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Report of the Ad-hoc Committee on Measuring Nonstandard Productivity (The Powers Report)

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Report of the Ad-hoc Committee on Measuring Nonstandard Productivity

“The strength of this institution lies in the breadth of knowledge and the creative activities of its faculty. To mandate prescribed activities for all faculty would stifle creativity and erode the quality of the educational program. Instead, NPS needs a mix of talents which crosses traditional academic disciplines as well as subspecialty areas of direct relevance to the Navy and Marine Corps. To foster this mix requires a flexible reward system which recognizes that a variety of activities are important to the mission of the institution.” *Report of the Ad-hoc Committee on Faculty, Activities, Incentives, and Evaluations (The Marto Report), 11 May 1987*

Introduction

The faculty at the Naval Postgraduate School (NPS) are engaged in a more diverse set of scholarly activities than ever before. There are several reasons for this, and these reasons indicate that increased diversification of activities will continue.

- Increased emphasis on interdisciplinary, operational curricula requires faculty members with a grasp of broad applications of techniques to military problems. These individuals may be former military officers, military laboratory workers, or industrial professionals who have not engaged in the traditional publication activities of academics.
- New program efforts will emphasize applications and practice, rather than the knowledge skills of the traditional academic programs. For example, the Total Ship Systems Engineering (TSSE) program has created a requirement for faculty experience in ship design and weapon-system design. Persons with the desired skills for these positions probably would not have a traditional academic background.
- The accrediting boards for the engineering programs have mandated increased design content in the engineering curricula. This requires engineering faculty who have had sufficient design experience to inaugurate and maintain design courses and design laboratories. These faculty will also engage in design activities as part of their professional careers.

One of the recommendations of the Marto Committee report was that

“...NPS should make a place within the permanent faculty for non-traditional or DoN-oriented individuals. The type of individuals envisioned here are those people, regardless of background, who are making significant contributions to a body of research which intersects the interests of DoN as well as NPS. These individuals, perhaps former military officers or senior executives, or those who have unique experience in a Navy laboratory or with a DoN contractor, can offer much to NPS involvement with DoN.”

The evaluation of the work produced by these faculty members presents a problem. The Marto Committee noted that “...at NPS, the situation (i.e., the evaluation of faculty) is more difficult because of our unique requirements to directly support the Navy. Applied, and even classified research, applied instruction, and certain types of service to the Navy are more difficult to evaluate than traditional academic activities.”

Recognizing the requirement for evaluation of faculty engaging in scholarly activities that result in products that are not amenable to the traditional outlets for academic work (e.g., journal publication, textbook preparation, professional society service), the three Deans of Faculty, Research, and Instruction established an Ad-hoc Committee for Measuring Nonstandard Productivity. The members of the committee were Professors Robert Ball (Aeronautics and Astronautics), Robert Bourke (Associate Dean of Faculty), James Fremgen (Administrative Sciences), Beny Neta (Mathematics), John Powers (Electrical and Computer Engineering), Joseph Sternberg (Electronic Warfare Group), and Max Woods (Operations Research).

The memo establishing the committee identified the “...need to put into place a better methodology for measuring the scholarly productivity of nonstandard faculty...By nonstandard we mean faculty who are engaged in instruction and research activities which do not normally result in the standard publications in refereed professional journals, e.g., applied Navy-related programs, interdisciplinary areas, programs with software as the output, classified work, etc.” The charter of the group was to develop a methodology for evaluating nonstandard scholarly productivity. The Committee sought to establish an evaluation methodology that would allow a faculty member to continually develop a vita that would be recognized by those involved in the promotion and tenure decisions and research evaluation decisions as representing both acceptable productivity and creativity. In addition, we wanted to establish a feedback mechanism that would allow a new faculty member to be mentored while establishing his/her career at NPS.

Definitions of “Nonstandard”

Early in our discussions, we found that there appears to be two connotations of “nonstandard”:

First, there are nonstandard *products* of faculty activity. Our committee's task was to offer some examples of these nonstandard products (some of which are listed later in this report) and to establish a methodology for measuring the quality of these nonstandard products. Our focus was on these nonstandard activities and their evaluation.

Second, there are faculty who have nonstandard *patterns* of activity within the three evaluation areas of instruction, scholarly activity, and service. In particular, these faculty members emphasize the non-research portion of their activities in favor of instructional activities or service activities. The Marto Committee focused on this type of individual and identified the need to measure both internal and external impact from these activities and to reward those individuals with demonstrable impact. We believe that the Marto report is still valid guidance to the faculty concerning the various types of activities that can lead to promotion and tenure. The output of these individuals are fairly standard faculty products (e.g., establishing courses, performing laboratory development); it is the proportion of the faculty member's total effort that is nonstandard. While the Committee feels that more work needs to be done to truly measure the impact of the work of such individuals, especially in the instruction area, we do not include these nonstandard profiles of activities within our purview. It is our hope that, with the recent appointment of a Dean of Instruction and the establishment of an Instruction Council, a methodology for evaluating instructional quality in all of its facets will be established.

Nonstandard Products

The following list is an attempt to characterize some of the activities that can lead to nonstandard products. (The list is intended to be illustrative, not encompassing.)

Internal Activities

- introducing new material in curricula and developing new courses, particularly special topics courses with DoN relevance.
- developing design courses.
- developing design or experimental laboratory facilities.
- developing and teaching courses in applied areas and in interdisciplinary curricula.

- guiding student class projects that are reported (orally and/or in writing) to a panel of visiting review experts from the Navy and industry.
- producing physical products as a result of design efforts. (If widely circulated outside NPS, this might be an external activity.)

External Activities

- providing technical analysis to support planning and evaluation of fleet exercises.
- producing software for external use.
- developing and instructing on-campus and off-campus short courses to DoN personnel.
- acting as a consultant for operational commands and other DoN organizations.
- publishing technical reports, either unclassified or classified.
- publishing articles in non-refereed, widely-distributed professional magazines.
- developing documents that become official documents of a DoD agency, such as MIL-STD (military standards) documents, military handbooks, or OD (“Ordnance Data”) documents.
- introducing procedures to external organizations to meet program-specific needs (e.g., a sampling procedure used to test components for reliability).
- writing or performing reviews or evaluations for DoN activities.
- writing military manuals and doctrine (or portions thereof).
- producing position papers that contribute significantly to high-level decisions.
- developing models that replace or demonstrably improve upon existing models
- receiving patents for design ideas.
- receiving state-board certification of skills (e.g., Professional Engineer, Certified Public Accountant) or professional-society certification of skills (e.g., Certified Reliability Engineer).

- producing hardware or software designs that are incorporated into systems or other products.
- guiding student designs that are entered into national design contests.

Background to Recommended Methodology:

It is not enough simply to identify nonstandard products, of course. We must be able to evaluate their quality in ways that are recognized and accepted as both objective and credible. A journal paper that is refereed (an objective evaluation) and published in a leading professional journal (establishing credibility) is a standard product, readily recognized for its quality. For nonstandard products, we need similar evidence from experts (with credibility) who can evaluate the quality of the product objectively. The nature and source of such evidence will vary with the specific nonstandard product being evaluated; only general guidelines can be developed. Our Committee has identified some common points that should be observed in any evaluation.

- All faculty members should be evaluated by the same methodology and to the same degree of detail. There should *not* be two levels of evaluation, one for faculty with standard products and a second, more strenuous, evaluation for faculty with nonstandard products. All evaluations must assess the quality of the work performed as well as the quantity of work.
- There must be a “product” of the work to evaluate. It is the responsibility of the faculty member to identify the product of his/her work that is to be evaluated. It is the responsibility of the faculty members performing the evaluation to identify a means to assess and evaluate the product. While the recommended methodology discussed below will help to guide most evaluations, there will always be some products that will require innovative techniques for performing the evaluation.
- The evaluation of the faculty member's products must be done continuously in order to provide feedback to the faculty member in the development of his/her career. If the products of a faculty member's work are found to be uniformly deficient in quality or applicability only at the time of tenure or promotion consideration, then the evaluation system has failed.
- We found that the Faculty Appraisal System provides a mechanism for yearly continuous evaluation of faculty performance and has incorporated into its standards, for the most part, appropriately diverse examples of faculty performance. We recommend that the Faculty Performance Appraisal standards

be augmented with more examples of activity leading to “non-standard” products. Appendix A contains an augmented set of appraisal standards with the additions indicated by the double-underlined material.

- It would be desirable to implement a continuous evaluation program that assesses the quality of all work products (standard and nonstandard) for all faculty at NPS, including tenured faculty as well. The design and implementation of such an evaluation process would be a significant increase in the peer evaluation process at NPS and lies beyond the scope of the charter of our Committee. Our evaluation methodology is, then, limited only to the evaluation of nonstandard work products.

Recommended Evaluation Methodology

The following describes the methodology that our Committee recommends for the evaluation of nonstandard products of faculty activity.

All faculty members eligible for future promotion and/or tenure award should have a Mentoring Committee appointed by their Chairman to evaluate their performance in terms of future promotion and/or tenure. This committee should be established as soon as the faculty member joins NPS. The membership and size of the committee would depend on the anticipated activities of the faculty member (e.g., an Academic Group would be represented on the Committee of a faculty member engaging strongly in Group-related activities). The Mentoring Committee could have representation on the Department Evaluation Committee (DEC) but probably would not constitute the entire DEC since the Mentoring Committee will have developed a close, and perhaps biased, relationship with the faculty member during its mentoring role.

A faculty member who anticipates that he or she will have nonstandard products to be evaluated must be especially careful during the standard-setting and workload-agreement phase of the annual Faculty Appraisal process. It is important that the faculty member's Department or Group Chairman agrees that the nonstandard product is a worthwhile goal in the context of the department's activities and in the context of NPS and DoN goals. If a faculty member produces nonstandard products that are deemed not to be in the interest of the department, NPS, or DoN, it is too late to rectify the situation at the time of consideration for promotion and/or tenure. This situation can be averted by a thorough and frank discussion before the faculty member embarks on working on the proposed projects. The Mentoring Committee should advise the faculty member on the appropriateness of the proposed work in consultation with the Department or Group Chairman. If the Department or Group Chairman concurs that the work is appropriate, a statement of work objectives in the form of a workload agreement should be signed by the faculty member and the Chairman. (In cases of disagreement between a faculty member and the Chairman about the

value of the work, we recommend that the Dean of Faculty should be called upon to mediate the dispute and to make the final judgement on whether the work is appropriate for a faculty member at NPS.) In all cases, a workload agreement, signed by the Chairman, should be obtained by any faculty member engaging in work producing nonstandard products. This agreement is evidence that the nonstandard work to be performed is within the domain of acceptable effort by faculty of NPS.

At the conclusion of each year's effort, each faculty member should have a measurable "product" that has had positive impact, either internal or external to NPS. It is the responsibility of the candidate, together with his/her Mentoring Committee, to annually identify all non-standard products to be evaluated. (The Faculty Activity Report should be revised to include a section where this identification of major products is done. Appendix B contains a suggested revised Faculty Activity Report format.) It should be noted that, if circumstances warrant, the evaluation of the work may also be on a more continuous basis. For example, a contribution of significant impact might be identified in the middle of a year; the Mentoring Committee may wish to begin the evaluation process without waiting to receive a Faculty Activity Report from the faculty member.

An annual assessment of progress should be made by the Mentoring Committee and discussed with the faculty member. This evaluation by the Mentoring Committee should focus on the assessment of the quality of the work that is claimed by the candidate to have either internal or external impact. While the evaluation is primarily for career counseling, the results of this evaluation could also be used by the Department or Group Chairman as part of the annual evaluation performed for pay-raise and performance-award purposes.

The method of evaluation of nonstandard products is to be determined by the Mentoring Committee. The evaluation of products producing external impact must include written assessments of quality by outside experts or users of the product. Appendix C contains examples of how a Mentoring Committee could perform evaluations of some of the nonstandard products that might be claimed by faculty. In cases where the effort has produced substantial internal impact, outside experts should also be used to evaluate the quality of the work. Copies of written materials could be sent to such experts for evaluations or a panel of evaluators could visit NPS to perform an evaluation. (We note that payment of an honorarium to non-government experts may be desirable to ensure a thorough, timely review.) It is important to note that all evaluations must attempt to assess the quality of an activity, not just the quantity.

It is expected that a Mentoring Committee might have to evaluate different aspects of a product in different ways at different times. For example, a process model might be proposed for adoption by a Navy activity, as a result of a faculty member's research, in the form of a technical report delivered to the sponsor. In the first year the Mentoring Committee might seek an evaluation based on the technical merits of the material from experts in the field. A year or two later, the faculty member might report that the model has

been tested by a Navy activity. The Mentoring Committee would contact the people who did the evaluation for an assessment of their test results. Then, after one more year, the faculty member might announce that the model has been implemented in the Fleet and proven successful. The Mentoring Committee would poll representative Fleet users to obtain an assessment of the utility and impact of the model. This continuous revisiting of the product as it wends its way through the adoption process will be necessary for those products with significant long-lasting impact. The identification of impact at various points in time is essential for such products.

Because of the diversity of possible products, letters requesting evaluation will have to be tailored to the product and to the person being asked to perform the evaluation. (A letter to an academician requesting a blind evaluation of a product would be different from a letter to a Navy sponsor requesting an evaluation of the impact of a product.) A single standard form letter will not suffice to elicit the type of information required for a meaningful evaluation.

Summary of Evaluation Methodology:

- Faculty member arrives at NPS.
- Appointment of Mentoring Committee with members appropriate to the faculty member's activities.
- Workload agreement for each year's effort, including activities leading to nonstandard products, is negotiated and signed by the faculty member and Chairman.
- At end of year's effort, faculty member identifies nonstandard products for evaluation. Also, the faculty member identifies any prior products that have had demonstrable internal or external impact for evaluation by the Mentoring Committee.
- Mentoring Committee performs annual evaluation. As necessary, the Committee solicits internal and external written evaluations of the nonstandard product's quality or impact.
- Results of the Mentoring Committee's annual evaluation are communicated in writing to faculty member and Department or Group Chairman.

Weighting of Material Evaluated

One problem that remains, beyond any evaluation methodology, is the amount of weight that should be given to a nonstandard activity. Is one model widely used in the Naval Supply system equal to two papers published in scholarly journals? Is the instruction of a successfully-reviewed design-project class equal to two lecture classes that receive high SOFs? These weighting factors cannot be specified quantitatively. Perhaps we should not even try to compare the categories of faculty performance, as that path leads us to esoteric arguments that would rival those to determine the number of angels that can dance on the head of a pin. The Marto Committee report asserts and the NPS Administration has reiterated that a successful faculty career can take many paths. Each path is equally useful to NPS and to DoN. All faculty, administrators, members of the Mentoring Committees, and members of the Department Evaluation Committees must work to remove the perception that work producing nonstandard products is of lesser merit than work resulting in the more traditional products in promotion and tenure considerations. The objective of the methodology that we propose is to ensure an environment that stimulates and supports the application of faculty scholarship to important problems of national defense while providing a means for the continuous evaluation of the products of such faculty activities.

Appendix A

Revised Standards for Annual Faculty Appraisal

(Material with double-underlines is recommended for addition to these standards.)

PERFORMANCE APPRAISAL RATINGS GUIDELINES (STANDARDS) TENURE-TRACK AND ADJUNCT FACULTY

INSTRUCTIONAL ELEMENT EVALUATION

This element includes classroom and laboratory instruction, thesis advising, evaluation of student academic performance, course and laboratory development, and other aspects of developing and delivering instructional material.

OUTSTANDING performance has many of the following attributes:

Instructional duties are carried out in an exceptional manner with students mastering the material in a highly motivated fashion.

Course syllabus is met; the interconnection of the material to other courses and the application to DoD and non-DoD problems is made clear.

Thesis students consistently complete high quality theses with results that have potential for major impact on the professional or defense community.

Course materials are widely used in other organizations.

Preparation and presentation of instructional materials is done in an extremely competent and creative fashion.

Course journals are of significant value to those instructing subsequent courses.

Prepares and uses military-related problems, cases, illustrations, and other instructional supplements to demonstrate how course content applies to military organizations and operations.

Develops courses and prepares course materials with unusually high relevance to Navy applications that are highly acclaimed by peers at NPS and by NPS students.

FULLY SUCCESSFUL performance includes such factors as:

Instructional duties are carried out in a competent manner with most students understanding the material and with an acceptable adherence to the course syllabus.

Thesis students receive sufficient and timely guidance.

Course materials are adequate for presentation of material at NPS.

Students and support personnel are treated fairly with resulting achievement of instructional goals.

Presentation and preparation of instructional materials are performed in a timely manner.

Most student learning difficulties are identified and resolved.

Informative course journals are submitted.

Uses supplementary materials and oral illustrations of military applications of course content.

Teaches courses relevant to Navy applications.

UNACCEPTABLE performance includes such factors as:

Instructional material is inaccurate, incomplete, and/or significantly different from course syllabus.

No thesis topics offered.

Thesis students often encounter major difficulty in accomplishing goals due to erroneous information from advisor or lack of advisor availability.

Course materials are of poor quality or totally lacking.

Does not submit course journals.

Behavior causes loss of student learning opportunities and/or obstructions to achieving educational objectives.

Instructional duties are performed late or not at all causing loss of timely learning and increased difficulties for students in understanding and relating the material to other instruction.

Insensitive to student learning difficulties and/or unavailable to students seeking to resolve difficulties.

Provides no illustrations of applications of course content to military activities, when such applications exist.

SCHOLARSHIP ELEMENT EVALUATION

Scholarship includes creative activity that results in new knowledge, development of new techniques and/or tools and capabilities, and new ways of communicating existing knowledge. Scholarly activity is demonstrated by technical reports, conference proceedings, student theses, book chapters, monographs, books, patents, software packages, etc., and presentations and lectures at conferences and other institutions. Evidence of the quality of scholarly activity includes its acceptance by the professional community external to NPS.

OUTSTANDING performance has many of the following attributes:

Results of work have a significant positive impact on DoD and/or academic specialty area.

Research proposals are complete, consistently funded, and result in high quality output.

Work published in the scientific and technical journals.

Presents invited papers/lectures at conferences and other institutions.

Organizes and/or chairs sessions at national and international meetings.

Guides and motivates other faculty in specialty area.

Published books, chapters, or monographs are widely acclaimed by other institutions or DoD activities.

Actively participates in his/her professional society and leadership is recognized by others.

Publishes results of scholarly activity in classified technical reports, NPS technical reports, or other formats with meritorious reviews by external reviewers and/or high utility of results by external agencies.

Results of scholarly activity provide new or improved hardware, software, systems, or procedures that demonstrably enhance effectiveness and/or efficiency of a military organization or operation.

FULLY SUCCESSFUL performance includes such factors as:

Complete research proposals are prepared and result in either internal and/or external funding.

Output results in student theses, classified reports, NPS technical reports, patents or software packages, books or monographs. Results are often published in the scientific and technical literature.

Participates in scholarly activity sufficiently to maintain thesis supervision and classroom instruction at the leading edge of his/her field.

Presents papers at conferences regularly.

Reports and theses are clearly and effectively written.

On occasion, material is used in other institutions.

Performs scholarly activity in areas relevant to military organizations or operations.

UNACCEPTABLE performance includes such factors as:

Work is lacking in technical detail or contains serious technical errors.

Unaware of current activities within his/her chosen specialty, and/or chooses not to attend professional meetings.

Does not get results published in open or classified literature.

Incomplete proposals or proposals of poor quality.

Performs no activities of either scholarly or military significance.

SERVICE ELEMENT EVALUATION

As professionals, members of the Naval Postgraduate Faculty are expected to participate in serving the institution, their professional discipline, the Department of the Navy or the Department of Defense. The exact nature and scope of this element will vary with the individual. This element may include such activities as NPS course or curriculum administration, faculty and academic governance, and administrative positions; professional society administrative positions or offices; membership on editorial boards; or service on DoN or other federal boards and panels.

OUTSTANDING performance has many of the following attributes:

Receives peer recognition for performance and contributions in professional service activities, especially those of high stature or visibility, e.g., NPS Faculty Chairman, national officer of a professional society, editor of a major journal, member of a major DoD board or panel (e.g., the CNO Executive Panel).

FULLY SUCCESSFUL performance includes such factors as:

Participates responsibly, professionally and willingly in council, committee or administrative service for NPS, professional societies, DoD, or other such appropriate organizations.

Conscientiously and effectively discharges the various responsibilities or duties attendant upon such position or office.

UNACCEPTABLE performance includes such factors as:

Does not participate responsibly or willingly in appropriate internal or external service activities. Refuses to accept such positions when offered.

If serving in such positions, fails to discharge the attendant responsibilities or duties, e.g., by repeated failure to attend meetings, failure to file appropriate reports, etc.

Does not submit required routine administrative paperwork in a timely and accurate manner, such as

textbook requests, Faculty Activities Reports, sole source justifications, etc.

Appendix B

Revised Abbreviated Format for Faculty Activity Report

Material with double-underlines is recommended for addition to this report format.

FACULTY PROFESSIONAL ACTIVITIES REPORT

1 January 199x to 31 December 199x inclusive

SECTION I. INTERNAL ACTIVITIES

a. Courses Offered (non-Reading): If appropriate, include comments on e.g., first time given, extensive revisions, new text used, etc.). You may attach any SOF forms you wish to share with the Provost.

b. Reading Courses you have taught: list number of students in each case.

c. Thesis Supervision of Completed Theses (title, authors, degree, date and whether advisor, co-advisor, or second reader)

d. Other internal curricular work. Include a brief description of other curricular work. Examples of such activities include text development which has not yet led to publication, introduction of new material to courses or curricula, development of new courses, substantial revision of existing courses, development of capstone courses in interdisciplinary areas, development of instructional laboratory facilities or exercises, results of class design presentations to visiting evaluation panel, etc.

e. Externally funded research activities. For each research project in which you participated, attach on a single sheet of paper a brief description of the project and a summary of your contribution. Be sure to include: 1) project title; 2) sponsor; 3) principal investigator and other project investigators; and 4) a general description of the scientific or technical contribution, relationship to DoD/DoN, contributions to

courses/curricula at NPS, and your own contribution to the research.

If you were the principal investigator, also complete the project summary requested in Appendix A in the specified format. (An example is included in Appendix A.)

f. Internally funded research activities. Same material as requested in e, including the project summary. Direct funded projects and Research Council projects should be included here.

g. Other internal research activities. Include comments on other internal contributions to research including such activities as visiting research associates attracted, laboratory facility development, technical staff developed/supported, contributions to developments and support of research facilities, research expositions to NPS visitors, internal seminars presented, etc. Attach a separate page.

h. Internal administrative activities.

1. Administrative positions and dates (include Dean, Chair, Associate Chair, Director, Academic Associate, etc.). Give indication of level of activity.

2. Committees. Service on school-wide, department, or other committees, councils and boards. Indicate quarter(s), title of activity, and level of your contribution.

3. Curricular reviews and revisions and other curriculum support activities. Indicate nature of these and describe nature of your participation.

4. Service to Academic Groups. List special service to academic groups and indicate nature and level of your participation.

5. Faculty development. Describe any activities related to faculty or staff development. (Include participation in instructional workshops/seminars).

SECTION II. EXTERNAL ACTIVITIES

a. **Publications and reports**

b. **Presentations**

c. Other research products delivered to external agencies. (Examples of such products include software, position papers, military manuals, patents, hardware or software designs that have been incorporated in products, models or procedures evaluated and adopted by external agencies, etc.)

d. External contributions to the Dept of the Navy and/or DoD. List items such as committee service, evaluations performed for operational commands, other DoN Activities, meetings attended, meetings organized, conference participation (non-speaker), presentation of research activities to operational commands, etc.

e. Continuing Education Short Courses (List on-campus and off-campus short courses; do not include which you carried on consulting time)

f. External Teaching Activities: Describe activities in which you have made contributions to the teaching efforts of others external to NPS.

g. Visits to other institutions. List visits and/or attendance at schools (e.g., ASW School in San Diego), visits to Naval Labs, experience cruises, etc.

h. Other external; professional contributions. Include activities in professional societies, editorships, reviews of papers, reviews of proposals, etc.

i. Contributions to the community. Include here only those that are not primarily associated with your profession.

SECTION III. CONSULTING AND OTHER PROFESSIONAL DEVELOPMENT ACTIVITIES. Summarize your consulting work during this period, and indicate its relevance to the mission of NPS.

SECTION IV. NARRATIVE FORMAT. Describe on a separate sheet of paper in narrative form your accomplishments of the past year. ~~your summary of the impact on NPS of your external activities.~~ Include any other items here that do not seem to fit elsewhere in the report, but which have relevance to your contributions to NPS, to the Department of the Navy, and to any external agencies. Also include any items that have been reported in prior years but have had demonstrable impact during the past year.

SECTION V. SUGGESTIONS (Voluntary). Attach a separate sheet with suggestions for changes and/or improvements to NPS. You may address these to any office you wish. They will be separated from the rest of the report and forwarded for consideration.

(Appendix A Research Summaries and Appendix B Publications follow.)

Appendix C

Examples of Evaluation of Nonstandard Products

Case 1. Professor A has written programs to be used in laptop notebook computers and programmable calculators for use by ASW patrol squadrons. These programs perform computations related to navigation, search pattern generation, and target tracking. The use of such programs is tightly reviewed and controlled within the Navy by the Fleet Program Library. Professor A has also been asked to review programs written by other workers for acceptance into the Fleet Program Library.

Professor A's Mentoring Committee should contact the chief official that administers the Fleet Program Library asking for particulars on the evaluation results of the reviewers of Professor A's program submissions. Information should be elicited, in writing, about the comparative quality of the program offerings, about the utility of the programs in the fleet, and about the value of Professor A's reviews of programs that have been submitted by others. The information about the comparative quality should be obtained from the reviewers and the administrator who runs the reviewing process. The information about the utility of the programs should be received from the aviators using the programs and from the Squadron leaders who can measure the integrated effectiveness over several users. The value of Professor A's reviews of other submitted programs would come from the administrator of the review process. Each of these components (and any others of the Committee's choosing) should be included in the evaluation of the activity; lack of information in any of these areas only weakens the appraisal of Professor A's work.

Case 2. Professor B has written several official Navy studies. These studies have been reviewed by many practitioners, by technical advisors, and by top-level military officers.

The Mentoring Committee contacts the reviewers and asks for a written assessment of the work. The military practitioners are asked to review the impact of the study on the operational aspects of their warfare fields, the technical reviewers are asked to evaluate the technical merit of the work being done, and the top-level officers are asked to assess the impact of the studies on their command. Note that each category of evaluator needs to receive a different letter in order to pinpoint the area of pertinence for their review.

Case 3. Professor C develops procedures for, writes, and delivers an OD document to the Strategic Systems Programs Office (SSPO). It is used in place of MIL-STD 105D or MIL-STD 414 to inspect samples drawn from lots of components that might have been directly screened. It ensures that lots with no defective items are always accepted, a practice that does not occur under MIL-STD 414. The method in the OD requires about one-half of the sampling of that required by MIL-STD 105D and, thus, generates significant savings.

The procedure was tested, evaluated, and adopted to perform acceptance sampling of components for the Polaris, Poseidon, and Trident missile programs.

The Mentoring Committee contacts SSPO personnel for an assessment of the quality of the work performed (the SSPO performed the document review before the document was adopted), DoD civilians and their consultants in the Naval Procurement Office (NAVPRO) at Lockheed Missiles and Space (where the procedure is used) for an assessment of the technique's impact on the missile programs and the estimated cost savings, and technical experts at Lockheed Missiles and Space for their technical assessment of the method.

Case 4. Professor D revised an inventory control model for the Navy Supply system to provide an increased emphasis on readiness rather than solely minimizing cost. The model was tested and adopted by the Naval Supply Systems Command (NAVSUP). Work continues on incorporating techniques to optimize the replenishment of stock while maintaining readiness and minimizing cost. The model is continually evolving and has not yet reached a steady-state.

The Mentoring Committee contacts officials at NAVSUP who are familiar with the testing of the model that was initially done that led to the later decision to adopt the model. These personnel could address the technical merits of the model. The Committee also contacts the decision-makers who decided to adopt the model to replace the previous model. These individuals could address the advantages offered by the model and the potential impact the model offered that caused them to make their decision. Finally, the Committee would also contact the sponsors of the present work to improve the model to provide a technical assessment of the model's features as well as an assessment of the potential impact of the model on NAVSUP inventory control system.

Case 5. Professor E works in the Electronic Warfare area. She performs work that is classified at the Top Secret and Secret levels and produces technical reports that are sent to a limited distribution list.

The Mentoring Committee is composed of faculty with the required security clearances to have access to the technical reports. Copies of the reports are sent to Navy laboratory researchers in technical areas appropriate to Professor E's work for technical review. These evaluators would have to have the proper clearance and access to the classified material. In addition, the sponsor of the work is requested to evaluate the work in terms of its technical merit and its impact on the military programs that it supports. It is expected that, while the exact nature of the work could not be divulged in an unclassified letter of evaluation, the technical merit and the impact of the work could be properly described. Follow-up conversations or visits might be required by a member of the Mentoring Committee to obtain detailed information. Note that, for this work, it is appropriate to assess both the technical merit of the work and the military impact. It should also be pointed out to Professor E that the Journal of Defense Research might be an appropriate classified medium for publication of these results, if the sponsor permits.

Case 6. Professor F teaches design. At the beginning of the course, she presents a specific "Request-for-Proposal" to the class. She then guides them through the multi-faceted, iterative system design process. The open-ended nature of the design process, the unique aspects of each design project, and the evaluation of each design solution as it progresses require more of her time than is usually required by a traditional analytic course. At the end of the course, she has the students present their design results to a panel of design engineers from Navy laboratories and industry, and retired Naval officers.

The Mentoring Committee contacts the members of the panel for a written assessment of the design and the students' preparation and guidance. For example, did the students demonstrate an overall understanding of the system and was the design methodology appropriate for the system being considered? Students who have completed the course should also be interviewed to obtain an assessment of the instructor's pedagogical techniques.

Case 7. Professor G prepares and delivers short-course material to DoD activities. He visits the activity to formulate the desired skill objectives for the course. He prepares a proposal to develop and deliver the course; this proposal is forwarded, accepted, and funded. Professor G develops the course materials and delivers the course at one or more sites. End-of-course questionnaires are completed by students at the finish of the course.

The Mentoring Committee contacts the people at each site who requested the course and reviewed the proposal to obtain information about the value, impact, etc. of the course. Summary information on the end-of-course questionnaires is requested in order to obtain some measure of the quality of instruction and the perceived value of the course to the participants. Additional information may be gathered on the uniqueness, applications to existing problems, and cumulative benefits as repeated offerings of the course are given. Special cost savings to the benefiting activities should be noted when such data are available.