic concepts with faculty, but ready access to appropriate learning resources such as a library must be provided by the distant location. Full-time faculty are involved in the planning, delivery and evaluation of NPS’ distance learning programs.

**Standard 4.E.3:** Credit for prior experiential learning is offered only at the undergraduate level and in accordance with the policy on Credit for Prior Experiential Learning.

NPS master’s and doctoral programs offer no credit for prior experiential learning, in accordance with these guidelines.

**Standard 4.E.4:** Travel/study courses meet the same academic standards, award similar credit, and are subject to the same institutional control as other courses and programs offered by the sponsoring or participating institution.

This Standard is not applicable to NPS.

**Standard 4.E.5:** Credit for travel/study courses is limited to a maximum of one semester unit of credit per week of full-time travel/study with one additional unit of credit for additional readings, papers, and class meetings required before or after the course (or the equivalent in quarter system units). Credit is not awarded for travel alone.

This Standard is not applicable to NPS.

**Standard 4.E.6:** Programs of study abroad are available to students carefully selected for their ability and interest, and operate consistent with the policy on Study Abroad.

This Standard is not applicable to NPS.

**Standard 4.F: Academic Planning**

> Academic planning is designed to achieve the aims of the institution and provides the rationale for the projected use of both currently available and future human, financial and physical resources. This systematic planning is based on continuing institutional self-evaluation and assessment of the needs of the institution’s constituencies. All appropriate segments of the institution are involved in planning.
Planning occurs on several levels and in different dimensions at NPS. A complete discussion would involve, at least, discussions of long-range and short range plans, internal and external influences, financial plans, facilities planning, human resources planning, and planning for academic programs (curricula, research), and perhaps more. No one individual or office has complete control over any of these aspects of planning. There are many who influence the future of NPS and the directions it will take. NPS is clearly influenced by planning at the national level with respect to budgets and the size and role of the military. Within the Navy, emphasis on graduate education can increase or decrease depending on many factors. The funding available for education ultimately depends on the competing budgetary demands and the forcefulness or persuasiveness of its advocates.

External planning affects NPS budgets, the officer pool of potential students, and the technologies that will be important in NPS’ curricula. These trends and changes are observed by NPS and influenced, where possible, in an attempt to assure that the Navy maintains a strong institution capable of meeting the Navy’s future needs for graduate education. NPS influences these exogenous factors in a myriad of ways, including through official positions and statements, and through informal activities of its faculty and administrators as they deal with the Navy’s leadership.

Within the School, the issues are:

1. Strategic planning (vision, goals, future directions, customers, programs, resources, etc.)
2. Budget planning, primarily for the current and next year
3. Long range faculty planning (size and distribution of the tenure-track faculty)
4. Planning for the size and distribution of the staff
5. Facilities planning

Each of these issues will is discussed briefly below:

1. Strategic planning is an imperfect, on-going process involving all levels of the School. There is a substantial top-down influence; but each Superintendent, Provost, Dean, or other administrator brings a different and useful perspective to the process. Faculty, staff, and students are encouraged to participate in strategic planning, but the process could be improved to draw additional input from those groups.
2. Mission budget planning is managed by the Provost through the Academic Planning Office. The primary vehicle for this planning is a weekly Mission Budget Meeting involving the Provost, Director of Academic Planning, Associate Provost for Planning, the Division Deans, and the Dean of Research. Other
managers are involved when the discussion is relevant to and of interest to them. For example, discussion of staff issues will involve additional participants.

3. Long range faculty (and staff) plans are summarized in the Mission Long Range Labor Plan. This document is discussed more fully in the Task Group report for Strategic Initiatives #5 and #6. The Mission Long Range Labor Plan was developed by the Academic Planning Office through discussions in the Mission Budget Meeting. Faculty long-range planning is also done by the Department Chairs and Division Deans, with support from the Academic Planning Office. Planning issues include the availability and distribution of experienced faculty, numbers and distribution of tenure-track and non-tenure-track faculty by department, compensation issues, retirement trends, etc.

4. Staff planning is focused on the numbers and distribution of permanent staff. NPS has made a concerted effort to reduce the numbers of permanent staff to be consistent with the budget available. Many staff are paid with "soft-money" (reimbursable funds). These funds are generally stable, but the goal is that only staff whose primary support is from direct funds be in permanent positions. The Mission Long Range Labor Plan summarizes staff long range history and plans.

5. Facilities planning at NPS has gone through significant changes in the last few years. The major disruption came with the creation of the Naval Support Activity, Monterey Bay. This separate command, reporting to the Superintendent, was created in response to Base Realignment and Closure activities in the early 1990s. With the closure of Fort Ord, NPS became the custodian of that base and also responsible for the maintenance of the Presidio of Monterey. Naval Support Activity, Monterey Bay has responsibility for the maintenance of the NPS facilities. NPS has established the Director of Academic Planning as its point of contact for interaction with Naval Support Activity, Monterey Bay. The Director of Academic Planning and his staff (a Facilities Management Specialist) screen and prioritize all work requests from the "mission" departments to Naval Support Activity, Monterey Bay. The Director of Academic Planning and his staff, in cooperation with the Provost, Division Deans, Department Chairs, and Laboratory Managers also plan for required facilities upgrades to be submitted to Naval Support Activity, Monterey Bay.

Standard 4.F.1: The institution has a clearly specified and implemented academic planning process that culminates in written statements that are regularly updated. These written statements are well publicized to the appropriate constituencies.

The budget planning documents for the "out years" are regularly updated and available as appropriate. All planning information in the Academic Planning office is available on request, including the current year budgets and plans for the coming year. Budget information is distributed in the weekly budget meetings, and more widely distributed as appropriate. The Mission Long Range Labor Plan is distributed whenever changed.
The facilities planning process is evolving. Plans for FY99 will be distributed when finalized. Longer range plans are still being developed to adjust to the new relationship with Naval Support Activity, Monterey Bay.

**Standard 4.F.2:** The relationship between institutional purposes and institutional programs is clear, and is reflected in long-range planning for both on- and off-campus instruction.

The mission of NPS is clear, and our programs and plans are clearly consistent with the mission.

**Standard 4.F.3:** Responsibility for design approval, and implementation of the curriculum is vested in designated bodies with clearly established channels of communication and control. The faculty has the major role in design and implementation of the curriculum.

Many people can be involved in the emergence of curricula, but control over their establishment and content is vested in the Academic Council, a body controlled by the faculty.

**Standard 4.F.4:** Human, financial, and physical resources are allocated on the basis of academic program needs and objectives, and are consistent with the academic plans. Resource planning takes into account a realistic assessment of institutional resources and stated goals. (See 2.B.5.)

The primary body involved in the allocation of mission resources is the Mission Budget Group (see standard 4F above). These individuals are the advocates for academic programs.

**Standard 4.F.5:** The institution engages in periodic review of program and departmental quality under clearly specified and demonstrably implemented procedures. This process is based on current qualitative and quantitative data which attempt to assess strengths and weaknesses in achieving program purposes and projected outcomes.

Program quality is regularly reviewed in the biannual "curriculum reviews" following establish procedures. The quality of the academic departments is reviewed in a variety of ways, including accreditation reviews by ABET and NASPAA and by occasional peer reviews conducted at the request of the Department Chairs, Deans, or Provost.

**Standard 4.F.6:** Curriculum assessment and planning take into account the role of information technology and the use of computing resources. (See 6.F.)
NPS strives to be a leader in the use of information technology and computing resources. These issues are an integral part of every discussion of curriculum assessment and planning.

**Standard 4.F.7: Policies and procedures for additions and deletions of programs or courses are carefully developed and administered, and are consistent with the resources of the institution, the capabilities of faculty, and the needs of students.**

The addition or deletion of curricula is carefully controlled by a process that involves all levels of the institution and external constituents as well. The addition or deletion of courses is controlled by the Academic Council, with preliminary review by the Division Deans.

**Standard 4.G: Non-Credit Courses and Programs**

*Non-credit courses and programs are consistent with the educational purposes of the institution. These courses are characterized by careful planning and high standards of instruction by qualified faculty.*

**Standard 4.G.1: Non-credit courses are administered under appropriate institutional policies and procedures. Campus administrators and faculty are involved in planning, administering and evaluating non-credit courses.**

Non-credit courses are planned by faculty essentially independent of campus administrators. Evaluation of non-credit courses is not uniform.

**Standard 4.G.2: The institution maintains records that describe the nature, level, and quantity of service provided through non-credit instruction.**

NPS maintains such records (refresher courses primarily).

**Standard 4.G.3: Institutions using the Continuing Education Unit for purposes of recognizing and recording participation in non-credit courses follow the national standards and guidelines established for measurement (one Continuing Education Unit being equivalent to 10 hours of instruction appropriate to the objectives of the course).**

Participation in non-credit courses is recognized by the award of Continuing Education Units. NPS follows the national standards and guidelines established for measurement of Continuing Education Units.

**Standard 4.G.4: Institutions do not enter into contracts wherein instruction is provided by unaccredited agencies. Institutions maintain full responsibility for the content and quality of the instructional program, the selection of faculty, and**
the collection and disbursement of funds. (See policy on Contracts With Unaccredited Organizations).

NPS does not enter into contracts wherein instruction is provided by unaccredited agencies, and maintains full responsibility for the content and quality of its instructional program, the selection of its faculty, and the collection and disbursement of its funds.

**Standard 4.H: Admissions and Retention**

*Established admission and retention standards ensure that student qualifications and expectations are compatible with institutional objectives. Admission and retention policies apply equally to students in regular and special degree programs.*

**Standard 4.H.1: Standards for admission at each level, including provisions for exceptional cases, are based upon norms of expectation generally recognized in higher education, and are consistent with the institution’s educational purposes.**

Admission to NPS requires an earned baccalaureate degree. In addition, entering students must satisfy certain minimum criteria. Non-Navy student transcripts are examined to determine suitability, while Navy students must meet the appropriate Academic Profile Code, although the Academic Profile Code is not the best measure of a student’s potential capacity for graduate work. In addition, admission to Doctoral programs involves special screening and higher eligibility requirements.

**Standard 4.H.2: Admission and retention policies and procedures are clear, available to all students, and carefully observed by the institution. Particular attention is paid to the application of sound admission and retention policies for athletes, international students, and other cases where unusual pressures may be anticipated.**

Admission and retention policies and procedures at NPS are clear, available to all students, and are carefully observed. The same high standards for admission that apply to officer students apply also to international students.

**Standard 4.H.3: Within the parameters defined by its mission, the institution actively seeks diversity in its student body.**

Diversity of the NPS student body is limited by the diversity in the pool of eligible students — DoD personnel and officers of foreign allied nations.

**Standard 4.H.4: Transfer credit is accepted from accredited institutions or from other institutions under procedures that provide adequate safeguards to ensure academic quality and relevance to the student’s program. Implementation of**
transfer credit policies is consistent with 4.B.8 as well as the policy on Transfer and Award of Academic Credit.

Applications for transfer credit are carefully reviewed by NPS. If necessary, a faculty member will interview the student to determine if previous coursework meets NPS requirements.

**Standard 4.H.5:** Credit for prior experiential learning is awarded only in conformity with 4.E.3 and the policy on Credit for Prior Experiential Learning.

Credit for prior experiential learning is not awarded at NPS.

**Standard 4.H.6:** Non-degree credit is not accepted toward a degree, whether upon transfer or otherwise.

Non-degree credit is not accepted towards a degree at NPS, either upon transfer or in any other case.

**Standard 4.H.7:** The institution specifies and publishes requirements for continuation in or termination from its academic programs, and maintains an appellate process. The policy for readmission of students who are disqualified for academic reasons is clearly defined.

NPS states clearly the requirements for continuation in its academic programs. Students who are disenrolled are not readmitted.

**Standard 4.H.8:** Periodic analyses of retention data and graduation rates are undertaken to validate admissions criteria and academic standards. To avoid grade inflation, studies of grading are also made.

NPS performs periodic analyses of retention data and graduation rates to validate its admission criteria and academic standards. However, it is not clear that grade inflation has been avoided.

**Standard 4.H.9:** When an institution recruits and enrolls international students, the institution has clearly defined admissions policies attentive to their special needs and interests. The institution complies with 7.A.8 and the policy on International Students.

NPS has clearly defined admissions policies attentive to the special needs and interests of its international students. The institution complies with 7.A.8 and the policy on International Students.

**Standard 4.H.10:** Graduation requirements are clearly stated in appropriate publications and are consistently applied in the degree certification process.
At NPS, graduation requirements are clearly stated in published form and are applied uniformly throughout the degree certification process.

**Standard 4.I: Academic Credit and Records**

*Evaluation of student learning or achievement, and the award of credit are based upon clearly stated and distinguishable criteria. Academic records are accurate, secure, comprehensive, and comprehensible.*

**Standard 4.I.1: Criteria used for evaluating student performance and achievement, including those for theses and dissertations, are appropriate to the degree level, clearly stated, and implemented.**

At NPS, the criteria used to evaluate student performance and achievement, both in coursework and theses, are appropriate to either the Master’s or Doctoral degree level, are clearly stated, and evenly implemented.

**Standard 4.I.2: Criteria for offering independent study clearly delineate expectations and responsibilities of students, faculty and site supervisors.**

This is not an issue at NPS. "Independent study," if any, consists of reading courses under the supervision of a faculty member.

**Standard 4.I.3: Evaluation of student performance and achievement differentiates among levels of quality and among attainments. Where lower and more advanced degree programs are offered in the same field of study, clear differences in levels of expectation and requirements are articulated.**

Requirements for different degree programs are clearly defined.

**Standard 4.I.4: Credit is defined and awarded consonant with the Glossary definition. When credit is measured by outcomes alone or other nontraditional means, student learning and achievement are demonstrated to be at least comparable in breadth, depth and quality to the results of traditional procedures.**

NPS instruction is monitored to assure that quality instruction is offered. Control is primarily at the department level. There is little "non-traditional" instruction.

**Standard 4.I.5: Clear and well-publicized distinctions are made between degree and non-degree credit. Institutional publications and oral representations explicitly indicate if credit will not be recognized toward the degree. Student transcripts clearly note when any credit awarded is non-degree credit.**

This is not an issue at NPS.
Standard 4.I.6: Credit awarded for prior experiential learning experience is in compliance with 4.E.3 and the policy on Credit or Prior Experiential Learning. Courses or subjects for which credit for prior experiential learning is given are clearly indicated as such on the student’s record and transcripts, and the institution is prepared, on request by another institution or agency, to furnish full documentation showing what learning was evaluated and the basis on which credit was awarded.

NPS reviews all requests for prior credit by incoming or current students. When required, a faculty member will interview the student to determine if prior credit should be given. NPS is prepared to furnish all required information to other institutions when required to validate their inquiries regarding prior credit.

Standard 4.I.7: If study abroad is offered, the institution follows the policy on Study Abroad.

This sub-standard is not applicable to NPS.

Standard 4.I.8: The institution makes provision for the security of student records of admission and progress. Student records, including transcripts, are private, accurate, complete and permanent. They are protected by fireproof and otherwise safe storage and backed by duplicate files. Data and records maintained in computing systems have adequate security and provision for recovery from disasters.

NPS makes provision for the security of student records of admission and progress. All student records, including transcripts, are private, accurate, complete and permanent. They are protected by fireproof and otherwise safe storage and backed by duplicate files. Data and records maintained in computing systems have adequate security and provision for recovery from disasters.

Standard 4.I.9: If an institution closes, provision is made for the future security and accessibility of academic records.

This is not an issue. However, if NPS were to close, appropriate provisions would be made.

**Standard 4.J: Public Service**

Public service, when offered, is consistent with the educational purposes of the institution.

Standard 4.J.1: Public service is designed in relation to the needs of the constituency and the available resources of the institution.
NPS seeks to interact positively with the local community and the broader constituency. As a Navy institution, the School stands ready to serve the Navy/DoD and the nation in any practical way. Community involvement includes a variety of public events, concerts, Discovery Day (a day of hands-on science learning and demonstrations for local children), etc. The School encourages its faculty, staff and students to contribute to the community.

**Standard 4.J.2: Faculty are encouraged to provide professional expertise as a service to the public.**

Faculty are so encouraged.

**Standard 4.J.3: Institutions collaborate, as appropriate, with neighboring elementary and secondary schools, community colleges, and other institutions to improve education at all levels.**

There are numerous examples of programs in which faculty, staff and students tutor in the local public schools, provide special enrichment programs, or invite community youth to NPS for special programs such as Discovery Day.

**Standard 4.J.4: If the institution includes public service as a goal, it has a long-range plan for public service and clear-cut administrative assignment of responsibility.**

This Standard is not applicable to NPS.

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**STANDARD FIVE:**

**FACULTY AND STAFF**

**Standard 5.A: Faculty Role in Academic Programs**

The faculty exercises central responsibility for the academic programs, quality, and character of the institution. The faculty is adequate in size and qualifications to meet its obligations.
The Academic Council, headed by the Provost and consisting of representatives from all NPS academic departments and groups, establishes, monitors, reviews, certifies and advises on policies and procedures that will ensure high and consistent academic standards of graduate education throughout NPS. The NPS Academic Council Policy Manual authorizes and spells out these responsibilities.

The faculty, through Academic Associates and their curriculum committees, takes a leadership role in developing each curriculum’s list of Educational Skill Requirements.

Of all courses taught in the most recent fiscal year, 1,022 were taught by civilian and 74 by military faculty. Military and other non-tenured or part-time faculty are well integrated into the School’s programs. The mix of these different faculty members assures both academic quality and military relevance of the School’s course offerings.

The School has been undergoing a planned reduction in its tenured faculty to correspond with a concomitant reduction in its student body following the end of the Cold War. From a peak of 275 in FY91, when the on-board student count was 1,867, the number of tenured faculty has come down to 222 today and is expected to reach 195 in FY01, when the student count is estimated to be around 1,300. Together with adjunct and research faculty, these numbers have worked well to ensure that the School fulfills its academic mission.

Almost all faculty have Ph.D. degrees from highly regarded schools, and their discipline diversity well meets the needs of the School’s diverse curricula.

Together with the Academic Council Policy Manual, the Faculty Handbook spells out details of faculty governance and assures academic freedom in faculty teaching and research. A Faculty Organization, supported by a Faculty Council that meets monthly, monitors the fulfillment of terms of employment and helps safeguard academic freedom. The Faculty Organization has a standing three-member Professional Practices Committee that has specific responsibility for dealing with complaints in any of these areas.

Courses offered off-campus, for example at the United States Naval Academy, have faculty direction of quality comparable with on-campus course offerings.

**Standard 5.B: Faculty Selection and Evaluation**

*Explicit and equitable faculty personnel policies and procedures are published, accessible, and implemented.*

The School has a Human Resources Office that monitors and promotes diversity in hiring and promotions, for both faculty and staff, in accordance with federal
government regulations and in compliance with federal laws. A Staff Handbook and a Faculty Handbook that include NPS policies on diversity are readily available and are provided to new employees during their orientation to the School. These references detail criteria for employment, retention, evaluation, advancement, and termination within a system governed by due process. Assurance of Equal Employment Opportunity is no less a concern for faculty than it is for staff. Workload requirements are made clear in policies that specify limits on outside work activities.

Most departments have a mentoring system that assists junior faculty in meeting requirements for retention and advancement. Teaching effectiveness as well as research productivity are important among these requirements. All departments conduct and maintain secure records of systematic reviews of faculty performance.

**Standard 5.C: Faculty Welfare and Development**

*The institution provides an environment favorable to faculty activity and development, and the faculty continue to be professionally active.*

The School requires eleven contact hours from each non-administrative faculty member per academic quarter in a breakdown that generally provides for eight hours of teaching split between two four-unit courses, with the remaining three hours accounted for by thesis supervision and administrative assignments or responsibilities.

A typical faculty member teaches two quarters per year, with one or two quarters devoted to research. Support for research comes generally from one of two sources: internal (so-called Directly Funded Research) or external (referred to as Reimbursable Research). Many faculty members teach or do research for four quarters per year although their contracts assure employment for only three. Typically, a faculty member who works four quarters receives reimbursable (external) research support. This work pattern appears to be conducive to progressive faculty development in both teaching and research. Faculty maintain a laudable record of research publications, as detailed in the Task Group Report on Strategic Initiative #8, which deals specifically with faculty.

Faculty members are eligible for annual teaching and research awards: The John Jay Schieffelin Award for Excellence in Teaching, and the Carl E. and Jessie W. Menneken Faculty Award for Excellence in Scientific Research.

NPS has a sabbatical program for faculty to refresh and renew their proficiency in their areas of specialization.

The School supports AAUP policies and makes every effort to assure that NPS personnel procedures follow AAUP guidelines, as detailed in the 1995 AAUP Policy Documents and Reports.
NPS faculty salaries and other conditions of employment are also discussed at length in the Task Group Report on Strategic Initiative #8, concerned specifically with faculty.

**Standard 5.D: Staff Selection and Policies**

*Administrative, professional, technical, and other staff are sufficient in number and qualified by training and experience to enable the accomplishment of institutional purposes.*

The Staff Handbook specifies criteria for staff appointment, retention, evaluation, advancement, and termination, as well as due process and periodic performance reviews. Policies on salaries and benefits are made clear. Professional staff development is an ongoing activity on campus. The Human Resources Office assures compliance with federal regulations regarding Equal Employment Opportunity. The Schools maintains complete, private, and secure personnel files.

The staff is adequate to assist faculty in meeting the academic mission of the School. Currently, approximately a one-to-one ratio exists between faculty and staff. This ratio is somewhat higher for directly funded than for reimbursably funded staff.

NPS staff wages and salaries and other conditions of employment are discussed at length in the Task Group Report on Strategic Initiative #7 concerned specifically with staff.

**STANDARD SIX:**

**LIBRARY, COMPUTING, AND OTHER INFORMATION AND LEARNING RESOURCES**

*Standard 6.A: General Requirements*

*Information and learning resources, including the holdings and any equipment needed to access the holdings of libraries, media centers,*
computer centers, and any other repositories, are sufficient to support institutional offerings at appropriate levels.

All curricula at NPS are supported by appropriate learning resources including, but not limited to, books, computer facilities, laboratories, and audio-visual aids. These facilities are readily available to both faculty and students. The Computer Center has staff on duty throughout the day to help with computing and word-processing problems, and the mainframe is accessible via modem 24 hours a day. Library reference services are likewise available via computer at all times, while a well-trained library staff is accessible during working hours to assist in locating reference and other library materials.

The Library and the Computer Center have systematic procedures for protecting secure documents.

Individual departments often have audio-visual and computer specialists and technicians, as well as computer laboratories, to assist faculty and students in both instructional and research projects.

A bookstore on campus serves the course requirements of both faculty and students in an environment supportive of the academic mission of the School.

LIBRARY

Standard 6.B: Quality of Holdings

Library holdings and media resources are sufficient in quality, depth, diversity, and currentness to support the institution’s academic offerings.

Supplemented by formal loan and access agreements with other libraries nationwide, military and civilian, the Library has extensive journal collections as well as scholarly books, CD-ROM, and Web databases related to all school curricula. Holdings include 400,000 monograph volumes, 500,000 microform volumes, and 1,370 current journal subscriptions. The Library also provides Web links for its users, onsite or remote, through its Web page. NPS library facilities are sufficient in both quality and quantity, as well as currency, to meet the diverse instructional and research needs of the School.

Standard 6.C: Acquisitions and Bibliographic Services

Library and learning resource materials are kept current; bibliographic services meet the needs of institutional users.
To assure collection adequacy, each School department or group has a Library representative responsible for communicating faculty needs to library staff.

Annual budget allocations are sufficient to support the library needs of all degree programs. The 1998 library budget totaled $1,072,000, 88 percent of which was spent on library resources. These figures compare with corresponding 1991 figures of $861,500 and 85 percent.

Library budget procedures changed in 1997 and 1998, when the Library was given authority to manage payroll to budget, allowing unspent payroll dollars to be transferred to meet the Library’s resource requirements.

The Library catalogue has been completely computerized, and Library users have access to catalogue references directly onsite and via modem from remote personal computers. Library staff facilitate bibliographic searches whenever requested to do so.

In addition to its extensive journal collections and scholarly books, the Library has comprehensive reference resources, including complete federal and state court and legislative materials. Student theses are available, as is classified material of potential use to qualified faculty and students. Through its automated catalogue, the Library also provides hot links to electronic journals.

**Standard 6.D: Availability and Use**

> *Collections are readily available for use by the institution’s academic community on-campus and where, by virtue of program or distance from the main campus, they are needed off-campus.*

The Library is open seven days a week: Monday through Thursday from 7:30 a.m. to 11:00 p.m., Friday from 7:30 a.m. to 5:00 p.m., Saturday from 9:00 a.m. to 5:00 p.m., and Sunday from noon to 11 p.m.

Access procedures are fast and efficient. The Library has open stacks. Current and recent material is stored in the main sections, while older material is stored compactly but still in a highly available manner in the Library basement. Library staff are readily available to assist in reference searches. Facilitated by document delivery, interlibrary-loan service operates with efficiency and speed. Orientation and training programs are offered to new students and faculty and are available to others on an as-needs basis.

Almost all degree programs are offered on the main campus. The School has only recently begun offering distance-learning programs. The Library supports these new programs through its Web-based resources, as well as its interlibrary-loan and document-delivery services.
Every academic quarter, Library staff provides customized subject-based tours of Library collections and resources, as well as one-on-one instruction on an as-needs basis. Library staff are available for classroom instruction when requested, such as eight sections recently in IS 2900, Introduction to Information Technology Management. The computer network offers formal classes on Library use through LEXIS/NEXIS.

The Library staff consists of 32 full-time personnel and one part-time and one temporary person. Of these, 16 are professional librarians, 15 library technicians, two laborers, and two in other non-professional positions (supply technician and resources specialist). Professional staff have master’s degrees in Library and Information Science, accredited by the American Library Association. In addition, some of the professional staff have further master’s degrees in subject areas that support particular NPS curricula. The Library Director has a doctorate in Library Science. A number of personnel on the technical staff have bachelor’s degrees, and a few have master’s degrees as well.

Standard 6.E: Facilities

The Library facilities accommodate the collections, readers, and staff so as to foster an atmosphere of inquiry, study, and learning.

Commodious and quiet, the library — with its recent additions — is a place highly conducive to study and bibliographic research. A well-trained and helpful staff assisted by modern computer technology and the presence of numerous study alcoves and carrels contribute to the academic atmosphere of the facility. Appropriate arrangements are in place to assure preservation and security of Library materials. Collections and services are accessible to the physically handicapped.

The Library follows and revises, as needed, plans for future holdings, technical aids, and possible uses. Responding to the dramatically changing environment of academic libraries, Library staff are continuously involved a strategic planning process. This process has recently produced a Library strategic planning document called *Meeting and Exceeding User Needs*.

COMPUTER AND ASSOCIATED RESOURCES

Standard 6.F: Information Technology

Computing and data communication services are provided as learning resources to the academic community in sufficient quantity and quality to support the academic offerings of the institution.
The School supports a variety of up-to-date computer resources to support both its instructional and its research missions. In addition to a central computer facility that houses a mainframe operation, each department has its own computer facilities in the form of servers and personal computers to support its special needs. An Associate Provost for Information Technology oversees the entire campus computer service, including a most-current, intra-campus computer communications network. NPS spends over 10 percent of its total budget on information technology, supported by a campus-wide staff of over 100 and serving a population of students, faculty, and staff numbering around 2,000.

Both the campus Computer Center and individual departments have computer laboratories where students may learn in a classroom environment. The Computer Center has a sizable staff that keeps its operations current and provides assistance when needed to faculty, students, and staff. The heart of the Computer Center is an IBM 9672 mid-sized mainframe that runs under VM/CMS and MVS operating systems 24 hours a day, every day of the year. Departments often have their own computer staffs to provide specialized assistance for both teaching and research. The campus network has a Help Desk manned by a staff that is available to assist in network use throughout each working day. Just installed, this network is state-of-the-art: redundant fiber-optic cables connect all campus buildings to three ATM switches, and, within each building, a floor-distribution hub is connected to the campus-wide network via fiber cables, while copper wire providing a wide bandwidth links each office or laboratory to its building hub. The network operates seven days a week all year long. Generally, access to computing facilities on campus is convenient and sufficient to meet all academic, as well as administrative, needs. Many newly developed instructional programs — such as distributed or distance learning, "smart" classroom instruction, and electronic distribution of library materials — depend on this recently installed computer network.

Appropriate software and adequate databases are available for diverse faculty, student, and staff requirements. Recently, in compliance with Navy "IT-21" standards, the School has standardized the software for use in its intra-campus communications network. All NPS administrative systems now work under Microsoft Windows NT and Office Pro.

Individual departments, meanwhile, use software and programs, such as MATLAB, and platforms, such as UNIX, that meet their special needs. A CRAY J-90 "supercomputer" and a high-performance SGI UNIX facility serve the needs of disciplines that require massive amounts of computation, while other equipment on campus is capable of providing production-quality video recording. NPS supports 81 computing laboratories for instruction and 67, funded by reimbursable funds, for research. Most of these facilities are available to faculty and students around the clock.

Campus and departmental computing facilities meet privacy and security requirements of systems users. Password protection, with automatic backup, safeguards all
hardware, software, and databases, while laboratories devoted to classified research are completely separated from other campus computer facilities.

Assisted by a Faculty Council standing committee on campus computing and an NPS Computer Users Council, the Associate Provost for Information Technology maintains an active planning process that addresses both future requirements and resources, near-term as well as long-range. Current planning addresses administrative areas such as student registration, class scheduling, and accounting functions including purchasing and payroll. The NPS computer planning process periodically produces a Strategic Plan for Computing; the most current, dated 11 September 1997, is accessible on the Web at http://web/nps.navy.mil/cis/plan97.html.

STANDARD SEVEN:

STUDENT SERVICES AND THE CO-CURRICULAR LEARNING ENVIRONMENT

Standard 7.A: Co-Curricular Educational Growth

The Institution supports a co-curricular environment that fosters the intellectual and personal development of students. That supportive environment is characterized by a concern for the welfare of all students, on and off campus; a commitment to student academic and self-development; a conscious attention to ethnic, socio-economic, and religious diversity consistent with institutional purposes; a responsiveness to the special needs of a diverse student body; a regard for the rights and responsibilities of students; and an active understanding of the interdependence of the elements of the learning environment.

Standard 7.A.1: The institution systematically identifies the characteristics and learning needs of the student population, including such constituencies as traditional-aged undergraduates, women students, re-entry older students, student parents, international students, the physically limited and learning disabled, racial and religious minorities, the academically disadvantaged,
veterans, and off-campus students such as military students. The institution then makes provision for meeting those identified needs, building an academic community that significantly involves its various populations.

Naval Postgraduate School students are military officers from all branches of the United States Armed Forces and other civilian government agencies, as well as 216 international students from 45 countries. The ethnic and gender diversity of enrolled students is representative of, and a reflection of, the make-up of the military officer ranks. There does not appear to be either an ethnic or gender bias in the selection process.

Selection of students for the Navy fully-funded graduate education program is based on outstanding professional performance, good promotion potential, and a strong academic background. Student selection is conducted by assignment officers from each service or agency represented at the School. These officers consider professional qualifications and, for military personnel, assign to each prospective student a three-digit Academic Profile Code that reflects his or her educational qualifications. Based on qualifications and Service needs, each selected student is assigned to a specific curriculum, such as Mechanical Engineering or Financial Management. The NPS Admissions Office reviews the academic record of each potential student and provides the Curricular Officer and Academic Associate an opportunity to comment on and ensure suitability for the assigned curriculum. Many students assigned to technical curricula need transition courses if they had non-technical undergraduate majors; NPS provides such courses, as well as refresher courses for students who have been out of school for a long time.

International students receive special consideration. Many have taken English courses at Lackland Air Force Base before coming to NPS. An office for international students monitors them after their arrival on campus. Often civilians in the community around NPS host international students at special events where they have an opportunity to meet local citizens and become familiar with American life.

The percentage of women students at NPS has increased over the years, reflecting an increasing percentage of women servicewide. NPS has always provided appropriate accommodations for women students. The School also has a long tradition of providing nearby housing for student families.

Standard 7.A.2: Policies on student rights and responsibilities, including the rights of due process and redress of grievances, are clearly stated, well publicized, and readily available. In addition, they are implemented in a fair and consistent manner.

Students are provided information on their rights and responsibilities throughout their orientation at the School. Prior to arrival, each student receives a Welcome Aboard
packet from his or her curriculum office and is assigned a student sponsor. Upon arrival, each student attends orientation briefings conducted by the Dean of Students and the Provost. Each curriculum also conducts New Student Briefings to ensure that all students clearly understand their responsibilities and the NPS chain of command, the primary avenue for due process and redress of ordinary grievances. The chain of command is inherent to the Navy system, and students are familiar with its role in the redress of grievances. Curriculum officers also have daily contact with students and are the starting point in any due process procedure.

The NPS Student Information Handbook is on the School’s homepage, and hardcopies of it are available from the curriculum offices.

Issues such as sexual harassment and fraud, waste, and abuse are addressed by Navy-wide policies that allow for redress of grievances outside the chain of command.

Applicable documents and instructions include:

1. NPS Student Information Handbook
2. NAVPGSCOLINST 1336.1, Special Request Procedures
3. NAVPGSCOLINST 12713.1H, Equal Employment Opportunity Processing of Discrimination Complaints and Appeal Procedures
4. NAVPGSCOLINST 12713.2J, Equal Employment Opportunity Multi-Year Affirmative Employment Program Plan
5. NAVPGSCOLINST 12713.7C, Policy and Guidelines on Sexual Harassment
6. NAVPGSCOLINST 12713.8, Equal Employment Opportunity Program
7. NAVPGSCOLINST 12713.3, Freedom from Restraint, Interference, Coercion and Reprisal
8. NAVPGSCOLINST 12713.1, EEO Discrimination Complaint Procedure

**Standard 7.A.3: Publications (e.g., student handbooks) describing student services and programs, student government and activities, as well as student rights and responsibilities are readily available. These publications also include policies and rules defining inappropriate student conduct.**

The Naval Postgraduate School Student Handbook is accessible on the NPS homepage. Printed copies are available in curriculum offices. This handbook addresses all issues pertaining to students, including policies and rules defining inappropriate student conduct like unauthorized commitments, inappropriate classroom conduct, attendance failures, inappropriate use of NPS computer systems, and the NPS Academic Honor Code. Students are made aware of the handbook and its contents during their NPS orientation briefings.

With regard to student government and activities, the Officer Student Advisory Council is discussed under standard 7.A.4 below.
Applicable documents and instructions include:

1. NAVAL POSTGRADUATE SCHOOL, Student Information Handbook
2. NAVPSCOLINST 5370.1A, Academic Honor Code for NPS students
3. NAVPSCOLINST 5370.2, Policy and Guidelines on Relations Between NPS Faculty and Students
4. NAVPSCOLINST 5370.3B, Policy Concerning Outside Employment and Professional Activities for Faculty, Staff, and Students

**Standard 7.A.4: The institution supports opportunities for student participation and leadership in campus organizations and student involvement in institutional governance (See 3.D):**

(3.D.1: A student governing body, if established, has well defined responsibilities and functions.)

(3.D.2: The role of students in various governing, planning, budgeting, and policy-making bodies is made clear and public.)

(3.D.3: Students are provided support to fulfill effectively their institutional responsibilities in governance.)

The Officer Student Advisory Council is the organized communication link between the NPS students and the NPS administration. It functions in an advisory capacity in matters involving curricula, facilities, procedures and policies deemed worthy of attention. The Officer Student Advisory Committee is comprised of thirty-five student representatives, and its membership is distributed among the curricula proportional to student population, with each curriculum having at least one representative. The Officer Student Advisory Committee is headed by a Chairman, Vice Chairman, and Secretary elected by members of the Student Council. Officers serve for six months.

Besides a Steering Committee and an Election Committee, Student Council committees are formed corresponding with those NPS committees or councils which have an impact on the student body and which can give or receive benefit from such representation. The following NPS standing Councils and Committees have Officer Student Advisory Committee representation: Academic Council, Faculty Council, Library Council, and Exchange/Bookstore Committee.

The purpose of the Officer Student Advisory Committee is to facilitate effective communication and understanding among student officers assigned to NPS, as well as between them and the NPS faculty and administration. It functions to bring forth new ideas and provide feedback and recommendations to improve the quality of NPS student life. The Chairman of the Officer Student Advisory Committee interfaces with
the Superintendent through the Dean of Students, the Provost, and other senior faculty and staff officers.

Other active student professional organizations and associations supported by NPS include the Naval Postgraduate School Alumni Association, the Surface Navy Association, the National Naval Officers Association, the American Society of Naval Engineers, the American Institute of Aeronautics and Astronautics, the Armed Forces Communication and Electronic Association, the American Society for Military Comptrollers, the Institute of Electrical and Electronics Engineering, and the Fleet Support Officers Association.

Applicable documents and instructions appear on the NPS-Officer Student Advisory Committee website/homepage, which includes the Officer Student Advisory Committee’s by-laws.

**Standard 7.A.5: An effective orientation responds to the needs of new students including special populations, both undergraduate and graduate.**

The Naval Postgraduate School provides an extensive orientation program for all students, beginning with a letter from the Director of Admissions to each prospective student congratulating him or her on being selected. In addition, each Curriculum Officer sends a Welcome Aboard letter providing students with key information to help facilitate their transition to the School and their move to the Monterey area. Included in each Welcome Aboard letter is the name of a current student who will be the sponsor for the incoming student and his or her family. The sponsor also sends a letter and provides information on whom to get in contact with to answer any questions.

Once students arrive on campus, New Student Orientation Briefings are conducted for all students. Attendees and speakers include the Provost, the Dean of Students, military service representatives, curricular officers, and medical administrative personnel.

Following these overview informational briefings, each individual Curriculum Officer provides new students with a New Student Briefing specific to his or her curriculum.

New Student and Family Briefings are given in the evening with remarks from the Superintendent and the Dean of Students. Immediately following this evening session, students and their families can visit tables set up by a number of Naval Postgraduate School and community groups and organizations providing information on support services and recreational opportunities in the area.

In addition to these orientations, the International Programs Office conducts its own New Student Briefings and orientations for international students.
Standard 7.A.6: A systematic program of academic advisement assists students in making appropriate academic decisions.

The Curriculum Officers and Academic Associates provide all students with an initial and an ongoing review of their course matrices. In addition, each student’s program is reviewed periodically and, based on academic background and abilities, adjustments are made as necessary to provide the best academic program possible.

Following each quarter, each student’s grades are reviewed by both the Curriculum Officer and the Academic Associate. Students are counseled on their academic progress. Students with academic difficulties are provided counseling on how to improve their study habits and grades.

Students work closely with both the Curriculum Officers and Academic Associates to plan their educational programs. Program requirements are clearly communicated to the students. Curriculum Officers and Academic Associates together comprise an effective student advisement team.

Standard 7.A.7: Intercollegiate athletics, if offered, are conducted pursuant to the policy on Collegiate Athletics (pages 71-2), in a manner consistent with sound educational policy, with standards of integrity, and with the institution’s published objectives and educational purposes. The administration and faculty of the institution have responsibility for the control of these programs; and academic policies and other expectations are the same for student athletes as for other students.

This sub-standard is not applicable to NPS, which has no intercollegiate athletic programs.

Standard 7.A.8: When an institution recruits and enrolls international students, the institution demonstrates that it admits and serves such students in a responsible and sensitive manner, consistent with the policy on International Students (see pages 74-75).

The International Programs Office is responsible for the cultural, social and academic integration of the international student community. The office is charged with interacting with the outside agencies, both military and civilian, to accomplish the goals of the Security Assistance Training Program and the Information Program, involving international students. Additionally, it is responsible for the International Sponsor Program and acts as the NPS sponsor to the International Committee, described further below.

The Naval Postgraduate School International Programs Office is responsible for the recruitment, admission and support of the more than 200 international officers from 45
different countries who attend NPS. The NPS International Programs have continued to grow, with students from new countries attending each year.

Some of these international students require no additional support above and beyond that required for U.S. students, but others do require and receive support, both for themselves and their families. The International Sponsor Program recruits American students and their families to help familiarize international students with U.S. customs and life in this country.

The International Committee assists with the functions of the international office and sponsors social and cultural events.

There is an excellent ongoing orientation for the international students that includes field trips to Washington, D.C., state and local government sites, and cultural and art museums. International students also have the opportunity to share their culture with other students through an Annual International Day held at the School, as well as other special programs throughout the year.

**Standard 7.A.9: Career development counseling and placement services are consistent with student needs and institutional purposes.**

Students attending Naval Postgraduate School are career military officers who are provided career development counseling in a number of ways.

Military career counseling is provided by the Curriculum Officers, who represent a significant number of Navy career communities, and by other senior officers assigned to NPS in a student’s branch of service or career field.

In addition, periodic visits by community managers and detailers (job assignment officers) and community manager briefings keep students abreast of career and career planning issues.

**Standard 7.A.10: Professional health care, including psychological health and relevant health education, is readily available to residential students, and to others, as appropriate.**

The Navy Medical Admin Unit at Presidio of Monterey Annex provides readily available health care to all military officers. The Navy Medical Admin Unit refers appropriate medical cases to Travis Air Force Base and San Diego Balboa Hospital. Cases are also referred to hospitals and specialists in the local Monterey area.

In addition, the Navy Family Service Center provides a wide range of counseling services, including family advocacy counseling.
Applicable documents/instructions include:

1. NAVPGSCOLINST 1752.1B, NPS Family Advocacy Program
2. NAVPGSCOLINST 1754.1A, Exceptional Family Member Program

**Standard 7.A.11:** If appropriate to its purposes, the institution provides adequate opportunities and facilities for student recreational and athletic needs apart from intercollegiate athletics.

An extensive program for student recreation and athletics is provided by the Morale, Welfare and Recreation Department located on base. A newly renovated gymnasium is also located on the base providing a full range of options for physical fitness. An active intramural sports program is available to all students.

Recreational and athletic venues include the Commissioned Officer and Faculty Club, the 18-hole Navy golf course, picnic grounds, tennis courts, a regulation-size basketball court in the gymnasium, volleyball courts, softball fields, a swimming pool and a sailing club.

Additionally, a number of special-interest groups and programs are sponsored by the recreation department, including a computer club, La Mesa Junior Soccer, La Mesa Junior Baseball, a tennis association, tennis lessons, the NPS Sailing Association, sailing lessons, Men’s and Women’s Golf Association, softball leagues, a soccer club, the Navy Flying Club, and the Scuba Club. Other activities include the Amateur Radio Club, the Computer Club, an Orienteering Club, the NPS Rifle and Pistol Team, the Taekwondo Association, and the Toastmaster’s Club.

Applicable documents/instructions include:

1. NAVPGSCOL INSTRUCTION 1710.15D, Management and Use of the Naval Postgraduate School Gymnasium
2. NAVPGSCOL INSTRUCTION 1710.11M, NPS Sailing Program
3. NAVPGSCOL INSTRUCTION 1710.3H, Procedures for the Operation of the NPS Swimming Pool
4. NAVPGSCOL INSTRUCTION 1710.8F, Management and Use of the NPS Golf Course
5. NAVPGSCOL INSTRUCTION 1710.4, Commissioned Officers and Faculty Club, NPS
6. NAVPGSCOL INSTRUCTION 1746.1, Regulations Governing Special Interest Group Clubs and Command-Sponsored Special Interest Teams.

**Standard 7.A.12:** The student financial aid program is well organized, well publicized, and administered equitably according to well understood criteria. It is subject to periodic audit.
Financial aid is not required for NPS students, as all military students are on full salary throughout their studies.

**Standard 7.A.13: Student housing, if provided, is designed and operated to enhance the learning environment. It meets recognized standards of health and safety, and is competently staffed.**

Students with dependents are offered the option of applying for Navy housing. The Housing Office is under the command of the Naval Support Activity, Monterey Bay. It is fully staffed by professional counselors who meet with incoming students one-on-one to determine the best housing options for them and their families. The Housing Office also provides an extensive referral service for off-base housing.

Single and unaccompanied students are provided with a Variable Housing Allowance that allows them to afford housing in the local area.

Limited temporary billeting is available on base for incoming and outbound students at the Bachelor Officer Quarters on campus.

Applicable documents/instructions include:

1. NAVPGSCOL INSTRUCTION 11101.4, Assignment, Utilization and Occupancy Termination of Military Family Housing at NPS
2. NAVPGSCOL INSTRUCTION 11101.7D, Off-Base Housing Referral Service
3. NAVSUPPACTMB INSTRUCTION 11101.6, Equal Opportunity for Military Personnel in Rental of Off-Base Housing Facilities
4. NAVPGSCOLINST 11103.2C, Naval Postgraduate School Bachelor Quarters Regulations

**Standard 7.A.14: If the institution has a bookstore, it supports the educational program and contributes to the intellectual climate (See Standard 6.A.7).**

The bookstore is located on campus and provides texts as required by professors and instructors to support the courses they teach. The bookstore also sells items other than books that support the teaching mission of the School.

Applicable documents/instructions include:

1. NAVPGSCOLINST 4066.1, Navy Exchange Bookstore Operations
2. NAVSUPPACTMBINST 4066.1, Navy Exchange Bookstore Operations

**Standard 7.A.15: Appropriate food services are provided for both resident and nonresident students. These services are supervised by professionally trained food service staff and meet recognized health and safety standards.**
There are no resident students at NPS. Food service is available in the El Prado room in Herrmann Hall. A continental breakfast is served, and a full lunch menu and a limited dinner menu are offered. This food service operation is staffed by professionally trained personnel.

**Standard 7.A.16: The institution makes adequate provision for the safety and security of its students and their property.**

The Naval Support Activity Monterey Bay police department is located on the NPS grounds. The police provide 24-hour security patrols of both the base and the housing areas. Frequent security checks are also conducted of NPS buildings.

Applicable documents and instructions include:

1. NAVPGSCOLINST 5530.1A, Physical Security Review Committee and Board
2. NAVPGSCOLINST 5530.2, Physical Security Plan

**Standard 7.B: Coordination and Administration**

**Standard 7.B.1: The professional staff has the training and experience necessary to implement the educational goals of the co-curriculum and is committed to the purposes of the institution.**

Faculty and staff are more than adequate to meet the co-curricular needs of students. The campus bookstore, Morale, Welfare and Recreation programs, laboratories, libraries, housing and childcare, and facilities for international students are all well staffed, professionally where appropriate. The reports of the Task Groups on Strategic Initiatives #7 and #8 (on staff and faculty) provide supporting details.

**Standard 7.B.2: Arrangements are in place which ensure that students and faculty are involved in the processes of policy development, program evaluation, and planning relevant to the co-curricular learning environment.**

Students, faculty and staff serve on committees designed to improve processes on campus. For example, a Process Action Team has been formed to improve the scheduling process at NPS; and an Instruction Committee has been formed to review student opinion forms, thesis quality control, and other issues relating to the student/instructor relationship. Also, focus groups have been interviewed in a study to improve communications. Additionally, curriculum review committees are active in each department and group to ensure that the course requirements and courses themselves remain current and relevant. Faculty and students work with civilian and military administration personnel in these activities.
Standard 7.B.3: The institution has a policy regarding fee refunds that is well publicized, uniformly administered, and consistent with customary standards.

Students are on full salary while enrolled at NPS. There are no fees. The only additional expense is for textbooks. Full-time students are provided a flat rate reimbursement for textbooks each quarter.

Standard 7.B.4: The students affairs program and its various agencies are periodically evaluated.

This sub-standard is not applicable at NPS.

Standard 7.B.5: The staff is engaged in planning for the future development of the co-curricular program; planning includes attention to staffing, facilities, demographic characteristics of the student body, and assessment and fulfillment of student needs.

The staff at NPS carefully monitors student needs outside of the classroom in areas such as religious worship, housing, child care and recreational activities.

There are two chapels — the Catholic Saint Thomas Aquinas Chapel and the Protestant Christ The King Chapel — on base offering a number of religious services. Religious education opportunities are also offered. Additionally, a Muslim Prayer Room is available 24 hours a day.

There are many other programs and activities in the Command Religious Program, such as a choir, bible studies, retreats, seminars, singles groups, pre-marriage counseling, and other counseling.

The Housing Office has contracted for extensive renovation of current units.

A new child development center has been completed to meet the needs of the students and their families.

Major renovations to the base gymnasium have recently been completed.

The Family Service Center offers job placement and transition to civilian life, counseling and classes for students and their families.

The Morale, Welfare and Recreation department provides ongoing events and discounted tickets to events for students and their families.

A Legal Assistance Office is available to provide limited legal services to active duty personnel of all military services and their family members. Services include providing
legal advice, and drafting legal documents and correspondence. Areas of practice include family law, wills, federal and state taxes, contracts, consumer law, indebtedness, real estate, civil suits, physical evaluation boards, enlistment contracts, and security clearance denials.

All of these facilities listed are adequately manned to support the needs of students and their families.

Applicable documents and instructions include:

1. NAVPGSCOL INSTRUCTION 1710.12H, Operation of the Child Development Center
2. NAVPGSCOL INSTRUCTION 1710.19B, Family Child Care Program
3. NAVPGSCOL INSTRUCTION 1730.1E, Command Religious Program

STANDARD EIGHT:

PHYSICAL RESOURCES

Standard 8.A: Instructional and Support Facilities

Sufficient physical resources, particularly instructional facilities, are designed, maintained and managed at both on and off-campus sites to achieve institutional purpose.

Standard 8.A.1: Instructional, research, and support facilities are appropriate to the instruction and/or research performed at the institution.

Generally speaking, the facilities of the Naval Postgraduate School are adequate for the institution’s instructional and research purposes; however, there does exist a need for further expansion and/or upgrading of these facilities to meet the growth of the institution into the next decade and beyond.

Since the last accreditation review in 1990, the following capital improvements have been made: (1) expansion of the Dudley Knox Library (40,000 additional square feet);
(2) erection of a new Mechanical Engineering building (62,000 square feet); and
(3) Glasgow Hall (108,000 square feet). This new building program has freed up space for use by other departments located in Ingersoll, Spanagel, and Root Halls; given Mechanical Engineering its own building; and provided shared space (in Glasgow Hall) the departments of Mathematics, Operations Research, and National Security Affairs.

Also completed since the last WASC accreditation are a new Child Development Center, a Public Works Complex, and a 400-seat expansion and seismic upgrade of King Hall, the School’s largest lecture facility.

The computer Local Area Network was expanded in the recent past to link previously unconnected buildings to the NPS electronic-communications network. These include the shipping and receiving warehouse, Bldg. 349, the Superintendent’s quarters, and a number of buildings remotely located at the golf course. The latter was accomplished using wireless networking equipment.

Currently, upgrades in the power and/or network distribution facilities are occurring in a number of buildings on campus, namely in Spanagel Hall and Bullard Halls. Glasgow Hall and the new Mechanical Engineering building with its 130-seat lecture forum are new, and are undergoing upgrading of the network only.

Spanagel Hall is currently having its power distribution system and its HVAC and fire evacuation and sprinkler systems upgraded. The entire campus will have received the benefits of an entirely upgraded data communication network by the end of calendar year 1998.

Classrooms in Spanagel Hall are also being remodeled to include network connections to student desks, audio/video playback, and large-screen display capability. This ongoing remodeling should be completed within twelve to eighteen months.

There is an existing plan to remedy power problems in Bullard Hall, along with upgrading the lighting and fire evacuation and sprinkler systems in the building; however, at the present time there are no funds available to complete the project.

**Standard 8.A.2: Facilities assigned to a function are adequate for the effective operation of that function.**

As noted in 8.A.1 above, the School’s facilities are generally adequate for their intended functions, but some are also in need of expansion and/or upgrading.

**Standard 8.A.3: Offices and other facilities for faculty provide the elements needed for them to conduct properly their various instructional, research, counseling and administrative responsibilities.**
Office space provided is adequate for the needs of the faculty. On average, offices provide 200 square feet of office space with reasonably adequate lighting, heating, and privacy. Furniture, desks, chairs, filing cabinets, phones, and, if necessary, safes are provided. All offices have a campus-wide computer network connection along with the appropriate computer hardware for use by faculty members. Generally, faculty members have separate, unshared offices.

**Standard 8.A.4:** All physical facilities include the furniture, equipment, utilities, and other amenities needed for a proper work and study environment for faculty, staff and students.

See the response to 8.A.3 above. This description also applies to staff and students. One unique feature is that students are also accommodated by providing them with personal study areas in or near their home department. This is generally accomplished in communal areas where each person has a small desk or study carrel. A significant amount of departmental space in each academic department is dedicated to this function.

**Standard 8.A.5:** An appropriate level of routine and preventive maintenance on buildings and grounds is provided.

Routine and preventive maintenance is currently being provided by the Public Works Division of the Naval Support Activity, Monterey Bay. This includes standing job orders on buildings (PM), as well as response to day-to-day troubles via the trouble desk. Public Works also works with individual academic departments in developing plans for sizeable projects of interest to them. Grounds maintenance and building janitorial service is provided by third party contractors administered by Public Works. The Naval Support Activity, Monterey Bay Public Works Officer can provide further information.

**Standard 8.A.6:** Facilities are constructed and maintained with due regard for health and safety considerations, and for access by the physically challenged.

Buildings were built in accordance with existing building codes at the time of construction, and any new construction is in accordance with current building and health and safety codes.

The Naval Postgraduate School has in place a vigorous health and safety program administered by the OSH Office. The entire facility is inspected thoroughly once every year, by both the OSH Office and the Fire Department. Every three to five years it is inspected by Navy OSHA. It is also subject to spot inspections by the State of California OSHA.

All facilities are compliant with Americans with Disabilities Act requirements.
The NPS Safety Office can provide further information on safety programs at the School.

**Standard 8.A.7: When programs are offered off-campus, the physical facilities at these sites are appropriate to the programs offered, and provide an environment conducive to learning.**

If utilized, off-campus facilities are generally contracted from local hotels and/or convention-center providers, depending on the size of the group. These facilities are more than adequate for the needs of users and typically support conferences and conventions that may be scheduled throughout the year. There is no use of off-campus facilities in support of coursework.

The NPS Conference Coordinator can provide additional information.

**Standard 8.B: Equipment**

*Equipment is sufficient to facilitate the educational objectives of the institution.*

**Standard 8.B.1: Suitable equipment is provided and is readily accessible at on and off campus sites to meet faculty, administrative staff and student needs.**

Equipment is readily available, and is generally adequate. A large percentage of equipment, however, is in excess of twenty years of age, with some older, and could be considered obsolete, though still functional.

There exists a need to recapitalize many of the laboratories in the various departments with modern state-of-the-art equipment. A lack of funds from the Department of the Navy has contributed to this situation. There is, however, a local plan supported in the recent NPS FY2000-2005 budget to recapitalize the School’s labs with newer equipment. This budget was submitted to the Chief of Naval Operations but, as of this writing, has not yet been approved or funded.

Captain George Conner (Ret.) can provide additional information.

**Standard 8.B.2: Equipment is maintained in proper, safe operating condition, and is adequately inventoried and controlled.**

Equipment in departments is maintained in good working order by departmental laboratory staff. There is also an on-campus facility, the Electrical and Computer Engineering Calibration and Repair Laboratory, which repairs items such as computers and electronic test equipment. This lab can also calibrate, to traceable standards, various items of electronic test equipment such as meters, signal generators and oscilloscopes.
The facility receives a small amount of funding for the calibration and repair of test equipment ($10,000 in FY1998) from its Calibration Program Sponsor, but receives no direct local funding. A limited amount of separate funds is set aside for repair and/or replacement of failed equipment.

Equipment generally on campus is sufficiently inventoried and controlled. The Property Management Branch, with assistance from the academic departmental property management personnel, is responsible for property control at the School. Audio-visual equipment, both within departments and in the NPS Audio-Visual Center, is maintained and upgraded as needed. Equipment is inventoried on a periodic basis, not less frequently than every three years.

**Standard 8.B.3: Periodic replacement of equipment is scheduled, budgeted, and purchased in accord with the academic and other needs of the institution.**

There is no known, viable life-cycle management of equipment or system assets at the School. Equipment has historically been procured on an as-needed basis or when an item that has failed is deemed economically non-repairable and needs to be replaced.

**Standard 8.C: Physical Resources Planning**

> Comprehensive planning occurs and is based upon the stated academic goals and objectives of the Institution.

**Standard 8.C.1: The master planning for campus physical development is consistent with the purposes of the institution and its long-range planning.**

Guidelines and master plans for physical development are derived from the School’s mission. Starting from the Navy’s requirement to educate a specific number of officers per year, classroom and laboratory requirements drive development plans to support the educational mission of the institution.

Professor Gilbert Howard, Director of Academic Planning, can provide further information on this topic.

**Standard 8.C.2: Physical facilities development and major renovation planning is accompanied by planning for the acquisition or allocation of the required capital and operating funds.**

Departmental plans for classroom and laboratory development are coordinated and integrated in a five-year budget request that the School presents to its Navy sponsors. When funding is made available, it is distributed to the division deans for allocation to the academic departments. This procedure has worked rather well, with some bumps and starts, over the years.
Standard 8.C.3: Physical resource planning enables ready access to campus facilities for various constituencies, including the physically challenged, and provides for appropriate security arrangements.

Since NPS is dedicated to the training of U.S. military and the military of friendly nations, the typical student is not physically challenged. However, to the extent that certain faculty, staff, or non-military students may, in fact, be physically challenged, proper security arrangements and reasonable accommodations are made. The institution is currently in compliance with the Americans with Disabilities Act and is readily accessible to the physically challenged.

Standard 8.C.4: The governing board, administrators, and others, as appropriate, are involved in planning physical facilities.

Responsibility for the planning and development of physical facilities is shared within the NPS community among the Executive Board, the Director of Resources, the Provost’s Academic Planning Office, the Academic Deans, and the Departmental Chairs or their representatives. The procedure has a history of working harmoniously, efficiently, and effectively.

STANDARD NINE: FINANCIAL RESOURCES


Financial resources are sufficient to achieve, maintain, and enhance the objectives of the institution at the level of quality required by these accreditation standards. The level of financial resources provides a reasonable expectation of financial viability and institutional improvement.

Standard 9.A.1: The commitment of resources among the various degrees and programs, undergraduate and graduate, reflects appropriately the educational objectives and priorities of the institution.
The distribution of resources among the various programs is determined externally through the PPBS, Congressional appropriations, the Graduate Education Review Board, and the NPS Board of Advisors. As new programs or changes to programs are introduced, the PPBS system addresses these priorities. Internally, the commitment of resources is allocated based upon the course structure of the curricula and the requirements for operations and infrastructure reinvestment.

**Standard 9.A.2: The continuity of each area of institutional income has been realistically assessed such that the current and anticipated total income is sufficient to maintain the educational quality of the institution.**

The main source of operational income is derived from the PPBS. The anticipated income in future years is expected to support a more efficient version of current operations, infrastructure reinvestment and new distributed learning technology initiatives.

**Standard 9.A.3: The analysis of the current year’s financial operations indicates financial strength.**

The analysis of current year’s financial operations reflects the continuing requirement to operate more efficiently with additional resources directed towards laboratory and Library investment.

**Standard 9.A.4: The financial statements indicate a history of financial stability. The institution has operated for at least three previous years without incurring operating losses. If an accumulated deficit has been recorded, a realistic plan to eliminate the deficit is clearly presented, understood, and approved by the governing board.**

The financial statement history using FY 1996 dollars for the preceding three years reflects essentially level funding, with laboratory and Library recapitalization more affordable in FY1997 and FY1998. Since the School is funded through the annual Congressional Appropriation cycle, it is not allowed to operate with losses or indebtedness.

**Standard 9.A.5: Adequate resources are available to meet debt-service requirements of short-term and long-term indebtedness without adversely impacting the quality of educational programs.**

Since the School is funded through the annual Congressional Appropriation cycle, it is not allowed to operate with losses or indebtedness.

**Standard 9.A.6: Transfers among the major funds and interfund borrowing are guided by clearly stated policies in accordance with the educational goals of the institution.**
This sub-standard is not applicable at NPS.

**Standard 9.A.7: The institution has the financial capacity to respond to financial emergencies or unforeseen occurrences.**

Incorporated in the PPBS system are procedures to address emergencies or unforeseen occurrences in the budget through submission of unfunded requirements to the Navy Comptroller Office, and during execution through submission of additional requirements for consideration at midyear. NPS received $1.1 million in FY1998 subsequent to a midyear request for funds to repair El Niño storm damage.


*Financial planning and budgeting are ongoing, realistic, and based upon institutional educational objectives.*

**Standard 9.B.1: The institution has an annual budget and the policies, guidelines, and processes for developing the budget are clearly defined and followed.**

The institution has an annual budget, and the policies, guidelines and processes for developing the budget are clearly stated in the Department of Defense Financial Management Regulations and major claimant instruction, FLDSUPPACTINST 7110.4 (Instructions for the Preparation and Submission of Annual O&M,N Budget Material).

**Standard 9.B.2: Annual budgets and long-range forecasts or budgets reflect realistic assessments of resource availability and expenditure requirements for academic priorities and support needs.**

Budgets and long-range forecasts are updated annually. Budget preparation guidance and subsequent review require an executable budget submission.

**Standard 9.B.3: The short and long-range capital budgets reflect educational objectives and relate to the plans for physical facilities.**

The Real Property Maintenance account has been underfunded in past years. This has caused growth in the maintenance backlog. The PPBS programming phase conducted in POM-98 partially addressed future years Real Property Maintenance funding with an increase in the budget.

**Standard 9.B.4: Faculty have an opportunity to participate with administrators in the development of budgets and financial plans.**

The PPBS system operates on an incremental budgeting basis. The Academic Planning Office, Deans, Chairs, and other administrators are involved in budget development.
Standard 9.B.5: Governing boards and state agencies have given the institution appropriate autonomy in budget and planning matters within overall mandates and priorities.

The PPBS requires NPS to submit an executable budget and provides a reasonable degree of autonomy to do this.

**Standard 9.C: Financial Management**

The financial management and organization, as well as the system of reporting, ensure the integrity of institutional finances, create appropriate control mechanisms, and provide a basis for sound financial decision making.

Standard 9.C.1: The management and organization of financial administration are clearly defined, with specific assignment of responsibilities set forth.

DoD, DoN and NPS instructions clearly establish these responsibilities.

Standard 9.C.2: All expenditures and income, from whatever source, and the administration of scholarships, grants-in-aid, loans and student employment, are fully controlled by the institution and included in its regular planning, budgeting, accounting and auditing procedures.

All expenditures and income are reflected in the DoD official accounting system operated under Defense Finance and Accounting System in accordance with the DoD FMRs. Internal planning and budgeting conducted by the Academic Planning Office, Dean of Research, Comptroller, Deans and Chairs include all sources of funds in support of Schoolhouse operations.

Standard 9.C.3: Financial reports and related documents are accurate and appropriately represent the total operations of the institution, including fund-raising.

Official accounting records are maintained by Defense Finance and Accounting System, supported by the NPS memorandum accounting system and documentation; e.g. timecards accurately reflect total labor operations.

Standard 9.C.4

This sub-standard is not applicable to NPS.

Standard 9.C.5
This sub-standard is not applicable to NPS.

**Standard 9.C.6**

This sub-standard is not applicable to NPS.

**Standard 9.C.7: Financial personnel have appropriate training and experience, and are committed to the educational purposes of the institution.**

Financial personnel are dedicated and experienced, some with fifteen plus years of Navy accounting experience. New Defense Finance and Accounting System systems and programs implemented in recent years present retraining issues and the need for reviewing accounting procedures to accommodate these systems.

**Standard 9.C.8: Institutional policies and a code of ethics have been developed and disseminated for employees involved in buying, bidding, or providing purchase orders to vendors.**

All such employees are required to attend annual ethics training in accordance with Navy policy. In addition, formal training in purchasing and contracting is conducted.

**Standard 9.C.9: The institution and any subsidiary entities or auxiliaries have policies on risk management, adopted by governing boards. These policies address loss by fire, burglary and defalcation; liability of the governing board and administration; and liability for personal injury and property damage.**

The U.S. government is self-insured. Property and casualty losses and liability issues are addressed in DoD, DoN and NPS instructions.

**Standard 9.C.10: When auxiliary organizations, such as foundations, have been established using the name and/or reputation of the institution, they support institutional aspirations, conform with institutional principles of operations, are carefully supervised by the institution, and are regularly audited by public or independent agencies.**

NPS management is prohibited from exercising control over the NPS Foundation. The Foundation was established independently to foster the interests of NPS, but it is not under the School’s control. It is subject to period audits.

**Standard 9.D: Fundraising and Development**

*Any organized development program to seek financial support from outside sources is closely coordinated with academic planning and reflects the educational objectives of the institution.*
Standard 9.D.1: All fundraising activities are governed by institutional policies, and comply with sound ethical accounting and financial principles.

As a federal institution, NPS cannot solicit contributions. The Alumni Association can, however, encourage giving to the NPS Foundation.