

# *SUMMARY OF RESEARCH 1998*

**Department of  
Systems Management**

**Reuben T. Harris  
Chair**

**Mark J. Eitelberg  
Associate Chair for Research**

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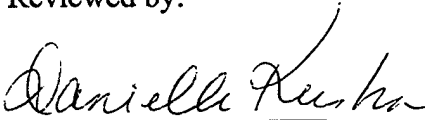
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R. Elster  
Provost

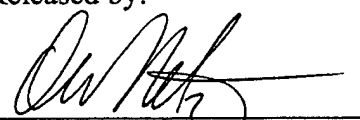
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Reviewed by:

  
Danielle A. Kuska  
Director, Research Administration

Released by:

  
David W. Netzer  
Associate Provost and Dean of Research

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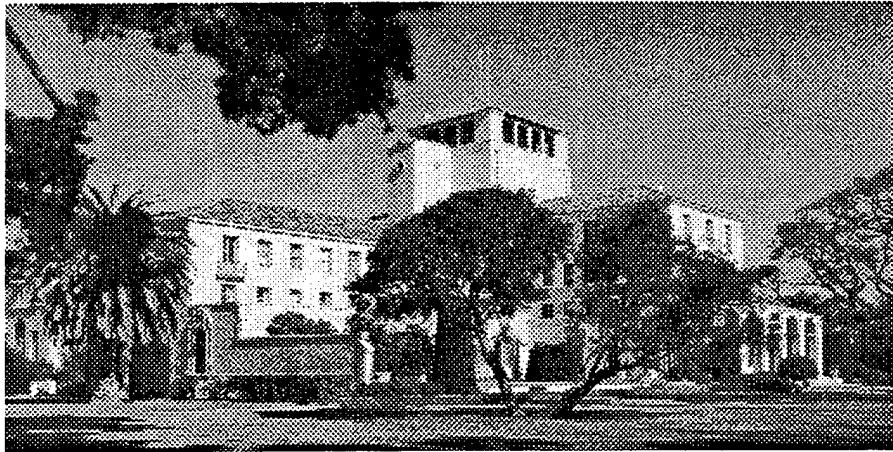
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**DEPARTMENT OF  
SYSTEMS MANAGEMENT**

**Reuben T. Harris  
Chair**

## **THE NAVAL POSTGRADUATE SCHOOL MISSION**

The mission of the Naval Postgraduate School is to increase the combat effectiveness of U.S. and Allied armed forces and enhance the security of the USA through advanced education and research programs focused on the technical, analytical, and managerial tools needed to confront defense-related challenges.



## CONTENTS

Preface .....	7
Introduction.....	9
Faculty Listing.....	11
Department Summary.....	15
Project Summaries.....	21
The Impact of Deployment on Army Reservists .....	21
America's All-Volunteer Force .....	21
Study of Socio-Economic Status and Personnel Performance in the Military.....	22
Study of Recruit Attrition from the Delayed Entry Program.....	23
Systems Management Research Support for the Rapid Acquisition of Manufactured Parts (RAMP) Program.....	24
Productivity Enhancing Concepts.....	24
Naval Postgraduate School Research Support for Naval Inventory Control Point (NAVICP) – Evaluation of Automated Non-Standard Requisitioning System (ANSRS).....	24
Maintenance Deployment Commodity Planning Tool .....	25
Distribution Problems in Sea-Based Logistics .....	26
Layout Methods for Crossdocks in the Retail and Trucking Industries.....	26
Chair of Management Analysis .....	27
Econometric Projection of Army Personnel Strength.....	27
Technology-to-Tactics for Sensor to Shooter Networks: A Strategy-to-Task Approach.....	27
Land-Based Search and Rescue (SAR) Outsourcing.....	28
Navy Practical Comptrollership Course (PCC).....	28
Leadership and Retention in Troop Program Units (TPU), Phase IV: Validation and Implementation of Leadership Feedback.....	29
Development of Performance Output and Cost Measurement Metrics .....	29
Analysis of Budget Reduction, Cost-Avoidance and Financial Management Initiatives in COMNAVAIRPAC .....	30
Investigation of DoD Inventory Management.....	31
Systems Acquisition Management (Curriculum 816) Support.....	32
A Readiness-Based Sparing Replenishment Model for Repairable Items.....	33
Manpower Systems Analysis (MSA) Faculty Research to Support N-1 (Chief of Naval Personnel).....	34
Minority Representation and Career Progression in Navy Enlisted Ratings .....	34
Analysis of Limited Duty Board and Central Physical Evaluation Board Processes .....	35
Recruit Station Location Project.....	36
External Acquisition Research Program Initiation .....	36
Knowledge-Based Re-Engineering: Intelligent Tools Development and Testing .....	37
Acquisition Management Distance Learning Program.....	38
Interorganizational Collaboration.....	38
Strategic Planning for Naval Construction Battalion Center.....	39
Financial Reporting and Analysis Research for the Department of Defense Security Research Center .....	40
Strategic Profit Analysis and Enterprise Resource Planning in Department of Defense Security Research Center .....	41
A Blueprint for Research in Defense Acquisition .....	42
Bureau of Medicine and Surgery (BuMED) Executive Management Education (EME) Deliverables and Research and Development for Fiscal Year 1999 .....	42
Marine Corps Retention Study .....	43
Diversity Analysis for United States Navy Leadership Continuum .....	43

Support for Development of Troop Program Unit (TPU) Leadership Training .....	44
Publications and Presentations.....	45
Thesis Abstracts.....	53
Initial Distribution List .....	153

## PREFACE

Research at the Naval Postgraduate School is carried out by faculty in the School's eleven academic departments, seven interdisciplinary groups, and the School of Aviation Safety. This volume contains research summaries for the projects undertaken by faculty in the Department of Systems Management during 1998. Also included is an overview of the department, faculty listing, a compilation of publications/presentations, and abstracts from theses directed by the department faculty.

Questions about particular projects may be directed to the faculty Principal Investigator listed, the Department Chair, or the Department Associate Chair for Research. Questions may also be directed to the Office of the Associate Provost and Dean of Research. General questions about the NPS Research Program should be directed to the Office of the Associate Provost and Dean of Research at (831) 656-2099 (voice) or [research@nps.navy.mil](mailto:research@nps.navy.mil) (e-mail). Additional information is also available at the RESEARCH AT NPS website, <http://web.nps.navy.mil/~code09/>.





## INTRODUCTION

The research program at the Naval Postgraduate School exists to support the graduate education of our students. It does so by providing militarily relevant thesis topics that address issues from the current needs of the Fleet and Joint Forces to the science and technology that is required to sustain the long-term superiority of the Navy/DoD. It keeps our faculty current on Navy/DoD issues, permitting them to maintain the content of the upper division courses at the cutting edge of their disciplines. At the same time, the students and faculty together provide a very unique capability within the DoD for addressing warfighting problems. This capability is especially important at the present time when technology in general, and information operations in particular, are changing rapidly. Our officers 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. Their unique knowledge of the operational Navy, when combined with a challenging thesis project that requires them to apply their focussed graduate education, is one of the most effective methods for both solving Fleet problems and instilling the life-long capability for applying basic principles to the creative solution of complex problems.

The research program at NPS consists of both reimbursable (sponsored) and institutionally funded research. The research varies from very fundamental to very applied, from unclassified to all levels of classification.

- **Reimbursable (Sponsored) Program:** This program includes those projects externally funded on the basis of proposals submitted to outside sponsors by the School's faculty. These funds allow the faculty to interact closely with RDT&E program managers and high-level policymakers throughout the Navy, DoD, and other government agencies as well as with the private sector in defense-related technologies. The sponsored program utilizes Cooperative Research and Development Agreements (CRADAs) with private industry, participates in consortia with other government laboratories and universities, provides off-campus courses either on-site at the recipient command or by VTC, and provides short courses for technology updates.
- **NPS Institutionally Funded Research Program (NIFR):** The institutionally funded research program has several purposes: (1) to provide the initial support required for new faculty to establish a Navy/DoD relevant research area, (2) to provide support for major new initiatives that address near-term Fleet and OPNAV needs, (3) to enhance productive research that is reimbursable sponsored, (4) to contribute to the recapitalization of major scientific equipment, and (5) to cost-share the support of a strong post-doctoral program.
- **Institute for Joint Warfare Analysis (IJWA) Program:** The IJWA Program provides funding to stimulate innovative research ideas with a strong emphasis on joint, interdisciplinary areas. This funding ensures that joint relevance is a consideration of research faculty.

In 1998, the overall level of research effort at NPS was 145 faculty workyears and exceeded \$35 million. The Department of Systems Management's effort was 19 faculty workyears and exceeded \$3.6 million. The sponsored research program has grown steadily to provide the faculty and staff support that is required to sustain a strong and viable graduate school in times of reduced budgets. In FY98, over 81% percent of the NPS research program was externally supported. In the Department of Systems Management 94% was also externally supported.

The department's research sponsorship in FY98 is provided in Figure 1.

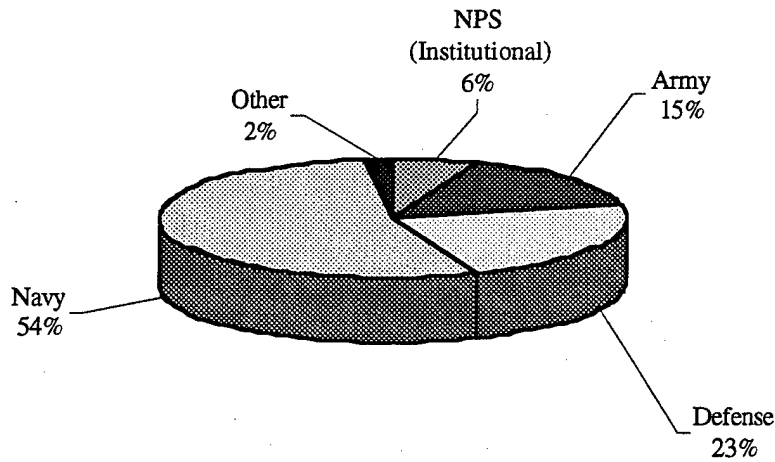


Figure 1. FY98 Sponsor Profile of the Department of Systems Management

These are both challenging and exciting times at NPS and the research program exists to help ensure that we remain unique in our ability to provide graduate education for the warfighter.

DAVID W. NETZER  
Associate Provost and Dean of Research

October 1999

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## FACULTY LISTING

---

Harris, Reuben T.  
Professor and Chair  
SM/Hr  
831-656-2161 (phone)  
831-656-4162 (fax)  
[rharris@nps.navy.mil](mailto:rharris@nps.navy.mil)

Eitelberg, Mark J.  
Associate Professor and  
Associate Chair for Research  
SM/Eb  
831-656-3160  
[meitelberg@nps.navy.mil](mailto:meitelberg@nps.navy.mil)

Barrett, Frank J.  
Associate Professor  
SM/Br  
831-656-2328  
[fbarret@nps.navy.mil](mailto:fbarret@nps.navy.mil)

Doyle, Richard  
Associate Professor  
SM/Dy  
831-656-3302  
[ddoyle@nps.navy.mil](mailto:ddoyle@nps.navy.mil)

Fremgen, James M.  
Professor  
SM/Fm  
831-656-2644  
[jfremgen@nps.navy.mil](mailto:jfremgen@nps.navy.mil)

Barrios-Choplin, Bob  
Research Assistant Professor  
SM/Bc  
831-656-2755  
[jchoplin@nps.navy.mil](mailto:jchoplin@nps.navy.mil)

Eaton, Don, RADM, USN, (Ret.)  
Senior Lecturer  
SM/Ed  
831-656-3616  
[deaton@nps.navy.mil](mailto:deaton@nps.navy.mil)

Gates, William  
Associate Professor  
SM/Gt  
831-656-2754  
[brgates@nps.navy.mil](mailto:brgates@nps.navy.mil)

Boudreau, Mike  
Senior Lecturer  
SM/Be  
831-656-3420  
[mboudreau@nps.navy.mil](mailto:mboudreau@nps.navy.mil)

Edwards, Lee  
Visiting Assistant Professor  
SM/Ed  
831-656-3628  
[ledward@nps.navy.mil](mailto:ledward@nps.navy.mil)

Gue, Kevin  
Assistant Professor  
SM/Gk  
831-656-4299  
[krgue@nps.navy.mil](mailto:krgue@nps.navy.mil)

Brinkley, Doug  
Lecturer  
SM/Bi  
831-656-2771  
[dbrinkle@nps.navy.mil](mailto:dbrinkle@nps.navy.mil)

Euske, Kenneth J.  
Professor  
SM/Ee  
831-656-2860  
[kjeuske@nps.navy.mil](mailto:kjeuske@nps.navy.mil)

Haga, William  
Senior Lecturer  
SM/Hg  
831-656-3094  
[haga@nps.navy.mil](mailto:haga@nps.navy.mil)

Cook, Mike  
Assistant Professor  
SM/Cm  
831-656-3508  
[mcook@nps.navy.mil](mailto:mcook@nps.navy.mil)

Evered, Roger  
Professor  
SM/Ev  
831-656-2646  
[revered@nps.navy.mil](mailto:revered@nps.navy.mil)

Hatch, William, CDR, USN, (Sel)  
Lecturer  
Sm/Hh  
831-656-2463  
[wdhatch@nps.navy.mil](mailto:wdhatch@nps.navy.mil)

Crawford, Alice  
Senior Lecturer  
SM/Cr  
831-656-2481  
[acrawford@nps.navy.mil](mailto:acrawford@nps.navy.mil)

Feitler, Jane  
Visiting Assistant Professor  
SM/Fj  
831-656-2768  
[jfeitler@nps.navy.mil](mailto:jfeitler@nps.navy.mil)

Henderson, David R.  
Associate Professor  
SM/Ht  
831-656-2524  
[drhender@nps.navy.mil](mailto:drhender@nps.navy.mil)

Cuskey, Jeffrey, LCDR, USN  
Lecturer  
SM/Ck  
831-656-2966  
[jcuskey@nps.navy.mil](mailto:jcuskey@nps.navy.mil)

Filizetti, Julie  
Lecturer  
SM/Dg  
831-656-3564  
[jdougherty@nps.navy.mil](mailto:jdougherty@nps.navy.mil)

Hildebrandt, Gregory G.  
Assistant Professor  
SM/Hi  
831-656-3407  
[ghildebrandt@nps.navy.mil](mailto:ghildebrandt@nps.navy.mil)

## FACULTY LISTING

---

Hleba, Theodore, CDR, USN  
Lecturer  
SM/Hb  
831-656-2884  
[tahleba@nps.navy.mil](mailto:tahleba@nps.navy.mil)

Hocevar, Susan P.  
Assistant Professor  
SM/Hc  
831-656-2249  
[shocevar@nps.navy.mil](mailto:shocevar@nps.navy.mil)

Jansen, Erik  
Visiting Associate Professor  
SM/Ek  
831-656-2623  
[ejansen@nps.navy.mil](mailto:ejansen@nps.navy.mil)

Jones, Lawrence R.  
Professor  
SM/Jn  
831-656-2482  
[lrjones@nps.navy.mil](mailto:lrjones@nps.navy.mil)

Kang, Keebom  
Associate Professor  
SM/Kk  
831-656-3106  
[kkang@nps.navy.mil](mailto:kkang@nps.navy.mil)

Lamm, David V.  
Associate Professor  
SM/Lt  
831-656-2775  
[dlamm@nps.navy.mil](mailto:dlamm@nps.navy.mil)

Lewis, Ira  
Associate Professor  
SM/Le  
831-656-2464  
[ialewis@nps.navy.mil](mailto:ialewis@nps.navy.mil)

Liao, Shu S.  
Professor  
SM/Lc  
831-656-2505  
[sliao@nps.navy.mil](mailto:sliao@nps.navy.mil)

Matthews, Dave  
Senior Lecturer  
SM/Md  
831-656-2360  
[dmatthews@nps.navy.mil](mailto:dmatthews@nps.navy.mil)

McCaffery, Jerry L.  
Professor  
SM/Mm  
831-656-2554  
[jmccaff@nps.navy.mil](mailto:jmccaff@nps.navy.mil)

McMasters, Alan W.  
Professor Emeritus  
SM/Mg  
831-656-2678  
[awmcmast@nps.navy.mil](mailto:awmcmast@nps.navy.mil)

Mehay, Stephen L.  
Professor  
SM/Mp  
831-656-2643  
[smehay@nps.navy.mil](mailto:smehay@nps.navy.mil)

Moses, O. Douglas  
Associate Professor  
SM/Mo  
831-656-3218  
[dmoses@nps.navy.mil](mailto:dmoses@nps.navy.mil)

Mutty, John  
Senior Lecturer  
SM/Mu  
831-656-2205  
[jmutty@nps.navy.mil](mailto:jmutty@nps.navy.mil)

Naegle, Brad, LTC, USA  
Lecturer  
SM/Nb  
831-656-3620  
[bnaegle@nps.navy.mil](mailto:bnaegle@nps.navy.mil)

Nissen, Mark E.  
Assistant Professor  
SM/Ni  
831-656-3570  
[mnissen@nps.navy.mil](mailto:mnissen@nps.navy.mil)

Owen, Walter  
Lecturer  
SM/On  
831-656-2048  
[wowen@nps.navy.mil](mailto:wowen@nps.navy.mil)

Pawlowski, Bruce  
Research Associate  
SM/Pa  
831-656-2650  
[bpawlowsk@nps.navy.mil](mailto:bpawlowsk@nps.navy.mil)

Roberts, Nancy  
Professor  
SM/Rc  
831-656-2742  
[nroberts@nps.navy.mil](mailto:nroberts@nps.navy.mil)

San Miguel, Joseph  
Professor  
SM/Sm  
831-656-2187  
[jsanmiguel@nps.navy.mil](mailto:jsanmiguel@nps.navy.mil)

Simon, Cary  
Assistant Professor  
SM/Sn  
831-656-2439  
[csimon@nps.navy.mil](mailto:csimon@nps.navy.mil)

Smith, David, CDR  
Lecturer  
SM/Sv  
831-656-3619  
[Dasmith@nps.navy.mil](mailto:Dasmith@nps.navy.mil)

Snider, Keith F.  
Assistant Professor  
SM/Sk  
831-656-3621  
[ksnider@nps.navy.mil](mailto:ksnider@nps.navy.mil)

Stone, Mark W.  
Assistant Professor  
SM/St  
831-656-3622  
[mwstone@nps.navy.mil](mailto:mwstone@nps.navy.mil)

## FACULTY LISTING

---

Suchan, James  
Associate Professor  
SM/Sa  
831-656-2905  
[jsuchan@nps.navy.mil](mailto:jsuchan@nps.navy.mil)

Thomas, Gail Fann  
Associate Professor  
SM/Fa  
831-656-2756  
[gthomas@nps.navy.mil](mailto:gthomas@nps.navy.mil)

Thomas, George  
Professor  
SM/Te  
831-656-2741  
[gwthomas@nps.navy.mil](mailto:gwthomas@nps.navy.mil)

Thomas, Kenneth W.  
Professor  
SM/Th  
831-656-2776  
[kthomas@nps.navy.mil](mailto:kthomas@nps.navy.mil)

Tudor, Rodney, E.  
Lecturer  
Sm/Tj  
831-656-2456  
[retudor@nps.navy.mil](mailto:retudor@nps.navy.mil)

Walls, Gregory, LTC, USA  
Lecturer  
SM/WI  
831-656-3301  
[gwalls@nps.navy.mil](mailto:gwalls@nps.navy.mil)

Weitzman, Ronald  
Associate Professor  
SM/Wz  
831-656-2694  
[rweitzman@nps.navy.mil](mailto:rweitzman@nps.navy.mil)

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## DEPARTMENT SUMMARY

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Systems Management is the largest academic department at the Naval Postgraduate School (NPS), with approximately 60 full-time faculty and 30 support staff. At any given time, there are over 300 students enrolled in one of Systems Management's graduate education programs. The department's mission is to "improve the managerial capabilities and leadership qualities of U.S. and international military officers and government civilians through graduate education, research, and professional service"; further, Systems Management strives to "conduct research that supports military decision making, problem solving, and policy setting, improves administrative processes and organizational effectiveness, contributes knowledge to academic disciplines, and advances the mission of graduate education." Faculty research is an important component of System Management's mission, and it is integrated to the greatest possible extent with the educational process. Students are encouraged to participate in faculty projects, and faculty research results are typically incorporated in classroom instruction. In 1998, the department's research efforts were augmented through its affiliation with the Institute for Defense Education and Analysis (IDEA) and by the participation of adjunct professors in many specialty areas.

### Functional Areas

The Department of Systems Management has primary responsibility for six academic programs and awards six graduate degrees. The largest program is a group of curricula in Systems Management. These curricula include Acquisition and Contract Management, Systems Acquisition Management, Financial Management, Manpower Systems Analysis, Material Logistics Support Management, Systems Inventory Management, Defense Systems Management (International), Shore Installation Management, Transportation Logistics Management, and Transportation Management. Graduates of curricula in the Systems Management Program receive the degree of Master of Science in Management, which is accredited by the National Association of Schools of Public Affairs and Administration. Additionally, the department offers the following programs and graduate degrees: Resource Planning and Management for International Defense, which awards the degree of Master of Science in International Resource Planning and Management; separate curricula in Contract Management and Program Management (for Department of Defense civilians at designated off-site locations), which award a Master of Science in Contract Management and a Master of Science in Program Management, respectively; Leadership Education and Development (for Company Commanders at the U.S. Naval Academy), which awards a Master of Science in Human Resources Management; and a new, off-site program for military reservists that awards the degree of Master of Business Administration.

In addition to these graduate education programs, the Department of Systems Management also offers several other programs through teleconferencing and on-site instruction. For example, in 1998, course offerings via distance learning included programs in Acquisition Management and in Fundamental Management. Further, course modules were delivered as part of the department's BuMed Executive Management Education Program and the TRICARE Financial Management Executive Education Program.

Systems Management faculty are drawn from a wide variety of academic disciplines—including management, business and public administration, political science, economics, education, accounting, law, information systems, psychology, operations research, and other fields—to meet the demands of the department's diverse curricula. In addition, faculty represent a number of sub-disciplines within academic areas. For example, in 1998, faculty with doctorates in economics specialized in labor economics, econometrics, microeconomics, political economy, and public finance; faculty with graduate degrees in psychology included those with specialization in psychometrics, industrial/organizational psychology, clinical psychology, experimental psychology, social psychology, and military psychology. In total, there are over 100 academic sub-disciplines represented within the Department of Systems Management.

The department's diverse, multidisciplinary character is similarly reflected in the breadth and depth of issues addressed by faculty research, which has historically been concentrated in applied areas of interest to the Departments of Defense and Navy. The department's research program may touch upon 50 or more distinct topics within the course of a year. These topics and issues can be grouped into five functional areas, based on the department's curricula. In 1998, the department's five functional areas included the following:

*Acquisition and Contracting*  
*Logistics and Transportation*  
*Financial Management*  
*Manpower Systems Analysis*  
*Organization, Management, and Policy Analysis.*

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## DEPARTMENT SUMMARY

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### Planning For the Future: General Guiding Principles

As noted, research in the Department of Systems Management is multidisciplinary and often widely diverse; but, all research is directed toward a common set of goals. As stated in the department's mission statement, the department conducts a variety of research to:

- support military decision-making, problem-solving, and policy-setting;
- improve administrative processes and organizational effectiveness;
- contribute knowledge to academic disciplines; and
- advance the mission of graduate education.

The primary goal of the department's research program is to provide the Navy and DoD with the capability of managing defense systems efficiently and effectively. This includes the efficient and effective utilization of resources, which derive from an existing base of knowledge or may require the development of new concepts and theory. Thus, the department recognizes the importance to the Navy and DoD of both basic and applied research; and it seeks to create a balance of both types of research in its research program.

The department's research program goals are further specified as follows on the Systems Management "web" page (<http://web.nps.navy.mil/~sm/research.html>):

- to apply the foundations of existing knowledge in support of resource utilization decisions;
- to develop new concepts or theory where no foundation of knowledge exists to support the policy decision-making process;
- to enhance the relevance of the department's instructional programs; and
- to involve the students in research, through their thesis work or class projects, in a manner that will enhance their decision-making capability.

Concepts, theory, and existing knowledge can generally be identified with a particular functional area or discipline. Actual resource utilization decisions or policies often require information or perspectives drawn from a variety of functional areas. Consequently, in addition to pursuing functional area research with a critical mass of faculty, the department actively seeks to engage in cooperative, interdisciplinary research. Such research places the department in a strong position to assist defense policy makers, since it allows for a coordinated, broad-based program under "one roof"—where researchers from diverse fields can share information and findings in a unified and truly systematic fashion.

### Planning for the Future: Research Opportunities by Functional Area

As the department prepares for the challenges of the future, it is appropriate to consider research fields that would help Systems Management achieve its program goals and simultaneously assist defense decision-makers. Potential fields of inquiry, or research opportunities for the future, are discussed below by each of the department's five functional areas.

*Acquisition and Contract Management.* Defense acquisition represents a process of critical importance to the military, not only to reduce taxpayer costs, but to ensure the quality and performance of today's increasingly sophisticated weapon systems. Nevertheless, negligible academic research has been applied to systematically investigate, understand, and model the acquisition process; and current innovations in this domain—such as process reengineering and acquisition reform—are uncoordinated, ad-hoc, and performed largely on a trial-and-error basis. This is the case because many acquisition policy makers and executives have little or no benefit of theory for practice.

The acquisition group's primary objective is outlined as a five-year program of multidisciplinary research, designed to address this dearth of acquisition theory. Generally, research objectives are directed at the following:

- basic theory-building research into critical questions;
- fundamental dimensionality and key attributes associated with defense acquisition; and
- exploring the integrated re-engineering and reform of acquisition processes through the development of empirical models, prototyping of advanced technologies, and rigorous analysis of process innovations and regulatory reform.

This research represents seminal scholarly work in the area of defense acquisition and draws from expertise in accounting, contracting, economics, information systems, law, organizational design, public policy, and other academic area disciplines. The research program also plans for contributions not only from the NPS faculty, but through collaborative research with other top-ranked universities outside DoD. This initial work can also help to establish both a precedent and the

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## DEPARTMENT SUMMARY

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standard for other research institutions to follow in terms of acquisition research; and it complements similar efforts by the department and NPS to reach beyond the customary, defense-oriented pool of researchers.

*Logistics and Transportation.* The primary mission of the Logistics and Transportation group is to educate military officers and DoD civilians in state-of-the-art concepts of logistics and transportation management. Emphasis is placed on understanding both military and non-military applications, so that students will be prepared to perform effectively in a military environment and interact efficiently with civilian contractors and suppliers. The general research perspective of the group is focused on improving DoD logistics and transportation performance as well as management effectiveness. Major research areas for the future include:

- DoD inventory policy;
- inventory and cycle time reduction;
- defense transportation and distribution systems;
- Total Asset Visibility (TAV) and real-time logistics/Transportation control;
- modeling and simulation for logistics decision support;
- reduction of manpower in aircraft and ship maintenance;
- aircraft Component Improvement Program (CIP); and
- sea-based logistics for the Navy and the Marine Corps.

*Financial Management.* Research in the area of financial management has become increasingly important since the end of the Cold War, as defense organizations “downsize” and policy makers exercise renewed efforts to gain maximum utility of shrinking resources at minimum cost. The Financial Management (FM) group has identified three major functional areas as targets of opportunity for future research. These are:

- financial resource policy formulation, analysis and management;
- financial management and budgeting; and
- cost analysis.

The first of these functional areas—financial resource policy formulation, analysis, and management—covers a range of sub-areas: national defense and national security resource policy and management; resource planning, programming, budgeting, and policy under the Planning, Programming, Budgeting System; and relationships between financial management, contracting, acquisition, and other policy fields. Financial management and budgeting includes the following: federal, DoD, and Navy budget formulation and execution; impacts of budget allocation, reallocation, and reduction; implementation of Defense Resource Management Systems; and the Chief Financial Officer Act and federal financial management reforms. The research area of cost analysis, in turn, covers the following: weapon systems and software cost estimation; resource requirement analysis; the cost of new technologies; and cost analysis of major system modifications.

*Manpower Systems Analysis.* As noted above, the primary goal of the department’s research programs is to provide defense policy makers with the capability of utilizing resources with maximum efficiency and effectiveness. This includes *human* resources, the focus of research in the Manpower Systems Analysis (MSA) group. Defense manpower policy makers have been faced with many challenges since the end of the Cold War. Key among these challenges were a reduction of the active-duty force by over 30 percent, budget reductions in recruiting and advertising, a steady operational tempo and deployment schedule with fewer people, new missions, declining levels of public and congressional support for the military, increasing pressure to change the “culture” of military service, renewed efforts toward population representation of women and racial/ethnic minorities throughout the force, a seemingly immovable, high rate of first-term attrition among new recruits, declining levels of personnel retention in certain critical areas, a number of high-profile “scandals,” and others. As the active-duty force was reduced and missions changed, it soon became clear that a smaller military had to be even more skilled and adaptable than the one that witnessed the end of compulsory service and performed so successfully throughout the early 1980s and early 1990s. These challenges confronting defense manpower policy makers are recognized by the MSA group as opportunities for research that will have a lasting impact on the future of the force. MSA research areas for the future can be summarized as follows:

- manpower supply and force requirements;
- improvements in selection and classification of enlisted personnel;
- innovations in recruiting and the application of new technologies;
- improvements in selection of officers and pre-commissioning programs;
- effectiveness of equal opportunity and diversity management programs;
- training effectiveness and efficiency;

## DEPARTMENT SUMMARY

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- innovations in instructional technologies;
- personnel retention in critical fields;
- reduction of first-term attrition rates among enlisted personnel;
- force management programs and planning;
- force structure and cost analysis;
- career-force modeling;
- officer promotion and performance;
- civil-military relations and the All-Volunteer Force; and
- manpower management in Reserve components.

The MSA group also expects to continue looking at the future manpower needs of the military, similar to its previous research for the Army, the Office of the Secretary of Defense, and the Navy.

*Organization, Management, and Policy Analysis.* Faculty in this functional area pursue basic and applied research on key management issues at a variety of organizational levels. Faculty bring a strategic perspective to this work, seeking to identify courses of action that will best achieve organizational goals in a given setting. Individual faculty are acknowledged experts who publish leading-edge research on a variety of issues. Top management issues include strategic planning, stakeholder analysis, organizational design (including the use of self-managing groups), downsizing, and the development of culture. Human resource management issues include the design of strategic reward systems, managing gender and diversity issues, managing stress, forming career identities, and alternative strategies to training and education (including distance learning). There is a strong expertise in leadership at all organizational levels. Leadership issues studied by faculty include leadership development, the identification of key leadership skills, innovation and change, motivational strategies, empowerment, coaching, communications strategies, conflict management, entrepreneurship, and constructive uses of power. Faculty are also experts in a variety of research methodologies—from highly sophisticated quantitative to in-depth qualitative analyses.

In addition to their subject area and methodological expertise, faculty have developed considerable knowledge of current military organizations through their research. Most of this work has been with Navy organizations, such as the Military Sealift Command, NAVAIR, CNET, Bureau of Medicine, and CINCLANTFLEET. However, faculty have also worked with organizations in other service branches, including extensive work with the U.S. Army Reserve Command and Coast Guard Headquarters. Recent DoD-wide research includes work for the 8th Quadrennial Review of Military Compensation. (Individual faculty have also consulted with state government agencies, the United Nations, and private-sector organizations.) Supervising student theses has broadened this knowledge even more. This organizational expertise increases the value of faculty as applied researchers for DoN and DoD organizations.

Generally, several research areas will be pursued in the future. These include:

- management of change in complex organizations;
- management of base closures and downsizing;
- diversity management;
- assessment of core values in a changing environment;
- organizational issues related to involvement in nontraditional missions or operations other than war;
- implementing Total Quality in DoD and the Navy;
- issues relating to managerial communication;
- leadership;
- intrinsic motivation (work-derived rewards);
- managing stress and emotion in organizations;
- strategic planning and management; and
- issues related to “reinventing” government.

### Research Labs and Centers

In 1998, the Department of Systems Management operated seven research labs: the Software Metrics Lab, the DecisionNet Lab, the Interoperability and Integration Lab, the Center for Organizational Computing, the Hands-On Networking Lab, the Database and Expert Systems Application Lab, and the Internet-to-the-Sea Lab. Six of these labs (all but the Hands-On Networking Lab) were moved during the year from Systems Management to the newly-formed NPS Division of Computer

## DEPARTMENT SUMMARY

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and Information Science and Operations, as part of a reorganization of academic departments and groups.

In addition, the Department of Systems Management was the “home” of two research centers: the Center for Information and Policy Analysis and the Center for Diversity Analysis.

### **Research Overview: 1998**

In fiscal year 1998, Systems Management faculty worked on over 90 research and other sponsored programs (including projects carried over from previous years), reflecting both the interdisciplinary nature of the department as well as the extensive range of faculty expertise. Funding for these programs totaled approximately \$3.6 million, with 94 percent of sponsorship from external sources. Research sponsorship during 1998 was distributed as follows by source: Navy, 54 percent; Defense, 23 percent; Army, 15 percent; NPS (institutional), 6 percent; and other external sources, 2 percent. Detailed information on Systems Management research projects—along with a list of related publications, conference presentations, student theses, patents, and other research products—is presented below.

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## PROJECT SUMMARIES

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### THE IMPACT OF DEPLOYMENT ON ARMY RESERVISTS

Bob Barrios-Choplin, Research Assistant Professor

George Thomas, Professor

Department of Systems Management

Sponsor: U.S. Army Center for Land Warfare

**OBJECTIVE:** To determine the impact of deployment on Army Reservists, including their retention, military and civilian careers, finances, families, and schooling. Suggestions for improving the deployment process were sought.

**SUMMARY:** On-site interviews with fifty reservists were conducted in four units. These members had deployed to Germany or Hungary for nine months, in support of the Bosnia mission. They were still participating in drills. Another fifty reservists who deployed and stopped participating in drills are being interviewed for comparison.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Reserves, Deployment, Turnover

### AMERICA'S ALL-VOLUNTEER FORCE

Mark J. Eitelberg, Associate Professor

Department of Systems Management

Sponsor: Office of the Assistant Secretary of Defense

**OBJECTIVE:** The goal of this project is to chronicle the manpower policies and programs that succeeded—or failed—in sustaining the All-Volunteer Force (AVF) and to provide a “lessons learned” evaluation that will assist in setting a course for the future.

**SUMMARY:** Information has been gathered from three major sources: published research, Congressional reports and Department of Defense documents; data maintained by the Defense Manpower Data Center; and interviews with current and former officials in the Department of Defense who were directly involved in designing or executing manpower policies during the AVF era (1973-present). Contractor support was obtained for three phases of the research: a study of the evolution of the AVF; an assessment of the “effectiveness” of the military since the end of the draft; and an evaluation of the military’s experience in Operation Desert Shield/Desert Storm, a defining moment of the AVF. Students at the Naval Postgraduate School have also made important contributions—in the form of project papers and theses—to the research effort. This study is a multi-year effort that looks at ten major areas, including recruiting, compensation, population participation, changing missions, and other topics. Several related publications have been reported in research summaries from previous years.

The principal investigator is preparing a book-length manuscript, tentatively titled *America's All-Volunteer Force*. Several individuals have contributed to the effort. Additional publications, theses, and related papers can be found in the research summaries for 1994-1997.

#### PUBLICATION:

Eitelberg, Mark J., “Women and Minorities in the Military: Research Trends and Future Directions,” *Proceedings of DEOMI, 1997 EO/EEO Research Symposium*, Patrick AFB, FL, April 1998.

#### CONFERENCE PRESENTATION:

Eitelberg, Mark J., “The All-Volunteer Force and Society,” Seminar on Transition to an All-Volunteer Force, sponsored jointly by the Council on Foreign and Defense Policy (Russia), the *Independent Military Review* (Russia), and the Center for Civil-Military Relations (Naval Postgraduate School), Moscow, Russia, January 1998.

## PROJECT SUMMARIES

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### THESES DIRECTED:

Davids, K.B., "Retention of Junior Naval Special Warfare Officers," Master's Thesis, Naval Postgraduate School, September 1998.

Dobel, T.A., "Study of Gender Integration in Classroom Training at the Navy Recruit Training Command," Master's Thesis, Naval Postgraduate School, September 1998.

Dooley, S.G., "Female Recruits and the United States Marine Corps: The Transformation Process," Master's Thesis, Naval Postgraduate School, March 1998.

Gelhausen, Volker, "The Effects of Economic, Military, Political, and Social Factors on the Successful Implementation of an All-Volunteer Armed Force," Master's Thesis, Naval Postgraduate School, March 1998.

Johnson, R.S., "Civilian Husbands in the Military Family: Current Issues and Future Concerns," Master's Thesis, Naval Postgraduate School, March 1998.

Pompey, W.G., "The Recruitment of African-American High School Students in the Naval Reserve Officers Training Corps," Master's Thesis, Naval Postgraduate School, September 1998.

Tierney, K.E., "Study of Navy and Marine Corps Prison Inmates Affiliated with Gangs and Extremist Groups: Trends and Issues for Enlistment Screening," Master's Thesis, Naval Postgraduate School, March 1998.

Young, Yeol Oh, "An Analysis of Factors that Influence Enlistment Decisions in the U.S. Army," Master's Thesis, Naval Postgraduate School, March 1998.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Military Manpower, Personnel, Recruitment, Population Representation, Compensation, Force Management, Roles/Missions, Attrition, Military Accession Policy

### STUDY OF SOCIO-ECONOMIC STATUS AND PERSONNEL PERFORMANCE IN THE MILITARY

Mark J. Eitelberg, Associate Professor  
Department of Systems Management  
Sponsor: Defense Manpower Data Center

**OBJECTIVE:** The primary objective of this study is to analyze the relationship between a service member's socioeconomic status and his or her performance in the military. The study uses the results of the Department of Defense Survey of Recruit Socioeconomic Backgrounds (or "SES Survey") that has been administered annually since 1989.

**SUMMARY:** A special database was created for this study. The database merges results from the SES survey with the Department of Defense Military Entrance Processing Command Cohort files and various performance-related data provided by the separate Services. The SES Survey sample includes approximately 106,000 recruits (from entry years 1989 through 1995). Initial data analysis compared the demographic composition of survey respondents, by year of entry, with the corresponding base population. This analysis indicated that the sample populations were reasonably representative of all recruits, with the exception of their gender composition. Data analysis will proceed in developing statistical models to examine the relationship between socioeconomic status and selected indicators of performance. The socioeconomic status variable in the statistical models will be based on two indices contained in the SES Survey database. Quantitative analyses may additionally explore the use of alternative socioeconomic measures developed from information contained in the

## PROJECT SUMMARIES

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survey database. Four students in the Manpower Systems Analysis Curriculum, Department of Systems Management, conducted thesis research directly related to the research project. This is a multi-year effort.

### **PUBLICATION:**

Eitelberg, M.J., "Minorities and Women in the Officer Pipeline," Washington, DC: Office of the Under Secretary of Defense for Personnel and Readiness Report, 1998 (Contributions).

### **THESES DIRECTED:**

Booth, S.J. and Schmiegel, K.M., "Socioeconomic Status and Performance in the U.S. Army and U.S. Marine Corps," Master's Thesis, Naval Postgraduate School, March 1998.

Harper, R.L. and Heldreth, C.R., "Socioeconomic Status and Performance in the U.S. Navy and U.S. Air Force," Master's Thesis, Naval Postgraduate School, March 1998.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Recruit Backgrounds, All-Volunteer Force, Equal Opportunity, Population Representation, Performance Measures, First-Term Attrition

### **STUDY OF RECRUIT ATTRITION FROM THE DELAYED ENTRY PROGRAM**

**Mark J. Eitelberg, Associate Professor**

**Department of Systems Management**

**Sponsor: Office of the Assistant Secretary of Defense**

**OBJECTIVE:** To identify factors associated with the attrition of recruits from the Delayed Entry Program (DEP); and to identify and evaluate possible approaches that would reduce this attrition.

**SUMMARY:** A study was designed and undertaken to determine trends in DEP attrition over time, the characteristics of DEP losses, and the reasons for DEP attrition. The initial focus of the study was on dropouts from the DEP who later entered active duty—including their background characteristics, the reasons for their attrition from the DEP, and the nature of their behavior and performance while on active duty. A special database for the study was created with the assistance of the Defense Manpower Data Center in Monterey. This database was also used by students in the Manpower Systems Analysis (MSA) Curriculum for a course project, and by two MSA students who are studying DEP attrition in related theses (scheduled for completion in March 1999).

### **PUBLICATION:**

Flyer, Eli S. and McCormick, David C., "Recruit Attrition From the Delayed Entry Program (DEP) and Reentry to Active Duty," Draft Technical Report, Washington, DC: Office of the Assistant Secretary of Defense (Force Management Policy), December 1998.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Delayed Entry Program (DEP), Recruit Attrition, Selection and Classification, Enlistment Screening, Military Manpower Policy

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## PROJECT SUMMARIES

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### SYSTEMS MANAGEMENT RESEARCH SUPPORT FOR THE RAPID ACQUISITION OF MANUFACTURED PARTS (RAMP) PROGRAM

Kenneth J. Euske, Professor  
Alan W. McMasters, Professor Emeritus  
Department of Systems Management  
Sponsor: Naval Supply Systems Command

**OBJECTIVE:** A continuing project to investigate how advanced manufacturing technology can be applied to processes in the Department of Defense.

**SUMMARY:** The efforts expended on this project have been to provide the Rapid Acquisition of Manufactured Parts (RAMP) Program Office information would help them identify how advanced manufacturing technology could be best used by the Department of Defense.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition)

**KEYWORDS:** Acquisition Management, Computer Integrated Manufacturing, Advanced Manufacturing Technology

### PRODUCTIVITY ENHANCING CONCEPTS

Kenneth J. Euske, Professor  
Department of Systems Management  
Sponsor: Naval Air Warfare Center-Aircraft Division

**OBJECTIVE:** The objective of this project is to provide research support to the Naval Air Warfare Center-Aircraft Division in identifying means to enhance productivity.

**SUMMARY:** The work executed on this project focuses on productivity enhancement in direct and support activities at the Naval Air Warfare Center, Aircraft Division.

#### THESES DIRECTED:

Haupt, Jeffrey S., "RDT&E Laboratory Capacity Utilization and Productivity Measurement Methods for Financial Decision-Making Within DoN," Master's Thesis, Naval Postgraduate School, June 1998.

Ross, Clifton G., "Incentive Measures for Navy Working Capital Fund Civilian Employees at Naval Air Warfare Center, Aircraft Division, Patuxent River, Maryland," Master's Thesis, Naval Postgraduate School, December 1998.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORD:** Productivity

### NAVAL POSTGRADUATE SCHOOL RESEARCH SUPPORT FOR NAVAL INVENTORY CONTROL POINT (NAVICP) - EVALUATION OF AUTOMATED NON-STANDARD REQUISITIONING SYSTEM (ANSRS)

Jane Feitler, Visiting Assistant Professor  
Department of Systems Management  
Sponsor: Naval Inventory Control Point

**OBJECTIVE:** To evaluate and determine the cost/benefits of implementing the Automated Non-Standard Requisitioning System (ANSRS) use for Navy procurement activities.

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## PROJECT SUMMARIES

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**SUMMARY:** NAVICP's new automated procurement software, ANSRS, was developed to meet several objectives. They are to: 1) to shift from a paper-oriented procurement system to a paperless one; 2) emphasizing ED/ED usage, to capture demand information regarding fleet purchases so that forecasting for future acquisitions would be made with relevant, accurate data; 3) to make current procurement processes more efficacious; and 4) to make the Navy's procurement process from entry of purchase demand, through order fulfillment, replenishment, and restocking, one of total asset visibility. This research was conducted over the course of several months and included on-site interviews, a review of ANSRS publications and software, e-mail, and telephone communications, and via interface with implementation teams. Sites visited include NAVICP Mechanicsburg, FISC-San Diego, FISC-Honolulu, and NAS-Barbers Point.

Overall, the ANSRS software package is an excellent one and it is highly recommend that it be implemented across the Fleet. At this time, there are only a few sites that have ANSRS installed. It is suggested that, prior to more implementations, the Windows version be completed, tested and verified to be user-friendly and "bug-free." Once a solid track record has been developed with current systems, ANSRS usage should have no problems being accepted and used by Navy personnel.

### CONFERENCE PRESENTATION:

Feitler, Jane N., "Even the Navy Can Go Paperless: Using ANSRS, the Automated Non-Standard Requisitioning System," Production and Operations Management Society (POMS) Annual Meeting, Santa Fe, NM, March 1998.

**DoD KEY TECHNOLOGY AREA:** Computer and Software

**KEYWORDS:** Automation, Non-Standard, Requisitioning, Procurement

### MAINTENANCE DEPLOYMENT COMMODITY PLANNING TOOL

Kevin R. Gue, Assistant Professor

Department of Systems Management

Sponsor: Naval Facilities Engineering Services Center

**OBJECTIVE:** To assist in the development of software tools through research in database design, requirements determination, and sparing model development.

**SUMMARY:** The design of a decision support system was supported to build maintenance and supply blocks for deploying Marine Corps units. The data and information system requirements were investigated for the tool, and an algorithm was written to determine the spare parts inventory. Briefly, the Marine Corps was found severely lacking in areas of data quality and collection capability. These were described in a thesis by Craig Penrose entitled, "Data Requirements for Availability Based Sparing in the U.S. Marine Corps." The sparing algorithm was delivered to the lead contractor for the system, who integrated it into the tool. Unfortunately, funding from the Marine Corps to our sponsor was lost, so this project will not move past the prototype stage, at least this year.

### THESES DIRECTED:

Keech, Janet L., "Use of Availability Based Sparing in Support of Deploying U.S. Marine Corps Units," Master's Thesis, Naval Postgraduate School, December 1998.

Penrose, Craig B., "Data Requirements for Availability-Based Sparing in the U.S. Marine Corps," Master's Thesis, Naval Postgraduate School, September 1998.

**OTHER:** The sponsor computer code entitled, "BlockBuilder," written in the Java programming language was delivered.

**DoD KEY TECHNOLOGY AREA:** Manufacturing Science and Technology

**KEYWORDS:** Inventory, Readiness-Based Sparing, Data Requirements

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## PROJECT SUMMARIES

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### DISTRIBUTION PROBLEMS IN SEA-BASED LOGISTICS

Kevin R. Gue, Assistant Professor  
Department of Systems Management  
Sponsor: Office of Naval Research

**OBJECTIVE:** To develop methodologies for positioning and distributing items in spatially dynamic and uncertain distribution environments, with particular application to Sea-Based Logistics.

**SUMMARY:** This reports the first of two years of research on this project. This year the concentration was on gathering data and information from academic and military sources related to the subjects of sea-based logistics and combat service support. An interesting problem was identified related to the positioning of Marine support units to support a set of maneuvering combat units and the flow of materials necessary to facilitate that maneuvering. A mixed integer program was formulated to solve the problem and this year plans are to construct decomposition methods to solve it. The model will be tested with data gathered this year, and hopefully the model can be used in upcoming war games.

**DoD KEY TECHNOLOGY AREA:** Other (Logistics and Transportation)

**KEYWORDS:** Distribution, Logistics, Dynamic Facility Location, Multi-Commodity Flows

### LAYOUT METHODS FOR CROSSDOCKS IN THE RETAIL AND TRUCKING INDUSTRIES

Kevin R. Gue, Assistant Professor  
Department of Systems Management  
Sponsor: Unfunded

**OBJECTIVE:** To design and test algorithms to assign trailers to doors in crossdocks to minimize labor cost and congestion.

**SUMMARY:** As part of a continuing thread of research, a new algorithm was designed and tested that establishes freight flows in a terminal to minimize labor costs and congestion. The models were tested at a freight terminal operated by Viking Freight System in Stockton, CA, and a productivity improvement of more than 11% was documented. Results of that test are reported in a recently submitted paper.

**PUBLICATION:**

Gue, K.R., "Balancing Labor Cost and Congestion in an LTL Freight Terminal," submitted to *Operations Research*.

**CONFERENCE PRESENTATION:**

Gue, K.R., "Layouts for Multiple Operations in a Freight Terminal," Annual Congress of the American Society of Mechanical Engineers, Anaheim, CA, 14 November 1998.

**DoD KEY TECHNOLOGY AREA:** Other (Logistics and Transportation)

**KEYWORDS:** Facility Layout, Less-Than-Truckload Motor Carriers, Crossdocks

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## PROJECT SUMMARIES

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### CHAIR OF MANAGEMENT ANALYSIS

Reuben T. Harris, Professor

Department of Systems Management

Sponsors: U.S. Transportation Command, Chief of Naval Personnel, and Naval Supply Systems Command

**OBJECTIVE:** The Admiral Jeremy Michael Boorda Management and Analysis (M&A) Chair will provide support and oversight of the Manpower Systems Analysis curricula as well as the Transportation Logistics Management, Transportation Management, and Acquisition and Contract Management curricula at the Naval Postgraduate School. The Chair will represent the Chief of Naval Personnel (CNP/N1) as well as the Chief of the Naval Supply Corps (NAVSUP), and Director, Plans and Policy, U.S. Transportation command (USTRANSCOM/TCJ5). The function of the chair is to establish a strong and ongoing liaison between curricula sponsors and NPS faculty and students.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Manpower, Personnel, Training

### ECONOMETRIC PROJECTION OF ARMY PERSONNEL STRENGTH

Gregory G. Hildebrandt, Visiting Associate Professor

Department of Systems Management

Sponsor: Office of the Deputy Chief of Staff, Personnel, U.S. Army

**OBJECTIVE:** This study, initiated 1 October 1997, supports the achievement of the required end strength using the Army's Strength Management System. Retention rates for various categories of officers and enlisted personnel are being projected using econometric forecasting models.

**SUMMARY:** During October 1998, representatives of HQDA (ODCSPER) were briefed on the econometric forecasting model developed for C-group Army personnel, which includes male three and four-year term high school graduates with AFQT scores of at least the 50th percentile. Two Multivariate Autoregressive Integrated Moving Average (MARIMA) forecasting models, which possess attractive statistical properties, were presented. One model was developed for members with three year terms; the other for members with four year terms. Military pay was shown to have a positive effect on the military retention of both groups. The approach to be taken to analyze other C-groups was discussed, and the extended work is underway. A single econometric time-series cross-section model is being developed in which each C-group would be identified as a special case. The results will be compared with those obtained using exponential smoothing methods. A Naval Postgraduate School thesis on Army retention is also being supervised.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Army's Strength Management System, Econometric Forecasting Model, Retention Rate

### TECHNOLOGY-TO-TACTICS FOR SENSOR TO SHOOTER NETWORKS:

#### A STRATEGY-TO-TASK APPROACH

Gregory G. Hildebrandt, Visiting Associate Professor

Department of Systems Management

Col Raymond E. Franck, Jr., USAF

United States Air Force Academy

Sponsor: Naval Postgraduate School-Institute for Joint Warfare Analysis

**OBJECTIVE:** This analysis builds on previous investigations of the Joint Reconnaissance-Strike Complex (JRUK). The relationship between a JRUK and its constituent sensor-to-shooter networks that have been developed to deal with specified

## PROJECT SUMMARIES

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Operational Situations (OPSITS) are being considered. The strategy-to-task framework is also being used to understand how the technology of a sensor-to-shooter network is related to the tactical concept.

**SUMMARY:** The Operational Maneuver from the Sea and Precision Strike OPSITS are being investigated. They are using the Unified Joint Task List (UJTL) and the Navy Tactical Task List (NTTL) is being used to develop Mission-Operations-Tasks-Performance Standards templates for the two OPSITS. Current plans are to employ multi-attribute utility function analysis as an aid to determining the relative value of the Operations and Tasks.

**DoD KEY TECHNOLOGY AREAS:** Sensors, Other (Operations)

**KEYWORDS:** Reconnaissance-Strike Complex, Sensor-to-Shooter Operational Situation, Unified Joint Task List, Navy Tactical Task List, Strategy-to-Task

### LAND-BASED SEARCH AND RESCUE (SAR) OUTSOURCING

Gregory G. Hildebrandt, Visiting Associate Professor

Department of Systems Management

Sponsor: Chief of Naval Operations (N88)

**OBJECTIVE:** The purpose of the study is to analyze the disparate requirements of land-based NAVAL SAR HELOs, consolidate those aircraft requirements and conduct an analysis of the gross benefits to the government of outsourcing this mission.

**SUMMARY:** The project was initiated on 1 October 1997. An NPS thesis on land-based SAR outsourcing was completed. The missions, functions, and activity-structure of personnel assigned to SAR stations have been completed for both officer and enlisted personnel. The Analytical Hierarchy method was employed to assess the gross benefits to the Navy of conducting land-based SAR in house versus outsourcing these activities. The extent to which there are greater gross benefits conducting these activities in house is computed.

#### THESIS DIRECTED:

Brodin, Robert K., "Comparative Analysis of Benefits Received From Naval Air Station Search and Rescue (SAR) Mission," Master's Thesis, Naval Postgraduate School, March 1998.

**DoD KEY TECHNOLOGY AREAS:** Air Vehicles, Other (Outsourcing)

**KEYWORDS:** Search and Rescue (SAR), Best Value to Government

### NAVY PRACTICAL COMPTROLLERSHIP COURSE (PCC)

CDR Ted A. Hleba, Lecturer

Department of Systems Management

Sponsors: Navy Financial Management Center and Space and Naval Warfare Systems Command

**OBJECTIVE:** To educate civilian and military personnel in DoD financial management fundamentals within the Department of Defense and the Department of the Navy.

**SUMMARY:** Research and instruction were conducted in the following areas: (1) Introduction to Financial Management; (2) DoD and DoN Financial Management Organizations; (3) Planning, Programming, and Budgeting System (PPBS); (4) Appropriations and Appropriation Law; (5) Budget Formulation and Execution; (6) Funding Sources and Mechanisms; (7) Unit Costing; (8) Working Capital Funds; (9) Accounting in DoD; (10) Property Accounting in DoD; (11) Support Agreements and Reimbursable Funding; and (12) the Prompt Payment Act.

## PROJECT SUMMARIES

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**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS:** Financial Management, Resource Management, PPBS, Fiscal, Budget, Budget Formulation, Budget Execution

### **LEADERSHIP AND RETENTION IN TROOP PROGRAM UNITS (TPU), PHASE IV: VALIDATION AND IMPLEMENTATION OF LEADERSHIP FEEDBACK**

**Erik Jansen, Visiting Associate Professor**  
**Kenneth W. Thomas, Professor**  
**Department of Systems Management**  
**Sponsor: U.S. Army Reserve Command**

**OBJECTIVE:** When originally funded by the previous Chief, Army Reserve (CAR), the objective of this project was to increase readiness and retention in company-level units (TPUs) in the U.S. Army Reserve by providing a reliable means of measuring unit commanders' leadership behaviors and key unit conditions.

**SUMMARY:** This FY98 project followed three previous phases of a research program to identify, measure, and improve key leadership behaviors by TPU commanders that influenced unit readiness and retention. Phase I had reviewed existing research to construct a conceptual model of how leadership behaviors influence unit retention and readiness via their impact on unit conditions. Phase II had conducted extensive interviews in TPUs to identify specific leadership behaviors and unit conditions seen by unit members to impact retention and readiness. The findings of this phase were widely disseminated within the USAR and resulted in a number of policy changes. Phase III had developed preliminary questionnaires to measure the leadership behaviors and unit conditions. Phase IV would have used those questionnaires to validate and extend the previous findings by quantitatively determining which leadership behaviors had the strongest impact upon retention and readiness measures. It would also have resulted in validated measures of leadership and unit conditions which could be used to mentor TPU commanders on their leadership, to more accurately predict system-wide retention in the USAR, and to suggest policy changes to enhance leadership. During FY98, however, there was a change of CAR and the project was ended. At present, another community is negotiating with the researchers to implement the study in FY99.

#### **CONFERENCE PRESENTATION:**

Thomas, K.W., Jansen, E., Thornburg, B.J., and Barrios-Choplin, J.R., "What Makes Research Impactful? Traditional and Non-Traditional Lessons from a High-Impact Project," 39<sup>th</sup> Annual Western Academy of Management Conference, Portland, OR, 26-28 March 1998.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Leadership Measurement, Retention, Readiness, Troop Program Unit, Army Reserve

### **DEVELOPMENT OF PERFORMANCE OUTPUT AND COST MEASUREMENT METRICS**

**Lawrence R. Jones, Professor**  
**Reuben Harris, Professor**  
**Department of Systems Management**  
**Sponsor: Space and Naval Warfare Systems Command**

**OBJECTIVE:** The purpose of this research is to conduct analysis on how to measure the performance and outputs of the SPAWAR Systems Command and to relate these variables to cost.

## PROJECT SUMMARIES

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**SUMMARY:** The project provided analytical assistance to the Office of the Comptroller, SPAWAR, in responding to the necessity for reviewing and assessing options for improving command measurement of costs and outputs.

**CONFERENCE PRESENTATION:**

Jones, L.R. and Harris, R., "International Budgeting and Financial Management," Association for Budgeting and Financial Management Annual Conference, Washington, DC, November 1998.

**DoD KEY TECHNOLOGY AREA:** Other (Cost Analysis)

**KEYWORDS:** Performance Measurement, Cost Analysis

**ANALYSIS OF BUDGET REDUCTION, COST-AVOIDANCE AND  
FINANCIAL MANAGEMENT INITIATIVES IN COMNAVAIRPAC**

**Lawrence R. Jones, Professor**

**Jerry L. McCaffery, Professor**

**Department of Systems Management**

**Sponsors: COMNAVAIRPAC and Naval Postgraduate School**

**OBJECTIVE:** To provide assistance to the Office of the Comptroller, AIRPAC, in analysis of initiatives for improving command management and management control, cost-reduction and cost avoidance in the Flight Hour Program (FHP), and in accommodating budget reduction.

**SUMMARY:** The project provided analytical assistance to the Office of the Comptroller, AIRPAC, in responding to the necessity for reviewing and assessing options for improving command management and management control, achieving cost-reduction and avoidance in the Flight Hour Program (FHP) and accommodating budget reduction in the period FY 1998 and beyond.

**PUBLICATIONS:**

Jones, L.R. and Thompson, F., "Responsibility Budgeting and Accounting," *Budget Theory*, A. Kahn, (ed.), New York: State University of New York Press, 1998.

Jones, L.R. and McCaffery, J.L., "Federal Government Financial Management," *Handbook of Government Budgeting*, R. Meyers, (ed.), San Francisco: Jossey Bass Publishers, 1998.

Jones, L.R. and Thompson, F., "Strategic Management in the Public Sector," *Azienda Publica*, 12/2 1998.

McCaffery, J.L., "Features of the Budgetary Process," *Handbook of Government Budgeting*, R. Meyers, (ed.), San Francisco: Jossey Bass Publishers, 1998.

**CONFERENCE PRESENTATIONS:**

Jones, L.R. and McCaffery, J.L., "Reinvention in the Department of Defense," Academy of Management Annual Conference, San Diego, CA, August 1998.

Jones, L.R. and McCaffery, J.L., "Does New Public Management Compromise Democracy?" Association for Public Policy and Management Annual Conference, New York, NY, October 1998.

Jones, L.R. and McCaffery, J.L., "International Budgeting and Financial Management," Association for Budgeting and Financial Management Annual Conference, Washington, DC, November 1998.

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## PROJECT SUMMARIES

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### THESES DIRECTED:

Gardiner, E., "An Empirical Analysis of the Navy Flight Hours Program," Master's Thesis, Naval Postgraduate School, December 1998.

Grogan, P., "Contracting Out and Outsourcing in the United States Marine Corps," Master's Thesis, Naval Postgraduate School, December 1998.

Keating, P. and Paulk, D., "An Analysis of Navy Flight Hours Program Underfunding," Master's Thesis, Naval Postgraduate School, December 1998.

Wright, A., "Comptrollership in the United States Marine Corps," Master's Thesis, Naval Postgraduate School, December 1998.

**DoD KEY TECHNOLOGY AREA:** Other (Resource Management, Financial Management)

**KEYWORDS:** Resource Management, Reinvention, Financial Management

### INVESTIGATION OF DOD INVENTORY MANAGEMENT

**Keebom Kang, Associate Professor**

**Department of Systems Management**

**Sponsor: Deputy Under Secretary of Defense for Logistics and Naval Postgraduate School**

**OBJECTIVE:** Improving DoD readiness via logistics cycle time and inventory reduction.

**SUMMARY:** The relationship between inventory levels and repair processes is troublesome in the military because it crosses physical, organizational, and financial barriers. Inventory managers strive to consolidate and minimize stocks of piece-parts to free up resources for other priorities. They also seek to get quick turnaround on repairable components in order to minimize pipeline inventory. Depot managers have different concerns, such as reducing costs by increasing worker efficiency and machine utilization. This leads to a natural conflict; inventory managers want short production runs to minimize pipeline inventory, while depot managers want long production lines to minimize repair costs. Simulation models were developed for analysis of aviation logistics repair cycle time and inventory management. The simulation models were used to quantify tradeoffs inherent in the inventory and repair processes.

### PUBLICATIONS:

Kang, K., "DoD Inventory Management Cultural Changes and Training in Commercial Practices," Naval Postgraduate School Technical Report, NPS-SM-98-002, March 1998.

Kang, K., Gue, K.R., and Eaton, D.R., "Cycle Time Reduction for Naval Aviation Depots," *Proceedings of the 1998 Winter Simulation Conference*, D.J. Medeiros, et al., (eds.), pp. 907-912, December 1998.

### CONFERENCE PRESENTATIONS:

Kang, K., Eaton, D.R., Mooney, K.F., and Sanchez, G., "Cycle Time Reduction to Improve Naval Aviation Readiness Using Modeling and Simulation," 66<sup>th</sup> Military Operations Research Society Symposium, Monterey, CA, 23-25 June 1998.

Kang, K., Gue, K.R., and Eaton, D.R., "Cycle Time Reduction for Naval Aviation Depots," 1998 Winter Simulation Conference, Washington, D.C., 13-16 December 1998.

## PROJECT SUMMARIES

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### THESIS DIRECTED:

Stearns, D.E., "Logistics Simulation Metamodel for F404-GE-400 Engine Maintenance," Master's Thesis, Naval Postgraduate School, December 1998.

**DoD KEY TECHNOLOGY AREAS:** Modeling and Simulation, Other (Logistics)

**KEYWORDS:** Readiness, Logistics, Inventory Management, Cultural Change

### SYSTEMS ACQUISITION MANAGEMENT (CURRICULUM 816) SUPPORT

David V. Lamm, Associate Professor

LTC Greg Walls, USA, Lecturer

Department of Systems Management

**Sponsors:** Director, Acquisition Career Management and Assistant Secretary of the Army  
(Research, Development and Acquisition)

**OBJECTIVE:** The Director, Acquisition Career Management (DACM) and the Military Deputy to the Assistant Secretary of the Army (Research, Development and Acquisition) is the sponsor of the Systems Acquisition Management (816) Curriculum at NPS. This funding supports Army thesis students (military and civilian) in the 816 Curriculum, an acquisition library and laboratory, faculty travel for developmental purposes, and the academic associate.

**SUMMARY:** The objective of the 816 Curriculum is to provide selected officers and Government civilians an advanced education in the fundamental concepts, methodologies, and analytical techniques necessary for the management of major defense systems. The curriculum is open to both U.S. students and officers/civilians of Allied Nations. The curriculum is six quarters for Army officers/civilians and seven quarters for all others. A key feature of this program is its relationship with the requirements of the Defense Acquisition Workforce Improvement Act (DAWIA) which statutorily requires mandatory training in various career fields. The most significant of these requirements is the Advanced Program Management Course (PMT302) sponsored by the Defense Systems Management College (DSMC). The NPS 816 Curriculum is the only program in the country which satisfies the equivalency requirements for PMT 302, a Level III (Executive Level) Program Management course. The 816 Curriculum also satisfies requirements through Level III in the Acquisition Logistics career field and Level II (Intermediate Level) in the Systems Planning, Research, Development and Engineering (SPRDE); Manufacturing, Production and Quality Assurance (PQM); Test and Evaluation (T&E); and Software Acquisition Management (SAM) career fields. Efforts are underway to obtain equivalency in the Business, Cost Estimating, Financial Management career field.

### THESES DIRECTED:

Bandy, Leigh M., "A Case Study of the Contract Closeout Process at Defense Contract Management Command Lockheed Martin Missiles and Space," Master's Thesis, Naval Postgraduate School, June 1998.

Carter, Charles A., "The Family of Medium Tactical Vehicles: Analysis of a Non-Developmental Item Acquisition Program," Master's Thesis, Naval Postgraduate School, June 1998.

DiMarco, Andrew J., "The Simulation-Based Acquisition Research Laboratory," Master's Thesis, Naval Postgraduate School, December 1998.

Ford, William M., "DoD Depot-Level Maintenance: Factors to Consider in Public/Private Competition," Master's Thesis, Naval Postgraduate School, December 1998.

Hirschman, Keith A., "The Cost and Benefits of Maintaining the Buy American Act," Master's Thesis, Naval Postgraduate School, June 1998.

## PROJECT SUMMARIES

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Romero, James, "Software Metrics: A Case Analysis of the U.S. Army Bradley Fighting Vehicle," Master's Thesis, Naval Postgraduate School, June 1998.

Shade, David M., "Optimizing the Privatization of Military Family Housing," Master's Thesis, Naval Postgraduate School, December 1998.

Slade, William C., "Other Transactions for Prototypes as Used in the Commercial Operations and Support Savings Initiative 1997: A Contractors' Perspective," Master's Thesis, Naval Postgraduate School, June 1998.

Visconti, Albert, "Dual-Use Technology Policy," Master's Thesis, Naval Postgraduate School, December 1998.

Wegler, Michael K., "Comparison of the Acquisition Systems of the Federal Republic of Germany and the United States Governments," Master's Thesis, Naval Postgraduate School, December 1998.

Whitworth, Robin E., "A Technical Analysis of the Requirements Document: DOD 5000 Series," Master's Thesis, Naval Postgraduate School, December 1998.

**DoD KEY TECHNOLOGY AREA:** Other (Systems Acquisition)

**KEYWORDS:** Acquisition, Program Management, Test and Evaluation, Systems Engineering, Contracting, Logistics, Manufacturing/Production, Quality Assurance, Software Acquisition, Reliability and Maintainability

### **A READINESS-BASED SPARING REPLENISHMENT MODEL FOR REPAIRABLE ITEMS**

**Alan W. McMasters, Professor Emeritus**

**Department of Systems Management**

**Sponsor: Naval Supply Systems Command**

**OBJECTIVE:** A continuing project to develop a wholesale level inventory model for the Navy's Inventory Control Point to use to replenish and repair its inventories of repairable items; the objective function of this model should be related to readiness.

**SUMMARY:** Recent simulation analyses have resulted in an approximate wholesale level inventory model for describing the inventory position and the net inventory at any instant of time as a function of the order quantity, repair quantity, and the maximum level of the inventory position under the assumption of Poisson and Normally distributed demands for a given repairable item. This past year simulation analyses of the safety stock were conducted in an attempt to derive an approximate formula to describe safety stock. Statistical analysis of the results provided at two approximate formulas which gave excellent statistical fits to the simulation results. A search was also begun for approximate formulas for the optimal order and repair quantities for any specified maximum inventory position. The optimality measure is the minimum expected annual costs to manage the inventory of an item.

**DoD KEY TECHNOLOGY AREA:** Modeling and Simulation

**KEYWORDS:** Inventory Management, Navy Repairable Items, Inventory Model



## PROJECT SUMMARIES

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### MANPOWER SYSTEMS ANALYSIS (MSA) FACULTY RESEARCH TO SUPPORT N-1 (CHIEF OF NAVAL PERSONNEL)

Stephen L. Mehay, Professor  
Department of Systems Management  
Sponsor: Chief of Naval Personnel

**OBJECTIVE:** The project provided umbrella funding within which individual projects were proposed and carried out by individual researchers. Professor Mehay coordinated the overall project and facilitated interactions between MSA faculty, thesis students, and N1/Bupers.

**SUMMARY:** The efforts under this umbrella project addressed a variety of manpower problems. Although the major focus was on officer issues, some enlisted topics were also addressed. For example, on the enlisted differences in measures of job performance for blacks and whites were analyzed, and adjusted these differences were adjusted for AFQT scores. On the officer side, one task investigated differences between minority and majority surface warfare officers in their career experiences. A second, analyzed the career experiences—performance on fitness reports, retention, and promotion—of submarine officers. The study attempted to isolate the impact of the officer's pre-commissioning academic performance with a view to evaluating the selection methods of the submarine force. A related study analyzed the impact of college selectivity, college grades, and college major on performance of URL and staff communities. Finally, a third study analyzed the impact of compensation on Navy physician retention. This study tracked the changes in the civilian health care system toward managed care and identified the impacts on physician pay by specialty. It then analyzed whether Navy physician pay has reflected the changes in relative compensation that have occurred in the civilian sector.

#### THESES DIRECTED:

Johnson, A. David, "The Influence of Demographics and Navy Career Experiences on the Performance of Junior Surface Naval Officers," Master's Thesis, Naval Postgraduate School, March 1998.

Lane, Michael and Melody, Brendan, "The Impact of Pay on Navy Physician Retention in a Health Care Reform Environment," Master's Thesis, Naval Postgraduate School, March 1998.

O'Connell, Richard, "College Selectivity and the Performance of Junior Navy Officers," Master's Thesis, Naval Postgraduate School, March 1998.

Roick, James A., "A Statistical Analysis of Black-White Performance Differentials of U.S. Military Personnel," Master's Thesis, Naval Postgraduate School, September 1998.

Woelper, Eric P., "The Impact of Academic Background on Submariner Performance, Retention, and Promotion," Master's Thesis, Naval Postgraduate School, March 1998.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Officer Retention, Officer Promotion, Officer Performance, Enlisted Performance

### MINORITY REPRESENTATION AND CAREER PROGRESSION IN NAVY ENLISTED RATINGS

Stephen L. Mehay, Professor  
Department of Systems Management  
Sponsor: Navy Personnel Research and Development Center

**OBJECTIVE:** The goal of this project was to analyze the representation of minorities across Navy enlisted ratings and specialties, and to determine whether the distribution is disproportionate to minority representation in the total end strength.

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## PROJECT SUMMARIES

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When this was observed, the research attempted to determine whether any disproportionate distribution is due to entry requirements, specifically Armed Services Vocational Aptitude Battery (ASVAB) test scores, that may limit opportunities in some rating, or whether it is due to the preferences of minority and women sailors, or to other factors.

**SUMMARY:** Accession quality goals, which determine recruiter mission requirements, are set in the aggregate. They are typically measured in terms of the number and proportion of Upper Mental Group (UMG) recruits and high school diploma graduates. A-school training seats are set at the rating and Navy Enlisted Code (NEC) level, and may include scores on other components of the ASVAB. One can estimate an Armed Forces Qualification Test (AFQT)-equivalent for the entry score requirements, but this will be an approximation that is, at best, correct only on average. This project aims to improve the recruit quality requirements determination process. It examined the effect that rating-specific requirements have on the supply and demand of recruits of various characteristics, and the role that recruit preferences play vs. requirements in the distribution of quality levels and minorities/women across skills.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** AFQT, Requirements Determination, Minority Representation, Navy Ratings

### ANALYSIS OF LIMITED DUTY BOARD AND CENTRAL PHYSICAL EVALUATION BOARD PROCESSES

Stephen L. Mehay, Professor  
Department of Systems Management  
Sponsor: Naval Bureau of Personnel

**OBJECTIVE:** The goal of this project was to analyze the efficiency of the processes for screening and managing the review of personnel who are non-deployable and unavailable for assignment. In particular, the project analyzed the flow of reviews via the limited duty board and central physical evaluation board.

**SUMMARY:** The screening and management of sailors with medical problems that render them non-deployable or non-assignable is a key manpower and readiness issue. The Navy manages service members unable to perform their duties due to medical reasons utilizing both the Temporary Limited Duty Assignment process (TLD) and the Disability Evaluation System (DES). This research analyzed the system for process inefficiencies to assess the impact on the amount of time that a member spends in a transient or limited duty status. An extensive summary of findings were provided with recommendations for streamlining the processes.

#### **THESIS DIRECTED:**

Keenan, M. Debra and Wilkins, Gail, "Disability Evaluation System and Temporary Limited Duty Assignment Process: A Qualitative Review," Master's Thesis, Naval Postgraduate School, March 1998.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Temporary Limited Duty Assignment, Disability Evaluation System

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## PROJECT SUMMARIES

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### RECRUIT STATION LOCATION PROJECT

Stephen L. Mehay, Professor

Kevin Gue, Assistant Professor

Michael Cook, Assistant Professor

Department of Systems Management

Sponsor: Office of Undersecretary of Defense, Personnel and Readiness

**OBJECTIVE:** The goal of this project is to build an optimization model that assists OSD and the Joint Recruiting Facilities Committee to locate military recruiting stations in specific geographic locations.

**SUMMARY:** This was the second of three years for this project. The concentration was on developing a number of models this year, all of which will be tied into a decision support system in the coming year as a deliverable to our sponsor. Two econometric models were refined and tested: one that estimates recruit production in a zip code based on its characteristics, and one that estimates the cost of a station in that zip code. These models are part of the optimization model that chooses the best locations for stations and allocates recruiters among them. For the optimization, a linear mixed integer program was developed and tested, which was solved with the Generalized Algebraic Modeling System (GAMS) modeling package. In the coming year these models will be integrated into a graphical interface using the MAPINFO GIS package and Visual Basic.

#### CONFERENCE PRESENTATIONS:

Cook, Michael, Mehay, Stephen, and Hogan, Paul, "Enlistment Supply at the Local Level," Western Economic Association, Lake Tahoe, CA, June 1998.

Gue, Kevin R., "Locating Facilities that Compete and Cooperate," Conference of the Institute for Operations Research and the Management Sciences, Seattle, WA, 2 November 1998.

#### THESIS DIRECTED:

Hostetler, David, "Navy Enlistment Supply Models at the Zip Code Level," Master's Thesis, Naval Postgraduate School, March 1998.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Recruiting, Recruit Stations, Recruiter Assignment, Location Models

### EXTERNAL ACQUISITION RESEARCH PROGRAM INITIATION

Mark Nissen, Assistant Professor

Department of Systems Management

Sponsor: Defense Acquisition University

**OBJECTIVE:** To plan and initiate an external acquisition research program for the Defense Acquisition University (DAU).

**SUMMARY:** The DAU is required by law to ensure acquisition research is accomplished. After working for several years to plan and initiate an acquisition research program, the DAU enlisted support from the Naval Postgraduate School. This research project examined the feasibility and potential of launching a program of acquisition research targeted toward universities and research institutions external to the Department of Defense. The project resulted in development of plans, processes and organizations required for the successful launch of the DAU External Acquisition Research Program in FY99. The DAU acquisition research program is described in detail via the Web at <http://web.nps.navy.mil/~menissen/earp/earp.html>.

## PROJECT SUMMARIES

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### PUBLICATIONS:

Nissen, M.E., Snider, K.F., and Lamm, D.V., "Managing Radical Change in Acquisition," *Acquisition Review Quarterly* 5:2, 1998.

Nissen, M.E., Snider, K.F., and Lamm, D.V., (eds.), *Acquisition Review Quarterly*, Special Issue on Managing Radical Change, 5:2, 1998.

### CONFERENCE PRESENTATION:

Nissen, M.E., "Acquisition Research: Questions and Ideas," 11th Annual National Contract Management Association Academic Conference for Contract Management Educators, Monterey, CA, October 1998.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition Policy)

**KEYWORDS:** Acquisition, Research

**KNOWLEDGE-BASED RE-ENGINEERING:  
INTELLIGENT TOOLS DEVELOPMENT AND TESTING**  
Mark Nissen, Assistant Professor  
Department of Systems Management  
Sponsor: Naval Postgraduate School

**OBJECTIVE:** To develop and test "intelligent" re-engineering tools (e.g., knowledge systems) to diagnose pathologies and faults in enterprise processes and to generate innovative redesign alternatives.

**SUMMARY:** A study was conducted to develop a knowledge system to provide intelligent re-engineering support through the Web on a real-time basis. A proof-of-concept system called KOPeR was successfully demonstrated in the laboratory and in the field to redesign key Navy procurement processes. KOPeR is also being used in the classroom to demonstrate Web-based intelligent systems design, and it has supported several thesis projects oriented toward process innovation. This intelligent redesign tool is now employed as a platform for research on process innovation and is made available to Defense organizations interested in re-engineering.

### PUBLICATIONS:

Nissen, M.E., "Redesigning Re-Engineering Through Measurement-Driven Inference," *MIS Quarterly*, 22:4, 1998.

Nissen, M.E., "A Configuration-Contingent Enterprise Redesign Model," *Process Engineering: Advancing the State of the Art*, T.R. Gullede, D.J. Elzinga, and C.Y. Lee, (eds.), Boston: Kluwer, accepted for publication, 1998.

Nissen, M.E. and Karty, A., "The Standard Procurement Systems and Beyond," *Innovative Contracting: Practical Approaches*, A. Lee, and C. Fisher, (eds.), Vienna, VA: National Contract Management Association, accepted for publication, 1998.

### CONFERENCE PRESENTATION:

Nissen, M.E. and Mehra, A., "Redesigning Software Procurement Through Intelligent Agents," 1998 American Association for Artificial Intelligence Conference, Workshop on Knowledge Management and Business Process Re-Engineering, Madison, WI, July 1998.

## PROJECT SUMMARIES

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### THESES DIRECTED:

Bazemore, W., "Facilitating Software Process Improvement Implementation Efforts: A Case Study of Financial Systems Activity, Kansas City," Master's Thesis, Naval Postgraduate School, September 1998.

Hudson, J., "Software Agents and the Defense Information Infrastructure: Re-engineering the Acquisition Process," Master's Thesis, Naval Postgraduate School, September 1998.

McCarthy, T., "Innovating the Standard Procurement Process," Master's Thesis, Naval Postgraduate School, December 1998.

McGuire, P., Palan, A., and White, D., "Process Innovation: Analysis and Redesign of the California Army National Guard State Emergency Mobilization Process," Master's Thesis, Naval Postgraduate School, September 1998.

Schutter, G., "Process Innovation Through Alpha Contracting: An Analysis of Department of Defense Service Contracts," Master's Thesis, Naval Postgraduate School, December 1998.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Manpower, Personnel, and Training, Modeling and Simulation

**KEYWORDS:** Acquisition, Artificial Intelligence, Re-Engineering, Systems Development

### ACQUISITION MANAGEMENT DISTANCE LEARNING PROGRAM

Walter E. Owen, Lecturer

Department of Systems Management

**Sponsors:** Marine Corps Systems Command-Quantico, National Reconnaissance Organization-Chantilly, Naval Surface Warfare Center-Dalghren, Naval Undersea Warfare Center-Newport, Program Executive Officer Ground Combat Support Systems, U.S. Army Tank and Automotive Command

**OBJECTIVE:** To deliver distance learning graduate education courses using video teleconferencing (VTC) to numerous sponsors as a cost-effective alternative to meet acquisition workforce education and training requirements under the Defense Acquisition Workforce Improvement Act (DAWIA). These courses are offered and delivered as part of on-going acquisition management reimbursable instruction projects.

**SUMMARY:** Course materials were developed and tailored for the distance learning environment.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training. Other (Weapon Systems Acquisition, Program Management)

**KEYWORDS:** Acquisition, Program Management, Requirements Generation, Science and Technology, Business Financial Management, Contracting, Systems Engineering, Logistics Support, Test and Evaluation, Software Development

### INTERORGANIZATIONAL COLLABORATION

Nancy C. Roberts, Professor

Department of Systems Management

Sponsor: United Nations Staff College

**OBJECTIVE:** A continuing project that brings together donors, non-governmental organizations, and UN personnel from field and headquarter agencies for the purpose of planning relief and development efforts in crisis countries.

## PROJECT SUMMARIES

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**SUMMARY:** The United Nations has sponsored an experimental project that brings together the major stakeholders who are intervening in a country in crisis for the purposes of joint planning. Afghanistan was the first country for which such planning was undertaken; it occurred in Islamabad, Pakistan with 86 representatives from various stakeholder groups in attendance. The purpose of the five-day planning session was to develop a strategic framework for relief and recovery efforts in Afghanistan. The strategic framework developed by field representatives was then sent to stakeholder counterparts at headquarters so a joint policy on Afghanistan could be issued. The lessons learned from this experiment in interorganizational collaboration are expected to inform planning efforts in other crisis countries.

### CONFERENCE PRESENTATIONS:

Roberts, N.C., "Stakeholder Collaboration and Planning in Crisis Countries," Academy of Management Conference, San Diego, CA, August 1998.

Roberts, N.C., "Peace Matters Most," Academy of Management Conference, San Diego, CA, August 1998.

### OTHER:

Roberts, N.C., "Dialogue and Transformation," *International Journal of Organization Theory and Behavior*, (Guest Editor), forthcoming.

**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Other (Planning)

**KEYWORDS:** Planning, Collaboration, Crisis

### STRATEGIC PLANNING FOR NAVAL CONSTRUCTION BATTALION CENTER

Nancy Roberts, Professor  
Department of Systems Management  
Sponsor: Naval Construction Battalion Center

**OBJECTIVE:** To conduct strategic planning exercises with Naval Construction Battalion Center.

**SUMMARY:** Naval Construction Battalion Center is in a period of dramatic change. It has requested help in its strategic planning exercises. The Bryson model of strategic planning will be utilized to guide its planning efforts. The Center has also requested that, in addition to site visits, reviews and assistance take advantage of VTC as much as possible to minimize costs.

### PUBLICATIONS:

Roberts, N.C., "Radical Change by Entrepreneurial Design," *Acquisition Research Quarterly*, Vol. 5, No. 2, pp. 107-127, 1998.

Roberts, N.C., "Innovation by Legislative, Judicial, and Management Design: Three Arenas of Public Entrepreneurship," *Reinventing Public Administration: The Management of Reform*, J. George Frederickson and J.M. Johnston, (eds.), University of Alabama Press, in press.

Roberts, N.C., "Organizational Configurations: Four Approaches to Public Management," *Advancing Public Management*, Jeff Brudney, Larry O'Toole, and Hal Rainey, (eds.), Washington, DC, Georgetown University Press, in press.

## PROJECT SUMMARIES

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Roberts, N.C. and Menker, J., "Strategic Management in the Federal Government: Necessary and Sufficient Conditions" *Handbook of Strategic Management, 2<sup>nd</sup> ed.*, J. Rabin, G.J. Miller, W.B. Hildreth, (eds.) New York, Marcel Dekker, in press.

Roberts, N.C., "Public Entrepreneurship as Social Creativity," *The Social Dimensions of Creativity*, Vol. 3, A.A. Montuori and R.E. Purser, (eds.), Hampton Press, in press.

### CONFERENCE PRESENTATION:

Roberts, N.C., "Strategic Planning and the Results Act: Lacking a Good Fit with the Political Context," Academy of Management, San Diego, CA, August 1998.

### THESES DIRECTED:

Bergeman, Russell, "Relocation Analysis of Marine Corps Air Station Futenma," Master's Thesis, Naval Postgraduate School, December 1998.

Calhoun, Todd R., "Evaluating Security Assistance Programs: Performance Evaluation and the Expanded International Military Education and Training (E-IMET) Program," Master's Thesis, Naval Postgraduate School, December 1998.

Weiss, Carl, "How Innovative is Naval Supply Systems Command?" Master's Thesis, Naval Postgraduate School, December 1998.

**DoD KEY TECHNOLOGY AREA:** Other (Planning, Evaluation, Management)

**KEYWORDS:** Strategic Planning, Strategic Management, Performance Evaluation and Measurement

### FINANCIAL REPORTING AND ANALYSIS RESEARCH FOR THE DEPARTMENT OF DEFENSE SECURITY RESEARCH CENTER

Joseph G. San Miguel, Professor

Department of Systems Management

Sponsor: Department of Defense Security Research Center

**OBJECTIVE:** The objective of this research is to provide financial reporting and analysis expertise to national security research projects of the Security Research Center of the Department of Defense. Various financial measures such as personal net worth and net income can be used as determinants of potential security risk from federal employees. In addition there are financial implications of security policies and programs of the Defense Investigative Service.

**SUMMARY:** Numerous initiatives are underway to evaluate the quality of financial and nonfinancial information for purposes of deterring or detecting security threats. Prior investigation and research has established that financial incentives and payments are generally the primary motives for acts of spying by U.S. citizens. The well-known spy cases involving Aldrich Ames and John Walker are examples. This project will consider the use of financial information for use as predictors of potential security risks and the need for security investigations. Financial information includes unexplained increases or decreases in an individual's net worth. The various sources of net worth such as earned income, inheritance, or sale of personal assets as well as the uses of net worth for investments and asset acquisitions are variables that must be considered.

### THESIS DIRECTED:

Conrad, K.M., "A Security Study of U.S. Government Employees' Net Worth in Relation to Their Household Gross Realized Income and Pertinent Personal Characteristics," Master's Thesis, Naval Postgraduate School, December 1998.

## PROJECT SUMMARIES

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**DoD KEY TECHNOLOGY AREA:** Other (National Security)

**KEYWORDS:** Financial Analysis, Cost Analysis, Cost Estimation

### STRATEGIC PROFIT ANALYSIS AND ENTERPRISE RESOURCE PLANNING IN DEPARTMENT OF DEFENSE SECURITY RESEARCH CENTER

Joseph G. San Miguel, Professor

Department of Systems Management

Sponsor: Department of Defense Security Research Center

**OBJECTIVE:** To what extent are strategic profit analysis and cost management systems integrated into Enterprise Resource Planning systems? Are cost management systems stand alone data systems? To what extent are cost management systems used for cost reduction, make/buy, outsourcing, business expansion, pricing, product and customer profitability analyses?

**SUMMARY:** For survival and growth in the global marketplace, a firm must effectively allocate its strategic resources, which include human, physical, and financial assets, across business operations and processes. Its strategy must be supported by management systems that assist the planning and control of operations and processes. Today information technology supports these information systems. In recent years enterprise resource planning (ERP) systems have been used as a means to comprehensively link firm-wide operations and processes. The majority of the thousand largest firms in the U.S. have either implemented or in the process of implementing enterprise resource planning systems. Because of the millions of investment dollars involved, executive management are keenly aware of ERP and its promised benefits. Today, ERP vendors and IT consultants are also targeting middle-level firms with annual sales less than \$1 billion. The question is how effective are these significant investments in assisting executive management in achieving corporate objectives.

#### PUBLICATIONS:

San Miguel, J.G., "Abrams Company," *Management Control Systems*, Robert N. Anthony and V. Govindarajan, (eds.), Irwin/McGraw-Hill, 1998.

San Miguel, J.G., "Grand Jean Company," *Management Control Systems*, Robert N. Anthony and V. Govindarajan, (eds.), Irwin/McGraw-Hill, 1998.

San Miguel, J.G., "Emerson Electric Company," *Management Control Systems*, Robert N. Anthony and V. Govindarajan, (eds.), Irwin/McGraw-Hill, 1998.

#### THESIS DIRECTED:

Nickless, S.R., "Analysis of the Operating Costs for Light Armored Vehicles in the United States Marine Corps," Master's Thesis, Naval Postgraduate School, December 1998.

**DoD KEY TECHNOLOGY AREA:** Other (Cost Management, Information Technology)

**KEYWORDS:** Financial Analysis, Cost Analysis, Cost Estimation



## PROJECT SUMMARIES

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### A BLUEPRINT FOR RESEARCH IN DEFENSE ACQUISITION

Keith F. Snider, Assistant Professor  
Department of Systems Management  
Sponsor: Naval Postgraduate School

**OBJECTIVES:** To accomplish foundational work to make possible the development of a sensible and coherent body of research in the emerging field of defense acquisition, and to propose a strategy and framework for Department of Defense investments in the conduct of acquisition research.

**SUMMARY:** This Research Initiation Project began in 1996. During 1998, the final year of the project, the work involved continued study of likely "high-payoff" approaches to enhance the quality of research in defense acquisition. Areas of focus included: (1) analysis of the degree to which the field of public administration has served in the past and may serve in the future to guide academic efforts in acquisition; (2) efforts to engage scholars outside the defense community to consider applying their research efforts in the acquisition context; and (3) analysis regarding the potential for a program of case study research to contribute to scholarship in acquisition. A project to develop such a case study program was approved and funded by the Office of the Assistant Secretary of the Army (Research, Development and Acquisition) for FY99. As a result of this project, other efforts remain in progress at the beginning of CY99: (1) five students performing acquisition case studies as their thesis research projects to be completed in CY99; (2) development, with TRADOC Analysis Center-Monterey, of an internet-based research center for the Army acquisition community; and (3) papers for various CY99 public administration and acquisition conferences and journals.

#### PUBLICATIONS:

Snider, K.F., "Issues in Teaching Defense Acquisition as Public Administration," *Proceedings of the Twenty-First National Conference on Teaching Public Administration*, Colorado Springs, CO, March 1998.

Nissen, M.E., Snider, K.F., and Lamm, D.V., "Managing Radical Change in Acquisition," *Acquisition Review Quarterly*, Vol. 5, No. 3, Spring 1998.

#### CONFERENCE PRESENTATION:

Snider, K.F., "Issues in Teaching Defense Acquisition as Public Administration," Twenty-First National Conference on Teaching Public Administration, Colorado Springs, CO, March 1998.

**DoD KEY TECHNOLOGY AREA:** Other (Systems Acquisition Management)

**KEYWORDS:** Acquisition, Acquisition Research, Acquisition Reform

### BUREAU OF MEDICINE AND SURGERY (BuMED) EXECUTIVE MANAGEMENT EDUCATION (EME) DELIVERABLES AND RESEARCH AND DEVELOPMENT FOR FISCAL YEAR 1999

Gail Fann Thomas, Associate Professor  
Reuben T. Harris, Professor  
Department of Systems Management  
Sponsor: Bureau of Medicine and Surgery (BuMED)

**OBJECTIVE:** This project is a continuation of a program that began in FY92. This year's purpose was to deliver scheduled EME program modules, incorporate DoD tri-service behavioral objectives into existing modules, develop case studies to tailor module application to specific MTF issues, and facilitate program coordination.

## PROJECT SUMMARIES

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**SUMMARY:** EME curriculum has been developed, overall program elements have been defined, and initial module delivery was accomplished FY92-95. FY96-99 included the delivery of a 3-week executive program of designated EME modules for prospective XOs and COs as delineated in BuMED's plan of work. FY99 will include program coordination, delivery of two or more 3-week programs for prospective BuMED XOs and COs, development of new materials to tailor module application to specific Military Treatment Facility (MTF) issues, development of course materials to support conversion to internet delivery, and research to guide and evaluate distance learning delivery of EME modules.

**DoD KEY TECHNOLOGY AREA:** Other (Military Healthcare Executive Education)

**KEYWORDS:** Executive Education, Healthcare

### MARINE CORPS RETENTION STUDY

George Thomas, Professor  
Alice Crawford, Senior Lecturer  
Daniel Dolk, Professor  
Susan Hocevar, Assistant Professor  
Department of Systems Management  
Sponsor: U.S. Marine Corps

**OBJECTIVE:** To implement longitudinal electronic retention and exit surveys and analyze first year results.

**SUMMARY:** This project was initiated in October 1998. Headquarters Marine Corps (HQMC) has recently developed retention and exit surveys. The surveys are intended to provide a data analytic basis for managing officer and enlisted retention. The retention survey process is intended to be a longitudinal data collection. The surveys will need current year analysis, a process for longitudinal archiving in a data warehouse, and a decision support system (DSS) for generating prespecified reports, ad hoc queries, and data extraction files for other applications.

The scope of the work includes: Appraise and Revise HQMA Developed Retention and Exit Surveys; Select Sample Stratification for Retention Survey; Upgrade Current Electronic Survey Questionnaires (HQMC); Design and Implement Survey Data Warehouse; Design and Implement Decision Support System (DSS); Complete Survey Test Cycles; Administer Surveys (HQMC); and Analyze Data.

The final product will include a written report analyzing USMC officer and enlisted retention and a briefing at HQMC of results of survey analyses including recommendations for retention policies. In addition, a data warehouse will be built for archiving current and future survey results with a user interface for report generation and data extraction.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Modeling and Simulation

**KEYWORDS:** Officer Retention, Enlisted Retention, Retention Survey, Decision Support Systems, Data Warehousing

### DIVERSITY ANALYSIS FOR UNITED STATES NAVY LEADERSHIP CONTINUUM

George Thomas, Professor  
Department of Systems Management  
Sponsor: Naval Education and Training Command

**OBJECTIVE:** To provide assessment of the diversity component of the Intermediate Officer module of the Leadership Continuum.

**SUMMARY:** This is a project that continues in 1999. During CY 1998 a module for the Leadership Continuum on Gender Awareness was created.

## PROJECT SUMMARIES

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### CONFERENCE PRESENTATION:

Thomas, George and Truesdale, Lisa, "Navy Recruit Training as a Gendering Process," Women's Research and Education Institute Annual Conference, Washington, D.C., December 1998.

### THESIS DIRECTED:

Truesdale, Lisa, "Navy Recruit Training: A Gendering Organization?" Master's Thesis, Naval Postgraduate School, March 1998.

**DoD TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Leadership, Diversity Management

### SUPPORT FOR DEVELOPMENT OF TROOP PROGRAM UNIT (TPU) LEADERSHIP TRAINING

**Kenneth W. Thomas, Professor**

**Department of Systems Management**

**Sponsor: Office of the Chief, Army Reserve**

**OBJECTIVE:** The goal of this project was to increase TPU readiness and retention by providing improved leadership training for TPU commanders. Specifically, this project developed a program of instruction (POI) for a leadership course for new or prospective TPU commanders, together with a pamphlet on TPU leadership to support that course.

**SUMMARY:** Troop Program Units (TPUs) are company-level units in the U.S. Army Reserve. An existing course for prospective TPU commanders has focused largely on specific administrative tasks, rather than on larger issues related to the effective leadership of the unit. In FY96, Professors Bob Barrios-Choplin and Kenneth Thomas had published the findings of a study that identified specific leadership behaviors by TPU commanders which were related to unit effectiveness: K. W. Thomas and B. Barrios-Choplin, "Effective Leadership in TPUs: Findings from Interviews at 16 Units" (Naval Postgraduate School Technical Report NPS-SM-96-002). In FY97, with funding from the Army Studies Program and the support of the Commander, Army Reserve (CAR), the project discussed here developed a revised POI for the existing pre-command course that incorporated key findings from the FY96 study. It also revised the earlier technical report into material for a U.S. Army Reserve Command (USARC) pamphlet on leadership to support that course. During FY98, the researcher remained available for technical support to USARC, and to the ARTEP personnel at Fort McCoy, Wisconsin, who were responsible for implementing the revised course. Continuing progress was also made on the conceptual model of leadership derived from the earlier USAR research. However, during early FY98, a new CAR assumed command, and implementation of the new course was put on hold.

### CONFERENCE PRESENTATION:

Thomas, K. W., "A Three-Dimensional Model of Leadership Values from the U.S. Army Reserve: Qualitative Evidence and Theoretical Ramifications," 6<sup>th</sup> International Conference on Work Values and Behavior, Istanbul, Turkey, 12-15 July 1998.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Leadership Training, Retention, Readiness, Troop Program Unit, Army Reserve

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Hildebrandt, G., "The Use of Performance Incentives in DoD Contracting," *Acquisition Review Quarterly*, Vol. 5, No. 2, Spring 1998.

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McCarty, R., Barrios-Choplin, B., and Atkinson, M., "The Impact of a New Emotional Self-Management Program on Stress, Emotions, Heart Rate Variability, DHEA, and Cortisol," *Journal of Integrative Physiological and Behavioral Science*, 33:2, 1998.

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Nissen, M.E., Snider, K.F., and Lamm, D.V., "Managing Radical Change in Acquisition," *Acquisition Review Quarterly* Special Issue on Managing Radical Change 5:2, 1998, also published in the *Acquisition Review Quarterly* World Wide Web electronic library: <http://www.dsmc.dsm.mil/pubs/arq/98arq/lamm.pdf>.

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## CONFERENCE PAPERS

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Hildebrandt, G. and Sze, M., "Aircraft O&S Cost Estimating Relations Using Cross-Section and Time Series Data," *Proceedings of the 66<sup>th</sup> Military Operations Research Society Symposium*, Monterey, CA, 23-25 June 1998.

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### CONFERENCE PRESENTATIONS

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Bowman, W. and Mehay, S., "Career Advancement of Minority Officers in the U.S. Navy," Western Economic Association Annual Meeting, Lake Tahoe, CA, June 1998.

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Gue, Kevin R., "Layouts for Multiple Operations in a Freight Terminal," Congress of the American Society of Mechanical Engineers, Anaheim, CA, 2 November 1998.

Gue, Kevin R., "Locating Facilities that Compete and Cooperate," Conference of the Institute for Operations Research and Management Sciences, Seattle, WA, 27 October 1998.

Hildebrandt, G. and Franck, R., "From Lanchester Models to Cost Analysis," 66<sup>th</sup> Military Operations Research Society Symposium, Monterey, CA, 23-25 June 1998.

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Roberts, N.C., "Peace Matters Most," Academy of Management Conference, San Diego, CA, August 1998.

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## OTHER

Gue, K.R., The sponsor computer code entitled, "BlockBuilder," written in the Java programming language was delivered.

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## 1998 THESIS ABSTRACTS

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### U.S. ARMS SALES TO THE GULF COOPERATION COUNCIL STATES

Isa Khalifa Abdulla Aljeeran-Captain, Bahrain Army

B.S., University of Bahrain, 1987

Master of Science in Management-September 1998

Advisors: Brad R. Naegle, Department of Systems Management

Keith F. Snider, Department of Systems Management

The purpose of this thesis is to discuss existing U.S. arms sales to the Gulf Cooperation Council states (GCC) and to propose an appropriate strategy for future arms trades. The GCC states' existing strategy for acquiring weapon systems has not been sufficient for the defense needs of the six countries. Each country has its own strategy and its main arms source. The reduction of the GCC states' resources due to a gradual reduction in oil price makes it necessary to consolidate their arms acquisition strategy to reach an efficient strategy that serves future defense requirements. U.S. weapon systems were discussed as one solution to obtaining state-of-art weapon systems with lower life cycle cost. U.S. foreign military sales (FMS) is a good tool to facilitate the arms trades between the U.S. and the GCC states. Direct offset was examined for future arms trades that enforce the GCC self-reliance. The U.S. M1A2 tank sales to Saudia Arabia and Kuwait were discussed as a case study to clarify proposals and recommendations. Lastly, recommendations for improving the FMS process were reviewed.

**DoD KEY TECHNOLOGY AREA:** Other (Gulf Cooperation Council, Foreign Military Sales, M1A2 Main Battle Tank)

**KEYWORDS:** Gulf Cooperation Sales, Foreign Military Sales, M1A2 Main Battle Tank

### RELIABILITY ENHANCEMENT OF THE NAVY METROLOGY AND CALIBRATION PROGRAM

Jon D. Albright-Lieutenant Commander, United States Navy

B.S., University of Wisconsin, Stout, 1986

Master of Science in Management-December 1997

Advisors: Donald Eaton, Department of Systems Management

Keebom Kang, Department of Systems Management

Three quarters of the Naval Air Systems Command Metrology and Calibration (METCAL) budget is spent on Support Equipment with calibration intervals that are 12 months or less. These intervals are based on End-of-Period (EOP) operational reliability targets of 72% for non-critical General Purpose Test Equipment (GPTE) and 85% for critical Special Purpose Test Equipment (SPTE). Over one-third of all Support Equipment are performing above their reliability targets, but are unnecessarily being inducted into calibration facilities due to maximum interval restrictions. With continued budget constraints, the Navy will be forced to adopt innovative measures to save costs, while not sacrificing readiness or safety. Based on analysis, it was concluded that by increasing the reliability targets, and interval restrictions, the Navy will save over \$1.2 million per year with a concomitant increase in the reliability of 46% of Naval Aviation's TAMS by 9.71%.

**KEYWORDS:** Metrology, Calibration, Reliability

**DoD KEY TECHNOLOGY AREAS:** Air Vehicles, Electronics

## 1998 THESIS ABSTRACTS

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### UPDATING ECONOMIC OPERATIONS IN THE POST INDUSTRIAL AGE

Carl A. Alex-Captain, United States Army

B.A., Saint Leo College, 1983

Master of Science in Defense Analysis, March 1998

Advisor: Gordon H. McCormick, Special Operations Curriculum Committee

Second Advisor: Gregory Hildebrandt, Department of Systems Management

This thesis addresses the economic aspect of coercive diplomacy to show that new instruments of coercive economic operations created by information age technology: 1) redefine coercive economic operations and 2) that the vulnerabilities and concerns brought about by these new economic instruments change the impact coercive economic operations have on coercive diplomacy. This thesis initially looks to the past, but the intention is to guide continuing future thought on coercive economic operations. This is important for coercive diplomacy because policy makers must be aware that ushered in with present and future technologies are new economic instruments which impact coercive economic diplomacy.

**DoD KEY TECHNOLOGY AREA:** Other (Coercive Diplomacy, Economic Sanctions)

**KEYWORDS:** Economic Operations, Economic Coercion, Economic Warfare, Economic Leverage, Economic Sanctions

### AN ANALYSIS OF THE EFFECT OF PRIOR-ENLISTED SERVICE ON NAVY OFFICER PERFORMANCE

Mark G. Astrella-Lieutenant, United States Navy

B.S., National University, 1989

Master of Science in Management-June 1998

Advisors: Stephen L. Mehay, Department of Systems Management

Mark J. Eitelberg, Department of Systems Management

This thesis compares commissioned officers who have prior-enlisted service with those who have no prior-enlisted service on the basis of selected measures of performance. The primary source of information is the Bowman-Mehay database, which is used to analyze the effects of prior service on promotions through lieutenant commander. The study also looks at the gender and ethnic background of officers with prior-enlisted service and the total naval force. Two measures of performance were examined for officers whose promotion board to lieutenant commander occurred between fiscal years 1985 and 1995: whether the officer received a Recommendation For Accelerated Promotion (RAP) and whether the officer was promoted to lieutenant commander.

The results of the study show that prior-enlisted officers generally are not Rapped as often as non-prior-enlisted officers but are promoted to lieutenant commander about equally. The results also suggest that the Navy lags in its attempt to have an officer corps that resembles the ethnic and gender composition of the enlisted force. This is noteworthy, since almost one-third of minority and female officers tend to come from the enlisted ranks. Several recommendations are offered for future research regarding prior-enlisted officers in the Navy.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Prior-Enlisted, Officer, Performance

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## 1998 THESIS ABSTRACTS

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### **PLANNING, PROGRAMMING, AND BUDGETING SYSTEM IN THE INDONESIAN NAVY: COMPARING THE BUDGETING PHASE OF THE INDONESIAN NAVY'S SYSTEM TO THE U.S. NAVY'S SYSTEM**

**Diki Atriana-Lieutenant, Indonesian Navy**

**B.S., Indonesian Naval Academy, 1988**

**Master of Science in Management-June 1998**

**Advisors: John E. Mutty, Department of Systems Management**

**Richard Doyle, Department of Systems Management**

This research evaluated the functionality of the Planning, Programming and Budgeting System (PPBS) in the Indonesian Navy. Specifically, the objective was to determine the feasibility of improving the Indonesian Navy PPBS using the U.S. Navy model as a reference, with emphasis on the budgeting phase. The research included conducting a review of the current processes in both systems. Several recommendations for improving the Indonesian Navy's system were made, including separating the programming and budgeting phases, establishing a team of dedicated budget analysts, and developing a budget review and reclaim process similar to the one used in the U.S. Navy. Additional recommendations regarding the need for further evaluation of the organizational structure, culture and political influences that affect the budgeting phase in the Indonesian Navy were made for improving the Indonesian Navy's budgeting phase.

**DoD KEY TECHNOLOGY AREA:** Other (Planning, Programming, and Budgeting)

**KEYWORDS:** PPBS, Indonesian Navy, Budgeting

### **THE EFFECTS OF FINANCIAL CONTROLS ON ACTIVITY OPERATIONS**

**Maureen Alexander-Commander, United States Navy**

**B.S. University of Southern California**

**Master of Science in Management-December 1997**

**Advisors: Robert Barrios-Choplin, Department of Systems Management**

**John E. Mutty, Department of Systems Management**

The Quadrennial Defense Review underscored the importance of reevaluating the operation of the Department of Defense. The Department of the Navy Organization Management and Infrastructure Team is charged with generating analysis to arrive at recommendations for change that will improve decision-makers information and incentives. Through the use of survey research and sorting techniques, this thesis identifies the need for budget flexibility during the execution phase for commanders to address emergent issues at the local level, especially at Recruiting, Supply and Support Commands. Financial controls such as fences, floors, ceilings and thresholds erode the commander's ability to manage the organization effectively. The financial controls and reduced funding combine to cause difficulties in command operations. The result is a hierarchy of funding. The mission first, quality of life second and facilities last. A model program, exercising budget flexibility during the budget execution phase, is recommended to provide further concrete evidence.

**KEYWORDS:** Budget Execution, Financial Controls, Comptrollership, Ceilings, Fences, Floors, Thresholds, Mission, Quality of Life, and Facilities

**DoD KEY TECHNOLOGY AREA:** Other (Financial Controls)

## 1998 THESIS ABSTRACTS

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### **THE POST COLD WAR CIVIL ENGINEER CORPS: WHAT HAS CHANGED AND WHY?**

**Tony L. Ammons, Jr.-Lieutenant, United States Navy**

**B.S.E.E., Virginia Military Institute, 1988**

**Master of Science in Management-December 1997**

**Advisors: Richard Doyle, Department of Systems Management**

**Patrick Parker, Command, Control, and Communications Academic Group**

With the end of the Cold War, the military services have experienced significant cuts in endstrength. Within the Navy, the Civil Engineer Corps (CEC) has also experienced some reductions. This thesis sought to determine how CEC endstrength is derived and whether it declined commensurate with overall naval officer endstrength. The command and billet structures for the CEC in 1986 and 1996 were used to represent the Cold War and Post Cold War respectively. The thesis determined how the CEC has changed and compared these changes to those that occurred in the larger naval officer community. One major finding is that CEC endstrength is indirectly affected by Naval officer endstrength and directly affected by the size of the infrastructure. Downsizing the military without downsizing infrastructure results in minor reductions in CEC endstrength. The CEC has experienced a 17 percent reduction in endstrength over the period, with more than 50 percent attributed to the closure of commands. Another finding is that these reductions have not changed the missions of the CEC, construction contract management, facilities maintenance, and advanced base construction.

**KEYWORDS:** Civil Engineer Corps, Seabees, Military Downsizing

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

### **COST/BENEFIT ANALYSIS OF LEASING VERSUS PURCHASING COMPUTERS**

**Alan J. Arceneaux-Captain, United States Marine Corps**

**B.S., Oregon State University, 1990**

**Master of Science in Management-December 1997**

**Advisors: Cynthia J. Levy, Department of National Security Affairs**

**Gordon E. Louvau, Department of Systems Management**

The purpose of this thesis was to present a cost/benefit analysis of leasing versus purchasing computers. This analysis was performed to provide a decision making model for the acquisition of computer assets. It is additionally intended to serve as a framework to compare the costs and benefits of leasing over purchasing.

To address this issue, a capital budgeting model was developed and net present value analysis performed. In constructing this model, several factors were considered, including: the purchase cost of computer equipment, annual lease payments, depreciation costs, the opportunity cost of purchasing, tax revenue implications and various leasing terms. Data for this thesis was collected using historical records, literature reviews, and interviews.

This research found that it is more cost effective for the Naval Postgraduate School and other Naval Shore-based commands to purchase equipment rather than lease.

**KEYWORDS:** Cost/Benefit Analysis, Leasing, Computer Acquisitions, Purchasing

**DoD KEY TECHNOLOGY AREA:** Other (Computer Technology)

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## 1998 THESIS ABSTRACTS

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### THE RELATIONSHIP BETWEEN ACADEMIC MAJOR AT THE UNITED STATES NAVAL ACADEMY AND SERVICE COMMUNITY SELECTION

Brian K. Arcement-Lieutenant, United States Navy

B.B.A., University of New Mexico, 1991

Master of Science in Leadership and Human Resource Development-September 1998

Advisors: Gregory G. Hildebrandt, Department of Systems Management

Rakesh Lall, Department of Leadership, Ethics and Law, United States Naval Academy

This study provides information for those individuals responsible for guiding midshipmen's choice of naval service community. This research focused on individuals who received their first community choice. The analysis demonstrates that choice of academic major frequently affects the likelihood that an individual will select a particular community. For example, a shift from a group one major to a group two major significantly decreases the likelihood of selecting Marine Corps. Another finding is that a shift from group one major to either group two or group three majors decreases the likelihood of selecting submarines. The fact that it is possible to predict community choice from academic major may not be obvious to midshipmen when they choose their major during the second semester of their plebe year (United States Naval Academy, 1997).

This project was designed to provide company officers with the information needed to counsel midshipmen about the service community available following graduation from the Naval Academy. The choice of career field is the culmination of four years of hard work by midshipmen, and this decision can affect their naval service career for many years. This information needs to be provided to the people involved in the major and community selection process. This should be done prior to the midshipmen choosing their academic major.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Personality and Vocational Interests, Psychological Type, Academic Major, Naval Service Community, Community Selection

### IMPROVING AVIATION DEPOT LEVEL REPAIRABLE (AVDLR) INVENTORY AND REPAIR MANAGEMENT

Dennis L. Baird-Lieutenant Commander, Supply Corps, United States Navy

B.S., University of the State of New York, 1986

Master of Science in Management-December 1997

Advisors: Thomas P. Moore, Institute of Defense Education and Analysis

Kevin R. Gue, Department of Systems Management

The processes by which the Navy manages the inventory and repair of Aviation Depot Level Repairables (AVDLRs) are complex and not well described in a single document. The purpose of this thesis is to document and provide an analysis of those processes as a basis for future research. Research was conducted on the process of returning not ready for issue (NRFI) units from the end user to the depot for repair and return to the supply system. Additionally, research was conducted to document the management process for determining repair requirements at the Naval Inventory Control Point Philadelphia and how those requirements are accepted and scheduled at NADEP North Island. These processes were described and analyzed, and six areas were identified that offer potential for reducing repair cycle time and improving AVDLR management.

**KEYWORDS:** Aviation Depot Level Repairable (AVDLR) Inventory and Repair Management

**DoD TECHNOLOGY AREA:** Other (Inventory Management)

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## 1998 THESIS ABSTRACTS

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### **A CASE STUDY OF THE CONTRACT CLOSEOUT PROCESS AT DEFENSE CONTRACT MANAGEMENT COMMAND (DCMC) LOCKHEED MARTIN (LM) MISSILES AND SPACE**

**Leigh M. Bandy-Captain, United States Army**

**B.S., Siena College, 1987**

**Master of Science in Computer Science-June 1998**

**Advisors: David A. Smith, Department of Systems Management**

**David V. Lamm, Department of Systems Management**

The primary purpose of this thesis is to provide a case analysis of the contract closeout process at DCMC Lockheed Martin (LM). The contract closeout policies and procedures at DCMC Headquarters are analyzed to develop a basis of comparison for DCMC LM. Secondary objectives include analysis of factors affecting untimely contract closeout, both DCMC-wide and at DCMC LM, and comparison of metrics results to analyze DCMC LM's progress in contract closeout. The current DCMC LM initiatives leading to increased contract closeout efficiency are discussed, and alternative closeout metrics are investigated. Finally, recommendations are made on the applicability of the DCMC LM initiatives to other organizations throughout DCMC.

**DoD TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Contract Closeout, DCMC, Canceling Funds, Metrics, Overhead Negotiations

### **IMPROVING ENGINEER RECONNAISSANCE IN FIRST MARINE DIVISION**

**Edward D. Banta-Major, United States Marine Corps**

**B.A., Colgate University, 1986**

**Master of Science in Management-December 1997**

**Advisor: Nancy Roberts, Department of Systems Management**

**Second Reader: Lieutenant Colonel Timothy Phillips, United States Marine Corps Representative**

This thesis explores alternative organizational designs to improve 1st Marine Division's engineer reconnaissance capability. It defines engineer reconnaissance as a complementary component of the divisions decentralized reconnaissance function, and addresses the evolution of engineer reconnaissance and its relevance to current and future maneuver commanders. This thesis expands on current deficiencies in training, organization, and coordination to define the engineer reconnaissance deficiency in terms of an organizational design problem. Four alternative solutions are proposed to develop and maintain an improved engineer reconnaissance core competency involving both structural and training changes. This thesis evaluates each alternative by three cost criteria (personnel, training, and lateral coordination requirements), and four benefit criteria (quality, acceptability, applicability, and maintainability) using an additive weighting and ranking method of analysis to determine an optimal course of action. Results of this analysis suggest that creating an engineer reconnaissance section at 1st Combat Engineer Battalion will provide the greatest engineer reconnaissance benefit to the division at the lowest cost.

**KEYWORDS:** Organizational Design, Engineer Reconnaissance, Cost/Benefit Analysis

**DoD TECHNOLOGY AREA:** Manpower, Personnel, and Training



## 1998 THESIS ABSTRACTS

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### **FACILITATING SOFTWARE PROCESS IMPROVEMENT IMPLEMENTATION EFFORTS: A CASE STUDY OF FINANCIAL SYSTEMS ACTIVITY, KANSAS CITY**

**Wendell Bazemore-Captain, United States Marine Corps**

**B.S.E.T., Old Dominion University, 1992**

**Master of Science in Information Technology Management-September 1998**

**Advisors: Susan P. Hocevar, Department of Systems Management**

**Mark E. Nissen, Department of Systems Management**

Software process improvement initiatives are not unlike other process reengineering efforts. They are influenced by such dynamics as resistance to change, organizational structure, cultural barriers, and other issues. An effective plan for software process improvement implementation must address concepts of organizational change. In this thesis three perspectives on organizational change provide the frameworks for analyzing the software process improvement efforts of four organizations. Based on the change theory and implementation strategies of four organizations best practices relative to preparing an organization for process improvement, implementing process improvements, and sustaining the improvement effort are derived. A process improvement survey, archival material, personal interviews and site visits provide data on the process improvement efforts of the Financial Systems Activity Kansas City. These data are analyzed to characterize the challenges to the organization's process improvement efforts. Recommendations for mitigating these challenges are provided. The recommendations include an explicit design for planned change, transition management teams, piloting, integration of process improvement activities into the project cycle, and scanning the environment.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Software Process Improvement, Organizational Change, Software Engineering, Software Engineering Process Group, Capability Maturity Model

### **AN ASSESSMENT OF THE IMPLEMENTATION OF THE SINGLE PROCESS INITIATIVE BY THE DEPARTMENT OF DEFENSE**

**Bradley A. Bergan-Lieutenant Commander, Supply Corps, United States Navy**

**B.A., Luther College, 1985**

**Master of Science in Management-December 1997**

**Advisors: Jeffrey R. Cuskey, Department of Systems Management**

**Sandra M. Desbrow, Department of Systems Management**

One tenet of acquisition reform is to reduce the number of military specifications and standards contained in Department of Defense (DoD) contracts and to allow contractors the opportunity to use their own best practices to satisfy contractual requirements. The Single Process Initiative (SPI) is DoD's effort to incorporate this policy into existing contracts, via a streamlined process. The SPI process supports the elimination or replacement of existing military specifications and standards with industry-wide practices and promotes the use of single manufacturing and management processes within a contractor facility.

This thesis uses the results from 43 surveys of Government and industry participants in SPI to examine the extent to which SPI has been successful in promoting the use of single manufacturing and management processes at contractor facilities.

**KEYWORDS:** Single Process Initiative, Acquisition Reform

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition and Contracting)

## 1998 THESIS ABSTRACTS

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### **EVALUATION OF THE MILITARY SPECIFICATION COATING, ALIPHATIC POLYURETHANE, CHEMICAL AGENT RESISTANT (CARC) — MIL-C-46168**

**Anthony P. Bohn-Captain, United States Army**

**B.A., Brigham Young University, 1989**

**Master of Science in Management-June 1998**

**Advisors: Brad Naegle, Department of Systems Management**

**Jane Feitler, Department of Systems Management**

An evaluation of the military specification coating, aliphatic polyurethane, chemical agent resistant (CARC) - MIL-C-46168, the mandated paint system for all United States Army tactical equipment, reveals the system is not expected to meet its primary intended purpose. The Army implemented the CARC system in FY85, based upon the overriding requirement to limit absorption of NBC contaminants and facilitates decontamination. However, tests indicate that CARC itself represents a significant residual chemical agent vapor hazard, even after decontamination. The analysis also examined the CARC system's impact from a total systems perspective. CARC is determined to cause a significant negative impact regarding issues of logistics, environment, safety, and life-cycle-costs. Various paint systems were also reviewed and compared to the CARC system, indicating other viable paint system options regarding substrate protection and life-cycle-costs.

**DoD KEY TECHNOLOGY AREA:** Chemical and Biological Defense

**KEYWORDS:** CARC, Paint Systems, Decontamination, Contaminates

### **SOCIOECONOMIC STATUS AND PERFORMANCE IN THE U.S. ARMY AND U.S. MARINE CORPS**

**Stefan J. Booth-Captain, United States Marine Corps**

**B.S., Ohio State University, 1992**

**Master of Science in Management-March 1998**

**and**

**Kevin M. Schmiegel-Captain, United States Marine Corps**

**B.A., College of the Holy Cross, 1989**

**Master of Science in Management-March 1998**

**Advisors: Michael D. Cook, Department of Systems Management**

**Mark J. Eitelberg, Department of Systems Management**

The purpose of this study was to examine socioeconomic status (SES) of recruits in the Army and Marine Corps and to analyze the relationship between a recruit's SES background and his or her performance in the military over time. Data for this study were obtained from three sources: the Department of Defense Survey of Recruit Socioeconomic Backgrounds (SES survey), Military Entrance Processing Command enlisted cohort files, and personnel data files provided by the Army and Marine Corps. After merging these data files, the SES survey respondents were tracked longitudinally, and several analyses were undertaken to assess the relationship between SES and performance in the military. The results of this research show that recruits in both services come from slightly lower SES backgrounds than do youths in the general population; and, most of this difference can be explained by the fact that soldiers and Marines are consistently underrepresented in the highest measures or correlates of SES and overrepresented in the lowest ones. Additionally, it was found that, while SES is not a strong predictor of first-term enlisted attrition in either service, it does explain differences in recruits' performance on-the-job in the Marine Corps. Further research is recommended, especially that which incorporates supervisors' rating of military performance.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Socio-Economic Status (SES), Attrition, Performance, All-Volunteer Force (AVF)

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## 1998 THESIS ABSTRACTS

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### **BASIC DIMENSIONS OF FINANCIAL CONDITION WITHIN THE DEFENSE INDUSTRY**

**Craig T. Bowden-Lieutenant, United States Navy**

**B.A., University of Rochester, 1991**

**Master of Science in Management-September 1998**

**Advisors: O. Douglas Moses, Department of Systems Management**

**James M. Fremgen, Department of Systems Management**

In the current economic climate of fiscally constrained resources, the Department of Defense (DoD) has become extremely sensitive to the ways in which it spends money in support of its mission of providing national security. Before awarding contracts to defense industry firms, the DoD routinely performs financial analysis on these defense contractors in order to assess their financial stability. The primary purpose of this thesis was to analyze financial data from a sample of defense industry firms in order to determine the basic dimensions of financial condition in the defense industry. A related objective was to compare these results with previous studies. This analysis is particularly relevant due to the recent and numerous changes, particularly mergers, that have reshaped the economic landscape for defense industry firms during the mid-1990s. The research covered fifty of the top one-hundred defense contractors. Fifty-one different financial ratios for these companies were calculated and analyzed. Factor analysis was the primary statistical method employed. The analysis concluded that there were nine distinct dimensions of financial condition within the defense industry. Future financial analysis of the defense industry should cover these distinct dimensions of financial condition.

**DoD KEY TECHNOLOGY AREA:** Other (Financial Condition of Defense Industry)

**KEYWORDS:** Defense Industry, Financial Ratios of Financial Condition, Factor Analysis, Indicators of Defense Industry Health

### **AN ANALYSIS OF THE DEVELOPMENT OF THE CHAIRMAN, JOINT CHIEFS OF STAFF PROGRAM ASSESSMENT (CPA) AND THE CHAIRMAN'S PROGRAM RECOMMENDATION (CPR)**

**John K. Bozick-Lieutenant Commander, United States Naval Reserve**

**B.S., United States Merchant Marine Academy, 1984**

**Master of Science in Management-June 1998**

**Advisors: Jerry L. McCaffery, Department of Systems Management**

**John E. Mutty, Department of Systems Management**

The Goldwater-Nichols Defense Reorganization Act of 1986 redefined the role of the Chairman, Joint Chiefs of Staff (Chairman). The Chairman now assumes many additional roles and responsibilities including the development of the Department of Defense (DoD) budget submission to the President. Two critical elements of this development are the Chairman's Program Assessment (CPA) and the Chairman's Program Recommendation (CPR).

This thesis analyzes the CPA and CPR development process. The modern military of today must engage in a complex game mixing requirements, capabilities, mission identification, threat, and politics to field the world's premier military force. The introduction of the Joint Warfighting Capability Assessment (JWCA) process improved the process of service requirement analysis. The Chairman combines these assessments and recommendations into the CPA and CPR.

Extensive research was conducted into the historical role of the Chairman relating to the requirements generation and resource allocation processes within the DoD. Numerous interviews of current Joint Staff and Navy Staff personnel familiar with the CPA and CPR were also conducted.

Findings show the CPA and CPR are closely held documents considered personal correspondence between the Chairman and the Secretary of Defense. This situation creates the potential to dramatically alter Service and Agency POM submissions.

**DoD KEY TECHNOLOGY AREA:** Other (Resource Allocation Processes)

**KEYWORDS:** Resource Allocation, CJCS, PPBS

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## 1998 THESIS ABSTRACTS

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### **A TRADEOFF ANALYSIS OF JUST-IN-TIME AND NON JUST-IN-TIME INVENTORY WITH TRANSPORTATION RAMIFICATIONS**

**Ataide R. Braga-Commander, Brazilian Navy  
B.S., Brazilian Naval Academy, 1979**

**Master of Science in Management-March 1998**

**Advisors: Jane N. Feitler, Department of Systems Management**

**James E. Suchan, Department of Systems Management**

The purpose of this research is to investigate when a Just-In-Time (JIT) inventory management technique is a worthwhile approach to managing inventories. Some experts in the field maintain that the additional transportation costs derived from using JIT and its costs due to frequent shipping is more than offset by the reduction in inventory levels. In this study a simulation is developed using the cost structure of Naval Air Station Lemoore for managing a selected group of items. Lemoore is considered the Inventory Control Point and the Stock Point for those items. Research results indicate that despite all the advantages of using JIT, JIT is not always the lowest cost approach. Recommendations are that inventory managers delineate the associated costs using each technique and perform a thorough analysis that compares the two alternatives, and that JIT is not a general solution leading to the lowest cost for management of all inventory items.

**DoD KEY TECHNOLOGY AREAS:** Modeling and Simulation, Other (Inventory Management)

**KEYWORDS:** Just-In-Time, Transportation Cost, Holding Cost, Break-Even Point, Trade-off Analysis, Contrasting Cost Structure

### **ARMY INVENTORY POLICY, THE NEED FOR STRATEGIC CHANGE: AN EXAMINATION OF READINESS BASED SPARING FOR RETAIL REPAIR PARTS SUPPLY SUPPORT**

**Robert D. Brem-Captain, United States Army  
B.S., Lafayette College, 1989**

**Master of Science in Management-December 1997**

**Advisor: Kevin R. Gue, Department of Systems Management**

**Second Reader: Michael W. Boudreau, Department of Systems Management**

Army Vision 2010 and Focused Logistics has recognized the need for a Revolution in Military Logistics to support the Revolution in Military Affairs in the information age. As well, readiness needs are increasingly having to be balanced with fiscal realities. Readiness Based Sparing inventory models can give commanders the tools necessary to make these critical resource allocation decisions.

The potential value of implementing a Readiness Based Sparing policy for Army retail level, repair parts inventory management was explored. Questions were answered about the effectiveness, implementation and potential barriers to implementation. In doing so, a description and analysis of current policy, its effects and consequences was offered. An introduction was presented to the Readiness Based Sparing methods, their evolution in military applications, successful implementations and lessons learned. The performance was compared with Authorized Stockage Lists determined using Readiness Based Sparing with those under current policy. Issues addressed include cost, supply performance, mobility, manpower, and transition to war, among others.

From this analysis, it was concluded that Readiness-Based Sparing methodology is superior to current methods of stockage determination and it was recommended that the Army embrace it as the preferred retail inventory policy. Suggestions for means of implementation and areas for further research are given.

**KEYWORDS:** Inventory Management, Readiness-Based Sparing, Army Retail Inventory Policy, Logistics Management

**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

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## 1998 THESIS ABSTRACTS

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### **AN ANALYSIS OF THE MANPOWER COSTS ASSOCIATED WITH THE HELICOPTER AIR WING COMMANDER CONCEPT**

**Peter J. Brennan-Lieutenant Commander, United States Navy**

**B.S., Marquette University, 1982**

**Master of Science in Management-March 1998**

**Advisors: John E. Muttu, Department of Systems Management**

**Richard B. Doyle, Department of Systems Management**

This thesis presents an analysis and comparison of manpower costs of three options for the United States Navy Helicopter force structure through the year 2020. The first option, the basic plan, leaves the force structure as it is today. The second option assumes the mission to support the Military Sealift Command (MSC) is outsourced and combines the Helicopter Combat Support (HC) and Helicopter Antisubmarine Warfare (HS) communities into a community referred to as HSC. The third option realigns the force along missions performed by the SH-60R and CH-60 under a Helicopter Air Wing Commander (HAWC). All three options support the requirements set forth in the Helo Master Plan (HMP) and are based on the acquisition of the CH-60 helicopter along with the upgrade of all SH-60Bs and SH-60Fs to SH-60Rs. The analysis involved developing manning levels, by pay grade, for the three options and determining the differences in those manning levels. Manpower costs were allocated to the total personnel requirements, and differences in costs among the options were calculated. The manpower cost associated with the basic plan set forth in the HMP is projected to be \$575 million per year. Because the HSC option does not support the MSC mission, it has the lowest annual projected manpower cost of \$531 million. When a factor accounting for the MSC requirement is added to compare the three manning structures on a consistent basis, the annual HSC option cost is \$579 million. The HAWC concept manpower cost is \$568 million per year.

**DoD KEY TECHNOLOGY AREAS:** Air Vehicles, Manpower, Personnel, and Training

**KEYWORDS:** Blackhawk, Seahawk, CH-60, SH-60, Helo Master Plan, HAWC

### **AN HISTORICAL ANALYSIS AND COMPARISON OF THE MILITARY RETIREMENT SYSTEM AND THE FEDERAL EMPLOYEE RETIREMENT SYSTEM**

**Bruce R. Breth-Lieutenant Commander, United States Navy**

**B.S., University of Minnesota, 1986**

**Master of Science in Management-June 1998**

**Advisors: Richard B. Doyle, Department of Systems Management**

**Frank J. Barrett, Department of Systems Management**

The most significant change to private as well as civil service employee retirement systems over the past 15 years has been the transition from defined benefit to defined contribution retirement plans. This trend has shifted a significant portion of the risk involved in funding retirement from corporations and the federal government to employees. This thesis examines the military retirement system and the Civil Service Retirement System/Federal Employee Retirement System, from their introduction to present day, addressing the reasons for major changes during their evolution. Government studies, private studies, periodicals and Internet resources were consulted to identify significant developments and legislation affecting the military retirement system and Federal Employee Retirement System (FERS). While the retirement system for federal employees has transitioned from a strict defined benefit system to a system with a defined contribution element, the military retirement system has not yet incorporated a defined contribution component. The trend of persistent legislative attention towards the military retirement system implies that the 1980 and 1986 reductions didn't cut deep enough and future reductions are possible. The success of FERS suggests that the application of a defined contribution element to the current military retirement system is very likely in the future.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Retirement, Compensation, Pension, Federal Employee Retirement System, Civil Service Retirement System

## 1998 THESIS ABSTRACTS

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**BUSINESS PROCESS REENGINEERING:  
A PRIMER FOR THE MARINE CORPS' PROCESS OWNER**  
**Rollin D. Brewster-Captain, United States Marine Corps**  
**B.A., University of Michigan, 1992**  
**M.S.M, Troy State University, 1996**  
**Master Science in Management-December 1997**  
**Advisors: Kenneth J. Euske, Department of Systems Management**  
**William J. Haga, Department of Systems Management**

As the defense establishment downsizes, it has turned to the private sector to model its methods for improved productivity. Business Process Reengineering (BPR) is a technique used by the private sector to achieve order of magnitude improvements in organizational performance by leveraging information technology to enable the holistic redesign of business processes. This thesis provides a guide to the methods and tools used during BPR, and presents a practical way for Marine Corps' leaders to establish and direct a reengineering effort. Instruction is provided on the basics of how to establish a strategic direction, organize the reengineering team, and analyze business processes through the use of process-maps, flowcharts, Integrated Definition for Function (IDEFO) models, Activity-Based Costing (ABC), and value-added assessment. Approaches and principles useful during the development of the new process are discussed, as well as benchmarking and the factors leading to process implementation and organizational change. Recommendations are made for further reading.

**KEYWORDS:** Business Process Reengineering, BPR, Process Innovation, Process Improvement, Process Maps, Flowcharts, Integrated Definition for Function Modeling, IDEFO, Activity Based Costing, ABC, Organizational Change

**DoD KEY TECHNOLOGY AREA:** Other (Management)

**COMPARATIVE ANALYSIS OF BENEFITS RECEIVED FROM NAVAL  
AIR STATION SEARCH AND RESCUE (SAR) MISSION**  
**Robert K. Brodin-Lieutenant Commander, United States Navy**  
**B.S.C.E., Colorado State University, 1985**  
**Master of Science in Management-March 1998**  
**Advisors: Gregory G. Hildebrandt, Department of Systems Management**  
**Donald R. Eaton, Department of Systems Management**

Outsourcing is one method the Department of Defense is actively pursuing in order to cut costs and fund its planned modernization. This thesis investigates the question of whether the U.S. Navy should outsource the SAR mission at Naval Air Stations. The overarching question of whether or not SAR is an "inherently governmental" function was considered as was the alternative possibility of competition, if it were a "commercial" function.

This thesis is designed to complement other ongoing analyses by concentrating on the non-direct cost issues. A direct cost analysis of this outsourcing initiative is not conducted in this thesis. This thesis, therefore, examines the gross benefits received by the U.S. Navy as a result of the SAR mission at Naval Air Stations. These benefits were categorized for analysis as personnel rotation-base, personnel experience-base, mission related and public related.

A Decision Support System Generator using the Analytical Hierarchy Process was introduced in the study as an experimental methodology for evaluating the benefits received by the Navy. Consistent results were obtained from two separate groups and insights were obtained for future improvements in these experimental techniques. There is also a discussion of how the Analytical Hierarchy Process might be extended to evaluate net benefits (that is, benefits minus costs) to the Navy.

**DoD KEY TECHNOLOGY AREA:** Modeling and Simulation

**KEYWORDS:** Outsourcing, Search and Rescue, Decision Support System Generator, Analytical Hierarchy Process, Military Sealift Command, U.S. Antarctic Research Program

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## 1998 THESIS ABSTRACTS

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### **DECISION SUPPORT REQUIREMENTS FOR THE AVIATION MAINTENANCE MATERIAL CONTROL OFFICER**

**Bruce W. Brosch-Civilian**

**B.S., University of Colorado at Boulder, 1986**

**Master of Science in Management-December 1997**

**Advisors: William J. Haga, Department of Systems Management**

**Donald R. Eaton, Department of Systems Management**

This thesis evaluates NALCOMIS based upon maintenance management information requirements and highlights how NALCOMIS does not support the maintenance material control officer (MMCO) as an information system.

The Automated Maintenance Environment (AME) initiative currently in development will be capable of providing the MMCO with the information needed to improve maintenance management decisions. The overall result will be reduced aircraft lifecycle costs and improved operational availability. A concept of operations at the organizational maintenance level is presented to illustrate the AME concept.

The full implementation of AME will have a profound effect on Naval aviation maintenance processes. Recommendations for further research are presented.

**KEYWORDS:** NALCOMIS, Automated Maintenance Environment, Aviation Maintenance

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Other (Aviation Maintenance)

### **AN ORGANIZATIONAL ANALYSIS OF THE MILITARY (NAVY) PERSONNEL PLANS AND POLICY DIVISION (N13)**

**Bradley D. Bruner-Lieutenant Commander, United States Navy**

**B.A., Florida State University, 1985**

**Master of Science in Management-September 1998**

**Advisors: Cary Simon, Department of Systems Management**

**Erik Jansen, Department of Systems Management**

This thesis is a descriptive organization analysis of N13, the Military (Navy) Personnel Plans and Policy Division. The purpose of the study was to describe the strategy, structure, processes, tasks, people, and culture of N13 using three models: the Systems model; the Configuration model, and, the Mintzberg model. Based on model comparisons, document reviews, semi-structured interviews and questionnaire responses of N13 leaders and managers, conclusions indicate that N13 is severely stressed due to personnel reductions and a partial relocation of BUPERS to Millington, Tennessee. N13 is struggling to cope with fast-changing 1990s problems using a post-Cold War, Political-Reactive configuration. Recommendations are offered to assist leaders and managers in making systematic change to improve the efficiency and effectiveness of N13 as well as the manpower and personnel system. Specific recommendations include: realignment to a team-based community approach vice the current fragmented and duplicative approach; divestiture of non-core areas; and creation of a realistic training program tailored to rapidly enhance individual knowledge and skill sets.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Manpower, Personnel, Organization, Organizational Change, Management, Bureau of Naval Personnel, BUPERS

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## 1998 THESIS ABSTRACTS

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### **A PROCESS SIMULATION DESIGN TO ASSESS PROMISING TECHNOLOGIES RELEVANT TO F/A-18 AIRCREW TARGET RECOGNITION**

**Eric V. Bryant-Major, United States Marine Corps  
B.S., San Diego State University, 1985**

**Master of Science in Information Technology Management-September 1998**

**Advisors: William K. Krebs, Department of Operations Research  
Terrance C. Brady, Department of Systems Management**

F/A-18 aircrew visual target recognition during air-to-ground weapons employment is accomplished by the integration of sensors, systems, and information processing by the aircrew. The aircrew's ability to rapidly obtain target recognition from the cockpit display of the target scene is critical to accurate weapons delivery.

Using system engineering principles, a process simulation design was devised consistent with DoD acquisition reform regulations, that simulates how aircrew perform visual search and target recognition in attack aircraft, and it provides measures of performance (MOP) for decision-makers to assess the effectiveness of promising technologies. Two assessments were performed. The first experiment measures for effect in aircrew target recognition reaction time and accuracy using two different sensors – visible and infrared. An analysis of variance (ANOVA) of the measured reaction times data showed that aircrew using a visible sensor were significantly faster than aircrew using an infrared sensor. The second assessment involves aircrew cognitive model building during pre-mission planning using Mission Rehearsal Simulation (MRS) software. An ANOVA of the measured data revealed that aircrew who used the MRS software was significantly faster than aircrew who did not. An optimum aircrew training methodology using MRS software was devised and it is currently being integrated into F/A-18 fleet replacement squadron training.

**DoD KEY TECHNOLOGY AREAS:** Human Systems Interface, Sensors, Modeling and Simulation, Other (Defense Acquisition, Systems Engineering)

**KEYWORDS:** Target Recognition, Human Factors, Simulation, Process Decomposition

### **A CONCEPTUAL FRAMEWORK FOR PROVIDING REQUISITE VARIETY IN THE FUTURE OPERATIONAL FORCES OF THE UNITED STATES ARMY**

**Douglas B. Bushey-Major, United States Army  
B.S., Indiana University, 1986**

**Master of Science in Management-December 1997**

**Advisors: Mark E. Nissen, Department of Systems Management  
Michael W. Boudreau, Department of Systems Management**

The future forces of the U.S. Army face a great variety of threats with unprecedented complexities. The American public demands a quick, decisive victory with minimal casualties. In order to accomplish this, the Army must have the capability to totally dominate and control the enemy. Requisite Variety is essential to this mission. This research shows that in order to totally dominate the battlefield, the variety of options available to the friendly commander must be greater than or equal to that of the enemy. However, concurrent with the dramatic changes in the global environment, the U.S. has significantly decreased defense spending. The competition for these dwindling defense dollars has increased the Army's risk of misallocating its scarce resources to a few "brilliant" systems without regard to the factor of variety. This research provides a conceptual framework that innovates the Requirements Determination process by utilizing variety as a factor. It reveals concrete ways to provide the commander with the necessary variety to dominate the battlefield: through regulation, information, and variety catalysts. By applying the framework to the concepts of Force XXI operations, the researcher develops the Time-Information Differential. This suggests that given the current budgetary constraints, the Army should focus its short-term material acquisitions on C<sup>3</sup>I and mobility assets. However, to achieve synergistic results, the Army should concurrently research other types of weapons systems using the framework as a guide.

**KEYWORDS:** Resource Allocation, Requisite Variety, Requirements Determination, Force XXI Operations

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## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREAS:** Air Vehicles, Battlespace Environments, Manpower, Personnel, and Training, Sensors, Ground Vehicles

### **THE FAMILY OF MEDIUM TACTICAL VEHICLES: ANALYSIS OF A NON-DEVELOPMENTAL ITEM ACQUISITION PROGRAM**

**Charles A. Carter-Captain, United States Army**

**B.S., University of Illinois-Urbana, 1987**

**Master of Science in Management-June 1998**

**Advisors: Brad R. Naegle, Department of Systems Management**

**Keith Snider, Department of Systems Management**

The Government has a unique opportunity to acquire state-of-the-art technology faster and cheaper through non-developmental item (NDI) acquisition than to develop new systems. The reduced acquisition time and cost savings present significant benefits to the DoD. One such weapon system that used a non-developmental item acquisition strategy is the U.S. Army's Family of Medium Tactical Vehicles (FMTV). This thesis examines the NDI acquisition process and through comparison with the NDI model describes how FMTV leveraged this process. Following conclusions drawn from this comparison, this thesis examines the FMTV program for lessons-learned that can be used by other programs to effectively manage future NDI programs.

The researcher draws several conclusions from the analysis of the FMTV program. One of these conclusions is that the Army realized several significant advantages from the FMTV shorter acquisition cycle, increased defense industrial base, and state-of-the-art truck technology.

One lesson-learned from the FMTV program is that the Army did not anticipate the complexity of integrating NDI components into a fully functional NDI system and therefore did not program adequate engineering manufacturing and development resources (acquisition phase II) to allow the system to mature.

The researcher makes several recommendations for improving the NDI acquisition process. One of the recommendations is that NDI programs should have EMD resources appropriate for the program's level of complexity.

**DoD KEY TECHNOLOGY AREA:** Ground Vehicles

**KEYWORDS:** Non-developmental Items (NDI), Family of Medium Tactical Vehicles (FMTV), Lessons-Learned, Commercial Items (CI), Acquisition Program Management

### **CAUSES OF REJECTED PAYMENT REQUESTS IN THE PREVALIDATION SYSTEM OF THE MARINE CORPS' ACCOUNTING SYSTEM AND RECOMMENDATIONS FOR THEIR ELIMINATION**

**Jennifer E. Carter-Captain, United States Marine Corps**

**B.S., United States Naval Academy, 1992**

**Master of Science in Management-December 1997**

**Advisors: James M. Fremgen, Department of Systems Management**

**John E. Mutty, Department of Systems Management**

On July 1, 1995, Defense Finance and Accounting Service, Kansas City fielded the On-line Prevalidation System for processing vendor payment requests. Its purpose was to prevent new Negative Unliquidated Obligations and Unmatched Disbursements by comparing disbursement requests to obligations prior to payment. The objectives of this thesis were to determine the causes of rejected payment requests by analyzing sample data drawn from Marine Corps Forces, Atlantic's Operations and Maintenance appropriation and to recommend ways to improve the prevalidation process so that obligation validation is more efficient and effective. Research included an investigation into the background of the prevalidation system and an analysis of UMDs and NULOs before and after the implementation of the OPV System. Seven causes of rejected payment requests were identified, along with the penalty interest charged as a result of document numbers remaining on the Rejected Payment Authorization Request Report. It was observed that the formation of new UMDs and NULOs

## 1998 THESIS ABSTRACTS

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has decreased as a result of the OPV's implementation. While the disbursements that are prevalidated generally do not result in problem disbursements, only a portion of all disbursements is prevalidated. Lowering thresholds at which disbursements must be prevalidated and expanding the types of payments that are subject to prevalidation will improve the credibility of DoD financial management and further decrease problem disbursement levels.

**KEYWORDS:** Prevalidation, NULO, UMD

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

### **THE UTILITY OF THE ADVANCED SEAL DELIVERY SYSTEM (ASDS) (U)**

**David E. Chelsea-Lieutenant Commander, United States Navy**

**B.S., University of California at San Diego, 1987**

**Master of Science in Defense Analysis June 1998**

**Master of Science in Management-June 1998**

**Advisors: Gordon McCormick, Special Operations /Low Intensity Conflict Curriculum Committee  
Bard Mansager, Department of Mathematics**

The United States Special Operations Command (USSOCOM) is in the process of procuring the Advanced SEAL Delivery System (ASDS), a mini-submersible, to be used by Naval Special Warfare (NSW) forces to conduct maritime special operations. During the development of the ASDS, costs have more than doubled. Consequently, USSOCOM is reevaluating the future of ASDS. This thesis assesses the utility of the ASDS by viewing the ASDS as a part of an "infiltration system" and analyzing the linkages and fit of ASDS within the strategic framework in which it is intended to operate. Modeling the primary factors that define ASDS as a viable special operations platform in high, medium, and low threat environments does this. The output of the model is the capability of ASDS expressed in terms of "mission success." The estimated annual cost of ASDS is also calculated using the current acquisition strategy. In order to compare against current capabilities and their respective costs, this process is repeated for four alternative NSW infiltration systems. Although the ASDS has the highest cost, it is the only system that presents an acceptable probability of mission success in high and medium threat environments. Given NSW's strategic framework, the ASDS has a high utility.

**DoD KEY TECHNOLOGY AREAS:** Surface/Undersurface Vehicles-Ships and Watercraft, Modeling and Simulation

**KEYWORDS:** Advanced SEAL Delivery System, Mini-Submersible, ASDS, NSW, USSOCOM, Mission Success

### **THE ROLE OF MEDIATION IN RESOLVING CONTRACT DISPUTES**

**Michael C. Christian-Captain, United States Marine Corps**

**B.S., United States Naval Academy, 1992**

**Master of Science in Management-December 1997**

**Advisors: Mark W. Stone, Department of Systems Management  
David V. Lamm, Department of Systems Management**

Mediation has emerged as a preferred ADR method among commercial organizations involved in contract disputes. However, its use by the Navy has been rare. Mediation has shown to provide benefits to its commercial users such as: improved business relations, time and cost savings, flexibility and adaptability and superior control over outcomes. This thesis provides information on mediation and examines the differences and similarities between how commercial organizations and the Navy use mediation. The goal is to improve the Navy's use of mediation to resolve contract disputes. This research found, through survey results and the literature review, that as commercial organizations increase their use of mediation, they become familiar with the process and tend to reach higher levels of process and outcome satisfaction, making them more likely to continue its use. In order for the Navy to improve its use of mediation, it should use outside agencies to provide training, use contract clauses requiring its use and selecting mediators with adequate technical and legal background.

## 1998 THESIS ABSTRACTS

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**KEYWORDS:** Mediation, Alternative Dispute Resolution (ADR), Contract Disputes

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition and Contracting)

### **TRANSFORMING DOD INTO A COMPLEX ADAPTIVE SYSTEM BY MEANS OF THE MARKET**

**Michael J. Castagna-Captain, United States Marine Corps  
B.A., University of California, Irvine, 1992**

**Master of Science in Information Technology Management-September 1998**

**Advisors: James C. Emery, Department of Systems Management**

**David R. Henderson, Department of Systems Management**

Many organizations, including the Department of Defense (DoD), are struggling to make sense of the new demands placed upon them by an environment characterized by constant change. While working within a constraint-filled domestic milieu, coping with an unfamiliar national security setting, and adapting to a transformation in warfare, DoD must foray into yet another challenging environment. The knowledge economy. To explore the possibilities offered by the knowledge economy is a must if DoD is to remain a viable instrument of American foreign policy. Only the market can provide the cost savings and efficiencies that will preserve DoD's position as the supreme warfighter.

This work will use the language of complexity theory to describe both the nature of the knowledge economy and the subsequent organizational forms that will be required to cope with its demands. These information-intensive surroundings are creating a common set of requirements for success, and these are blurring the distinction between public and private sector organizations.

In order to withstand the rigors of the new realities, organizations will have to evolve emergent-like properties that are found in complex adaptive systems. One way to incorporate emergent-like properties is through the adoption of the price mechanism. This is demonstrated with the use of agency theory and transaction-cost economics. Finally, the work shows that only through the gates of a reformed acquisition process can DoD begin its journey to a more complex adaptive form.

**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Other (Economics and Information Technology)

**KEYWORDS:** Acquisition, Agency Theory, Complexity Theory, Economics, Market, Organization Theory, and Systems Analysis

### **MODELING DEPARTMENT OF DEFENSE CONTROLLED ATMOSPHERE TRANSHIPMENTS FOR FORWARD DEPLOYED FORCES**

**Douglas F. Cochrane-Lieutenant Commander, United States Navy  
B.A. Texas Christian University, 1985**

**Master of Science in Management-March 1998**

**and**

**Catherine L. Lawson-Lieutenant, United States Navy  
B.S., United States Naval Academy, 1989**

**Master of Science in Management-March 1998**

**Advisors: James Kerber, Department of Systems Management**

**Jane Feitler, Department of Systems Management**

The objective of this thesis is to explore the cost savings, product quality improvement, and process efficiencies that can be realized by the integrated design and application of an innovative logistics system for the purchase and transshipment of fresh fruits and vegetables (FFV) to forward deployed units.

The expanding global marketplace, strategic partnerships with private industry, aggressive utilization of commercial-off-the-shelf (COTS) technology, and an aggregate understanding of the logistics pipeline process will enable the Depart-

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## 1998 THESIS ABSTRACTS

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ment of Defense (DoD) logistician to provide the customer with a wider variety of fresher, higher quality products, while exploiting monetary savings through competitive pricing, lower transportation costs, and reduced product handling losses and damage.

The aggressive application of this process can result in the wholesale shift of the current operational paradigm with regards to the support of forward deployed forces, from the sea. Combat Logistic Forces will have increased flexibility for scheduling and ultimately expanding their operational capability, remaining at sea for longer periods of time, carrying more product, and better serving the warfighter.

A summary of findings is provided with recommendations for further research into specific applications of technologies, training, and existing processes.

**DoD KEY TECHNOLOGY AREAS:** Other (Clothing, Textiles, and Food)

**KEYWORDS:** Fresh Fruit and Vegetables, Logistics, Transportation

### RECOMMENDATIONS OF RULES, REGULATIONS, AND CODES FOR MANAGING THE FEMALE OFFICERS IN THE TURKISH NAVY

Yurdagul Colakoglu-Lieutenant, Turkish Navy

B.S., Turkish Naval Academy, 1984

Master of Science in Management-September 1998

Advisors: Alice Crawford, Department of Systems Management

Lee Edwards, Department of Systems Management

The Turkish Navy commissioned its first female graduates from the Naval Academy in 1957, but these officers were not utilized in combat roles onboard ships. In 1960, the Navy ceased commissioning women altogether. Political and social pressure in the 1980s caused the Navy, once again, to open its doors to women in educational, engineering, and medical roles. In 1992, the Naval Academy updated its rules and regulations and allowed women to enter with the goal of fulfilling combat roles. As a result of this process, the Turkish Navy commissioned its first combatant female officers in the summer of 1996. This created a need for new rules, regulations, and codes for managing these combatant female officers. Research using the United States system as a likely source for managing issues related to combatant female officers and the description of social, traditional, and cultural differences between American and Turkish Nations in historical perspective are the focus of this thesis.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Combatant, Fraternalization, Sexual Harassment, Family Care Equal Opportunity, Abortion

### A CASE STUDY ON THE RELATIONSHIP BETWEEN OPM-CRUSADER, UDLP, AND TACOM-ARDEC IN THE DEVELOPMENT OF THE CRUSADER ARMAMENT

William E. Cole-Captain, United States Army

B.S., United States Military Academy, 1987

Master of Science in Management-December 1997

Advisors: Michael W. Boudreau, Department of Systems Management

Sandra M. Dresbrow, Department of Systems Management

The purpose of this research paper is to analyze the relationships between the Office of the Project Manager-Crusader (OPM-Crusader), the U.S. Army Armaments Research, Development, and Engineering Center (a component of the U.S. Army Tank-Automotive and Armaments Command, abbreviated TACOM-ARDEC), and United Defense Limited Partnership (UDLP) in the development and delivery of the Crusader Armament System. These relationships are unique because, although the armament system is being developed by TACOM-ARDEC and manufactured by Watervliet Arsenal, it is not being supplied to UDLP as Government-Furnished Property (GFP). Rather, a teaming relationship has been developed

## 1998 THESIS ABSTRACTS

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directly between TACOM-ARDEC and UDLP. OPM-Crusader transfers funding to TACOM-ARDEC which performs the work under the technical and programmatic direction of UDLP. TACOM-ARDEC's role is similar to that of a subcontractor. This research paper examines the relationships between the organizations, and contrasts them to the relationships that are found in traditional GFP situations. The research showed that these relationships should result in a better-designed howitzer at a lower cost to the Government.

**KEYWORDS:** Government-Contractor Teaming, Government-Furnished Property, Artillery Development, Crusader

**DoD KEY TECHNOLOGY AREAS:** Conventional Weapons, Ground Vehicles

### AN ASSESSMENT OF THE SHIPBOARD TRAINING EFFECTIVENESS OF THE INTEGRATED DAMAGE CONTROL TRAINING TECHNOLOGY (IDCTT) VERSION 3.0

Stephen J. Coughlin-Lieutenant, United States Navy

B.S., United States Naval Academy, 1988

Master of Science in Management-March 1998

Advisors: Bernard J. Ulozas, Naval Training Systems Center

Alice Crawford, Department of Systems Management

The ability of a ship's crew to control damage is a critical measure of readiness for U.S. Navy ships. Proficiency in this area is largely a function of routine shipboard training. Since damage control skills tend to be perishable if not continuously practiced, shipboard personnel must have an effective means of exercising damage control skills. Computer-based technologies that utilize the advantages of interactive courseware (ICW) present training opportunities that challenge the traditional methods of shipboard training. The Integrated Damage Control Training Technology (IDCTT) is an application of ICW that allows shipboard repair teams to exercise their damage control skills continuously. The trainer was installed onboard *USS Harpers Ferry* (LSD-49) and evaluated as a stand-alone training device through the administration of opinion surveys then compared to various aspects of full-scale drills with a standardized performance evaluation system.

Upon conclusion of this study, the shipboard IDCTT was found to be an effective shipboard training device that saves time. Additionally, it has significant cross-training and team-building qualities that integrate well into an existing damage control training program. Recommendations of this study include the implementation of software-related troubleshooting training for fleet technicians and logistical support associated with commercial-off-the-shelf (COTS) computer-based training equipment.

**DoD KEY TECHNOLOGICAL AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Damage Control, Interactive Courseware, Training Technology

### THE MOST IMMEDIATE AND COST EFFECTIVE WAY TO ADDRESS VEHICLE CORROSION IN HAWAII

Kenneth L. Crabtree-Captain, United States Marine Corps

B.S., Pennsylvania State University, 1992

Master of Science in Management-December 1997

Advisor: Michael W. Boudreau, Department of Systems Management

Second Reader: William R. Gates, Department of Systems Management

In the late 1980s the Marine Corps procured the M900 series 5-ton truck. Within four years of this acquisition, a serious corrosion problem developed with the M900 series truck. Efforts to control this corrosion have proven to be unsuccessful. The current maintenance budget does not adequately fund the corrosion program nor are the facilities and procedures able to handle the workload. The objective of this thesis was to identify the most immediate and cost-effective way to handle corrosion control in Hawaii by analyzing the environment in which the Marine Corps units in Hawaii operate and recom-

## 1998 THESIS ABSTRACTS

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mend the most reasonable solution given the constraints. Research included an analysis of the background of Marine Corps equipment in service in Hawaii, as well as an identification of alternative measures of corrosion control management. Four alternatives were identified and evaluated in terms of the associated costs, manpower requirements, vehicle turn-around time, throughput capacity, and USMC controls. It was determined that the current corrosion control process is not adequate, and if left unchanged, the Marine Corps will face an overwhelming amount of deadlined vehicles before the replacements are available. The analysis concludes that the current method of corrosion management is inefficient. Alternative recommendations are then provided for more efficient use of the resources.

**KEYWORDS:** Corrosion Control, Maintenance, Outsourcing

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

### **FINANCIAL ANALYSIS OF OPERATING AND SUPPORT COSTS FOR H-3 AIRCRAFT VERSUS CH-60 AIRCRAFT TO COMPLETE HELICOPTER COMBAT SUPPORT MISSIONS**

**Hans K. Croeber-Lieutenant Commander, United States Navy**

**B.S.A.M., Auburn University, 1986**

**Master of Science in Management-March 1998**

**Advisors: Shu Liao, Department of Systems Management**

**Gregory Hildebrandt, Department of Systems Management**

The United States Navy's aging fleet of H-3 aircraft, that are used to complete helicopter combat support missions, will eventually be replaced by the CH-60. The CH-60 will be able to successfully complete the missions currently being performed by the H-3 and provide some additional capabilities. The CH-60 helicopter will be less expensive to operate, in terms of operating and support costs, than the H-3 helicopter. By accelerating the replacement schedule by eight years, 292.06 million dollars in operating and support costs can be saved. Once the CH-60 has fully replaced the navy's H-3 fleet, there will be an annual operating and support cost decrease of 36.508 million dollars needed to complete the helicopter combat support missions currently being performed by the H-3s. The sooner this replacement can be accomplished, the greater the potential to save operating and support costs.

**DoD KEY TECHNOLOGY AREA:** Air Vehicles

**KEYWORDS:** Helicopter, Operating and Support Costs, CH-60, Helicopter Combat Support

### **REPAIR CYCLE TIME REDUCTION AT NAVAL AVIATION DEPOTS VIA REDUCED LOGISTICS DELAY TIME**

**David F. Cruz-Lieutenant Commander, United States Navy**

**B.S., University of South Carolina, 1987**

**Master of Science in Management-December 1997**

**Advisors: Keebom Kang, Department of Systems Management**

**Donald R. Eaton, Department of Systems Management**

This thesis is a study of an alternative acquisition program for piece parts that support readiness degrader aviation components. Components with outstanding piece parts with an acquisition lead times of greater than 45 days migrate to an awaiting parts status termed a supply condition code G. The U.S. Navy currently has more than 500 million dollars worth of components in G condition with more than 76 million dollars worth of piece parts outstanding. The current average time components at the Naval Aviation Depot North Island (NADEP-NI), California spends in G condition is 190 days. The major focus of the thesis is the development of an alternative acquisition system to investigate the effect of reduced acquisition lead times on repair cycle times and component inventory levels. The alternative acquisition system would reduce the acquisition lead time on all piece parts that are directly attributable to more than 20% of the applicable G condition components from an average of 199 days to only 60 days. This proposed change would reduce Logistics Delay Time (LDT) for the

## 1998 THESIS ABSTRACTS

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*steady state* components an average 32.4%, the average Repair Turnaround Time (RTAT) would be reduced an average 14.5% and the inventory levels would be reduced by 53 units or 4.42 million dollars. The comparison of the costs of the priority purchase system to the benefits indicates that for every one dollar invested in priority purchasing would result in 28 dollars in savings through reduced inventory levels.

**KEYWORDS:** Acquisition, Aviation, Components, Degraded, Inventory, NADEP, Readiness

**DoD KEY TECHNOLOGY AREA:** Other (Inventory Management)

### **AN EXAMINATION OF THE MARINE OPERATING AND SUPPORT INFORMATION SYSTEM (MOSIS) AS A MECHANISM FOR LINKING RESOURCES TO READINESS FOR MARINE OPERATING FORCES**

**Paul D. Cucinotta-Captain, United States Marine Corps**

**B.A., Washington State University, 1992**

**Master of Science in Management-December 1997**

**Advisors: Gregory G. Hildebrandt, Department of Systems Management**

**John E. Mutty, Department of Systems Management**

Continued downsizing efforts have imposed increasingly stringent restrictions on Department of Defense budgetary resources. Program and activity managers are expected to justify their budgets based on well-defined quantitative measures of performance, activity level and readiness. This thesis examines the resources-to-readiness issues in DoD, specifically focusing on Marine Corps Operating Forces. Additionally, this thesis evaluates the Visibility and Management of Operating and Support Costs (VAMOSC) program as a mechanism for analyzing detailed operating and support cost data in order to relate resources to readiness.

DoD's VAMOSC program as a whole as well as the individual Service's VAMOSC systems are described. The Marine Operating and Support Information System (MOSIS), which incorporates Marine ground combat systems into Navy VAMOSC, is evaluated with regards to its contribution to cost analysis. Currently, the MOSIS database is limited in the number of weapon systems on which it collects data and the O&S cost categories it covers. In addition, it lacks critical operating tempo data needed to conduct useful cost analysis. This makes it extremely difficult to currently develop cost factors that can be effective in the formulation and justification of budgets. Ongoing efforts to expand MOSIS have the potential to enhance analysis of resources-to-readiness issues.

**KEYWORDS:** Budgeting, Budget Justification, Cost Analysis, Marine Corps Operating Forces, MOSIS, Operating and Support Cost, Operating Tempo, OPTEMPO, OSMIS, Readiness, Resources-to-Readiness, USMC, Visibility and Management of Operating and Support Costs, VAMOSC

**DoD KEY TECHNOLOGY AREA:** Other (Management Information Systems)

### **MARINE GROUND INTELLIGENCE REFORM: HOW TO REDESIGN GROUND INTELLIGENCE FOR THE THREATS OF THE 21ST CENTURY**

**Drew E. Cukor-Captain, United States Marine Corps**

**B.A., University of Southern California, 1992**

**Master of Science in Management-December 1997**

**Advisors: Nancy Roberts, Department of Systems Management**

**Eric Jansen, Department of Systems Management**

Present-day Marine ground intelligence is configured for attrition warfighting and the predictable conventional adversaries of the past. Designed during WWII, it has undergone little change; what has changed is the threat environment. Modern-day threats are less centralized and regimented. They think on their own and they adapt quickly. This thesis analyzes the current configuration of Marine ground intelligence and compares it with two major threats of the next century: asymmetric military threats and non-conventional threats. To counter these smart adversaries, Marine ground intelligence will need to be

## 1998 THESIS ABSTRACTS

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configured differently. Sophisticated sensors and rote intelligence work are no longer enough to identify and track these powerful threats. The performance of Marine intelligence during the Gulf War demonstrates that having failed against the Iraqi army, intelligence is very likely to fail again. Indeed, Marine intelligence faces a serious dilemma: it can either reform or face ever-decreasing relevance and effectiveness. Having presented the rationale for urgent reform, this work recommends an intelligence enterprise centered on the leveraging of human intellect. It suggests the network as the design change that best leverages intellect and optimally configures ground intelligence for operating successfully against the threats of the next century.

**KEYWORDS:** Ground Intelligence, Intelligence Reform, Maneuver Warfare, Attrition Warfare, The Gulf War, Operation Restore Hope, UNOSOM II, Asymmetric Military Threats, Emerging, Non-Conventional Threats, Network Intelligence, Virtual Intelligence

**DoD KEY TECHNOLOGY AREAS:** Battlespace Environments, Command, Control and Communications, Human Systems Interface, Materials, Processes and Structures

### **IMPROVING THE ENGINEER RECONNAISSANCE REPORTING PROCESS THROUGH THE USE OF DIGITAL IMAGERY AND HANDHELD COMPUTERS**

**Roger P. Dalziel-Captain, United States Marine Corps**

**B.S., University of Redlands, 1992**

**Master of Science in Information Technology Management-September 1998**

**Advisors: Rudy Darken, Department of Computer Science**

**Terrance C. Brady, Department of Systems Management**

This thesis explores an automated solution to improve the Engineer Reconnaissance Reporting Process. It proposes a proof-of-concept to enhance and improve the digital portion of the reporting process. This thesis defines the current process identifying its capabilities, limitations, and deficiencies. It identifies a prototype suite of equipment to perform the automation. The prototype capitalizes on the inherent capabilities on the reporting process and minimizes the deficiencies.

This thesis investigates emergent Commercial Off-the-Shelf components to locate those devices that satisfy the requirements and take full advantage of current technological advances. It evaluates each component against a criteria of minimum requirements and selects the most compatible device. This thesis performs an actual implementation of the prototype testing its performance against a fictional scenario. It provides a step-by-step description and graphic representation of the implementation. This thesis analyzes and summarizes the data generated during the implementation and provides recommendations. Results of this analysis suggest implementation of the prototype is feasible and that it satisfies the imagery portion of the Engineer Reconnaissance Reporting Process.

**DoD KEY TECHNOLOGY AREA:** Command, Control, and Communication

**KEYWORDS:** Engineer Reconnaissance, Proof-of-Concept, Hand-Held Personal Computer, Digital Imagery, Wireless Communication

### **RETENTION OF JUNIOR NAVAL SPECIAL WARFARE OFFICERS**

**Keith B. Davids-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1990**

**Master of Science in Management-September 1998**

**Advisors: Alice Crawford, Department of Systems Management**

**Mark J. Eitelberg, Department of Systems Management**

The Commander of the Naval Special Warfare Command (NSWC) has identified junior officer retention within the Naval Special Warfare community as a significant problem. In 1997, the community experienced the highest number of resignations on record, and this trend has continued in 1998. NSWC has taken several steps to identify the cause of recent retention

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## 1998 THESIS ABSTRACTS

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trends, one of which was to provide support for this study. The purpose of this study was to identify the factors that lead to resignation of junior Sea-Air-Land (SEAL) officers. Three data sources were developed specifically for this study: an Active Duty Survey of junior officers serving in SEAL billets, a Resignation Survey of officers who requested resignation in FY98 and FY99, and focused interviews with SEAL officers who recently separated or were awaiting separation from the Navy. The results of the research show that the majority of SEAL officers greatly enjoyed their job. Nevertheless, family separation, improper utilization by operational commanders, minimal chances for conducting combat operations, and the perceived lack of vision of senior SEAL leadership contribute significantly to a service member's decision to leave. Additionally, the study found that pay and marital status did not affect the decision to leave service as long as the service member was satisfied with job-related factors. Once a service member became dissatisfied with the job, pay and marital status were found to play a significant role in the stay/leave decision. The results also suggest that many of the officers departing from service were top performers.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Officer Retention, Naval Special Warfare, SEALs, Manpower Planning

### **PRESCRIBED LOAD LIST CONSOLIDATION INTO THE FORWARD SUPPORT BATTALIONS ASSIGNED STOCKAGE LIST**

**Richard A. DeLude II-Captain, United States Army**

**B.S., University of Central Florida, 1989**

**Master of Science in Management-December 1997**

**Advisor: Kevin R. Gue, Department of Systems Management**

**Second Reader: Michael W. Boudreau, Department of Systems Management**

The Army has millions of dollars tied up in Class XI inventories at the company level. We describe the costs and benefits of consolidating these inventories within the Forward Support Battalion's (FSB) Assigned Stockage List (ASL). We show that consolidating at the FSB reduces the overall variance in demand for many of the inventory lines and allows the brigade to stock lower quantities of these lines, while maintaining essentially the same service levels. Potential savings to the Army exceed one and a half million dollars for the 3<sup>rd</sup> Brigade Combat Team alone.

**KEYWORDS:** Prescribed Load List, Authorized Stockage List, Inventory Consolidation

**DoD KEY TECHNOLOGY AREA:** Other (Inventory Management)

### **STUDY OF GENDER-INTEGRATION IN CLASSROOM TRAINING AT THE NAVY RECRUIT TRAINING COMMAND**

**Tracy A. Dobel-Lieutenant, United States Navy**

**B.S., Miami University, 1991**

**Master of Science in Management-September 1998**

**Advisors: Lee Edwards, Department of Systems Management**

**Mark J. Eitelberg, Department of Systems Management**

This thesis examines progress towards gender-integrated training at the Navy Recruit Training Command (RTC) in Great Lakes, Illinois. The study is largely descriptive, and attempts to determine if gender discrimination or gender bias occurs in the Navy's recruit training classes. The study adopted a definition of gender discrimination and gender bias by the American Association of University Women in a 1992 evaluation of gender equity in the educational setting. Focus-group interviews were conducted with 34 personnel at RTC. Ten classroom sessions were observed to assess interactions between classroom instructors and recruits and to determine whether gender discrimination or gender bias occurs in the training classrooms. Six main themes emerged from the interviews and the classroom observations, including: a strong consensus that gender-integrated training is valued by classroom instructors and recruits alike; and no apparent evidence of gender

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## 1998 THESIS ABSTRACTS

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discrimination or gender bias in the recruit training classroom. These results offer an analytical lens for viewing and assessing gender-equitable training at the "bootcamp" phase in the Navy.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Gender-Integrated Training, Gender Discrimination, Gender Bias, Recruit Training

### **FEMALE RECRUITS AND THE UNITED STATES MARINE CORPS: THE TRANSFORMATION PROCESS**

**Susan G. Dooley-Major, United States Marine Corps**

**B.A., College of the Holy Cross, 1981**

**M.A., Webster University, 1987**

**Master of Science in Management-March 1998**

**Advisors: Mark J. Eitelberg, Department of Systems Management**

**Cary A. Simon, Department of Systems Management**

This thesis examines initial military training of women in Marine Corps boot camp. The study focuses on changes implemented in 1996 and applied during four phases of the Commandant's "Transformation Process": recruiting, recruit training, cohesion, and sustainment. Semi-structured interviews were conducted with 43 female Marines. Eleven main themes emerged from the interviews, including: strong consensus that the partially-integrated, phased-approach to boot camp was beneficial to individual women and effective for the Marine Corps; progressive gender-integration enhances team-building and unit cohesion; the recruiting process prepares women for the physical, but not the emotional, challenges of boot camp; and the complete integration of women during the "sustainment" phase still requires substantial reinforcement. The study findings also suggest that Marine Corps leaders need additional training and education to understand and exemplify the complete "Transformation Process," to improve acceptance of women in the Marine Corps, and to improve military readiness.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Gender-Integration, Recruit Training, Marine Corps

### **ACTIVITY-BASED COSTING OF THE PRESIDIO OF MONTEREY'S FEDERAL POLICE DEPARTMENT**

**Clyde A. Dopheide-Captain, United States Army**

**B.S., University of Colorado, 1989**

**Master of Science in Management-December 1997**

**Advisors: Kenneth J. Euske, Department of Systems Management**

**James L. Kerber, Department of Systems Management**

The Army's current activity-based costing model, called Service-Based Costing, focuses on costing Major Commands (MACOMS) and large installations. The Army has yet to develop an activity-based costing model for smaller organizations. This thesis develops an activity-based costing model for a small army organization, the Presidio of Monterey's Law Enforcement Command (LEC). This study arrived at the model by analyzing the LEC to determine the LEC's products, processes/activities needed to produce those products, and the resources consumed by processes/activities while producing products. The model identifies seven major products produced by the LEC and their associated costs. These products are Police Information, Police Patrol Service, Investigations, Crime Prevention Education, Crime Watch Hot-line, Physical Security Inspections, and Magistrate Support.

**KEYWORDS:** Activity-Based Costing, Police Departments, Law Enforcement, Army, Service-Based Costing

**KEY DoD TECHNOLOGY AREA:** Other (Resource Management)

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## 1998 THESIS ABSTRACTS

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### **AN ANALYSIS OF FEDERAL AIRPORT AND AIR CARRIER EMPLOYEE ACCESS CONTROL, SCREENING, AND TRAINING REGULATIONS**

**Mark W. Dover-Lieutenant, United States Navy**

**B.S., Auburn University, 1991**

**Master of Science in Management-March 1998**

**and**

**Edward G. Miller-Lieutenant Commander, United States Navy**

**B.S., Embry Riddle Aeronautical University, 1986**

**Master of Science in Management-March 1998**

**Advisors: Donald R. Eaton, Department of Systems Management**

**David G. Brown, Department of Systems Management**

Current Federal Aviation Regulations concerning civil aviation security are focused on countering the threat of a passenger hijacking a commercial airplane. Current media and government emphasis is focused on a passenger breaching security at an airport in the U.S. and not an employee breaching security. The security of the U.S. air travel industry from terrorist attacks hinges on an effective civil aviation security program. Government and aviation industry officials would greatly benefit from the revision of the current Federal Aviation Regulations concerning civil aviation security to address the issue of terrorism initiated by an employee.

This thesis provides a thorough examination of current Federal Aviation Regulations parts 107 and 108 sections concerning airport and air carrier employee access control, screening, and training. Based upon field research of five U.S. airports, the work furthermore analyzes related issues and problems associated with these regulations and generates recommendations that serve to enhance security for the traveling public, air carriers, and persons employed by or conducting business at public airports.

**DoD KEY TECHNOLOGY AREA:** Other (Civil Aviation Security)

**KEYWORDS:** Airport Security, Federal Aviation Regulation Part 107, Federal Aviation Regulation Part 108

### **A PROPOSAL TO CONDUCT GOVERNMENT CONTRACTING ON THE INTERNET**

**Joseph F. Dunn-Lieutenant Commander, United States Navy**

**B.A., University of Denver, 1984**

**Master of Science in Management-June 1998**

**Advisors: Mark Stone, Department of Systems Management**

**William Haga, Department of Systems Management**

The primary purpose of this thesis is to examine the legal ramifications of conducting Government Agency contracting on the Internet. The author proposes that the Internet is a suitable medium on which to process and conduct all aspects of Government contracting. The thesis examines the current legal issues surrounding contract formation across the open architecture of the Internet. The thesis then examines the latest cryptological schemes for both encryption and decryption and the logistical challenge of passing keys between participants. The thesis discusses current Federal agencies and current Federal policies regarding encryption and its suitability for Government contracting. The thesis also examines the latest efforts among State legislatures and commercial legal ramifications for contracting on the Internet.

**DoD KEY TECHNOLOGY AREA:** Other (Contracting)

**KEYWORDS:** Internet, Cryptology, Public Key Encryption, Rules of Evidence, Digital Signatures, Uniform Commercial Code, Public Key Infrastructure, Authentication, Attribution

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## 1998 THESIS ABSTRACTS

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### DEVELOPMENT OF SPREADSHEET MODELS FOR FORECASTING MANPOWER STOCKS AND FLOWS

Michael G. Earl-Lieutenant, United States Navy

B.S., United States Naval Academy, 1993

Master of Science in Management-March 1998

Advisors: Paul R. Milch, Department of Operations Research

Julie Dougherty, Department of Systems Management

The computerized manpower planning models developed in this thesis were designed to be used by students taking the Manpower Personnel Models course, in the Manpower Systems Analysis Curriculum at the Naval Postgraduate School. The purpose of the course is to introduce students to some of the basic manpower modeling concepts and these models are the prime instruments toward achieving that goal. The models constructed using Microsoft Excel™ include a Markov Chain Model, a One Grade Vacancy model, a Multigrade Vacancy model with Non-Instantaneous Filling of Vacancies, and a Vacancy model with Instantaneous Filling of Vacancies.

The models are designed to be run on personal computers with a Microsoft Windows 95™ operating system. User's manuals and example problems are included for each model in the appendices.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Modeling and Simulation

**KEYWORDS:** Excel, Modeling, Markov, Vacancy, Replace, Manpower Planning, Personnel Flows, Spreadsheet Modeling, Manpower Forecast

### DECISION SUPPORT FOR RECONNAISSANCE USING INTELLIGENT SOFTWARE AGENTS

Marcia R. Edmiston-Lieutenant, United States Navy

B.A., University of Kansas, 1989

Master of Science in Information Technology Management-March 1998

and

Darrell R. Gregg, Jr-Captain, United States Army

B.S., Northeast Missouri State University, 1989

Master of Science in Information Technology Management-March 1998

and

David G. Wirth-Lieutenant, United States Navy

B.S., Pennsylvania State University, 1990

Master of Science in Information Technology Management-March 1998

Advisors: Tung X. Bui, Department of Systems Management

Carl R. Jones, Information Sciences Academic Group

Suresh Sridhar, Information Sciences Academic Group

Research in reconnaissance traditionally focuses on data detection and discrimination methods. Less emphasis is placed on transforming the collected data into useful information and presenting it to key command and control nodes in time for operational use. Information not presented in a timely manner is excluded from the decision process. This thesis proposes a conceptual model of intelligent software agents to support the human decision process and reconnaissance related tasks. The Mobile Agent Reconnaissance Kit (MARK) suggests a hierarchy of software agents to facilitate data integration and coordination in a network-centric multisensor environment. The model uses static and mobile agents to collect data from dispersed, heterogeneous data sources, process and fuse the data, and present the resultant information to the user in an HTML file. The authors explore applications of MARK in terms of the Military Intelligence Cycle, the Joint Director of Laboratories (JDL) Technical Panel for C3I Data Fusion Model, and the Joint Operations Planning and Evaluation System (JOPES) Crisis Action Procedures.

## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREAS:** Command, Control and Communications, Computing and Software, Human Systems Interface

**KEYWORDS:** Software Agent, Intelligent Software Agent, Mobile Software Agent, Reconnaissance, Decision Support

**SHAPING FUTURE AFRICAN PEACEKEEPING FORCES: ORGANIZATION  
DESIGN AND CIVIL-MILITARY RELATIONS LESSONS LEARNED  
FROM THE WEST AFRICAN PEACE FORCE IN LIBERIA**

**Alassane Fall, Lieutenant-Colonel, Senegalese Armed Forces  
"Matrise" in Economic Sciences, Sorbonne University, France, 1990  
Master of Science in Management-June 1998**

**Advisors: Lee E. Edwards, Department of Systems Management  
Benjamin J. Roberts, Institute for Defense Education and Analysis**

The Economic Community of West African States (ECOWAS) established in 1990, a peace forces the ECOWAS Monitoring Group (ECOMOG), to help resolve the Liberian civil war. This force is considered as a model for future African peacekeeping forces, the idea of which has significantly evolved during the first half of the 1990s, and is supported by the international community. The effectiveness of such forces, based on the ECOMOG experience, is thought to be dependent on the availability of resources and on training.

This thesis discusses organization design and civil-military relation's considerations to take into account when shaping future African peacekeeping forces. It makes recommendations toward improving effectiveness.

**DoD KEY TECHNOLOGY AREA:** Other (Peacekeeping)

**KEYWORDS:** ECOMOG, ECOWAS, African Peacekeeping Forces

**AN ANALYSIS OF SELECTED DEPARTMENT OF DEFENSE  
REPROCUREMENT PROGRAMS FOR ACQUISITION OF LEGACY  
SYSTEM SPARE PARTS VIA SMALL MANUFACTURERS**

**Brett E. Fillmore-Lieutenant, United States Navy  
B.S., United States Naval Academy, 1991**

**Master of Science in Management-December 1997**

**Advisors: Kenneth J. Euske, Department of Systems Management  
Alan W. McMasters, Department of Systems Management**

The life-cycle extension of weapons systems has created problems for sustaining spare parts procurement. This study analyzes selected DoD reprocurement initiatives for securing responsive manufacturing capacity of small manufacturing companies to overcome these problems. Interviews were also conducted with Government and industry representatives and managers of small manufacturing shops to identify possible barriers to the application of the DoD initiatives. The findings reveal that the DoD initiatives and their associated technologies could dramatically reduce costly lead time delays by enabling the electronic exchange of technical product data between a geographically dispersed set of qualified machine shops and DoD supply centers. However, unless DoD efforts are directed at unifying the components necessary for procuring legacy weapons system spare parts, the barriers will remain as significant obstacles.

**KEYWORDS:** On-Demand Manufacturing, Reprourement, Virtual Parts Supply Base, STEP, RAMP, Flexible Manufacturing, CALS

**DoD KEY TECHNOLOGY AREA:** Manufacturing Science and Technology (MS&T)

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## 1998 THESIS ABSTRACTS

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### **DISESTABLISHMENT OF MARINE CORPS MEDICAL LOGISTICS COMPANIES THROUGH FULL IMPLEMENTATION OF THE DEPARTMENT OF DEFENSE PRIME VENDOR PROGRAM**

**E. Marie FitzGerald-Lieutenant, Medical Service Corps, United States Navy**

**B.B.A., National University, 1989**

**Master of Science in Management-December 1997**

**Advisor: Jane Feitler, Department of Systems Management**

**Second Reader: Donald R. Eaton, Department of Systems Management**

The purpose of this thesis is to analyze the possibility of eliminating the Marine Corps Medical Logistics (MedLog) Companies through full implementation of the Department of Defense's Prime Vendor Program. The MedLog Company is tasked with the maintenance and storage of Marine Corps Authorized Medical/Dental Allowance Lists (AMALs/ADALs) to support a Marine Expeditionary Force in theater for 45 days. More than 2300 individual items compose these AMALs/ADALs. AMALs/ADALs are classified as Prepositioned War Reserve (PWR) materials, stored primarily for contingency operations. The first 15 days of supply are required to be immediately available for combat support, and are in modularized form to facilitate deployment. The additional 30 days of supply are maintained in warehouses in bulk form. Due to recent reductions in manpower and money, the task of maintaining these supplies has become nearly impossible under current practices. Complete implementation of Prime Vendor (PV) could eliminate the need to stock a majority of the bulk supplies and eliminate the labor-intensive management of those stocks. In addition, use of PV will improve readiness as longer shelf life could be guaranteed on order for perishable items, and long procurement lead times would be a thing of the past. Losses due to expiration would be virtually eliminated. This thesis analyzes the logistical benefits that can be achieved by extending the current PV Program to include Medical/Surgical items. Use of PV will allow the Navy and Marine Corps team to better utilize manpower and reduce inventory footprint. Analysis shows that a \$17.3 million inventory could be reduced to approximately \$8.8 million, and that it could then be managed by the individual medical units who are the current customers of the MedLog Companies.

**KEYWORDS:** Prime Vendor, Medical Logistics, AMALs/ADALs, MedLog

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Materials, Processes, and Structures

### **A STUDY OF THE FEASIBILITY AND BENEFITS OF CONVERTING CERTAIN FLEET SUPPORT COMMUNITY BILLETS FROM MILITARY TO CIVILIAN**

**Eric L. Fitzpatrick, Lieutenant, United States Navy**

**B.A., University of Texas, 1990**

**Master of Science in Management-March 1998**

**Advisors: John E. Mutty, Department of Systems Management**

**William R. Gates, Department of Systems Management**

The latest Quadrennial Defense Review (QDR) determined that the Department of Defense must reduce the amount of money it spends on infrastructure to recapitalize the armed forces. The QDR and the General Accounting Office (GAO) have identified the civilianization of military support billets as a means of cutting infrastructure spending. This thesis studied the Navy's Fleet Support Community (designator 1700) to determine the feasibility and potential savings of converting certain 1700 billets from military to civilian. Civilianization of billets would have a significant affect on the Fleet Support Community and, possibly, on the number of female Naval officers. This thesis explored options for the community's future and studied the impact changes might have on female officer manning. If the 628 billets this thesis identified as conversion candidates were civilianized, an annual savings of \$7.4 million would result. However, military and civilian personnel cannot be compared on the basis of cost only, other issues must be considered before any decision to civilianize billets could occur.

## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Fleet Support Community, Military to Civilian Conversion, Force Mix, Downsizing

**OPERATIONALIZATION OF INFORMATION TECHNOLOGY FOR  
THE 21ST CENTURY (IT-21): THE FLIGHT SCHEDULING  
FUNCTION IN PATROL SQUADRON 40 AS A CASE STUDY**

**Richard P. Flatau, Jr.-Major, United States Marine Corps**

**B.S., George Mason University, 1983**

**Master of Science in Information Technology Management-September 1998**

**Advisors: Norman F. Schneidewind, Information Systems Academic Group**

**Douglas E. Brinkley, Department of Systems Management**

In the past several years, greater exploitation of information technology to increase leverage of information has become a central focus in the military. This focus is reflected in a number of strategic vision documents. Two significant examples are "Joint Vision 2010" signed in 1996 by the Chairman of the Joint Chiefs of Staff and the 1997 Quadrennial Defense Review Report. Achieving and using information superiority is seen as essential to future military success. This has led to the emergence of a new warfare paradigm: network-centric warfare.

Towards this end, the Navy's service-wide IT improvement initiative is Information Technology for the 21<sup>st</sup> Century (IT-21). IT-21 establishes a standard for IT capability to be achieved throughout the Navy within which Navy units can shape their IT improvements.

This study explores a requirements-approach for planning improvement of IT through IT-21. Specifically, it focuses on a single function of one squadron: flight scheduling in Patrol Squadron 40. This study addresses how to establish information requirements, assess current IT performance, and formulate specifications by which to drive planning for IT improvement. It concludes by mapping IT-21 components to requirements to provide VP-40 with a plan for improving its flight scheduling process through IT-21.

**DoD KEY TECHNOLOGY AREA:** Other (Information Technology Systems Analysis and Design)

**KEYWORDS:** IT-21, Flight Scheduling, Information Technology, Systems Analysis and Design

**IMPACT OF THE SUPREME COURT DECISION *ADARAND VS.  
PENA* ON THE FEDERAL CONTRACTING PROCESS**

**James D. Flowers-Lieutenant Commander, U.S. Navy**

**B.S., University of South Carolina, 1984**

**Master of Science in Management-June 1998**

**Advisors: Sandra M. Desbrow, Department of Systems Management**

**George W. Thomas, Department of Systems Management**

One of the most controversial topics that has been debated in the last two decades is affirmative action. In 1989 Adarand Constructors offered the lowest bid to subcontract guardrails on a Department of Transportation highway contract, but was not awarded the contract. The award instead went to a minority firm so the prime contractor could receive monetary incentives from the Government for subcontracting with minorities. Adarand sued the Government on the basis that the affirmative action policy violated its constitutional rights of equal protection and due process. In 1995, the U.S. Supreme Court reviewed the case and held that the level of scrutiny applied in future applications of affirmative action implementing Federal socioeconomic policy would be raised from intermediate to strict. This thesis studied the need for such programs. The history of socioeconomic policy in Federal contracting, previous Supreme Court cases challenging affirmative action, the changes resulting from the Court's *Adarand* decision on the Federal contracting process, and interview results exploring reaction to the decision in the small business community. The methodology provided could be used for further research and

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## 1998 THESIS ABSTRACTS

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reaction to the decision in the small business community. The methodology provided could be used for further research and to assist agencies in making decisions about their continued use of affirmative action.

**DoD KEY TECHNOLOGY AREA:** Other (Contracting)

**KEYWORDS:** Adarand, Affirmative Action, Contracting, Socioeconomic

### **FISCAL POLICY IMPLICATIONS OF THE 1988 MEDICARE CATASTROPHIC COVERAGE ACT**

**James K. Flynn-Commander, United States Naval Reserve  
B.S., Humboldt State University, 1976**

**Master of Science in Management-December 1997**

**Advisors: Richard B. Doyle, Department of Systems Management  
William R. Gates, Department of Systems Management**

Congress passed the 1988 Medicare Catastrophic Coverage Act (MCCA) in an effort to provide seniors with protection from catastrophic medical costs. The MCCA marked a turning point in Medicare policy. It sought to expand Medicare by requiring the beneficiaries themselves to fund the added benefits to the program through increased premiums and linking the size of the increase to beneficiary income. The MCCA was largely financed by middle and upper income beneficiaries. Enacted on July 1, 1988, the MCCA was repealed 17 months later on November 22, 1989, due to controversy and opposition from senior citizens concerned about its financing and lack of long-term care benefits. This thesis examines the fiscal and political environment that led to the genesis, evolution, passage, and repeal of the MCCA. The legislative process and the financing mechanisms of the MCCA are examined within a political context dominated by the need to reduce spending and balance the budget. Data was obtained from congressional documents, periodicals, journals, and Office of Management and Budget, Congressional Budget Office, and Health Care Financing Administration documentation. The MCCA failed because of strong opposition from senior citizens and lobby groups regarding its means-tested financing and lack of long-term care. The complexity of the MCCA caused public misunderstanding and permitted opposition groups to promote misinformation concerning the bill and the Medicare program.

**KEYWORDS:** Medicare, Finance, Budget, Healthcare, Public Policy

**DoD KEY TECHNOLOGY AREA:** Other (Public Policy Analysis)

### **ASSESSMENT OF THE DIVERSITY COMPONENTS OF THE INTERMEDIATE OFFICER LEADERSHIP COURSE**

**Philippe E. François-Lieutenant, United States Navy  
B.S., Pepperdine University, 1991**

**Master of Science in Management-March 1998**

**Advisors: George W. Thomas, Department of Systems Management  
Cary Simon, Department of Systems Management**

This thesis assesses the Navy Leadership Continuum Intermediate Officer Leadership Course (IOLC) based on the Valuing Differences model. The thesis identifies diversity components of the IOLC, describes the Valuing Differences model, surveys a sample of Department Head level Naval officers who attended an IOLC, and makes recommendations to help the Navy achieve its diversity goals.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training



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## 1998 THESIS ABSTRACTS

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**KEYWORDS:** Leadership Continuum, Intermediate Officer Leadership Course, Diversity Leadership, Diversity, Diversity Management, Managing Diversity, Diversity Training

**DOMESTIC TERRORISM AND WEAPONS OF MASS DESTRUCTION: AN  
EVALUATION OF INTERAGENCY RESPONSE CAPABILITIES (A USER'S GUIDE) (U)**

**George M. Fraser-Major, United States Army**

**B.A., California State University, 1987**

**Master of Science in Defense Analysis-September 1998**

**and**

**Mark F. Hinch-Lieutenant, United States Navy**

**B.A., New Hampshire College, 1988**

**Master of Science in Defense Analysis-December 1998**

**Advisor: Gordon H. McCormick, Special Operations/Low Intensity Conflict Curriculum Committee**

**Second Reader: Erik Jansen, Department of Systems Management**

The purpose of this thesis is to analyze and identify existing and potential flaws that inhibit integration of civilian and military agencies in response to domestic terrorist threats involving weapons of mass destruction (WMD). The study reviews the existing counterterrorism legal and institutional frameworks in conjunction with current interagency coordination mechanisms. The subsequent analysis of these areas revealed strengths and weaknesses that influence interagency response to domestic WMD terrorism. Corresponding recommendations for review and implementation are provided to assist improvement of current response capabilities. Furthermore, the recommendations offer a "model" that can be used to consider the transfer of authority from civilian to military control in times of specific domestic crisis.

**DoD KEY TECHNOLOGY AREA:** Chemical and Biological Defense

**KEYWORDS:** Domestic Terrorism, Counterterrorism, Weapons of Mass Destruction, Crisis Management, United States Code, Department of Defense, Department of Justice, Presidential Decision Directive 39, Presidential Decision Directive 62

**THE EFFECTS OF ECONOMIC, MILITARY, POLITICAL, AND SOCIAL FACTORS ON  
THE SUCCESSFUL IMPLEMENTATION OF AN ALL-VOLUNTEER ARMED FORCE**

**Volker Gelhausen-Lieutenant Commander, Germany Navy**

**Abitur, Konrad Adenauer Gymnasium, 1984**

**Master of Science in Management-March 1998**

**Advisors: Mark J. Eitelberg, Department of Systems Management**

**Gregory G. Hildebrandt, Department of Systems Management**

The end of the Cold War and a decline in public and political acceptance for military power has raised the questions in a number of nations over the continuing need for compulsory military service. This thesis, therefore, develops a conceptual model that shows the estimated effects of social, economic, political, and military variables on the successful implementation of an all-voluntary armed force. The research is based mainly on the experience of all-volunteer recruitment in the United States and Great Britain and recent trends elsewhere, especially in Western Europe. The main focus in this study is on economic considerations and the question about the fit between different key components in the military organization, the so-called "Military Design Factors." The model illustrates the open-system character of the military organization and highlights the close interrelationship between social, military, economic, and political elements in its environment. This thesis provides a basis for the design of a quantitative model that could be used to assess whether a specific country with compulsory military service possesses the conditions for successful conversion to an all-volunteer system.

## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Military, Economic, All-Volunteer Force

### **JOINT STRATEGY AND STRATEGIC SEALIFT FOR THE NEXT CENTURY**

**Bobby L. Gopffarth-Lieutenant, United States Navy**

**B.S., U.S. Naval Academy, 1991**

**Master of Science in Management-March 1998**

**and**

**Ernest E. Johnson-Lieutenant, United States Navy**

**B.S., Oregon State University, 1991**

**Master of Science in Management-March 1998**

**Advisors: Jane N. Feitler, Department of Systems Management**

**William R. Gates, Department of Systems Management**

The President's National Security Strategy (NSS) calls for the U.S. military to "shape-respond-prepare" for a strategic environment that continues to advance U.S. interests. It also prescribes the necessity to move toward a more joint way of life. With increased emphasis on jointness, the Navy has made significant strides in becoming a partner with the other services. Not only are the services more joint, but so are the organizations participating in contractual agreements. One area where DoD and industry has increased their joint relationship is in the area of strategic sealift.

As the world's shipping industries have grown the U.S. industry has reduced by one third. This has presented DoD with a major dilemma. The current NSS calls for strategic sealift to support two simultaneous Major Regional Conflicts (MRC). The MSA of 1996 was passed by Congress to ensure supportability of U.S. forces overseas. VISA is an agreement to make intermodal shipping services and capacity available to DoD as required to support the emergency deployment and sustainment of U.S. military forces. It is accomplished by cooperation between DoD, Department of Transportation, and industry. This research presents an analysis of current policies and sealift capabilities in support of the two MRC scenarios.

**DoD KEY TECHNOLOGY AREA:** Surface/Under Surface Vehicles - Ship and Watercraft

**KEYWORDS:** Strategic Sealift, Maritime Security Act, Voluntary Intermodal Sealift Agreement, Jointness

### **POST-COLD WAR PERSONNEL TEMPO (PERSTEMPO) POLICIES AND CHALLENGES: AN EXAMINATION OF THE BASELINE ENGAGEMENT FORCE ASSESSMENT AND MODEL**

**Wayne G. Graddock-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1993**

**Master of Science in Leadership and Human Resource Development-September 1998**

**Advisors: Richard B. Doyle, Department of Systems Management**

**Walter Owen, Department of Systems Management**

This thesis addresses policy and analytical challenges associated with the Post-Cold War personnel tempo (PERSTEMPO). It examines a study conducted by the Joint Staff called the Baseline Engagement Force (BEF) Assessment. The majority of the data were obtained from the Force Structure, Resources, and Assessment Directorate (J-8) of the Joint Staff. The BEF assessment determined the level of military effort required to support peacetime engagement demands and revealed that PERSTEMPO reporting among the Services is diverse in that reporting and tracking methods and concepts differ. Misunderstanding of reporting and tracking methods and concepts led to under-reporting of PERSTEMPO. Errors, by a factor of ten, consistently occurred when reporting PERSTEMPO to the Secretary of Defense and the Chairman of the Joint Chiefs of Staff. Another finding was that the current PERSTEMPO is placing heavy demands on the deployable pool, rather than the end strength. PERSTEMPO increases by twelve percent when the deployable pool is placed in the denominator when calculating deployment percentages. The Assessment also revealed that there is no tool for the services to conduct real time

## 1998 THESIS ABSTRACTS

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assessments of PERSTEMPO. To make these assessments, a Baseline Engagement Force Model was developed by the RAND Corporation and the Systems Research and Applications (SRA) Corporation for the Joint Staff. This Model was designed to produce alternatives for reducing the impact of deployments on military members and to help determine policy regarding the capabilities of the unit deployment and personnel management process.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** OPTEMPO, PERSTEMPO, Baseline Engagement Force Assessment, Baseline Engagement Force Model, Readiness, All-Volunteer Force, National Security Strategy, National Military Strategy, Quadrennial Defense Review

### MEASURING SATISFACTION IN THE PROGRAM MANAGER-PROCURING CONTRACTING OFFICER RELATIONSHIP

**John S. Gray-Lieutenant Commander, United States Navy**  
B.A., Illinois College, 1985

Master of Science in Management-December 1997

Advisors: Susan Hocevar, Department of Systems Management

Jeffrey Cuskey, Department of Systems Management

When Executive Order 12862 was signed on September 11, 1993, Federal agencies were directed to analyze the extent to which their customers were satisfied with the agency's products/services. To comply with this Executive Order, Navy contracting offices require an effective methodology for developing an instrument to measure the satisfaction of their customers, Navy Program Managers. The purpose of this thesis was to develop and provide a methodology to Procuring Contracting Officers for measuring an individual Program Manager's level of satisfaction with the contracting services provided him. The approach utilized in this methodology has two components: to identify the dimensions and attributes which influence an individual Program Manager's satisfaction formation construct; and to translate these dimensions and attributes into measurable behaviors or activities. The measurement instrument developed through this research furnishes a Navy contracting office with useful information concerning their customers' needs and perceptions, and provides a means of evaluating the effectiveness of the Procuring Contracting Officer as measured by the satisfaction of the Program Manager. This thesis provides detailed instructions for implementing this methodology, instructions for performing the data collection process, and two illustrative customer satisfaction measurement instrument.

**KEYWORDS:** Metrics, Performance Measurement, Customer Satisfaction, Contracting, Program Management

**DoD KEY TECHNOLOGY AREA:** Other (Customer Satisfaction)

### COST EFFECTIVENESS ANALYSIS OF CONVERTING A CLASSROOM COURSE TO A NETWORK-BASED INSTRUCTION MODULE

**Samatha J. Green-Lieutenant, United States Navy**  
B.S., United States Naval Academy, 1991

Master of Science in Management-December 1997

Advisor: William R. Gates, Department of Systems Management

Second Reader: James L. Kerber, Department of Systems Management

The Superintendent of the Naval Postgraduate School (NPS) presented a State-of-the-School address that profiled the university of the future. This futuristic university included Network Based Learning (NBL) to provide training to a dispersed audience. Through a Jackson Foundation Grant, the NPS Institute for Defense Education and Analysis (IDEA) is funding two contractors to convert two Executive Management Education (EME) classes into NBL modules. This thesis performs a cost effectiveness analysis converting the two modules and discusses the intangible costs and benefits associated with converting traditional classroom courses. Using data collected from IDEA and the Bureau of Medicine and Surgery, this thesis compares the total cost per student as a greater number of courses are converted to a traditional EME conference

## 1998 THESIS ABSTRACTS

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with no NBL modules. The findings revealed that converting only two modules is by no means cost effective in the short term. However, cost savings can be realized by converting more modules. As the same modules are used repeatedly, the high start-up costs eventually become cost effective. The many intangible benefits of NBL also add to the effectiveness of this endeavor.

**KEYWORDS:** Cost Effectiveness Analysis, Executive Management

**DoD KEY TECHNOLOGY AREA:** Other (Case Study)

### **UNDERGRADUATE ACADEMIC ACHIEVEMENT AS AN INDICATOR OF FLEET PERFORMANCE AND RETENTION**

**John D. Gremillion-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1993**

**Master of Science in Leadership and Human Resource Development-September 1998**

**Advisors: Alice Crawford, Department of Systems Management**

**Gregory G. Hildebrandt, Department of Systems Management**

This research analyzes the relationship between academic performance and fleet performance and retention of United States Naval Academy (USNA) graduates. Linear and LOGIT regression models are developed for USNA classes of 1980 through 1985 to analyze the effect of explanatory variables on the measures of occupational success, fitness reports (FITREPs) and retention in the Navy.

Understanding the relationship between college academic performance and job performance is important because of the organizational and cultural emphasis placed on academic grades. At the Naval Academy, high academic performance affords midshipmen extra privileges and, most importantly, precedence for service selection.

Analysis of academic factors and several other explanatory variables, both academic and military, shows that academics account for only a small percent of the variation in fitness report grades. Subjective criteria, such as military performance grades, proved much more predictive than course grades for both performance and retention. This study recommends that the component weighting of the order of merit calculation be revisited. That way, midshipmen and Naval Academy focus is realigned to emphasize factors predicting occupational success.

**DoD KEY TECHNOLOGY AREA:** Other (Human Resources)

**KEYWORDS:** Military Officers, U.S. Naval Academy, Retention, Academics

### **A METRIC EVALUATION APPROACH FOR THE DEFENSE ACQUISITION WORKFORCE IMPROVEMENT ACT**

**Kathy E. Gordon-Lieutenant Commander, United States Navy**

**B.S., Ball State University, 1981**

**Master of Science in Management-December 1997**

**Advisor: Walter E. Owen, Department of Systems Management**

**Second Reader: Shu S. Liao, Department of Systems Management**

The Defense Acquisition Workforce Improvement Act (DAWIA) was enacted in 1990 to improve the quality and professionalism of the Department of Defense acquisition workforce. To assess the effectiveness of DAWIA, actual outcomes of the law must be compared to its original objectives. A particular difficulty in evaluating public policies is that they usually cannot be measured in terms of output, such as dollars, hours, or physical units. The primary objective of this study was to find and introduce a performance measurement approach suitable for identifying effective metrics. A second objective was to establish a link between metrics and outcomes. Using the performance measurement approach as a tool, an analysis attempted to link acquisition workforce metrics with specific outcomes. To explore this issue, a literature review of relevant organizational and management texts on public policy analysis, performance measurement and program evaluation

## 1998 THESIS ABSTRACTS

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was conducted. Four suitable frameworks for performance measurement were found and evaluated. The preferred approach for evaluating DAWIA was determined to be a combination of two performance measurement approaches. The new approach is called Metric Assessment and Measurement Approach. It includes valuable features of the two approaches, and a newly developed metric template for evaluating metrics.

**KEY WORDS:** Performance Measurement, Metrics, DAWIA

**DoD KEY TECHNOLOGY AREA:** Other (Metrics)

### ASSESSMENT OF THE FISCAL YEAR 1997 DEPARTMENT OF DEFENSE BUDGET AND PROGRAM ACTIVITIES FOR DOMESTIC DEFENSE AGAINST WEAPONS OF MASS DESTRUCTION

Glenn R. Guenther-Captain, United States Marine Corps

B.S., Pennsylvania State University, 1990

Master of Science in Management-December 1997

Advisors: Richard B. Doyle, Department of Systems Management

Gordon E. Schacher, Department of Physics

This thesis examines Department of Defense involvement in U.S. preparedness to manage the consequences of a nuclear, radiological, biological, or chemical terrorist attack against its cities. It analyzes the establishment and implementation of the Defense Against Weapons of Mass Destruction Act of 1996 which directed the Department of Defense to assist in the training of state and local emergency response agencies involved in consequence management activities. The historical analysis focuses on the proliferation of weapons of mass destruction since the dissolution of the Soviet Union, major terrorist incidents since 1993, international standards, and legislative and executive efforts undertaken to combat terrorism up to 1996. The \$150 million Nunn-Lugar-Domenici amendment to the FY-97 National Defense Authorization Bill is examined in detail from introduction on the Senate floor to eventual passage and enactment. Problems and policy issues associated with resourcing and implementing the resulting Domestic Preparedness Program are treated. Although the DoD was given responsibility for implementing city training, an interagency effort ensued involving the Public Health Service, Environmental Protection Agency, Federal Bureau of Investigation, Federal Emergency Management Agency, Department of Energy, and others. Potential weaknesses may materialize due to several characteristics of the Domestic Preparedness Program, including its novelty and uniqueness, the unorthodox legislative process by which it was established, and its complex organizational structure and temporary nature.

**KEYWORDS:** NBC Defense, Domestic Preparedness, Terrorism, Weapons of Mass Destruction, Department of Defense Budget

**DoD KEY TECHNOLOGY AREA:** Chemical and Biological Defense

### DEVELOPMENT OF A NAVY RECRUITING VEHICLE BUDGET MODEL

Jennifer D. Gundayao, Lieutenant United States Navy

B.S., Texas Tech University, 1991

Master of Science in Management-December 1997

Advisors: Stephen L. Mehay, Department of Systems Management

Shu S. Liao, Department of Systems Management

This thesis attempts to develop a predicting model for the Commander, Navy Recruiting Command, (CNRC) and Recruiting District. The thesis attempts to identify the relevant data on vehicle activity and vehicle costs across four Navy Recruiting Areas and 31 Navy Recruiting Districts that will be useful in developing a model to predict the demand for vehicles. The data file consists of pooled, cross-sectional time-series data covering three fiscal years, 1995, 1996, and 1997, and 31 Recruiting Districts. This data file is used to estimate regression models of vehicle demand using ordinary least squares

## 1998 THESIS ABSTRACTS

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techniques. The candidate independent variables whose values are statistically significant are used as the explanatory (predictor) variables to explain the variation in the number of vehicles across Districts. The thesis concludes that there is a strong relationship between the number of enlisted production recruiters and total vehicle mileage in explaining the number of recruiting vehicles. Using these relationships a simple model is developed that can be used to predict future vehicle demand by District and assist decision-makers in making vehicle distribution decisions.

**KEYWORDS:** Navy Recruiting, Vehicle Management, Vehicle Budgets

**DoD KEY TECHNOLOGY AREA:** Ground Vehicles

### **FOREIGN MILITARY SALES VERSUS DIRECT COMMERCIAL SALES**

**Metin Gultekin-Lieutenant Junior Grade, Turkish Navy**

**B.S., Turkish Naval Academy, Istanbul, 1993**

**Master of Science in Management-September 1998**

**Advisors: Orin E. Marvel, Command, Control, and Communications Academic Group**

**John E. Muttu, Department of Systems Management**

The transfer of arms from the U.S. to other countries under the Security Assistance Program is done in two basic ways: government-to-government Foreign Military Sales (FMS), and contractor-to-government Direct Commercial Sales (DCS). These methods help to increase standardization and interoperability between the U.S. and its Allies. This study examines the U.S. arms sales policies and procedures for FMS and DCS. It is aimed at identifying the advantages and weaknesses of these methods and to provide information to the Turkish Navy decision-makers for future arms procurements. The objective of this study

is to improve the effectiveness and efficiency of the Turkish Navy in procuring weapon systems/services from U.S. sources. The research found demonstrates that the choice of either FMS or DCS is driven by the special circumstances of the Turkish Navy, rather than by substantive differences in the two systems. The final decision on procurement methods with the U.S. depends on the country and items to be purchase. This study examines the major trade-offs between the FMS and DCS systems, and recommends the factors which the Turkish Navy should take into account to minimize costs, maximize effectiveness, and maximize efficiency.

**DoD KEY TECHNOLOGY AREA:** Other (Systems Acquisition Management)

**KEYWORDS:** Foreign Military Sales, Direct Commercial Sales, Turkish Navy, Arms Sales, Security Assistance

### **THE IMPACT OF PREMIUM TRANSPORTATION ON USMC LOGISTICS PROCESSES**

**William T. Hagerott-Captain, United States Marine Corps**

**B.S., U.S. Naval Academy, 1992**

**Master of Science in Management-December 1997**

**Advisors: Paul J. Fields, Department of Systems Management**

**Lieutenant Colonel Timothy Phillips, United States Marine Corps Representative**

The purpose of this thesis is to use simulation models to evaluate the benefits and costs of premium transportation on inventory levels at I MEF, Camp Pendleton, CA. The core of the research focuses on studying the impact that 100% premium transportation has on Order Ship Time (OST) and requisitioning objective inventory levels at I MEF. Although premium transportation is expensive, the savings in inventory costs provide an opportunity to offset transportation costs, decrease OST, and improve overall customer service. The research results show that the benefits generally outweigh the costs when premium transportation is used for consumable items. Premium resupply from the New Cumberland/Mechanicsburg Depot resulted in significant OST reductions while incurring an additional cost of only \$400 per month. Premium resupply from the Sharpe/Tracy Depot is available at no cost because the depot has unused premium transporta-

## 1998 THESIS ABSTRACTS

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tion capacity readily available. Repairable items, however, do not appear to support the use of premium transportation due to their high weight, and thus high transportation cost.

**KEYWORDS:** Precision Logistics, Order Ship Time, Requisitioning Objective, Simulation, Model

**DoD KEY TECHNOLOGY AREAS:** Materials, Processes, and Structures, Modeling and Simulation

### **THE AMMUNITION SUPPLY CHAIN AND INTERMODALISM: FROM DEPOT TO FOXHOLE**

**Sam R. Hancock Jr.-Lieutenant, United States Navy**

**B.S., Auburn University, 1990**

**Master of Science in Management-March 1998**

**and**

**Peter J. Lee-Captain, United States Army**

**B.S., Centenary College, 1988**

**Master of Science in Management-March 1998**

**Advisors: David G. Brown, Department of Systems Management**

**Jane N. Feitler, Department of Systems Management**

The Department of Defense (DoD) has started a modernization effort to support the movement of ammunition and general cargo for contingency operations. This modernization effort includes the procurement of new intermodal containers, container handling equipment, port upgrades and agreements with commercial industry.

In order to understand how ammunition can be transported effectively and efficiently, the supply chain must be examined to identify choke points, limitations and shortfalls that occur during the ammunition movements from the depot to the "foxhole."

This thesis examines the issues affecting the ammunition supply chain within the DoD and the Defense Transportation System. Analysis and recommendations are provided to improve the transportation of ammunition through this system.

**DoD KEY TECHNOLOGY AREAS:** Materials, Processes, and Structures

**KEYWORDS:** Defense Transportation System, Intermodal Ammunition Transportation, Logistics

### **SOCIOECONOMIC STATUS AND PERFORMANCE IN THE U.S. NAVY AND U.S. AIR FORCE**

**Rebecca L. Harper-Lieutenant, United States Navy**

**B.A., Ohio Wesleyan University, 1983**

**Master of Science in Management-March 1998**

**and**

**Carl R. Heldreth-Commander, United States Navy**

**B.S., Texas Christian University, 1980**

**Master of Science in Management-March 1998**

**Advisors: Michael D. Cook, Department of Systems Management**

**Mark J. Eitelberg, Department of Systems Management**

Policymakers concerned about population representation in America's armed forces have frequently referred to the "unfair burden" of military service borne by young people from lower socioeconomic backgrounds. The purpose of this study was to examine the socioeconomic status (SES) of recruits in the Navy and Air Force and to analyze the relationship between a recruit's SES background and his or her performance in the military over time. Data for this study were obtained from three sources: the Department of Defense Survey of Recruit Socioeconomic Backgrounds (SES survey), Military Entrance Processing Command enlisted cohort files, and personnel data files provided by the Navy and Air Force. After merging these data files, the SES survey respondents were tracked longitudinally, and several analyses were undertaken to assess the relationship between SES and performance in the military. The results of this research show that recruits in both services

## 1998 THESIS ABSTRACTS

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come from slightly lower SES backgrounds than do youths in the general population; and, most of this difference can be explained by the fact that sailors and airmen are consistently underrepresented in the highest measures or correlates of SES and over represented in the lowest ones. Additionally, it was found that, while SES is not a strong predictor of first-term enlisted attrition in either service, it does explain differences in recruits' performance on-the-job in the Air Force. Further research is recommended, especially that which incorporates supervisors' ratings of military performance.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Socio-Economic Status, Performance USN, USAF

### **APPLICATION OF THE WENGER TAXONOMY FOR CLASSIFYING GOODS PROCURED BY THE FEDERAL GOVERNMENT TO COMMERCIAL OFF-THE-SHELF COMPUTER HARDWARE EQUIPMENT**

**William M. Harrison-Major, United States Marine Corps**

**B.S., United States Naval Academy, 1984**

**Master of Science in Management-December 1997**

**Advisors: David V. Lamm, Department of Systems Management**

**Mark E. Nissen, Department of Systems Management**

The Wenger Taxonomic Model provides a means to classify goods procured by the Federal Government so as to provide procurement professionals with strategic buying insight. Several aspects of the model have been explored by various researchers. These researchers have found that the model is both valid and useful. This study focuses on application of the Wenger Taxonomic Model to Commercial Off-the-Shelf computer hardware equipment procured by a specific buying activity. It proposes a slightly different version of the Wenger Taxonomic Model. It also proposes five areas where the model would help procurement professionals make smarter Information Technology investments. These areas are: cost-benefit analysis, source selection evaluation, warranty purchases, contingency contracting, and evaluating the organizational impact of Information Technology acquisitions.

**KEYWORDS:** Taxonomy, Classification, Commercial Off-the-Shelf, Computers

**DoD KEY TECHNOLOGY AREA:** Other (Taxonomic Classification)

### **RDT&E LABORATORY CAPACITY UTILIZATION AND PRODUCTIVITY MEASUREMENT METHODS FOR FINANCIAL DECISION-MAKING WITHIN DON**

**Jeffrey S. Haupt-Lieutenant Commander, United States Navy**

**B.S., University of Virginia, 1983**

**Master of Science in Management-June 1998**

**Advisors: Kenneth J. Euske, Department of Systems Management,**

**John E. Mutty, Department of Systems Management**

This thesis identifies capacity utilization and productivity measures applicable to Department of the Navy (DoN) Research, Development, and Test and Evaluation (RDT&E) laboratories. The recent emphasis on efficiency and sound business practices from financial management perspective mandates that the Navy evaluate and incorporate appropriate laboratory performance measures. Industry capacity utilization and productivity measurement techniques and models were evaluated for their potential application to the Naval Air Warfare Center Aircraft Division (NAWCAD) RDT&E organization. The CAM-I capacity model was selected from the twelve industry models reviewed as a measure of capacity utilization. Additionally, laboratory productivity was examined in terms of revenue and full cost with measures of return on operations, operating margin, and operating margin per square foot. Productivity data were collected from NAWCAD accounting records. Observations, interviews, and a questionnaire were used to gather laboratory operating characteristics and capacity utilization data. The data were input to the selected measures and the results were analyzed. This analysis found that the



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## 1998 THESIS ABSTRACTS

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measures identified provide a financial basis for responsible RDT&E resource decision-making and have potential application to all Department of Defense (DoD) RDT&E laboratory activities.

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS:** Financial Management, RDT&E Laboratories, Productivity, Capacity Utilization, Performance Measures

### **DEFENSE INDUSTRY MERGERS AND MONOPOLY POWER: ANALYSIS OF ABNORMAL EARNINGS USING THE EDWARDS-BELL-OHLSON MODEL**

**J. Mark Heisey-Captain, United States Marine Corps**

**B.S., Old Dominion University, 1989**

**Master of Science in Management-December 1997**

**Advisors: O. Douglas Moses, Department of Systems Management**

**Walter E. Owen, Department of Systems Management**

Recent defense industry consolidation has created several large defense firms. As a result of merger activity with their suppliers and competitors, these firms account for an increasing percentage of sales to the Department of Defense. This thesis investigated seven large defense industry mergers, involving 12 defense firms, to assess the effect of the mergers on the firms. Changes in a firm's anticipated abnormal earnings both premerger and post-merger were analyzed to determine whether the defense firms exhibit monopoly power.

The merger process was divided into five stages. The Edwards-Bell-Ohlson (EBO) valuation model was used to create measures of firms' expected abnormal earnings at each stage. Each firm's resulting abnormal rates of return on equity were observed and analyzed between stages to track changes in assessments of expected abnormal earnings as the merger process proceeded.

Major findings indicate that post-merger abnormal rates of return increased from premerger levels for all firms. These findings are consistent with defense firm earnings power and monopoly position increasing due to merger activity.

**KEYWORDS:** Defense, Defense Industry, Mergers, Monopoly, Accounting Models

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

### **A CAUSAL BASED INVENTORY FORECASTING MODEL FOR AN ELECTRONICS CAPITAL EQUIPMENT MANUFACTURER**

**John E. Hicks-Lieutenant Commander, United States Navy**

**B.S., Manhattan College, 1985**

**Master of Science in Management-December 1997**

**Advisors: Kevin R. Gue, Department of Systems Management**

**Second Reader: Shu S. Liao, Department of Systems Management**

With declining budgets for making inventory decisions throughout the business sector, the Navy, and the Department of Defense, the need for accurate inventory demand forecasting is becoming an increasingly important issue. The need for accurate forecasts and adequate inventory models is integral to cost savings, attaining customer service levels, and to the climate of both for-profit and public sector organizations.

This thesis develops a forecasting model for a high-technology firm that attempts to predict future demand by considering several *causal-factors* that might reflect future demand for items. Our results suggest that the model is no better than the current demand-based model, either because our factors did not contain sufficient predictive power, or perhaps because no such factors exist.

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## 1998 THESIS ABSTRACTS

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**KEYWORDS:** Inventory, Forecasting, Causal

**DoD KEY TECHNOLOGY AREA:** Other (Inventory Management)

### THE COSTS AND BENEFITS OF MAINTAINING THE BUY AMERICAN ACT

Keith A. Hirschman-Captain, United States Army

B.A., Westminster College, 1987

Master of Science in Management-June 1998

Advisors: David R. Henderson, Department of Systems Management

Mark W. Stone, Department of Systems Management

This thesis explores the costs and benefits of the Buy American Act (BAA). The BAA requires a domestic preference for all Federal Government purchases. The thesis uses accepted economic analysis on the gains from international trade to show that the costs of maintaining such protectionist legislation are potentially high relative to the uncertain benefits of maintaining excess industrial surge capacity. Moreover, surge capacity did not appear to be an issue in the debate over passage of the BAA in 1933. Passed at the trough of the depression, the Act appears to have been motivated by the mistaken belief that it would on net save U.S. jobs. In light of the declining real procurement budget for the Department of Defense, a relaxation of the BAA seems called for. This thesis concludes by recommending that the scope of the Buy American Act be narrowed.

**DoD KEY TECHNOLOGY AREA:** Other (Procurement Policy)

**KEYWORDS:** Buy American Act, Free Trade Agreements, and Federal Procurement Policy

### RISK ASSESSMENT AND ANALYSIS OF THE M109 FAMILY OF VEHICLES FLEET MANAGEMENT PILOT PROGRAM

Stephen E. Hitz-Major, United States Army

B.S., United States Military Academy, 1986

Master of Science in Management-December 1997

Advisors: Keith F. Snider, Department of Systems Management

David F. Matthews, Department of Systems Management

The purpose of this thesis is to conduct a risk assessment and analysis for the M109 155mm Self Propelled Howitzer (SPH) Fleet Management Pilot Program. The objective of this program is to reengineer the fleet's logistical support system by outsourcing those functions which make sense and that can be performed more efficiently by private industry. This innovative approach places one contractor, or Fleet manager, in charge of sustaining the entire fleet. The researcher used the Concept of Operations (CONOPS) Document for the program as the primary tool to conduct the risk assessment and analysis. Using the CONOPS Document as a preliminary work Breakdown Structure, the researcher developed two surveys to identify and assess the risks associated with the program. These surveys enabled the researcher to develop a Risk Watchlist that identifies and prioritizes the most severe cost and performance risks. The researcher utilized this watchlist to develop Risk Charts to analyze the potential impact of these risk events. The Risk Charts graphically display both the risk events identified in the program and where they might occur. Developing similar Risk Watchlists and Risk Charts can assist DoD Project Managers in controlling and mitigating the risks associated with their programs.

**KEYWORDS:** Risk Assessment and Analysis, Fleet Management

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition Outsourcing and Logistics)

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## 1998 THESIS ABSTRACTS

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### **K-12 LOCAL AREA NETWORK DESIGN GUIDE**

**Cody L. Horton-Lieutenant, United States Navy**  
**B.S., University of New Mexico, 1987**

### **JOINT STRATEGY AND STRATEGIC SEALIFT FOR THE NEXT CENTURY**

**Bobby L. Gopffarth-Lieutenant, United States Navy**  
**B.S., U.S. Naval Academy, 1991**

**Master of Science in Management-March 1998**  
**and**

**Ernest E. Johnson-Lieutenant, United States Navy**  
**B.S., Oregon State University, 1991**

**Master of Science in Management-March 1998**

**Advisors: Jane N. Feitler, Department of Systems Management**  
**William R. Gates, Department of Systems Management**

The President's National Security Strategy (NSS) calls for the U.S. military to "shape-respond-prepare" for a strategic environment that continues to advance U.S. interests. It also prescribes the necessity to move toward a more joint way of life. With increased emphasis on jointness, the Navy has made significant strides in becoming a partner with the other services. Not only are the services more joint, but so are the organizations participating in contractual agreements. One area where DoD and industry has increased their joint relationship is in the area of strategic sealift.

As the world's shipping industries have grown the U.S. industry has reduced by one third. This has presented DoD with a major dilemma. The current NSS calls for strategic sealift to support two simultaneous Major Regional Conflicts (MRC). The MSA of 1996 was passed by Congress to ensure supportability of U.S. forces overseas. VISA is an agreement to make intermodal shipping services and capacity available to DoD as required to support the emergency deployment and sustainment of U.S. military forces. It is accomplished by cooperation between DoD, Department of Transportation, and industry. This research presents an analysis of current policies and sealift capabilities in support of the two MRC scenarios.

**DoD KEY TECHNOLOGY AREA: Surface/Under Surface Vehicles - Ship and Watercraft**

**KEYWORDS: Strategic Sealift, Maritime Security Act, Voluntary Intermodal Sealift Agreement, Jointness**

### **A STATISTICAL ESTIMATION OF NAVY ENLISTMENT SUPPLY MODELS USING ZIP CODE LEVEL DATA**

**David L. Hostetler-Lieutenant Commander, United States Navy**  
**B.S., United States Naval Academy, 1986**

**Master of Science in Management-March 1998**

**Advisors: Stephen L. Mehay, Department of Systems Management**  
**Michael Cook, Department of Systems Management**

The Department of Defense has relied greatly upon active duty members assigned to recruiter positions to achieve enlistment goals. The Commander, Navy Recruiting Command (CNRC) is tasked with ensuring that Navy recruitment goals are attained in order to maintain the supply of personnel to support prescribed force size. This thesis will examine the Navy Recruiting Stations and their respective production of new contracts using zip code level data from the Standardized Territory Analysis Management (STEAM) database. The effect of individual level station attributes will be predicted using regression with new contract production as a function of recruiting station population statistics drawn from the STEAM database. A secondary purpose of this thesis is to determine if the interaction of the target recruiting population, the number of recruiters assigned to a market, and the presence of other armed forces recruiting stations in the same location have an effect on recruiting production. Both models showed that recruiter presence was the most important factor in attaining new contracts. Also, Navy contracts were positively related to other armed services recruiting production. This suggests complementarity. The county unemployment rate was positively related to Navy recruiting production, as were all race/ethnicity coefficients.

## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Recruiting, Manpower Supply

### **K-12 LOCAL AREA NETWORK DESIGN GUIDE**

**Cody L. Horton-Lieutenant, United States**

**B.S., University of New Mexico, 1987**

**Master of Science in Information Technology Management-March 1998**

**Advisors: Barry Frew, Department of Systems Management**

**Maxine Reneker, Dudley Knox Library**

This thesis is presented as a Local Area Network (LAN) design and planning guide for kindergarten through twelfth grade (K-12) educators preparing to design and implement LANs in K-12 schools and libraries. Data was collected during the implementation of LANs in K-12 schools of the Monterey Peninsula Uniform School District (MPUSD). Though the author recognizes that each school will have unique issues it is also reasonable to assume that other K-12 schools will have needs and face challenges similar to those of the MPUSD.

This document provides a person who is not a network professional with a LAN design guide based on network design practices and lessons learned from the MPUSD LAN implementation. The information in this document is also relevant to Navy commands preparing to implement LANs in small and medium sized offices and training schools. Navy commands and schools will face many of the same challenges that the MPUSD schools faced when planning and implementing LANs. The author focuses on areas that were most effective or most challenging during the MPUSD LAN implementation. Highlights of successful initiatives employed by educators during the MPUSD network installation process should prove valuable to other educators preparing to implement LANs in K-12 schools.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Local Area Network, LAN, Network Design, K-12 LAN, Networking

### **ADVANCED MATERIAL PRESENTATION: A STUDY IN TECHNOLOGY AND ERGONOMICS**

**Terje M. Hougen-Lieutenant, United States Navy**

**B.S., Southern Illinois University, 1995**

**Master of Science in Information Technology Management-March 1998**

**Advisors: Douglas E. Brinkley, Department of Systems Management**

**Frank Barrett, Department of Systems Management**

Governments and local school systems continue to invest millions of dollars in educational technology. Most of these investments have not produced as promised and some are complete failures. The purpose of this thesis is to determine the state-of-the-art for the implementation of educational technology into the classroom and create a set of common lessons learned from these experiences. Also, an experiment using Microsoft Powerpoint is used to determine students specific likes and dislikes on the infusion of technology into their classroom. Two sections of the same class are used for the experiment. One is a control group that has the lecture material presented to them in the traditional manner (overhead transparencies and blackboard) and the second receive the same material plus additional information made possible by the abilities of Powerpoint. The students are then given a three-part survey to express their feelings on the use of presentation technology. Overwhelmingly, the students prefer the use of presentation technology. They feel that the use of technology increases their ability to learn and adds flexibility for the professor and students. Also, the decreased time the instructor must spend writing notes on the blackboard is beneficial.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Information Technology, Education

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## 1998 THESIS ABSTRACTS

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### USING "OTHER TRANSACTIONS" AS AN EFFECTIVE RESEARCH AND DEVELOPMENT (R&D) CONTRACTUAL VEHICLE

Robert E. Howell-Lieutenant Commander, United States Navy

B.S., Spring Hill College, 1985

Master of Science in Management-December 1997

Advisors: Mark W. Stone, Department of Systems Management

David A. Smith, Department of Systems Management

The Federal Government is no longer the preeminent market for high technology. With billions of dollars being spent in the commercial sector on Research and Development (R&D), the uniformed services cannot afford to be a non-participant in state-of-the-art technology due to the cumbersome and prescriptive practices of the standard procurement system. This thesis establishes the rationale for using "Other Transactions" (OT) authority as a contractual mechanism in the R&D arena. Background into the Defense Advanced Research Projects Agency's (DARPA) use of OTs is the main thrust of this thesis as they have been the predominant and most experienced user of this contractual vehicle since its creation in 1989. This thesis also presents the legislation that created OT authority and the background that established the need for it. Additionally, the analysis focuses on important elements that are fundamental in embracing the use of OTs. If increased utilization of this contractual vehicle by the Services can be achieved, it will facilitate current technology insertion into military systems and attract more resources for future high technology endeavors.

**KEYWORDS:** Other Transactions, OT, Other Transaction Authority, OTA, Defense Advanced Research Projects Agency, DARPA, 10 U.S.C. 2371, Section 845 Authority, Prototyping, High Technology Acquisition

**DoD KEY TECHNOLOGY AREA:** Other (Management)

### SOFTWARE AGENTS AND THE DEFENSE INFORMATION INFRASTRUCTURE: RE-ENGINEERING THE ACQUISITION PROCESS

Jerome Hudson-Major, United States Army

B.S., Prairie View A&M University, 1984

Master of Science in Management-September 1998

Advisors: Mark E. Nissen, Department of Systems Management

Tung X. Bui, Information Systems Academic Group

Process innovation within the Department of Defense (DoD) procurement system ultimately translates into flexibility, combat effectiveness, and technological advantage on the modern battlefield. A critical enabler of process innovation is the effective use of advanced information technology (IT) products, such as software agents. Software agent-based systems are used as an IT enabler for redesigning processes within the Defense Information Infrastructure (DII) Acquisition system. The Simplified Acquisition Procedures (SAP), a key element of acquisition reform, are used as the focus of our redesign efforts. To accomplish this task, the process is represented using a traditional process-flow model, Use Case analysis to integrate the DII macro-process view and the agent technology micro-view, and using a heuristic measure of process complexity to identify processes suitable for machine versus human performance. By exploiting the inherent strengths of both software and human agents, productivity is enhanced by freeing human agents from routine tasks and enables the refocusing of human resources to high value acquisitions. The result is an agent-based redesign of SAP processes where human agents and software agents share in the responsibilities for process execution.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Software Agents, Acquisition Reform, Process Innovation, Defense Information Infrastructure

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## 1998 THESIS ABSTRACTS

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### **THEORETICAL ECONOMICS STUDY OF THE FORMATION OF DEFENSE ALLIANCES**

**Toshihiko Inomori-Lieutenant, Japan Maritime Self Defense Force**

**B.S., Japan National Defense Academy, 1990**

**Master of Science in Management-June 1998**

**Advisors: Katsuaki L. Terasawa, Department of Systems Management**

**William R. Gates, Department of Systems Management**

This thesis is a theoretical economics study on the formation of defense alliance. It discusses the probability that countries, which are characterized by both their perceptions about benefits and risks of alliance membership and the gross domestic product, form an alliance.

Primarily, an alliance model was created with and without risk perceptions based on the joint product model and the self-protection model. Next, the behavior was examined of countries in the model. Finally, the implications of the results were considered. The characteristics of the countries may influence the alliance burden sharing and productivity of defense were considered expenditure whose effects on the country's utility influences the alliance formation.

**DoD KEY TECHNOLOGY AREA:** Other (Alliance)

**KEYWORDS:** Defense, Alliance, Economics

### **THE INFLUENCE OF DEMOGRAPHICS AND NAVY CAREER EXPERIENCES ON THE PERFORMANCE OF JUNIOR SURFACE NAVAL OFFICERS**

**A. David Johnson-Lieutenant, United States Navy**

**B.A., University of New Mexico, 1991**

**Master of Science in Management-March 1998**

**Advisors: Stephen L. Mehay, Department of Systems Management**

**William R. Bowman, Department of Economics, United States Naval Academy**

This thesis examines the relationship between pre-commissioning and post-commissioning characteristics and junior surface naval officer performance, retention, and promotion. The study uses data from the Officer Promotion History Files, (1981-1995). Data on 7,038 officers entering the Navy from 1976 to 1986 are analyzed. Results indicate that Naval Academy graduates, business majors, officers with CRUDES experience, and non-minority officers are more likely to achieve Surface Warfare qualification and receive top fitness report scores. NESEP and NROTC graduates, math majors, officers with CRUDES experience and top fitness reports, and minorities officers are more likely to stay in the Navy to the 04 promotion board. Academy graduates, engineering majors, officers with CRUDES experience, and officers with top fitness reports are more likely to promote to Lieutenant Commander. No significant difference is observed between minority and non-minority 04 promotion probabilities after pre-commissioning and post-commissioning factors are controlled. However, the effects of CRUDES experience, warfare qualification, and fitness report scores may lead to indirect effects which lead to observed performance and promotion rate differences between race/ethnic groups.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Surface Warfare Officer Performance, Retention, and Promotion

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## 1998 THESIS ABSTRACTS

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### **CIVILIAN HUSBANDS IN THE MILITARY FAMILY: CURRENT ISSUES AND FUTURE CONCERNS**

**Roni S. Johnson-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1989**

**Master of Science in Management-March 1998**

**Advisors: Alice Crawford, Department of Systems Management**

**Mark J. Eitelberg, Department of Systems Management**

This thesis explores various issues confronting women officers and their civilian spouses. Population data are analyzed by officer pay grade and community to describe the increasing proportion of women officers in the Navy and Marine Corps who are married to civilians. Focused interviews were conducted with 32 female officers and their spouses. All interviews were taped and transcribed, from which 25 general themes emerged. These themes cover many topics relating to gender role conflicts, spouse employment challenges, career conflict, spouse support for the officer, and the officer's career intentions. Several conclusions are drawn from the research. It is noteworthy that a vast majority of civilian husbands have military experience. This experience is perceived by many interviewees as the key to the male spouse's ability to successfully cope with the challenges facing him as a trailing spouse or as a primary care-giver for children. For these officers, marriage to a civilian provides more flexibility and less stress than experienced previously when the spouse was also in the military. Most spouses believe the security and benefits derived from their wife's military career outweigh the disadvantages of their mobile lifestyle. Interview excerpts should offer valuable information to decision makers in the area of family support policy.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Civilian Husband, Military Family, Civilian Male Spouse, Stay-At-Home Care-Giver, Officer Retention, Gender Roles, Dual-Career

### **ASSESSMENT OF LOGISTICS IMPROVEMENTS MADE BY DEPARTMENT OF DEFENSE REINVENTION LABORATORIES**

**Todd M. Jenkins-Captain, United States Marine Corps**

**B.S., Ohio State University, 1991**

**Master of Science in Management-December 1997**

**Advisors: Lawrence R. Jones, Department of Systems Management**

**Second Reader: Jerry L. McCaffery, Department of Systems Management**

This thesis examines the logistics accomplishments of Reinvention Laboratories in attempting to improve business practices within the Department of Defense. It documents five cases in which over \$342 million in annual savings were achieved to show the potential of continuous improvement. It also provides recommendations for further research and for investment of resources to permit DoD logistics organizations to obtain greater savings.

This thesis provides a tool and a knowledge base useful to existing and new Reinvention Labs. Through review of the lessons learned and study of the barriers to success, it is hoped that avoidance of the many pitfalls encountered with implementing change can be avoided.

Through business process reengineering (BPR) and the entrepreneurial spirit, DoD can transform its large and inefficient logistics organizations into more flexible, effective, streamlined institutions capable of rapidly adapting to the changing needs of the Armed Services. This thesis illustrates how DoD, through the resource savings in reengineering and reinvention, can generate funding to invest in modernization to prepare for the missions identified in the DoD's template for the future—Joint Vision 2101.

**KEYWORDS:** Logistics, Business Process Reengineering (BPR), Entrepreneurial Spirit, Restructuring, Reengineering, Reinvention, Realignment, and Rethinking

**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

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## 1998 THESIS ABSTRACTS

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### **AN ANALYSIS OF THE EFFECTS OF ACCESSION SOURCE AS A PREDICTOR OF SUCCESS OF NAVY NURSE CORPS OFFICERS**

**Paula M. Jonak-Lieutenant Commander, Nurse Corps, United States Navy**

**B.A., Rockhurst College, 1982**

**B.S.N., Research College of Nursing, 1984**

**M.S., Chapman University, 1996**

**Master of Science in Management-March 1998**

**and**

**Rosemarie J. Paradis-Lieutenant Commander, Nurse Corps, United States Navy**

**B.S.N., University of Tennessee Center for the Health Sciences, College of Nursing, 1985**

**Master of Science in Management-March 1998**

**Advisors: William R. Gates, Department of Systems Management**

**Julie A. Dougherty, Department of Systems Management**

This study explores various avenues for entering the Navy Nurse Corps and analyzes whether accession source is a predictor of military career behavior. Military career behavior is defined as completing initial obligated service, retention beyond initial obligated service, and promotion to lieutenant commander. Specific accession pipelines examined are the Naval Reserve Officer Training Corps (NROTC), Nurse Commissioning Program (NCP), Medical Enlisted Commissioning Program (MECP), direct procurement, and now defunct sources to include the Health Services Commissioning Program (HSCP), Baccalaureate Degree Completion Program (BDCP), and Full-time Out-service Training (FTOST). Cohort files were developed at the Naval Postgraduate School (NPS) from the Navy Officer Master Files, historical Master Loss and Reserve Files maintained at the Defense Manpower Data Center (DMDC), and the Naval Medical Information Management Center's (NMIMC) Bureau of Medical Information System (BUMIS) database. A multivariate logit regression was used to examine the relationship between accession source and success measures. The empirical analysis indicates that accession source could be used to predict retention after developing a better fitting model. Further research should be conducted on more recent accession cohorts, using a more inclusive model, to assist the Navy Nurse Corps in the development and use of future accession programs.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Manpower Supply, Retention, Recruiting

### **ASSESSMENT AND SELECTION OF PERSONNEL FOR THE TURKISH SPECIAL FORCES COMMAND**

**Erdal Kenar-First Lieutenant, Turkish Army**

**B.S., Turkish Military Academy, 1992**

**Master of Science in Management-June 1998**

**Advisors: Lee E. Edwards, Department of Systems Management**

**Mark J. Eitelberg, Department of Systems Management**

The objective of this study is to develop a model for the assessment and selection of personnel for the Turkish Special Forces Command based on procedures applied by the United States Army Special Forces. The study assumes a high degree of similarity between the United States and the Turkish Special Forces in terms of organizational structure and mission statement. A survey was conducted of members of the Turkish Special Forces to obtain their views regarding the most critical personal attributes in the Turkish Special Forces Command. Assessments of these attributes were then compared with those specified for personnel in the United States Special Forces. The results of the survey indicate that the most critical personal attributes of the United States and the Turkish Special Forces are generally similar with some slight differences. The study concludes that a standardized personal selection program such as the United States Special Forces Assessment and Selection process can be used in the Turkish Special Forces with some modifications that account for differences in culture and organizational missions.



## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, Training

**KEYWORDS:** Special Forces, Personnel Assessment and Selection, Personal Attributes

### **A LOGISTIC LIFE CYCLE COST-BENEFIT ANALYSIS OF POWER QUALITY MANAGEMENT IN THE AVIONICS REPAIR FACILITY**

**Christopher J. Kennedy-Lieutenant Commander, United States Navy  
B.S., West Virginia University, 1986**

**Master of Science in Management-June 1998**

**Advisors: Katsuaki L. Terasawa, Department of Systems Management  
Keebom Kang, Department of Systems Management**

The objective of this research is to investigate the impact that power quality management can have on the intermediate level of maintenance. Power quality management is a preventative process that focuses on identifying and correcting problems that cause bad power. Using cost-benefit analysis the effects of implementing a power quality management program at AIMD Lemoore and AIMD Fallon was compared. The implementation of power quality management can result in wide scale logistical support changes in regards to the life cycle costs of maintaining the DoD's current inventory of sensitive electronic equipment. Power quality management provides logisticians the opportunity to reduce maintenance costs, reduce maintenance cycle times, and improve fleet operational availability.

The research identifies potential savings of \$1.5 million from reduced test bench maintenance costs and productivity increases, and recommends the DoD institutionalize the use of power quality management.

**DoD KEY TECHNOLOGY AREA:** Other (Life Cycle Management)

**KEYWORDS:** Cost-Benefit Analysis, Power Quality Management, Logistics

### **ASSIGNMENT PROCESS: A QUALITATIVE REVIEW**

**M. Debra Keenan-Lieutenant Commander, United States Navy  
B.S., Southern Illinois University, 1984**

**Master of Science in Management-March 1998  
and**

**Gail M. Wilkins-Lieutenant Commander, United States Navy  
B.A., San Francisco State University, 1982**

**Master of Science in Management-March 1998**

**Advisors: Stephan L. Mehay, Department of Systems Management  
Cary S. Simon, Department of Systems Management**

The screening and management of services members with medical situations that render them non-deployable and unavailable for world-wide assignability is a key manpower and readiness issue. The Navy manages service members unable to perform their duties due to medical reasons utilizing both the Temporary Limited Duty Assignment process (TLD) and the Disability Evaluation System (DES). The objective of this thesis is to analyze the Temporary Limited Duty Assignment process and the Disability Evaluation System, identify process inefficiencies, compile a reference document and assess the impact on Force Structure and the Individuals Account. An in-depth review of the steps in each process is provided with timeline flow charts. This thesis analyzes the factors that contribute to the amount of time a service member spends in a transient and limited duty status. The thesis also identifies the primary claimants and their roles and responsibilities in each process and analyze the inter-relationship of TLD and DES. An extensive summary of findings is provided with recommendations for streamlining the processes to improve efficiency.

## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel and Training

**KEYWORDS:** Temporary Limited Duty, Disability Evaluation System, Physical Evaluation Board (PEB)

**APPLYING THE MULTIPLE PUBLIC GOOD MODEL FOR  
ESTABLISHING A SECURITY POLICY FOR HUNGARY**

**Laszlo Kereki-Major, Hungarian Defense Force**

**B.S., Military College of Engineering Troops, Kaliningrad, 1985**

**Master of Science in International Resource Planning and Management-June 1998**

**Advisor: Katsuaki L. Terasawa, Department of Systems Management**

**Second Reader: Donald Abenheim, Department of National Security Affairs**

This study was written with an aim to suggest a security policy approach for Hungary after becoming a member of NATO. The formulation of the country's security policy started with examination of security threats in general and analysis of Hungary's close security environment in particular. The analysis revealed that the threat of large scale military aggression has disappeared. However, other types of security challenges—economic crises, ethnic hostilities, environmental pollution, proliferation of weapons of mass destruction prevailed—and the military concerns of security has decreased in importance.

The issues of globalization, and diversification of threat perception could be addressed by cultivating a portfolio of security provisions. The multiple public good model suggested by Mark A. Boyer, an associate professor of political science at the University of Connecticut, for analyzing defense alliances was an appropriate approach to formulation of Hungary's security policy.

Based on the results from the threat assessment and the suggestions of the multiple good model, Hungary's security policy was introduced as a portfolio of defense provisions which in turn was Hungary's contribution to the Alliance. The evidence of contribution to the collective defense was seen through an examination of Hungary's path toward acceptance into NATO and an analysis of domestic stakeholders. The suggested portfolio contained three particularly important fields: economic cooperation as a means of spreading security eastward, handling the questions of ethnic minorities in neighboring countries, and modernization of the Hungarian Defense Force.

**DoD TECHNOLOGY AREA:** Other (International Defense Cooperation)

**KEYWORDS:** Multiple Public Good, Economic Theory of Alliances, Hungary, Commitment and Contribution

**A STUDY OF THE SHIPMENT OF PRODUCE TO  
DEPARTMENT OF DEFENSE CUSTOMERS IN KOREA**

**John J. Kerns-Lieutenant, United States Navy**

**B.S., University of Florida, 1986**

**Master of Science in Management-March 1998**

**Advisors: James Kerber, Department of Systems Management**

**Kevin Gue, Department of Systems Management**

The Department of Defense (DoD), through the Defense Supply Center Philadelphia, procures and ships a variety of subsistence items to locations worldwide, including customers in the Western Pacific. Historic problems associated with shipments of perishable items include high transportation costs, spoilage, and irregular deliveries.

This thesis documents and analyzes the processes currently used for shipments of produce to various DoD customers in Korea. Recent innovations in information management, controlled atmosphere container technology, "push" logistics, and global sourcing are discussed in addition to other possible enhancements that could improve customer service and cost effectiveness.

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## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREA:** Clothing, Textiles, and Food

**KEYWORDS:** FFV, Transportation, Shipments

**A RELIABILITY CENTERED MAINTENANCE ANALYSIS OF  
AIRCRAFT CONTROL BEARINGS USED IN THE NAVY'S S-3 AIRCRAFT**

**Merrill F. King, Jr.-Lieutenant Commander, United States Navy**

**B.S., New Jersey Institute of Technology, 1983**

**Master of Science in Management-December 1997**

**Advisors: Keebom Kang, Department of Systems Management**

**Donald R. Eaton, Department of Systems Management**

This thesis uses the Naval Air Systems Command Integrated Reliability Centered Maintenance Program software (IRCMS) to analyze the performance of aircraft control bearings used in the flight control system of the Navy's S-3 aircraft. The IRCMS is used to determine whether changes can be made in preventative maintenance procedures, or if redesign of the system is warranted. We show in our analysis that each bearing should be redesigned.

In our research, we analyzed and established a historical bearing failure data baseline of current reliability and maintenance costs. We developed a mathematical model to determine the effects of using improved bearings, currently available from commercial manufacturers, on bearing reliability and life cycle costs. We show that failure rates can be reduced by 50 percent, and maintenance costs can be reduced by 48 percent, which represents \$16,000 in annual savings over the remaining life of the aircraft.

We show that an increase in bearing and flight control system reliability is important from the aspect of aircrew safety, and reduces the exposure of aircrews to the potential of in-flight failures.

**KEYWORDS:** Reliability Centered Maintenance

**DoD KEY TECHNOLOGY AREA:** Air Vehicles

**PARTNERING DEFENSE DEPOTS WITH INDUSTRY FOR THE PERFORMANCE OF  
DEPOT-LEVEL MAINTANANCE: A CASE ANALYSIS OF THE AIM XXI PROGRAM**

**Ryan B. Kivett-Captain, United States Army**

**B.A., East Carolina University, 1987**

**Master of Science in Management-December 1997**

**Advisors: Mark W. Stone, Department of Systems Management**

**David F. Matthews, Department of Systems Management**

Partnering the public and private sector for the performance of depot-level maintenance and repair is a relatively new concept. While partnering arrangements offer tremendous opportunities to increase the efficiency of the industrial base; to be successful, these arrangements are complicated by their reliance upon full and open communication, plus their dependency on the total commitment of senior leadership from all involved organizations. Phase I of the Abrams Integrated Management for the Twenty-First Century (AIM XXI) program, a partnering arrangement between General Dynamics Land Systems (GDLS) and Anniston Army Depot (ANAD), which called for the complete rebuild and modernization of 17 M1A1s, offers valuable insight to acquisition professionals who are considering establishing a partnering arrangement. A principal finding of this research is the necessity for partnering arrangements to have the long-term commitment of senior management, and be thoroughly disseminated throughout the involved organizations, particularly to the mid-level managers who are responsible for executing the arrangement. Open and honest communication is the key to the success of partnering arrangements. Partnering is more than a new buzz-word brought about by Acquisition Reform (AR). It is a new dimension to the relationship between the public and private sectors. Acquisition officials must ensure that the parties fully understand this, and the groundwork for this environment is established prior to approving requests to partner.

## 1998 THESIS ABSTRACTS

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**KEYWORDS:** Partnering, AIM XXI, Depot-Level Maintenance and Repair, Outsourcing, M1A1 Abrams MBT

**DoD KEY TECHNOLOGY AREA:** Other (Systems Acquisition and Contract Management)

### **LOGISTICS SUPPORT FOR COMMERCIAL ITEMS AND NON-DEVELOPMENTAL ITEMS CASE STUDY: THE P-3C ANTI-SURFACE WARFARE IMPROVEMENT PROGRAM (AIP)**

**Kurt M. Kohanowich-Lieutenant, United States Navy**

**B.A., University of Florida**

**Master of Science in Management-September 1998**

**Advisors: David F. Matthews, Department of Systems Management**

**Jane Feitler, Department of Systems Management**

The technological advances of the last decade have resulted in the commercial market leading the military market in many areas of technological development. As a result, the military depends on the commercial sector for increased capabilities in many systems. The Commercial Item and Non-Developmental Item procurement strategy has been utilized to capitalize on this development. Using pre-existing systems to provide additional capabilities for military weapon systems results in a shorter procurement time and enables new technology to be used sooner. However, the logistics support of these items suffers since there is less time to test and plan for spare parts, training facilities, and support equipment. More assets are needed during the initial planning stages for these items to identify and produce the support structures needed for the life of the system. Finally, the shift of logistics support from an organic, military support system to a commercial support system has certain cost savings that are realized early in the program, but may have long-term effects in terms of security risk and overall life-cycle cost.

**DoD KEY TECHNOLOGY AREAS:** Air Vehicles, Materials, Processes, and Structures

**KEYWORDS:** Naval Aviation, Acquisition, Commercial Items, Non-Developmental Items, Logistics Support

### **DETERMINANTS OF NONPARTICIPATION IN THE UNITED STATES ARMY RESERVE**

**Aimee L. Kominiak-Captain, United States Army**

**B.S., United States Military Academy, 1987**

**Master of Science in Management-December 1997**

**Advisor: Robert Barrios-Choplin, Department of Systems Management**

**Second Reader: Gregory Walls, Department of Systems Management**

The end of the Cold War generated military budget constraints and downsizing that resulted in the active force having to rely on Reserve component support. Enlisted losses in the USAR, however, have been increasing. For FY97, approximately 23% of enlisted losses were due to unsatisfactory participation. These losses equate to lost training dollars and decreased force readiness. The objectives of this thesis are to identify the factors that lead to unsatisfactory participation within U.S. Army Reserve units, and recommend changes which should lead to increased participation and force readiness. This study has used a methodology that involved talking to reservists, who left their units, to discuss the reasons and timing of their decisions to depart. An integrated model has been developed as a framework to study the Reserve organizational socialization process. Many identified unmet expectations in training and leadership areas, and many exited because they were unable to resolve these dissatisfactions. Unit leadership exacerbated these problems through little or ineffective attempts to rectify the reservists' problems, as well as inadequate efforts to influence the reservist to return to the unit. Recommendations include: providing new reservists realistic job previews; emphasizing the importance of the first training weekend and the sponsorship program in leadership training; expanding the unit retention sergeant's duties to cover the entire scope of the retention process; and publicizing and rewarding "best practices."

## 1998 THESIS ABSTRACTS

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**KEYWORDS:** Army Reserve, Turnover, Nonparticipation, Personnel Readiness

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

### **THE FISCAL, MARITIME, AND NATIONAL SECURITY FACTORS INFLUENCING THE DEVELOPMENT OF THE MARITIME SECURITY ACT OF 1996 (MSA)**

**Timothy J. Kott-Lieutenant, United States Navy  
B.S., United States Merchant Marine Academy, 1990  
Master of Science in Management-December 1997**

**Advisors: Richard B. Doyle, Department of Systems Management  
VADM Philip M. Quast, USN (ret.), Admiral Michael J. Boorda Chair of Management and Analysis**

The Merchant Marine Act of 1936 established the federal government's policy of developing and maintaining a commercial merchant marine capable of carrying a substantial portion of the Nation's waterborne commerce and performing as a military auxiliary in time of war. Today the merchant marine continues to serve the Nation in commerce and provides sustainment sealift assets and skilled seafaring crews to help meet DoD strategic mobility requirements. To maintain such a fleet, a highly regulated system of subsidy payments was provided to shipowners to offset the higher costs associated with the U.S. registry. Despite the outlay of over \$14 billion in aid, the U.S. merchant marine has continually declined both in numbers of ships and the percentage of U.S. trade carried. This study examines the development of the Maritime Security Act of 1996 (MSA), and the policy decision to continue financial assistance in support of maintaining the merchant marine. To analyze the implications of this policy a comprehensive examination of congressional documents and industry publications was conducted. DoD and DoN mobility planners can benefit from this study, as the condition of the merchant marine impacts both national security and mobility readiness. The study concluded that the MSA was a compromise reflecting many interests, reducing federal investment in the program and requiring recipients of payments to make available their entire transportation infrastructures to support DoD mobility requirements in times of crisis.

**KEYWORDS:** Sustainment Sealift, Merchant Marine, Public Policy, Fiscal, National Security

**DoD KEY TECHNOLOGY AREA:** Other (Public Policy Analysis)

### **FORECASTING FINANCIAL MARKETS USING NEURAL NETWORKS: AN ANALYSIS OF METHODS AND ACCURACY**

**Jason E. Kutsurelis-Lieutenant, United States Navy  
B.S., United States Naval Academy, 1991  
Master of Science in Management-September 1998**

**Advisors: Katsuaki Terasawa, Department of Systems Management  
William R. Gates, Department of Systems Management**

This research examines and analyzes the use of neural networks as a forecasting tool. Specifically a neural network's ability to predict future trends of Stock Market Indices is tested. Accuracy is compared against a traditional forecasting method, multiple linear regression analysis. Finally, the probability of the model's forecast being correct is calculated using conditional probabilities. While only briefly discussing neural network theory, this research determines the feasibility and practicality of using neural networks as a forecasting tool for the individual investor. This study builds upon the work done by Edward Gately in his book *Neural Networks for Financial Forecasting*. This research validates the work of Gately and describes the development of a neural network that achieved a 93.3 percent probability of predicting a market rise, and an 88.07 percent probability of predicting a market drop in the S&P500. It was concluded that neural networks do have the capability to forecast financial markets and, if properly trained, the individual investor could benefit from the use of this forecasting tool.

## 1998 THESIS ABSTRACTS

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**DoD TECHNOLOGY AREAS:** Modeling and Simulation, Other (Artificial Intelligence, Neural Networks)

**KEYWORDS:** Neural Networks, Finance, Time Series Analysis, Forecasting, Artificial Intelligence

### **FORECAST MODELING FOR ESTIMATING BASE REALIGNMENT AND CLOSURE (BRAC) ENVIRONMENTAL RESTORATION COSTS**

**Brent J Kyler-Lieutenant, United States Navy  
B.S., Drexel University, 1989**

**Master of Science in Management-December 1997**

**Advisors: John E. Mutty, Department of Systems Management  
Shu S. Liao, Department of Systems Management**

The U.S. military has faced imposing force structure reductions during the last decade. Complementing the force structure reductions, four rounds of Base Realignment and Closure (BRAC) have been authorized to reduce surplus infrastructure. However, as the BRAC process unfolds, environmental cost issues are being placed under ever increasing scrutiny. Military environmental restoration costs have risen sharply (and above expectations) in recent years, with the unanticipated cost growth occurring most visibly for bases on the BRAC lists.

The complexity of the environmental clean-up enterprise, the numerous and varied regulatory requirements, and the uniqueness of individual installations have led to tremendous difficulty in effective budgeting. In today's austere budgetary environment, a reliable expenditure model is essential to accurately demonstrate the resource requirements necessary to complete suitable environmental restoration and subsequent transfer/reuse of BRAC lands.

To meet the need for an accurate and functional forecast model, thesis research developed and validated a tenable Department of the Navy (DoN) BRAC environmental restoration cost forecast model. The developed model utilized a comprehensive and inclusive multiple regression data analysis to arrive at the most statistically significant set of installation restoration parameters. A spreadsheet-based forecast model implementation procedure, incorporating empirically determined "rules of thumb" for estimating the parametric effects of BRAC initiation, serves as the culminating product of the research effort.

**KEYWORDS:** Base Realignment and Closure (BRAC), Environmental Restoration, Multiple Regression Analysis

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

### **THE USE OF FINANCIAL DATA IN EVALUATING ACQUISITION PROGRAMS: THE ADVANCED FIELD ARTILLERY TACTICAL DATA SYSTEM (AFATDS) CASE**

**Marc J. LaClair-Major, United States Marine Corps  
B.A., University of Michigan, 1986**

**Master of Science in Management-December 1997**

**Advisors: William J. Haga, Department Systems Management  
Kenneth J. Euske, Department Systems Management**

As Department of Defense budgets decline, acquisition programs will be scrutinized by a number of stakeholder agencies within and outside of the Department of Defense. This study identifies the stakeholder agencies that can influence defense acquisition programs and evaluates the role that financial management information plays in shaping their objectives and interactions. A case study of the Advanced Field Artillery Tactical Data System (AFATDS) Program was used to test the relevance of financial data by the stakeholder groups.

The relevance of financial data varies between stakeholder groups. The quantifiable nature of financial data leads to its precedence over user's requirements during debate over program direction. The selective presentation of financial data influenced the way it was interpreted.

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## 1998 THESIS ABSTRACTS

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influenced the way it was interpreted.

**KEYWORDS:** Acquisition, AFATDS, Financial Management, Program Evaluation, Stakeholders

**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Other (Financial Management)

### THE IMPACT OF PAY ON NAVY PHYSICIAN RETENTION IN A HEALTH CARE REFORM ENVIRONMENT

Michael N. Lane-Lieutenant, United States Navy

B.A., National University, 1992

Master of Science in Management-March 1998

and

Brendan T. Melody-Lieutenant, United States Navy

B.S., University of Scranton, 1991

Master of Science in Management-March 1998

Advisors: Stephen Mehay, Department of Systems Management

Michael Cook, Department of Systems Management

James Scaramozzino, Institute for Defense Education and Analysis

Physicians are the most difficult health care professional group to retain on active duty beyond their first obligated tour. A major problem is the disparity between military and civilian physician income. In fiscal year 1997, the Department of the Navy spent approximately \$135 million in specialty pay on the Navy's 4,000 active duty physicians. Health care reform has altered the demand for specialty and primary care physicians, accelerating the movement toward managed care. In this thesis, the authors quantify the role of the pay differential using a multivariate logistic model and conclude that the civilian-military pay differential has a significant influence on the probability that a physician remains in the Navy. Physician personnel and earnings data were gathered from the Defense Manpower Data Center, the American Association of Medical Colleges, and the Hay Group. Results indicate that recent shifts in demand have resulted in a greater sensitivity of retention to pay for primary care physicians. Specialty specific elasticities can be applied to analyze the expected impact of pay on retention of representative pay plans. Increases in pay to the civilian median level would substantially increase retention, but would be costly. This changing military environment in union with health care reform may be cause for the Navy to re-evaluate its physician pay structure and examine options for the amount, attached obligation, and recipients of medical special pays.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Physician Compensation and Retention, Specialty Pay, Health Care Reform

### A COMPARATIVE ANALYSIS OF GRADUATE MANAGEMENT EDUCATION

John A. Lathroum-Lieutenant Commander, United States Navy Reserve

B.A., Western Maryland College, 1981

Master of Science in Management-March 1998

Advisors: Gail Fann Thomas, Department of Systems Management

Nancy C. Roberts, Department of Systems Management

This thesis analyzes the top ten Master's of Business Administration (MBA) programs and top ten Public Management programs in the United States and has established a definition of quality in graduate management education in terms of programs offered, students selected, and faculty.

The top ten MBA and Public Management programs were then compared to the Master of Science (MS) in Manage-

## 1998 THESIS ABSTRACTS

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and Public Management curricula by requiring an extensive mission-related project (thesis), prior professional work experience, and learning through a team based orientation.

Keeping with its mission, the Department of Systems Management offers curricula that span programs from both MBA and Public Management. Because of this broader scope, the average length for the MS in Management at NPS is about two months longer than the average MBA and Public Management program. Additionally, the average total courses taken are the same as the average MBA program but six more than the average Public Management program. Students at NPS are selected based on academic and leadership ability instead of GMAT and GRE scores used at the selected schools. Finally, the faculty are a civilian and military mix whose goal is to produce quality graduates to fill subspecialty billets for the DoD.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Graduate Management Education, Master of Business Administration, Public Management

### **COMPETING GOALS OF THE GOVERNMENT WIDE PURCHASE CARD PROGRAM: CUSTOMER SATISFACTION, VENDOR ROTATION, FAIR AND REASONABLE PRICING**

**Thomas E. Leard-Major, United States Marine Corps  
B.S., University of Pittsburgh, 1982**

**M.S., University of Southern California, 1986**

**M.A., Naval Postgraduate School, 1991**

**Master of Science in Management-June 1998**

**Advisors: James L. Kerber, Department of Systems Management**

**Mark W. Stone, Department of Systems Management**

The rapidly developing Government Wide Commercial Purchase Card (GCPC) Program primarily affects commercial procurements valued at \$2,500 or less, which comprise more than 90 percent of all acquisition transactions. It is considered a major contributor to streamlining the procurement process. The program is efficient, but little research has been done on its effectiveness. This thesis analyzed the Navy/Marine Corps Purchase Card Program by modeling the purchasing process, then determining if the program goals of customer satisfaction, rotating orders among vendors, and obtaining products and services at a fair and reasonable price were effectively achieved or whether goal conflicts in any way hindered full implementation of the program. Specifically, measurements were collected on goal achievement and goal congruence at the installation level using the Naval Postgraduate School (NPS) as an example. The NPS program was effective in achieving strategic goals. While end-users anticipated a potential problem meeting the goal of vendor rotation while also achieving customer satisfaction and a fair and reasonable price, there was actually no significant problem found in achieving all three goals. There was fundamental goal congruence. The methodology presented could be used for further research, potentially streamlining the program for other installations by determining the effectiveness of goal achievement.

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management, Contracting)

**KEYWORDS:** Government Wide Purchase Card Program



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## 1998 THESIS ABSTRACTS

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### **CANNIBALIZATION AT THE PACIFIC FLEET F/A-18 TRAINING SQUADRONS**

**Karon R. Lewis-Captain, United States Marine Corps  
B.S., United States Naval Academy, 1990**

**Master of Science in Management-December 1997  
and**

**Racquel M. Williams-Lieutenant, United States Navy  
B.S., United States Naval Academy, 1990**

**Master of Science in Management-September 1997**

**Advisors: Donald R. Eaton, Department of Systems Management**

**William R. Gates, Department of Systems Management**

This thesis analyzes cannibalization as it affects the Pacific Fleet Navy and Marine Corps F/A-18 Fleet Replacement Squadrons. This thesis researches the supply/support posture of the F/A-18, identifies its shortcomings, analyzes the cannibalizations performed by the squadrons and determines the impact and usefulness of cannibalizations. An increase in cannibalizations increases component failure rates. Cannibalization doubles maintenance man-hours and depletes valuable resources. The data showed no clear linear relationship between cannibalizations and mission capable rate, flight hours completed, sorties completed or direct maintenance man-hours. There were many inconsistencies between different data sources. Cannibalizations should be kept to a minimum. More specific guidance is needed for cannibalization. A better tracking system is needed to capture all cannibalization data. Incentives should be incorporated to encourage truth and accuracy in reporting.

**KEYWORDS:** Cannibalization, Maintenance, Supply, Spare Parts

**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

### **PRIVATIZATION OF WATER IN GOVERNMENT OWNED HOUSING: A FORECASTING MODEL**

**John E. Lobb-Lieutenant Commander, United States Navy  
B.S., United States Naval Academy, 1986**

**Master of Science in Management-December 1997**

**Advisors: Shu S. Liao, Department of Systems Management**

**John E. Mutty, Department of Systems Management**

This thesis examines the option of privatizing water utilities, requiring residents of Government Owned Housing (GOH) to pay for all consumption. To assist in the payment, a Water Allowance (WA) would be provided to residents based on the average consumption of local Private Sector Housing (PSH) residents. The goal of this thesis is to determine if implementing a WA would reduce the overall water consumption in GOH. Specifically, it determines the historical usage of water in the Naval Postgraduate School's La Mesa Housing Village (LMV) area and the local PSH areas. It then develops forecasting models for both areas to predict the future consumption of water, sets a baseline consumption rate for LMV residents, and identifies the savings that would be generated from implementing the WA program.

After validating the forecasting models and comparing costs under the WA concept, this study concludes that the WA concept would save approximately \$18,355 annually at LMV alone. Although, the WA concept does not meet the Navy's goal of identifying and implementing by 2005 all life cycle cost-effective water conservation measures with a payback period of less than 10 years, it does recoup the initial metering cost of \$237,200 in 12.7 years. By implementing a WA concept, the projected savings in LMV alone are approximately 6.1% per person per day. Although the study focuses on LMV, it is assumed that similar water consumption inefficiencies are being demonstrated in other GOH areas.

**KEYWORDS:** Utilities, Government Owned Housing, Privatization, Water Utilities, Modeling and Simulation

**DoD KEY TECHNOLOGY AREAS:** Modeling and Simulation, Other (Water Utilities)

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## 1998 THESIS ABSTRACTS

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### **INCENTIVE CONTRACTS: TAKING THE GUESS WORK OUT OF SETTING FLEET AVIATION CONSOLIDATED ALLOWANCES (AVCAL)**

**Arturo A. Lopez-Lieutenant Commander, United States Navy**

**B.S., United States Naval Academy, 1984**

**Master of Science in Management-June 1998**

**Advisors: Jeffrey R. Cuskey, Department of Systems Management**

**Katsuaki Terasawa, Department of Systems Management**

Over the years in an attempt to create cost savings, the Navy has changed its ways of determining parts allowances. Originally, the Navy used Demand Based Allowancing, in which parts allowances were assigned based upon Original Equipment Manufacturer recommendations, and fleet demand. In the late 1980's, the Navy changed its parts allowancing to Readiness Based Sparing.

During this same time, the parts managers at the Navy Inventory Control Points (ICPs) have received reduced funding for parts support. As a result, parts have been transferred from one deploying unit to the next deploying unit.

This thesis studied the possibility of using incentive contract types in an attempt to ensure the allowances provided to the fleet are accurate and meaningful. Additionally, the use of an incentive-type contract can be used to ensure the parts required to fill the assigned allowances are available to the fleet at Material Support Date (MSD).

This study conducted a comparative analysis of past (post MSD) and present (at MSD) weapon systems to identify costs and benefits associated with the use of incentive-type contracts. Lastly, this study identified a system that has not reached MSD (future) which could possibly benefit from an incentive-type contract.

**DoD KEY TECHNOLOGY AREA:** Other (Contracting)

**KEYWORDS:** Incentive Contracts, Supply Logistics Support, Supply Parts Allowancing

### **A STATISTICAL ANALYSIS OF THE DETERRENCE EFFECTS OF THE MILITARY SERVICES' DRUG TESTING POLICIES**

**Antonio Martinez-Captain, United States Marine Corps**

**B.S., University of Utah, 1992**

**Master of Science in Management-March 1998**

**Advisors: Stephen L. Mehay, Department of Systems Management**

**Rosalie Liccardo Pacula, University of San Diego**

This thesis examines the magnitude of the deterrence effect associated with the military services' drug testing policies. Using data from the 1995 Department of Defense Survey of Health Related Behaviors Among Military Personnel and the 1995 National Household Survey on Drug Abuse, illicit drug use rates are modeled as a function of pertinent demographic characteristics.

The natural variation in drug testing policies is exploited to estimate the deterrence effects of such programs. The first analysis relies on the variation in drug testing policies among the military services. The second analysis relies on the difference in the extent of drug testing between the military and civilian sectors. Non-linear maximum likelihood (logit) techniques are used to estimate the deterrence effects.

The results indicate a significant deterrence effect associated with the frequency and intensity of the services' drug testing program both in comparison to each other and in comparison to the civilian sector. However, omission of price and income controls may have caused overestimation of the true deterrence value. Further study using more sophisticated techniques is recommended to clarify this potential bias.

## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Modeling and Simulation

**KEYWORDS:** Manpower Policy Analysis, Demographic Modeling, Illicit Drug Use, Alcohol Use, Tobacco Use

### **PROCESS INNOVATION: ANALYSIS AND REDESIGN OF THE CALIFORNIA ARMY NATIONAL GUARD STATE EMERGENCY MOBILIZATION PROCESS**

**Patrick F. McGuire-Captain, United States Marine Corps**

**B.S., Pennsylvania State University, 1992**

**Master of Science in Information Technology Management-September 1998**

**and**

**David A. White-Lieutenant, United States Navy**

**B.S., Jacksonville University, 1990**

**Master of Science in Information Technology Management-September 1998**

**and**

**Andrew J. Palan-Captain, United States Marine Corps**

**B.A., University of Missouri-Columbia, 1991**

**Master of Science in Information Technology Management-December 1998**

**Advisors: Suresh Sridhar, Information Systems Academic Group**

**Mark E. Nissen, Department of Systems Management**

Process innovation can empower an organization to realize orders of magnitude improvement in its key business processes. Through process redesign, information technology can be used as an enabler to support effective, efficient, and cross-functional business processes. The area of research for this thesis is the analysis and redesign of the State Emergency Mobilization Process (SEMP) of the California Army National Guard. This is accomplished through a detailed study of the State Emergency Mobilization Process with an emphasis of the key business processes of the California Army National Guard. The baseline process will be measured and diagnosed for inhibiting pathologies, and redesigned processes will be proposed based on benchmarking best practices of other organizations and by utilizing Process Innovation best practices. Critical process enablers such as people, culture and technology will be examined and applied to redesign alternatives. Once completed, the best redesigned business process will be recommended and an implementation plan drafted to integrate with the CA-ARNG Strategic Information Systems Plan.

**DoD KEY TECHNOLOGY AREA:** Other (Process Innovation)

**KEYWORDS:** California Army National Guard, Benchmarking, Reengineering, CA-ARNG, Change Management

### **THE IMPLICATIONS OF THE EBC SCORECARD ON THE SKILLS, ROLES, AND TOOLS OF NAVY MTF COMPTROLLERS**

**Jeannette Lucas-Lieutenant Commander, United States Navy**

**B.A., Oakwood College, 1982**

**M.H.C. A., University of Mississippi, 1984**

**Master of Science in Management-June 1998**

**Advisors: O. Douglas Moses, Department of Systems Management**

**James A. Scaramozzino, Institute for Defense Education and Analysis**

The United States Health Care System and the Military Health System (MHS) have long been faced with escalating health care cost. Implementing a managed care strategy, a system designed to integrate financing and delivery of appropriate health care services, has been viewed as the answer. As a result of implementing managed care, the MHS has transitioned from a workload-based financing methodology to a capitation methodology. Initially, the MHS implemented "modified capitation" financing. Effective FY-1998, the MHS began phasing-in the latest version of capitation, enrollment-based

## 1998 THESIS ABSTRACTS

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capitation (EBC). Under EBC, military treatment facility (MTF) Commanders' performance will be tracked and scored on an EBC Scorecard.

The purpose of this thesis is to present a baseline assessment, describing new skills, roles and tools which comptrollers of Navy MTF are adopting to improve their MTF's performance under the indices of the EBC Scorecard. To address this issue, MTF Comptrollers from four medium-sized Navy MTFs were asked to participate in a survey. The survey instrument was designed based on indices of the EBC Scorecard; strategies and initiatives available to improve performance on the EBC Scorecard; and skills and tools available to MTF Comptrollers. The results from this research indicates that MTF comptrollers are not involved in the implementation of EBC; nor are they aware of strategies and initiatives being implemented by private sector managed care organizations and the MHS; nor are they using some of the tools and skills which could improve their performance. MTF Comptrollers need to understand the implications of EBC on their future budgets.

**DoD TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS:** Managed Care, Enrollment-Based Capitation, Medical Treatment Facility

### MAINSTREAMING MILITARY COMPENSATION: PROBLEMS AND PROSPECTS

**David J. MacDonald-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1990**

**Master of Science in Management-September 1998**

**Advisors: Richard B. Doyle, Department of Systems Management**

**John E. Muty, Department of Systems Management**

Changes to the military retirement system in the 1980's and attention by law makers, military leadership, and service members to pay comparability between the private sector and the military indicate that current military compensation policies may be inadequate to recruit and retain the necessary personnel. This thesis examines the military retirement system in light of developments in private sector retirement policy. It also examines the pay structure used in the military and addresses current pay gap issues. Defined contribution plans in the private sector have been increasingly successful in public and government organizations. Examples include the Federal Employees Thrift Savings Plan and Section 403 (b), Section 457, and Section 414(h)(2) tax-deferred retirement plans. These plans benefit employees in retirement by providing them with tax incentives to encourage saving during their working years. The recent introduction of the Roth IRA provides individuals a new opportunity to save for retirement years. The success of the U.S stock market since the 1970's indicates that saving through a defined contribution plan or IRA may provide income security for retirement years. It is concluded that the current military retirement system may have to be modified to reflect these developments in the private sector. Prospects for reform include some form of defined contribution plan for military members, eliminating or reducing the perceived pay gap, restructuring the military pay system, and improving DoD's financial management programs.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Other (Public Policy Analysis)

**KEYWORDS:** Military Retirement, Compensation, Federal Employee Retirement System, Personal Financial Management, Defined Contribution Plans, Individual Retirement Accounts

## 1998 THESIS ABSTRACTS

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**INDONESIA: THE ECONOMIC CRISIS 1997-1998**  
Desi Albert Mamahit-Lieutenant Commander, Indonesian Navy  
B.S., Indonesian Naval Academy, 1984  
Master of Science in Management-June 1998  
Advisors: K.L. Terasawa, Department of Systems Management  
William R. Gates, Department of Systems Management

This paper provides a short study of Indonesia's economic performance before July 1997 and an early diagnosis of the economic crisis in Indonesia, which occurred from July 1997 to March 1998. After achieving a remarkable economic development success over the past several decades, Indonesia unavoidably had to face economic difficulties. What are the causes of economic crisis? To answer this question is the purpose of this paper. The paper finds that the combination of several factors contributed to the creation of the economic crisis, the factors are: Thailand's economic crisis; contagion/spillover effects; Indonesia's structural weakness, debt and crisis of confidence; globalization and integration within the financial/capital market; investors and panic-stricken lenders; speculative attacks; socio-political factors, drought, and forest fires; and foreign exchange rate regimes.

**DoD KEY TECHNOLOGY AREA:** Other (International Macroeconomic Policy)

**KEYWORDS:** Financial Crisis

**AN ANALYSIS OF THE IMPACT OF MILITARY EXPORT OFFSETS  
ON THE UNITED STATES INDUSTRIAL BASE**  
David G. McCord-Captain, United States Marine Corps  
B.S., United States Naval Academy, 1989  
Master of Science in Management-September 1998  
Advisors: Thomas H. Hoivik, Department of Operations Research  
Sandra M. Desbrow, Department of Systems Management

The purpose of this thesis is to determine what effect the growth of offsets, as a condition of sale of military articles, has had on the U.S. defense industrial base. These effects are measured by assessing how this trade practice has impacted the employment, trade, and competitiveness of the U.S. defense industry. Additionally, the present U.S. Government policy towards offsets is explained. Analytical data taken from both Office of Management and Budget and Department of Commerce reports are presented and analyzed. Interviews with large and small- to medium-sized business spokesmen, in addition to Department of Commerce experts, are presented to augment the quantitative results. Different levels of U.S. Government oversight are explained as well as their advantages and disadvantages. The macroeconomic effects of offsets on the U.S. defense industry are inconclusive. However, offsets do seem to impact the U.S. defense industry adversely at the subcontractor level when specific industrial sectors are analyzed. Large defense contractors view offsets as a necessary marketing tool in order to maintain global competition. Most small- to medium-sized contractors do not support the use of offsets, claiming that they export jobs and work orders overseas, eroding the defense industrial base at the subcontractor level.

**DoD KEY TECHNOLOGY AREA:** Other (Defense Industrial Base)

**KEYWORDS:** Defense Contractors, Offsets, Defense Industrial Base, Defense Industry

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## 1998 THESIS ABSTRACTS

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### **GUIDANCE FOR THE IMPLEMENTATION OF MARKET RESEARCH FUNDAMENTALS AT A DEPARTMENT OF DEFENSE FIELD CONTRACTING ACTIVITY**

**James A. McCormack-Lieutenant Commander, United States Navy**

**B.S., Western New England College, 1986**

**Master of Science in Management-December 1997**

**Advisors: David V. Lamm, Department of Systems Management**

**David A. Smith, Department of Systems Management**

As a federally mandated requirement, market research within the federal acquisition arena has made little progress since its inception well over a decade ago. It is the researcher's belief that the slow progress realized in the area of market research is due to Department of Defense Field Contracting Activities not really understanding how to incorporate the process into their existing routine and what skills are required of their personnel in order to effectively conduct market research. Furthermore, it is my belief that provided the proper guidance, or blueprint, field contracting managers will be less reluctant to incorporate a formalized market research process into their existing routine, and will realize greater success in doing so.

This thesis will investigate, analyze and promulgate the means by which a Department of Defense Field Contracting Activity can evolve from an organization totally absent of any market research capabilities, to an activity which performs effective market research. This research provides managers of Department of Defense Field Contracting Activities a blueprint for the implementation and maintenance of an effective market research process within their organizations and the metrics necessary to gauge the level of effectiveness being achieved as a result.

**KEYWORDS:** Market Research, Purchasing Research, Market Survey, Market Investigation, Acquisition Reform

**DoD KEY TECHNOLOGY AREA:** Other (Contracting and Acquisition Management)

### **ANALYSIS OF ENLISTED RECRUITING PATTERNS WITHIN THE DEPARTMENT OF THE NAVY**

**James A. McGregor-Major, United States Marine Corps**

**B.S., United States Naval Academy, 1984**

**Master of Science in Management-December 1997**

**Advisors: Katsuaki Terasawa, Department of Systems Management**

**William R. Gates, Department of Systems Management**

In order to improve business practices within the Department of the Navy, an analysis of the advantages and disadvantages of optimizing the schoolhouse and its effects upon recruiting, recruit training, and the fleet is currently underway. As part of this analysis, this thesis examines if there is an optimal recruiting pattern within both the Navy and the Marine Corps based upon historical data. With a database consisting of 23,590 enlistment records, standard statistical and quantitative methods are used to analyze DEP attrition, first-term attrition, and reenlistment rates. Additionally, the monthly cost per recruit is analyzed for four functional cost areas for the Navy area and Marine Corps district recruiting levels.

Major findings are: the longer a poolee remains in the DEP, the more likely the poolee will attrit from the DEP. Poolees who survive the DEP, however, are more likely to complete their first-term of enlistment as their time in-DEP increases. As time in-DEP increases, a Navy poolee is less likely to reenlist; in the Marine Corps, a poolee is more likely to reenlist. For both the Navy and Marine Corps, the highest quality shippers, per contract cost, occur during July, August, and January.

**KEYWORDS:** Delayed Entry Program, DEP, First-term Attrition, Reenlistment, Cost per Recruit, Optimal Recruiting Pattern

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

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## 1998 THESIS ABSTRACTS

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### **FINANCIAL ANALYSIS OF OUTSOURCING THE HELICOPTER COMBAT SUPPORT MISSION ABOARD MILITARY SEALIFT COMMAND SHIPS.**

**Michael D. McLean-Lieutenant Commander, United States Navy**

**B.S.M.E., Villanova University, 1986**

**Master of Science in Management-December 1997**

**Advisors: James M. Fremgen, Department of Systems Management**

**Shu S. Liao, Department of Systems Management**

Department of Defense leaders plan to use outsourcing to reduce operations and maintenance spending and enable them to increase procurement and research and development spending. Even functions once labeled inherently governmental are now being evaluated for outsourcing in the quest to reduce spending. One such function is the Helicopter Combat Support (HC) Mission aboard Military Sealift Command (MSC) ships.

This thesis evaluates service contract cost escalation rates and compares them to in-house cost escalation rates. Three Navy service contracts were evaluated, two aircraft maintenance contracts and one aircraft simulator maintenance contract. The purpose was to determine if the escalation rates differed enough to significantly affect DoD's ability to reduce spending through outsourcing. This thesis also determines the total in-house cost to perform the HC mission aboard MSC ships and evaluates commercial alternatives. The purpose is to establish the contract cost at which outsourcing this mission will result in long-term cost reduction.

This thesis found that service contract costs escalate faster than in-house costs in certain industries. This difference reduces or eliminates anticipated cost savings from outsourcing. The total in-house performance cost of the HC MSC mission was determined for two different options currently under consideration.

**KEYWORDS:** Outsourcing, Helicopter Combat Support, Military Sealift Command, Cost Benefit Analysis, Combat Logistic Force

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

### **LEADERSHIP SELECTION AT THE U.S. NAVAL ACADEMY: AN ANALYSIS OF BRIGADE LEADERS AND THEIR FLEET SUCCESS**

**Eric J. Micheli-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1989**

**Master of Science in Leadership and Human Resource Development-September 1998**

**Advisors: Alice Crawford, Department of Systems Management**

**Gregory Hildebrandt, Department of Systems Management**

This research analyzes the selectivity and career success of midshipmen leaders from the United States Naval Academy. Those studied are former midshipmen from the classes of 1980 through 1985 who were carefully screened by USNA's leadership selection process to hold significant leadership positions in their final year at the Academy. Using data compiled from several sources, non-linear logistic regression methodology is employed to determine statistically significant factors for selection and whether such individuals have a statistical advantage in later promotion as officers. Qualitative data in the form of surveys are used to analyze current midshipmen satisfaction with the selection process and recent midshipmen leaders. Results indicate that these midshipmen leaders were the most promising candidates for admission to the Academy and the most successful midshipmen in all areas of performance, especially academics and military conduct grades. They also are found, as a whole, to have a higher promotion rate at the Commander promotion board. However, analysis of the views of recent midshipmen and midshipmen leaders indicates that other measures, such as peer and subordinate evaluations, may improve the process of identifying the most promising leaders and role models for the Brigade of Midshipmen and the U.S. Navy.

## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Leadership Selection, Leadership Assessment, Military Officers, Officer Promotion, U.S. Naval Academy, Commissioning Sources

### **IMPLEMENTATION OF INFORMATION TECHNOLOGY IN THE FREE TRADE ERA FOR INDONESIA**

**Sinulingga Minan-Captain, Indonesian Army**

**B.S., Indonesian Military Academy, 1987**

**Master of Science in Management-June 1998**

**Advisors: William James Haga, Department of Systems Management**

**Lee E. Edwards, Department of Systems Management**

During the 1990s and early in the twenty-first century, the management of information technology in enterprises will undergo a revolutionary change in Indonesia. Previous changes were evolutionary and largely driven by the advancement in technology such as: the introduction of the operating systems in the 1960s, the introduction of the minicomputer in the 1970s, and the introduction of personal computers in the 1980s. Now, both technology and business directions are driving information technology management to a fundamentally new paradigm.

Information technology is no longer exclusive for the information systems specialists. Line business managers increasingly have taken responsibility for information technology decisions, as computing and telecommunication is becoming more and more universal.

By understanding all the changes that may transform management and information systems, managers can anticipate possible weaknesses in their organization. Given this phenomenon, managers need detailed information and a substantial source of references they can utilize to make decisions.

This thesis explores a new paradigm of information system management from the Indonesian's management perspective. Alternative approaches to solve a number of major problems that may help foreign investors understand the business environment and culture will encourage Indonesian and foreign enterprises to invest in information technology.

While this thesis is proposed for Indonesian future managers, it is also structured a reference for decisions making of information technology outsourcing based on the Indonesian culture, and possibly other Asian cultures.

**DoD KEY TECHNOLOGY AREA:** Other (Outsourcing Information Technology)

**KEYWORDS:** Information Technology Implementation

### **IMPROVED AVIATION READINESS AND INVENTORY REDUCTIONS THROUGH REPAIR CYCLE TIME REDUCTIONS USING MODELING AND SIMULATION**

**Kevin F. Mooney-Lieutenant Commander, United States Navy**

**B. A., St. Edward's University, 1984**

**Master of Science in Management-December 1997**

**and**

**Guy R. Sanchez-Lieutenant Commander, United States Navy**

**B. A., Western Washington University, 1982**

**Master of Science in Management-December 1997**

**Advisors: Keebom Kang, Department of Systems Management**

**Donald R. Eaton, Department of Systems Management**

This thesis research focuses on improved aviation readiness and reductions in pipeline inventory investment through repair Turn Around Time reductions related to the component repair processes internal to the Naval Aviation Depot (NADEP). Specific emphasis was given to the repair flow of a specific component from induction into the depot for repair to the

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## 1998 THESIS ABSTRACTS

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ultimate availability for sale to customers in a ready-for-issue status. The research models the current NADEP repair process flow and simulates enhancements to the process flow. These enhancements identify savings of over \$52,000 in repair pipeline inventory investment for the candidate item. Our model and associated simulations provide NADEP with graphical and quantitative feedback which demonstrates the impact of process flow enhancements on repair turn-around-time and work-in-process inventory efficiency.

**KEYWORDS:** Repair Turn-Around Time, Pipeline Inventory Reduction, Operational Availability

**DoD KEY TECHNOLOGY AREA:** Modeling and Simulation

### **THE MINI-TRIAL: A VALUABLE ALTERNATIVE DISPUTE RESOLUTION TOOL FOR THE UNITED STATES NAVY**

**Steven A. Morgan-Lieutenant Commander, United States Navy  
B.S., Villanova University, 1987**

**Master of Science in Management-December 1997**

**Advisors: David V. Lamm, Department of Systems Management**

**Mark W. Stone, Department of Systems Management**

In order to avoid unnecessary, time consuming, and costly litigation, the Department of Defense and more specifically the United States Navy, has adopted the use of alternative dispute resolution (ADR) to resolve contract disputes. One of the less-used, but highly successful ADR techniques is known as the mini-trial.

The primary goals of this thesis are to provide contracting professionals and attorneys with a better understanding of the mini-trial, explore how the Navy might make better use the technique, and outline the steps the Navy should take to further implement its use. The thesis provides information on the technique's background, factors for use, advantages and disadvantages, format, and roles of participants. The researcher found that there are a number of issues surrounding the mini-trial including; problems with neutrals and principals, and the perception that the Navy has been reluctant to use the technique. Principal findings from the research revealed that there are key measures of success for the mini-trial, that barriers exist to convince contractors to participate, that there are certain conditions for its use, and that the Navy will increase its use of the technique in the future. Principal recommendations are that the Navy should not second guess its principles, ensure settlement funds are paid promptly, establish an agency ombudsman to answer ADR questions, and conduct face-to-face discussions with contractors to convince them that the mini-trial and ADR are in both parties' best interest.

**KEYWORDS:** Mini-Trial, Alternative Dispute Resolution (ADR), Contract Disputes

**DoD KEY TECHNOLOGY AREA:** Other (Legal Issues, Alternative Dispute Resolution)

### **THE IMPACT OF SUBSISTENCE PRIME VENDOR ON NAVY AFLOAT FOOD SERVICE OPERATIONS**

**Christopher S. Mosher-Lieutenant Commander, United States Navy  
B.S., United States Naval Academy, 1988**

**Master of Science in Management-June 1998**

**Advisors: David A. Smith, Department of Systems Management**

**Mark E. Nissen, Department of Systems Management**

The Subsistence Prime Vendor (SPV) program represents a significant deviation from DoD's traditional subsistence inventory management system. The traditional subsistence distribution system involved storing food items in DoD owned depots and warehouses and relied upon DoD transportation assets to make deliveries to the end users. This system was determined to be overly costly and inefficient as it did not take advantage of best business practices. The SPV system relies upon commercial distributors to deliver food items directly to end users, bypassing the DoD depots and warehouse facilities. The commercial distributors use just-in-time inventory management philosophy and other best business practices to procure

## 1998 THESIS ABSTRACTS

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and distribute subsistence items much more efficiently and effectively than DoD had done previous to SPV. A concern is the prime vendor program's ability to meet the surge and sustainment of full scale military mobilization. Recommendations to reduce the risk of the Navy's surge requirements, as well as other contractual and administrative remedies are presented in this thesis. Customer, administrator, and contractor feedback are also addressed.

**DoD KEY TECHNOLOGY AREA:** Clothing, Textiles, and Food

**KEYWORDS:** Prime Vendor

### A STATISTICAL ANALYSIS OF THE DETERMINANTS OF NAVAL FLIGHT OFFICER TRAINING ATTRITION

Scott F. Murray-Lieutenant, United States Navy

B.S., Bridgewater State College, 1990

Master of Science in Management-March 1998

Advisors: Stephen L. Mehay, Department of Systems Management

Gregory G. Hildebrandt, Department of Systems Management

The purpose of this thesis is to identify factors that lead to Naval flight officer (NFO) training attrition. Data was compiled on student NFO cohorts who entered between 1991 and 1996. A multinomial logit model is specified with the dependent variable categorized into four outcomes: attrition for performance failure of the individual, attrition for medical reasons, dropping on request and passing aviation training. Independent variables utilized in the model include commissioning source, race, and undergraduate major. The statistical analysis sought to determine the effect of each of these demographic factors on the probability of attrition by reason.

The results show that commissioning source has a significant effect on attriting for performance failure and dropping on request. United States Naval Academy graduates had the lowest attrition rates for these reasons, followed by ROTC then OCS graduates. Caucasian student NFOs had the lowest attrition rates among the race categories. Undergraduate major also affects attrition behavior with technical majors succeeding (earning wings) at a slightly higher rate than non-technical undergraduate majors.

**DoD TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** NFO, Training, Attrition

### THE NAVY'S DELAYED ENTRY PROGRAM: A STUDY OF THE EFFECTIVENESS OF PREPARING RECRUITS FOR BASIC TRAINING

John D. Nell-Lieutenant, United States Navy

B.S., University of Wisconsin, 1988

Master of Science in Management-March 1998

Advisors: Alice Crawford, Department of Systems Management

Bernard Ulozas, Training Systems Division, Naval Air Warfare Center

In FY-97, over 14 percent of all recruits who entered basic training attrited and nearly one-third of these were due to motivational problems. Could adequate training in the Navy's Delayed Entry Program (DEP) provide the necessary tools to prepare recruits for basic training and reduce attrition? This thesis examines the DEP's effectiveness in preparing recruits for basic training. It examines: how well the recruits were prepared; the types of training conducted; how effectively the recruits perceived their training to be while in the DEP; use of the DEP Personnel Qualification Standards (PQS); DEP meetings; and required recruiter/recruit weekly contact. Recruits at basic training were surveyed on various questions that pertained to their time in the DEP. The findings showed that training is not being conducted in the DEP. DEP PQS is not utilized as a primary training guide. Over one-third of the recruits sampled indicated that they were not told what to expect

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## 1998 THESIS ABSTRACTS

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at basic training. Finally, over one-third of the recruits felt that the DEP did not prepare them for basic training. Recommendations were made to improve training in the DEP.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Delayed Entry Program, DEP, Attrition, Basic Training, United States Navy, Training, Great Lakes, Recruit Training Center, Commander Navy Recruiting Command, Pre-entry Level Training, Realistic Job Preview, ICW

**MITIGATING THE INEQUITY OF THE MILITARY RETIREMENT  
SYSTEM BY CHANGING THE RULES GOVERNING INDIVIDUAL  
RETIREMENT ACCOUNTS FOR SERVICE MEMBERS**

**David B. Newman-Captain, United States Marine Corps**

**B. A., The George Washington University, 1990**

**Master of Science in Management-December 1997**

**Advisors: David R. Henderson, Department of Systems Management**

**Shu S. Liao, Department of Systems Management**

This thesis provides a summary of the military retirement system's history, structure, and purpose, demonstrating that its all-or-nothing structure is unfair to the majority of service members. It reviews the structure of Individual Retirement Accounts (IRA) and the Employee Income Retirement Security Act, which governs private-sector retirement plans and their treatment by the Internal Revenue Code. It demonstrates that the inequity of the military retirement system is compounded by the fact that although the system does not comply with the minimum standards required of private-sector retirement plans, it is treated identically in determining whether the employee is eligible to deduct his IRA contributions from taxes. The thesis reviews the extensive economic literature on the IRAs' effectiveness in increasing private saving and concludes that IRAs do lead to additional saving. The thesis proposes allowing all service members to deduct their IRA contributions from taxes regardless of income, and estimates the effect of doing so on government debt and national savings. It concludes that the cost is so small—at most \$30 million annually—that cost is no obstacle to the proposal.

**KEYWORDS:** Military Retirement, Individual Retirement Account, Internal Revenue Code, Saving Incentive

**DoD KEY TECHNOLOGY AREA:** Other (Military Retirement)

**DEFENSE BUDGETING IN A CONSTRAINED ECONOMY: REENGINEERING THE BUDGET PROCESS  
TO MEET THE CHALLENGES OF A MODERNIZING ZIMBABWE DEFENSE FORCE**

**Charles H. Nhemachena-Lieutenant Colonel, Zimbabwe National Army**

**A.C.I.S., Zimbabwe, 1993**

**Master of Science in International Resource Planning and Management-June 1998**

**Advisors: Larry H. Jones, Department of Systems Management**

**Robert E. Looney, Department of National Security Affairs**

The Zimbabwe Defense Force faces a resource crisis that threatens capability to fulfill its mission to defend Zimbabwe's national interests. At the same time the National Defense Policy makes a commitment to modernize the force and the executive constantly echoes this through policy statements at various forums. The Zimbabwean economy's ability to sustain the modernization program is questionable given its failure to sustain the force in a period of low-level activity.

This paper examines ZDF's budgetary process to assess the prospects of reengineering it to meet the challenges of modernization in a constrained economy. A detailed description of the current process is presented and analyzed against relevant theory on policy analysis, reengineering, and contemporary budgeting systems, in particular PPBS.

The analysis concludes that in addition to reengineering, major strategic changes need to be made. In particular, inclusion of defense aspects in national development planning, adoption of a program or mission budgeting system, institution of the

## 1998 THESIS ABSTRACTS

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strategic planning process, evolution of an information technology strategy, and continuous improvement in human resource management would be fundamental to improvement in resource mobilization, planning and management.

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS :** Zimbabwe Defense Forces, Reengineering, Budgeting, Modernization

### **MANAGEMENT IN THE JAPAN MARITIME SELF DEFENSE FORCE: THE EFFECTS OF JAPANESE VALUES AND BELIEFS**

**Takeshi Norimatsu-Lieutenant, Japan Maritime Self Defense Force**

**B.S. Equivalent, National Defense Academy, 1991**

**Master of Science in Management-December 1997**

**Advisors: Erik Jansen, Department of Systems Management**

**Roger D. Evered, Department of Systems Management**

This thesis examines the organization and management of Japan Maritime Self-Defense Force (JMSDF) and its similarities and common features with Japanese corporate management, a common style grounded in culture and more specifically in the Japanese educational system. In nearly one hundred years organizational theory, practices, and systems were mostly transplanted from the United States and European countries. However, these systems evolved to fit the environment and culture of the Japanese people. This study investigates features and relationships among the Japanese environment, culture, educational systems, and management style. Japanese society and culture deeply effect the education system, and this system in turn socializes people in basic beliefs and values (e.g., harmony and loyalty) foundational to Japanese corporate practices (e.g., group decision making and lifetime employment). This study seeks to advance our understanding of how JMSDF participates in the same culture, is grounded in the same beliefs, and engages in similar practices as other Japanese organizations.

**KEYWORDS:** Management in the Japan Maritime Self-Defense Force, Effects of Japanese Values and Beliefs

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

### **SUITABILITY OF MRP II TO MATERIAL PLANNING FOR COMPONENT REPAIR AT NAVAL AVIATION DEPOT, NORTH ISLAND**

**Timothy J. O'Brien-Lieutenant Commander, U.S. Navy**

**B.S., State University of New York, 1983**

**Master of Science in Management-June 1998**

**Advisors: Paul J. Fields, Department of Systems Management**

**Keebom Kang, Department of Systems Management**

Manufacturing Resource Planning (MRP II) is being implemented at Naval Aviation Depot, North Island (NADEP NI) to combat chronic material deficiencies. MRP II is a planning tool designed for scheduling manufacturing activities with known demand. NADEP NI is a job shop component repair facility with component forecast error ranging up to 800 percent, making the suitability of MRP II questionable. This research studies material planning at NADEP NI to identify forecast error, probability of part replacement error, and material lead-time variability in order to make recommendations for improved success with MRP. Fifteen percent of requisitions for work-in-process components are between one and two years old. If lead-times are reduced to a maximum of one year, the planning horizon can be reduced. Work-in-process inventories can also be reduced by \$2.3 million based on 26 components sampled from the top revenue generators. Currently material is ordered five weeks prior to the repair quarter. Ordering material when the forecast is generated can reduce work-in-process inventories by \$6.2 million for the sample components.

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## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

**KEYWORDS:** MIRP II, Component Repair, Forecasting

**THE EFFECT OF COLLEGE SELECTIVITY, GRADES, AND MAJOR  
ON-THE-JOB PERFORMANCE OF OFFICERS IN THE U.S. NAVY**

**Richard F. O'Connell, Jr.-Lieutenant, United States Navy  
B.S., United States Naval Academy, 1990**

**Master of Science in Management-March 1998**

**Advisors: Stephen L. Mehay, Department of Systems Management  
William R. Bowman, Department of Economics, United States Naval Academy**

Numerous studies in the civilian sector have documented a positive relationship between college selectivity, college major, and college grade point average and job performance. This thesis investigates if such a relationship exists in the United States Navy from a sample of Officer Candidate School (OCS) officers. The OCS sample was divided into separate operational and staff officers. Two measures of performance were employed in the models: (1) promotion to Grade 04, and (2) the percentage of evaluations an officer was recommended for early promotion (RAP'd) from Grade 01 through Grade 03.

The results supported the hypothesis that for OCS operational officers, college selectivity has a positive impact on officer performance. Collegiate grade point average also showed a positive relationship. College major results showed a slight advantage for business/management majors in the promotion model, and a negative impact for staff officers with technical majors in the evaluation model. Females performed better than their male counterparts under these performance measures. Minorities received fewer evaluations RAP'd, but were not statistically affected at the Grade 04 promotion board.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** Navy Officer Performance, Navy Officer Candidate School, College Quality

**AN ANALYSIS OF THE INITIAL DECISION PROCESS OF ORGANIZING THE  
NAVY MEDICAL DEPARTMENT'S EXECUTIVE MANAGEMENT EDUCATION  
MODULE CONVERSION TO NETWORK-BASED INSTRUCTION**

**Cesar A. Odvina-Lieutenant, United States Navy  
B.S., Technological Institute of the Philippines, 1989**

**Master of Science in Management-June 1998**

**Advisors: James E. Suchan, Department of Systems Management  
Thomas R. Hazard, Institute for Defense Education and Analysis**

This thesis examines the initial decision process of organizing to convert a course module from the Navy Medical Department Executive Management Education. The objective is to track and model the process used to integrate Network-Based Instruction technology into an existing traditional classroom course of instruction. This research includes survey of Network-Based Instruction literature, and an assessment of the decision process involved. The goal is to capture the context of the key decisions made during the preliminary stage of an actual conversion project, analyze the effectiveness of the approach and if possible generate a model for future efforts.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Executive Management Education (EME), Network-Based Instruction (NBI)

## 1998 THESIS ABSTRACTS

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### AN ANALYSIS OF FACTORS THAT INFLUENCE ENLISTMENT DECISIONS IN THE U.S. ARMY

Young Yeol Oh-Major, Korean Army

B.S., Korea Military Academy, 1983

Master of Science in Management-March 1998

Advisors: Mark J. Eitelberg, Department of Systems Management

Gregory G. Hildebrandt, Department of Systems Management

The purpose of this thesis is to analyze factors that influence decisions to enlist in the U.S. Army. This thesis uses 1997 New Recruit Survey data from the Army Recruiting Command and examines new recruits who contracted between October 1, 1996 and September 30, 1997, but had not yet entered basic training. This study employs cross-tabulations and a Multi-Nomial Logit model, using PROC CATMOD, to analyze the data. The results show that recruits who differ in gender, ethnicity, past status, educational expectations, years of service, and contact initiation are influenced to enlist by different factors. Educational incentives, especially the Army's College Fund, and self-development, including "to do something I can be proud of," are given as the most important reasons to enlist. Recruiters and friends are the most influential sources of information about the Army, and TV advertisements are the most influential sources in the mass media. Key barriers to enlistment are the perceptions that service in the military is a serious obstacle to educational progress, followed by military life, and conflicting interests. Immediate family members, especially parents, are key influencers in the enlistment decision. The results suggest that the Army should strive to improve its image and service environment, as well as continue to sustain enlistment incentives and resources at an adequate level.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Recruiting, Enlistment Reason, New Recruit Survey, Multi-Nomial Logit Model, Enlistment Incentive, Advertisement, Key Barriers, Key Influencers

### DECISION SUPPORT MODEL FOR EVALUATING MK16 MINE COUNTERMEASURE SYSTEM READINESS IMPROVEMENTS

Jack Redpath O'Rourke-Lieutenant Commander, United States Navy

B.S., The Pennsylvania State University, 1984

Master of Science in Management-December 1997

Advisors: Keebom Kang, Department Systems Management

Donald R. Eaton, Department Systems Management

We have developed a decision support model to evaluate potential alternatives for improving MK 16 Mine Countermeasure (MCM) system mission readiness. Explosive ordnance disposal (EOD) resource managers are expected to maximize readiness in the face of increasing operational commitments and declining budgets. In order to remain effective in this environment, managers must take a more aggressive approach toward cost efficiency. This can be accomplished by reducing the potential variability associated with resource allocation decisions. We find we can reduce uncertainty through the use of decision support models and the application of sensitivity analysis. We will apply our model to reduce the uncertainty associated with the alternatives for improving MK 16 MCM system mission readiness.

**KEYWORDS:** Decision Support Model, Mission Readiness

**DoD KEY TECHNOLOGY AREA:** Other (Logistics Management)

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## 1998 THESIS ABSTRACTS

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### **THE IMPACT OF FULLY-FUNDED GRADUATE EDUCATION AND RESIDENT JOINT PROFESSIONAL MILITARY EDUCATION ON AVIATOR PROMOTION AND COMMAND SELECTION**

**Michael S. Orzell-Lieutenant Commander, United States Navy**

**B.S., United States Naval Academy, 1986**

**Master of Science in Management-March 1998**

**Advisors: Julie A. Dougherty, Department of Systems Management**

**Gregory E. Hildebrandt, Department of Systems Management**

The purpose of this thesis is to examine the impact that Fully-Funded Graduate Education (FFGE) and Joint Professional Military Education (JPME) have on aviator promotion to the ranks of commander and captain and on selection for command. This thesis accurately measures their impact by incorporating new measures of performance, namely good jobs. These two proxies for performance were developed to help capture those unmeasurable characteristics that do not show up on Officer Fitness Reports. This study examines officers appearing before the 1988-1994 commander and captain promotion boards. Two separate Logit models are used to estimate the effects of these educational opportunities on promotion both before and after the start of the drawdown. Separate Logit regression models for command screen are also specified for these two time periods. Model results indicate that FFGE had a significant positive impact on commander selection and a significant negative impact on command selection in the pre-FY90 period. The impact of JPME was significant and positive for promotion to commander in both periods and for command screen in the pre-FY90 period. Joint Duty Assignment had a significant and negative impact on command selection in both periods. The results of these models may reflect changes in the policies of the aviation community toward FFGE and JPME as well as differences in the officers who choose the educational opportunity. This thesis provides evidence of difficulties in combining FFGE, JPME and JDA in an aviation career.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Aviator, Education, JPME

### **SOCIOTECHNICAL SYSTEMS AS APPLIED TO KNOWLEDGE WORK**

**Ronald G. Oswald-Lieutenant, United States Navy**

**B.S., Massachusetts Maritime Academy, 1989**

**Master of Science in Information Technology Management-June 1998**

**Advisor: Frank Barrett, Department of Systems Management**

This study examines the logic behind choosing variances and the design of forums during the planning of deliberations in non-routine work environments using a Sociotechnical System design approach. This study was accomplished through review and comparison of literature on sociotechnical applications of non-routine, knowledge work environments. The traditional sociotechnical application applied to factory settings with linear and routine work tasks analyzes unit operations within an open system, identifying technical variances that contribute to problems and social roles that control the variances. A new sociotechnical approach has been developed for systems involved in non-routine, knowledge work environments. This approach focuses on deliberations formed around topics, establishes variances that lead to poor deliberations, design forums that minimize variances and gives control of variances to discretionary coalitions. These results generally support that variances contributing to poor deliberations are well established and that organizations need only identify the key variances that contribute to problems in their system. Organizations need to understand how the key variances effect the development of knowledge and how forums can be designed to enhance deliberations. This study places specific focus on the design of information technology forums that enhance knowledge development.

**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Computing and Software, Human Systems Interface

**KEYWORDS:** Sociotechnical Systems, Non-Routine Work, Knowledge Work, Deliberations

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## 1998 THESIS ABSTRACTS

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### AN ANALYSIS OF BEST VALUE PROTESTS OF 1997

John T. Palmer, Sr.-Lieutenant Commander, Supply Corps, United States Navy

B. S., The Citadel, 1988

Master of Science in Management-June 1998

Advisors: Mark W. Stone, Department of Systems Management

Sandra M. Desbrow, Department of Systems Management

Best value is the driving theme in the newly approved rewrite of the FAR Part 15. Best value is now the goal of all negotiated Government procurements. One measure of contracting officer effectiveness is to examine protest decisions handed down by the General Accounting Office (GAO). This thesis examines all protest decisions of best value awards from 1997. The research reveals a sustainment (success) rate of 19.44 percent for 1997. GAO's published sustainment rate for all protests is 12 percent for the same year.

Best value sustainments (21 total) are first categorized in this thesis by agency improprieties in the evaluation of a tradeoff element (e.g., past performance, technical merit, cost/price, or labor qualifications) or improper pre- or post-award changes. The sustainments are then thoroughly analyzed to reveal pitfalls which contracting officers must avoid to preclude protest sustainment.

These pitfalls are then incorporated into a final analysis where they are merged with the contracting process (acquisition planning, solicitation, source evaluation/selection, negotiation, and award resulted in sustainment in 1997 are uncertainty of requirements, poorly crafted solicitations, failure to follow solicitations, failure to use all relevant facts, failure to evaluate total cost/price, improper cost/price realism analyses, pre-award solicitation changes without modification, failure to hold meaningful discussions when required, failure to support contract award with narrative, out-of-scope post award changes, and contract administrative improprieties.

**DoD KEY TECHNOLOGY AREA:** Other (Procurement)

**KEYWORDS:** Best Value Contracting, Best Value Protests

### THE NAVAL OFFICER OF 2020

Daniel L. Packer Jr.-Lieutenant, United States Navy

B.S., United States Naval Academy, 1992

Master of Science in Management-September 1998

Advisors: George Thomas, Department of Systems Management

Julie Filizetti, Department of Systems Management

The naval officer of 2020 must be different than the naval officer of today. The environment has changed and the military and the naval service must change with it. For the naval service to be effective and relevant in the dynamic and uncertain environment of the future, the Navy must be fast, responsive to change as measured in seconds and minutes rather than the hours and days of the past. This necessitates that the combat forces, at least, within the Navy be organized in a very flat hierarchy. There will be little or no time for information to flow up and down the chain of command. Decisions are going to have to be made at the lowest level possible. Consequently, the Navy will require officers capable of making decisions and officers capable of leading decision makers. The intent of this thesis is to frame a dialogue about the future naval officer by creating a vision of the naval officer of 2020 and presenting recommendations for the development and management of these officers.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Naval Officer, Officer Personnel Management, Revolution in Military Affairs, Network Centric Warfare, Professional Military Education, Manpower



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## 1998 THESIS ABSTRACTS

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### **A NAVAL RESERVE DATABASE APPLICATION AND FUTURE NETWORK SOLUTIONS**

**Bruce M. Patrou-Commander, United States Naval Reserve  
B.S., University of West Florida, 1981**

**Master of Science in Information Technology Management-June 1998**

**Advisors: Suresh Sridhar, Information Sciences Academic Group**

**William R. Gates, Department of Systems Management**

This thesis develops a Naval Reserve squadron database management system prototype and provides recommendations on future network solutions. The development centers on a Strike Fighter Squadron 203 (VFA-203), located in Atlanta, Georgia.

This project focuses on an application, which will support those current critical administrative systems that are not electronically automated or do not reside in a distributed computing environment. Emphasis is on utilizing current hardware and software while minimizing costs, training and organizational change associated with new information systems. Database scalability using Access 97 and IT 21 compliance are important features of this system.

A small local area network (LAN) option in a Peer-to-Peer configuration is discussed as a means to increase system efficiency by providing distributed access to this application. Future client/server network architecture capable of far greater scalability, network sharing and security will be recommended for further increases in system effectiveness.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Database Management System, DBMS, Access 97 Software, Local Area Network, LAN

### **THE FUTURE OF THE CHILEAN SHIPBUILDING AND DOCKING COMPANY-ASMAR: A STRATEGIC MANAGEMENT MODEL ANALYSIS**

**Heinz J. Pearce-Captain, Chilean, Navy**

**B.S., Chilean Naval Engineering School, 1980**

**Master of Science in Management-December 1997**

**Advisors: Nancy C. Roberts, Department of Systems Management**

**Roger D. Evered, Department of Systems Management**

This study describes and defines five different management models applied to major naval or government shipyards. The study also addresses the importance of the shipyard industry to the national interest of a nation. The study analyzes the shipyard industries of the North Hemisphere in the United States, Great Britain, Germany, France, and Spain and in the Southern Hemisphere of Argentina, Brazil, Colombia, Peru, Venezuela, and Chile. Although the study concludes that the shipyard industry in the world is in crisis, it also shows that each country has unique problems, which require unique solutions depending on the country or region. The study includes a summary of the political environment and economic trends of each country. The shipyard industry is a highly competitive market. For the North Hemisphere countries, the solution has been management model changes and cooperative work among the shipyards. For South American countries the solution is unique to each nation. In these nations the solution consists primarily of government actions establishing new maritime policy. These policies result usually in management model changes. The study also examines the managerial evolution of some major naval shipyards as a way to capitalize on this experience in the light of the South American defense development trends and the realities of Chilean defense. At the present time Chile does not have an explicit defense policy. The study concludes with the recommendation that the most appropriate management model for the future of ASMAR-Shipbuilding and Docking Company is the Government Owned, Navy Managed Model. This assumes, of course, the current defense norms.

**KEYWORDS:** Shipyard Management, Strategic Management, Chile, South America, ASMAR

**DoD KEY TECHNOLOGY AREA:** Other (Strategic Management)

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## 1998 THESIS ABSTRACTS

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### **DATA REQUIREMENTS FOR AVAILABILITY-BASED SPARING IN THE U.S. MARINE CORPS**

**Craig B. Penrose-Captain, United States Marine Corps  
B.S., San Francisco State University, 1988**

**Master of Science in Information Technology Management-September 1998**

**Advisors: Kevin R. Gue, Department of Systems Management**

**Mark E. Nissen, Department of Systems Management**

Availability based sparing was prescribed for use in all the military services by the DoD in 1985. Since then, the Army, Navy, and Air Force have all implemented, in varying degrees, availability based models; however, the Marine Corps has made little progress. Recent studies by the Center for Naval Analyses (CNA) suggest that the Marine Corps has a difficult road ahead as it seeks to implement such models. Among the most demanding challenges are the requirements for more detailed and accurate data. While the CNA studies examined a full-scale implementation of availability-based sparing, we argue that the Marine Corps can, and indeed should implement such models on a limited scale with data from current information systems. Because availability-based sparing models have different data requirements than the Marine Corps demand configured supply (SASSY) and maintenance (MIMMS) logistical information systems, we recommend changes to these systems in order to implement a full-scale availability-based model.

**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

**KEYWORDS:** Inventory Management, Readiness Based-Sparing, USMC Inventory Policy, Precision Logistics

### **THE EFFECT OF MILITARY SERVICE AND SKILL TRANSFERABILITY ON THE CIVILIAN EARNINGS OF VETERANS**

**Steven J. Petroff-Lieutenant, United States Navy  
B.A., Old Dominion University, 1990**

**Master of Science in Management-March 1998**

**Advisors: Stephen L. Mehay, Department of Systems Management**

**Michael D. Cook, Department of Systems Management**

This thesis analyzes the effect of military service on the civilian earnings of veterans. It specifies and estimates log-earnings models to obtain the impact of: (1) veterans' status, (2) transferability of military-acquired skills, and (3) length of service. Data from the 1992 Reserve Components Survey was used to develop a matched comparison group analysis between veterans (reservists with between two and twenty years of active service) and nonveterans (reservists with less than two years of active service). The results indicate a small negative effect of veterans' status on both male and female veterans' earnings. When examined separately by branch of service, male Army veterans suffered earnings penalties, male Navy veterans experienced no earnings differentials, and male Air Force and Marine Corps veterans received earnings premiums. Female Navy veterans suffered earnings penalties, with no differentials noted for female veterans of the other branches. Examining earnings by reserve component revealed that male Army Reserve, Army National Guard, Naval Reserve, and Air Force Reserve members received earnings penalties with no differentials noted for Air National Guard or Marine Corps Reserve veterans. Veterans of all services, with the exception of the Army, benefited from having transferable military skills. Length of active duty service had no significant impact on veterans' earnings.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Veterans, Post-Service Earnings, Military Service, Military Training, Transferability, Earnings Function, Human Capital, Reserve Component

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## 1998 THESIS ABSTRACTS

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### THE RECRUITMENT OF AFRICAN-AMERICAN HIGH SCHOOL STUDENTS INTO THE NAVAL RESERVE OFFICERS TRAINING CORPS

Wanda G. Pompey-Lieutenant, United States Navy

B.S., New York University, 1986

Master of Science in Management-September 1998

Advisors: Alice Crawford, Department of Systems Management

Mark J. Eitelberg, Department of Systems Management

This thesis addresses the recruitment of African-American high school students for Naval Reserve Officers Training Corps (NROTC) programs, with an emphasis on programs located at Historically Black Colleges and Universities. The study seeks to determine if the current recruitment process is adequate to meet the needs of the Secretary of the Navy's "Enhanced Opportunities for Minorities Initiative." This initiative is a recruiting strategy designed to increase the number of minorities on active duty and to create a culturally diverse force that reflects the racial composition of the United States. This thesis draws upon information from Pers-61, Navy Recruiting Command, the Center for Navy Education and Training, and NROTC units, as well a survey conducted with current and former recruiters. Also examined are statements by the Chief of Naval Operations, Chief of Naval Personnel, Commander of Naval Recruiting Command and numerous other Flag Officers in briefings held at the 1998 National Naval Officers Association Conference. A major theme that emerged from the study is that the Navy should enhance its visibility and use more African-Americans in minority recruiting programs for the officer corps.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Minority Officers, Minority Recruitment, Race in Military, Blacks in the Navy, Population Representation, Naval Reserve Officers Training Corps

### AN ANALYSIS OF THE FEASIBILITY OF OUTSOURCING CONTRACT ADMINISTRATION FUNCTIONS WITHIN THE DEFENSE CONTRACT MANAGEMENT COMMAND

Douglas P. Porter-Lieutenant Commander, United States Navy

B.A., California State University, Bakersfield, 1986

Master of Science in Management-June 1998

Advisors: Janice M. Menker, Department of Systems Management

Sandra M. Desbrow, Department of Systems Management

Secretary of Defense William Cohen announced on November 10, 1997 the Defense Reform Initiative (DPI) which essentially outlines a plan to mirror those business practices that American industry has successfully used to become leaner, more flexible and more competitive. The DPI calls for a reduction in DoD infrastructure by means of subjecting the positions of 120,000 civil-service personnel performing non-inherently Governmental functions to the competitive A-76 process with private firms and other Government agencies during the next five years.

The Defense Contract Management Command (DCMC) which provides central contract administration services to DoD customers, has not historically pursued outsourcing as a means to reduce costs. This thesis examines outsourcing through the A76 process, its advantages, disadvantages and its feasibility, applicability and current use at DCMC.

**DoD KEY TECHNOLOGY AREA:** Other (Contract Administration)

**KEYWORDS:** Outsourcing, Privatization, Inherently Governmental, Infrastructure, Contractor Self-Oversight, DCMC

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## 1998 THESIS ABSTRACTS

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### **COSTS AND BENEFITS OF SOFTWARE PROCESS IMPROVEMENT**

**Karen D. Prenger-Civilian**

**B.S., National University, 1983**

**Master of Science in Software Engineering-December 1997**

**Advisors: James Emery, Department of Systems Management**

**Elizabeth Gramoy, Space and Naval Warfare Systems Center-San Diego**

There are numerous problems in DoD software development projects. The ad hoc practices used in the military services and in industry have resulted in unpredictable costs and schedules and low-quality products. This thesis proposes that one solution to these problems is to integrate Software Process Improvement (SPI) activities based on a proven model into software development projects. Both a formal and an informal approach to SPI is discussed. The thesis also describes not only the problems encountered in most software development projects, but also the activities defined in these SPI approaches that are designed to solve these problems. A case study of a military project that has spent several years implementing SPI activities based on Software Engineering Institute's (SEI) Capability Maturity Model (CMM) is presented. The SPI activities were implemented in an effort to deliver a high quality product with high reliability while maintaining a high level of control of costs and schedule. This project has succeeded in its goals and the costs and benefits of the project's efforts are presented.

**KEYWORDS:** Software Process Improvement, SmartNet, Capability Maturity Model, Rapid Application Development

**DoD KEY TECHNOLOGY AREA:** Computing and Software

### **A COMPARATIVE ANALYSIS OF THE EFFICIENCY AND EFFECTIVENESS OF THE F-14 TOMCAT OVERHAUL PROCESS**

**Arthur P. Pruett-Lieutenant Commander, United States Navy**

**B.S., United States Naval Academy, 1987**

**Master of Science in Management-June 1998**

**and**

**Michael W. Zarkowski-Lieutenant Commander, United States Navy**

**B. S., Millersville University, 1987**

**Master of Science in Management-June 1998**

**Advisors: Paul J. Fields, Department of Systems Management**

**Donald R. Eaton, Department of Systems Management**

The objective of this thesis is to examine the process and managerial policies used for the F-14 Standard Depot Level Maintenance (SDLM) and compare it to the processes and managerial policies for overhaul of the F/A-18 and for the United Airlines 737. Efficiencies discovered in the F/A-18 and 737 overhaul processes that can be applied to reduce the F-14 SDLM Turn Around Time (TAT) are identified. The F-14 community faces the possibility of having insufficient numbers of aircraft to satisfy fleet requirements due to excessive SDLM TAT. A 50% reduction in TAT would yield an increase of 10 to 11 aircraft available for use per year. A TAT reduction of 10% is required by the fourth quarter of Fiscal Year 1998 in order to alleviate the premature retirement of approximately 10% of the inventory (21 F-14 aircraft). This research identifies areas for potential F-14 SDLM TAT improvement pertaining to planning, pre-induction requirements, and the component management policies at NADEP Jacksonville, Florida.

**DoD KEY TECHNOLOGY AREA:** Other (Depot Level Maintenance)

**KEYWORDS:** Cycle Time Reduction, Logistics

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## 1998 THESIS ABSTRACTS

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### AN ANALYSIS OF REASONS COMMERCIAL ENTITIES PREFER NOT TO PARTICIPATE IN DEFENSE BUSINESS

Susan O. Randall-Lieutenant Commander, United States Navy

B.S., San Diego State University, 1986

Master of Science in Management-December 1997

Advisors: David V. Lamm, Department of Systems Management

Mark W. Stone, Department of Systems Management

In 1987, Dr. David V. Lamm conducted a study to identify the extent to which firms have taken the position of refusing to participate in Department of Defense (DoD) business and the principal reasons for their refusal. Since his study, major changes have occurred in the acquisition environment resulting from the collapse of the Soviet Union and subsequent Defense budget reductions. Such changes include passage of acquisition reform legislation that has prompted initiatives focused on streamlining the procurement process. The purpose of this study is to identify the extent to which companies prefer to not do business with DoD and the associated reasons for that preference in today's acquisition environment. A survey was sent to 1,300 companies in various industries. Analysis of the responses indicated that 42% of the respondents (primarily small businesses) refused to conduct business with the DoD, twice the proportion of 1987. Four of the five top concerns for not participating in Defense business in 1997 replicated the 1987 study's most serious concerns: burdensome paperwork, Government bidding methods, more attractive commercial ventures and low profits. This study analyzes industry's concerns and the implications for small and large businesses, subcontractors and prime contractors, and major industries.

**KEYWORDS:** Defense Industrial Base, Participation in Defense Business

**DoD KEY TECHNOLOGY AREA:** Other (Defense Procurement Policies and Procedures)

### AN ANALYSIS OF INSTITUTIONAL AND NON-INSTITUTIONAL FACTORS AFFECTING NAVAL AVIATOR RETENTION

Kevin H. Rasch-Lieutenant, United States Navy

B.A., Villanova University, 1989

Master of Science in Management-March 1998

Advisors: Stephen L. Mehay, Department of Systems Management

Julie Dougherty, Department of Systems Management

The objective of this thesis is to quantitatively examine the effect of several institutional and non-institutional factors that have traditionally impacted Naval aviator retention. It uses a unique database that includes summarized continuation rate information for pilots from each sub-community by year group and commissioning source. The effects of varying unemployment rates, air transportation industry hiring rates, aviation continuation pay (ACP) opportunities, and changing minimum service requirement (MSR) policies are measured statistically to determine their relative significance in impacting aviator continuation rates. The study analyzed the continuation rate behavior between 1990 and 1996 for aviators in year groups 1984 through 1989. Results from the statistical analysis indicate that institutional factors such as changing MSR policies and ACP availability have a greater impact than non-institutional factors such as unemployment rates and air transportation industry hiring rates. Specifically, recent changes in MSR policies have been successful in increasing continuation rates while ACP has not been successful in increasing retention.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Aviator Retention, Continuation Rates

## 1998 THESIS ABSTRACTS

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### **AN ANALYSIS OF EXPANDING THE DEFENSE INDUSTRIAL BASE THROUGH CIVIL-MILITARY INTEGRATION**

**Christopher J. Ray-Lieutenant Commander, United States Navy  
B.S., Clemson University, 1985**

**Master of Science in Management-June 1998**

**Advisors: David R. Henderson, Department of Systems Management  
Jeffrey Cuskey, Department of Systems Management**

This thesis examines expanding the defense industrial base through civil-military integration. The reduction in the procurement budget and subsequent consolidation of the major defense contractors are described as well as the difference between the commercial and defense markets. This thesis identifies three strategies to promote civil-military integration: conversion, diversification, and dual-use initiatives. The researcher found dual-use initiatives to be the most promising strategy to implement civil-military integration.

Current initiatives to promote civil-military integration such as dual-use science and technology, the commercial operations and support initiative and commercial technological insertion project are described. An evaluation of the costs and benefits of civil-military integration is provided.

This thesis also reviews the barriers to implementing civil-military integration. The researcher's analysis concludes that the existing regulatory barriers to civil-military integration prevent it from becoming a viable policy option for expanding the defense industrial base.

**DoD KEY TECHNOLOGY AREA:** Other (Defense Industrial Base)

**KEYWORDS:** Industrial Base, Civil-Military Integration

### **BARRIERS TO MORE ACTIVE CONTRACTOR PARTICIPATION IN THE DEPARTMENT OF DEFENSE VALUE ENGINEERING PROGRAM**

**John R. Ray-Lieutenant, United States Navy  
B.S.B.A., University of Florida, 1986**

**Master of Science in Management-June 1998**

**Advisors: David A. Smith, Department of Systems Management  
Keith F. Snider, Department of Systems Management**

The purpose of this thesis is to determine the barriers to more active contractor participation in the DoD Value Engineering (VE) program. A review of professional literature such as DoD Inspector General, General Accounting Office, and other research reports provide the background information necessary to explain potential barriers to more active contractor participation in the DoD VE program. Thirty telephone surveys were conducted with Government and contractor personnel to solicit the opinions of these acquisition professionals concerning barriers to more active contractor participation in the DoD VE Program. The results and analysis of the interviews are reported. It was concluded that there are four significant barriers preventing more active contractor participation in the DoD VE program. The four significant barriers to more active contractor participation in the DoD VE program are insufficient funding, the VECP submission and approval process, a low level of VE awareness among acquisition professionals, and a lack of support for the VE program among top-level DoD management. Recommendations to improve contractor participation in VE are establishment of a centrally managed VE fund, a streamlined VECP process, improved VE training, increased VE personnel resources, enforcement of VE savings goals, and greater top-level management support.

**DoD KEY TECHNOLOGY AREA:** Other (Logistics, Contracting)

**KEYWORDS:** Value Engineering, VECP, Contractor Participation

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## 1998 THESIS ABSTRACTS

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### **DETERMINANTS OF FLIGHT TRAINING PERFORMANCE:**

**NAVAL ACADEMY CLASSES OF 1995 AND 1996**

**Paul M. Reinhart-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1991**

**Master of Science in Leadership and Human Resource Development-September 1998**

**Advisors: Gregory G. Hildebrandt, Department of Systems Management**

**Roger D. Little, Department of Economics, United States Naval Academy**

This thesis investigates the relationship between observable characteristics and performance during the primary stage of flight training. The data for this study consists of 272 observations from Naval Academy graduates in the classes of 1995 and 1996. Analysis of the variables was conducted using the Heckman two-stage regression technique to correct for possible selectivity bias. In this technique a first-stage probit model, which predicts the likelihood of primary phase completion, is used to generate a correction factor for possible selectivity bias. The correction factor is then used in the second-stage adjusted least-squares regression model. The conclusions of this study are: The biographical inventory from the Aviation Selection Test Battery (ASTB) is a valid predictor of primary phase completion. The Pilot Flight Aptitude Rating (PFAR) from the ASTB, academic achievement (AQPR) at the Naval Academy, and previous flight experience are all valid predictors of flight training performance. Additionally, it appears that sample selection bias does not seem to be a problem in this analysis.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Naval Academy, Pilot Selection, Flight Training, Selectivity Bias

### **A CASE STUDY: ACQUISITION REFORM AND THE NEW V-22 OSPREY PROGRAM**

**Paul M. Riegert-Captain, United States Marine Corps**

**B.S., United States Naval Academy, 1989**

**Master of Science in Management-March 1998**

**Advisor: Michael W. Boudreau, Department of Systems Management**

**Second Reader: Sandra M. Desbrow, Department of Systems Management**

This thesis provides background information on the once-cancelled V-22 program and acquisition reform and then examines the impact of the latter on the former. It analyzes the V-22 program using DoD's "ten guiding principles of acquisition reform" as a standard and concludes that acquisition reform is having mixed results on this Major Defense Acquisition Program.

Much is being accomplished with acquisition reform in the V-22 program. A transformation of the business process from the top down is enabling the program office and its prime contractors to optimize cost, schedule, and performance. Earned value management metrics are actively being incorporated into the program's risk management process. Concurrent contractor/Government testing and maintenance reduces test time required by 72 percent. Cross-functional IPTs, as the backbone of the program, are breaking down "stove pipes" and facilitating concurrent engineering. Successfully implementing initiatives like CAIV and CLS and focusing on overall cost of ownership are reducing the cost of the program from cradle to grave. Commercial products and processes, like the Allison AE-1107C engine and CATIA software, are providing high quality systems at market controlled prices. Commercial item acquisition and CLS are being used effectively to minimize life-cycle costs. "Win-Win" contracting with industry is providing engine reliability that should improve with time and save 30 percent in support costs.

Much can be accomplished still. Realistic contingency funding should be included in fiscal budgets to eliminate the migration of funds from R&D and PROC to O&S. SPI should be altered to pass any program-related savings back to the program office.

**DoD KEY TECHNOLOGY AREA:** Air Vehicles

**KEYWORDS:** Acquisition Reform, V-22 Osprey

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## 1998 THESIS ABSTRACTS

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### **MARINE LEADERSHIP OF CIVILIAN PERSONNEL: AN ANALYSIS OF MARINE CONTRACTING OFFICERS' MANAGEMENT OF CIVILIAN PURCHASING AND CONTRACTING PERSONNEL**

**Macon R. Robinson-Captain, United States Marine Corps**

**B.S., Lewis and Clark College, 1986**

**Masters of Science in Management-December 1997**

**Advisors: Sandra M. Desbrow, Department of Systems Management**

**Benjamin J. Roberts, Institute for Defense Education and Analysis**

The Marine Corps currently has 18 regional contracting offices located throughout the continental U.S. and one office in Okinawa, Japan. Ten out of the 18 regional contracting offices are headed by military contracting officers. The majority of the personnel that make up the workforce in these offices are civilians. The military side of the workforce continues to get smaller not only because of downsizing but in part as a result of the Defense Acquisition Workforce Improvement Act (DAWIA). DAWIA requires the Department of Defense to increase the ratio of civilian personnel to military personnel in the acquisition workforce each year, a move toward civilianization of this profession. As more and more civilians take over acquisition and contracting positions the real challenge will be for those military officers that must head these newly formed organizations which rely heavily on civilian workforce. The major challenge that any military officer will be facing in this environment is how to manage civilians effectively.

This thesis identifies the issues associated with the management of civilian purchasing and contracting (P&C) personnel in a USMC regional contracting Office. A survey and interviews of USMC military contracting officers and civilian P&C personnel were conducted by the researcher and the results were used to develop conclusions and recommendations to enhance to management skills of Marine Corps Officers.

**KEYWORDS:** Civilian Personnel Management, USMC Regional Contracting Offices

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

### **A STATISTICAL ANALYSIS OF BLACK-WHITE PERFORMANCE DIFFERENTIALS OF U.S. MILITARY PERSONNEL**

**James A Roick-Lieutenant Commander, United States Navy**

**B.A., University of California San Diego, 1986**

**Master of Science in Management-September 1998**

**Advisors: Stephen L. Mehay, Department of Systems Management**

**Barry T. Hirsch, Department of Economics, Florida State University**

Research has suggested current civilian black/white wage differentials can be explained primarily by a skill gap. The research also suggests that much of this gap is a result of differences in premarket acquired cognitive skills, rather than innate ability, labor market discrimination, or quantity of education. The first goal of this thesis is to determine whether gaps in military productivity exist and whether they are comparable in size to the civilian wage/productivity gaps. The second goal is to determine whether any gaps in observed military productivity can be explained by acquired cognitive abilities. Following the civilian literature, this thesis uses AFQT to measure the skills of enlistees, and college GPA to measure the skills of officers. Multivariate models are used to analyze black-white performance differences for Navy officers and Marine Corps and Air Force enlisted personnel. The findings indicate that there is a black-white gap in performance of military personnel, although the gap tends to be smaller than civilian wage differences. In addition, acquired skills explain some, but not the majority, of this gap. The relatively weaker relationship between AFQT and productivity in the military is likely to result from selection by the military and self selection by individuals.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Productivity, Differential, Black-White



## 1998 THESIS ABSTRACTS

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### **SOFTWARE METRICS: A CASE ANALYSIS OF THE U.S. ARMY BRADLEY FIGHTING VEHICLE A3 PROGRAM**

**James S. Romero-Captain, United States Army**

**B.S., United States Military Academy, 1989**

**Master of Science in Management-June 1998**

**Advisors: David F. Matthews, Department of Systems Management**

**Mark E. Nissen, Department of Systems Management**

Software development efforts have become the highest-risk element of modern program management. One way that we can mitigate this risk is through the use of metrics. Software metrics can give us insight about the progress, quality, and expected completion of a software development effort. In earlier software development efforts, programming was viewed as a "black art" and, consequently, software metrics were not commonly used. Today, it is generally accepted that a software development effort should be properly planned and that software metrics should be used to control the project. Program managers are no longer concerned about whether or not to use metrics, but are more concerned with which metrics to use and whether or not the ones chosen will be effective. The Bradley Fighting Vehicle A3 Program provides valuable insight into the use of metrics. A principal finding of this research is that implementing an effective metrics program is extremely difficult, especially when the contractor is not experienced in developing software-intensive systems. Because this situation often exists, future and current program managers must assess their own knowledge of software development and plan to mitigate the effects of other factors they cannot influence. They must educate themselves on software issues and metrics and solicit assistance from independent agencies that specialize in software development.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Ground Vehicles Command, Control, and Communications

**KEYWORDS:** Software Development, Software Metrics, Bradley Fighting Vehicle A3, MICOM Software Engineering Directorate

### **ANALYSIS OF THE TRANSFORMATION PROCESS OF GENERAL DETAIL SAILORS**

**Thomas G. Roulston-Lieutenant, United States Navy**

**B.S., Embry-Riddle Aeronautical University, 1990**

**Master of Science in Management-September 1998**

**Advisors: Alice Crawford, Department of Systems Management**

**Lee Edwards, Department of Systems Management**

This thesis investigates the possibility of a training gap between course content at the Navy Recruit Training Command (RTC) and the needs of the fleet. The focus is on the internal and external environments that may drive training decisions and curriculum changes at RTC. General Detail (GENDET) seamen with less than two years of service were studied to reflect the direct effects of RTC's mission and to determine RTC effectiveness in transforming civilians to sailors and meeting fleet needs. The study found that RTC appears to function in a political/reactive configuration, which may drive many of the curriculum changes. RTC's curriculum is designed as a military socialization process as part of the transformation process into the Navy. RTC does not, however, appear to instill work ethic, pride in self and the Navy institution, or respect for authority. The fleet desires sailors with the aforementioned attributes. Additionally, a comparative analysis was conducted between the current RTC curriculum and the Navy Enlisted Occupational Classification System (NEOCS). NEOCS determines Naval Standards for knowledge, skills, and abilities based on each pay grade and rating. It was found that RTC should review NEOCS to incorporate more hands-on training, all recruits should be put in leadership roles while at RTC, Recruit Division Commander (RDC) training time is not standardized, and RTC should review the RDC Excellence Award program.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Recruit Training, Navy

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## 1998 THESIS ABSTRACTS

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### **COST BENEFIT ANALYSIS OF INCLUDING BULGARIA IN A SYSTEM FOR COMMON SECURITY**

**Pavlin T. Roussanov-Lieutenant Colonel, Bulgarian Air Force  
Eng., Bulgarian Air Force Academy, 1982**

**Master of Science in International Resource Planning and Management-June 1998**

**Advisors: Katsuaki L. Terasawa, Department of Systems Management  
William R. Gates, Department of Systems Management**

After the revolutionary changes in 1989 and following dissolution of the Warsaw Pact, Bulgaria remained alone and unsecured on the Balkan Peninsula. On 17 February 1997 the Bulgarian Government approved a decision on the country's full membership in NATO. This decision was reached after carefully considering the possible strategic choices for Bulgaria's national security. All possible consequences (political, military-strategic, financial-economic, and social and legal) from this decision were taken into account. This thesis presents the real situation on the Balkans: economic conditions within Bulgaria and its neighbors, the countries' military expenditures, their armed forces, and arms transfers. In order to evaluate the costs and benefits for Bulgaria joining NATO and to show the advantages of integration, a model of NATO enlargement on the Balkans is created. The simulation of the model clearly shows that independent of the scenario of Bulgaria's integration in a system for common security on the Balkans, all of the countries included in this integration process benefit from it. These benefits include considerable drops in countries' military expenditures and increases in their national security. The methodology presented in the thesis could be used for further study in which the model would be expanded to incorporate the costs of membership and international advantages.

**DoD TECHNOLOGY AREA:** Other (Defense Alliances)

**KEYWORDS:** National Security, Military Alliances, Model for Common Security, Nash Equilibrium

### **COST BENEFIT ANALYSIS OF DISTANCE LEARNING ALTERNATIVES FOR DOD UNIFORMED PERSONNEL AND CIVILIAN EMPLOYEES**

**Marge M. Sell-Lieutenant Commander, United States Navy**

**B.S., Southern Illinois University, 1983**

**M.A., Webster University, 1985**

**Master of Science in Management-June 1998**

**Advisors: Steven R. Lamar, Institute for Defense Education and Analysis  
Gordon Louvau, Department of Systems Management**

This thesis supports the evaluation of standard classroom course conversion to distance learning alternatives for disseminating advanced education at the Naval Postgraduate School (NPS). Distance learning is widely used throughout business, military, and academic organizations. Distance learning is convenient and gaining significant interest and importance to military personnel in assignments which hinder standard classroom attendance. This study focused on developing methodologies that could properly support a cost comparison for conversion of standard classroom instruction to distance learning. This study involved personal interviews with both military and civilian professors and other academic experts in distance learning design and implementation as well as a review of the literature. This thesis recommends NPS conduct further research to design a database to collect reliable and relevant cost data to support future cost studies. NPS should also compare equivalent existing distance learning courses for content currently offered at various institutions other than NPS for consideration as possible substitutes for NPS classroom instruction.

**DoD TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS:** Distance Learning Alternatives, Course Content Comparison, Cost/Benefits Analysis

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## 1998 THESIS ABSTRACTS

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### **COST ANALYSIS OF INTER-DEPOT TRANSPORTATION OPTIONS FOR U.S. NAVY EAST COAST AIR-LAUNCHED MISSILES**

**Charles L. Sellers-Lieutenant, United States Navy**

**B.S., Virginia Polytechnic Institute and State University, 1990**

**Master of Science in Operations Research-September 1998**

**Advisor: David G. Brown, Department of Systems Management**

**Second Reader: Kevin J. Maher, Department of Operations Research**

Since the disintegration of the Warsaw Pact and the Soviet Union, the Department of Navy has had to learn how to meet its commitments with an ever-decreasing budget. One Navy community addressing this downsizing is the east coast ordnance community. Because of restructuring and the closure of Weapon Station Charleston, South Carolina, the remaining east coast weapon stations are handling the same amount of ordnance with fewer personnel. As a result of the restructuring, the aircraft carriers, ordnance ships, and large deck amphibious ships conduct ordnance transfers at Naval Weapon Station (NWS) Earle, New Jersey. These ships all carry air-launched missiles that have to be maintained at Naval Weapons Station Yorktown. This thesis develops cost equations associated with several different methods of transportation (commercial and Department of Defense). These equations are being used to generate cost curves for each of four types of missiles being transported between NWS Earle and NWS Yorktown. The curves are analyzed, and decision policies are determined which ensure the most cost-effective method of transportation is being used to transport the missiles.

**DoD KEY TECHNOLOGY AREA:** Conventional Weapons

**KEYWORDS:** U.S. Navy Ordnance, Ordnance Logistics, Decision Support, Transportation, Cost Analysis

### **IMPLEMENTATION OF "MARGINALISM" IN DAY-TO-DAY LIFE**

**Elyezer Shkedy-Colonel, Israeli Air Force**

**B.Sc., Ben Gurion University, Israel, 1987**

**Master of Science in Management-June 1998**

**Advisors: Katsuaki Terasawa, Department of Systems Management**

**William R. Gates, Department of Systems Management**

Economics, and especially the theory of Marginalism, can be very useful in "day-to-day" life, but for many reasons people do not really use it. This work tries to explain the "economic way of thinking" basically by verbally explaining the main idea, by providing examples from day-to-day life with minimum needed mathematics, and exploring the most important steps in the decision-making process. Hopefully, this work will encourage people to adopt and use the economic way of thinking and, as a result, gain its benefits.

**DoD TECHNOLOGY AREA:** Other (Economics)

**KEYWORDS:** Economics, Marginalism, Decision-Making

## 1998 THESIS ABSTRACTS

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### **OTHER TRANSACTIONS FOR PROTOTYPES AS USED IN THE COMMERCIAL OPERATIONS AND SUPPORT SAVINGS INITIATIVE 1997: CONTRACTORS' PERSPECTIVE**

**William Collier Slade-Captain, United States Army**

**B.A., Wofford College, 1987**

**Master of Science in Management-June 1998**

**Advisors: Mark W. Stone, Department of Systems Management**

**David A. Smith, Department of Systems Management**

The Commercial Operations and Support Savings Initiative (COSSI) is a Government effort to reduce Operations and Support (O&S) costs by inserting commercial products and processes into fielded military systems. This initiative utilizes Other Transactions for Prototypes, also known as Section 845 Agreements, to attract non-traditional Government contractors and to speed the development of prototype kits for insertion. This thesis examines the benefits and limitations, from the contractors' perspective, of using Section 845 Agreements, as applied in COSSI 97.

The researcher concludes that the participants found the agreements to be effective tools that fostered improved relations with the Government. The agreement also resulted in an expanded vendor base; six of the 30 participants are non-traditional contractors and would not have participated, had an agreement not been used.

The researcher concludes that the participants identified the Government's inexperience with the agreement as a major limitation. The research also shows that innovative, trained Agreements Officers who are knowledgeable of the program's objectives can only achieve the full potential of the authority. The researcher makes several recommendations for an agency using or preparing to use the authority; one of which is to provide follow-on training for nontraditional contractors.

**DoD KEY TECHNOLOGY AREA:** Other (Contracting)

**KEYWORDS:** Commercial Operations and Support Savings Initiative, Other Transactions, Section 845 Authority

### **THE LOGISTICS MANAGEMENT DECISION SUPPORT SYSTEM (LMDSS): AN EFFECTIVE TOOL TO REDUCE LIFE CYCLE SUPPORT COSTS OF AVIATION SYSTEMS?**

**Carolynn M. Snyder-Lieutenant Commander, United States Navy**

**B.S., Whitman College, 1983**

**Master of Science in Information Technology Management-September 1998**

**and**

**Ellen E. Moore-Lieutenant Commander, United States Navy**

**B.S., University of Delaware, 1984**

**Master of Science in Management-June 1998**

**Advisors: Donald Eaton, Department of Systems Management**

**William Haga, Department of Systems Management**

This thesis assesses the capability of the Logistics Management Decision Support System (LMDSS) to meet the information needs of Naval Air Systems Command (NAVAIR) logistics managers based on surveys of logistics managers and interviews with LMDSS program representatives.

The LMDSS is being introduced as a tool to facilitate action by NAVAIR logistics managers to reduce the life cycle support costs of aviation systems while protecting readiness. We conclude the LMDSS does not meet the definition of a Decision Support System due to the lack of modeling capabilities. The LMDSS architecture and capabilities meet the information needs of surveyed logistics managers and support Affordable Readiness initiatives which are the means by which NAVAIR intends to reduce life cycle costs while sustaining aviation system readiness levels. Lack of modeling, graphics, and sensitivity analysis capabilities limits identification, analysis, and comparison of Affordable Readiness initiatives.

We recommend modeling tools and graphics capabilities be incorporated as part of the LMDSS application. We further recommend that initiatives to improve data validity be expedited and that Maintenance Level 3 detail cost data be provided. Recommendations are made for further research.

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## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Decision Support Systems, Logistics, Life Cycle Costs

**COSTS AND BENEFITS OF NETWORK BASED INSTRUCTION AT  
THE NAVAL POSTGRADUATE SCHOOL**

**Brian K. Sorenson-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1991**

**Master of Science in Management-June 1998**

**Advisors: John E. Mutty, Department of Systems Management**

**William R. Gates, Department of Systems Management**

The Naval Postgraduate School's (NPS) Strategic Plan for 1998 addresses the significance of distant education in NPS's future. Network Based Instruction (NBI) utilizes new technology and the Internet to provide education at a distance. This thesis provides a framework which identifies the costs and benefits associated with converting, administering and maintaining a traditionally taught course using Network Based Instruction.

Conversion, hardware, administration and maintenance costs to provide an NBI course are examined in the cost analysis section. The benefit analysis examines benefits of reduced NPS residency, a career learning continuum, on-line reference, and short course savings in addition to other intangible benefits.

This study finds NBI to be a viable option for future learning at NPS. It is recommended that NPS proceed with conversion of courses into an NBI format. Knowledge gained during conversion of initial courses will be instrumental in the subsequent design of efficient and effective distant education programs.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Manpower, Personnel, and Training

**KEYWORDS:** Cost-Benefit Analysis

**A COMPREHENSIVE STUDY OF FACTORS IMPACTING THE FUTURE  
SIZE AND SCOPE OF MILITARY GRADUATE MEDICAL EDUCATION**

**Jason E. Spencer-Lieutenant, United States Naval Reserve**

**B.B.A., University of Texas at Austin, 1992**

**Master of Science in Management-December 1997**

**Advisors: Richard B. Doyle, Department of Systems Management**

**William R. Gates, Department of Systems Management**

Graduate medical education (GME) is the postgraduate medical education required for all medical school graduates pursuing licensure. Since World War II, the military medical services have undertaken full time inservice GME missions to ensure a supply of quality physicians and surgeons for both the military's wartime readiness and peacetime health benefit missions. However, determining the number of active duty physicians and surgeons, and the specialties which they practice, has been a complex and controversial issue within military medicine, particularly since the end of the Cold War. This thesis examines the factors impacting the future size and scope of military GME. A comprehensive history of military GME is provided. Detailed events and issues impacting GME which surfaced following the Cold War are also discussed. The current Department of Defense GME policy and funding issues are examined, as well as the operational GME implementation model developed by the United States Navy. This thesis found that GME has historically been a valuable tool for recruiting, training, and retaining quality physicians and surgeons. Post-Cold War budget constraints and readiness policies and private sector changes in GME are likely to force changes in military GME programs, decreasing both the number of doctors and specialties.

## 1998 THESIS ABSTRACTS

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**KEYWORDS:** GME, Residency, Medicare, Rightsizing, Readiness

**DoD KEY TECHNOLOGY AREA:** Other (Defense Health Care Policy)

### **ANALYSIS OF DEPARTMENT OF DEFENSE (DOD) TRANSPORTATION MODE STRATEGIES FOR SHIPPING FRESH FRUITS AND VEGETABLES (FFV) TO GUAM**

**Glen T. Stafford-Lieutenant Commander, United States Navy**

**B.S., United States Naval Academy, 1986**

**Master of Science in Management-March 1998**

**Advisors: James Kerber, Department of Systems Management**

**Kevin Gue, Department of Systems Management**

The objective of this thesis is to identify the Department of Defense (DoD) transportation mode alternatives used to ship fresh fruits and vegetables (FFV) to Guam, to discuss which alternatives provide the highest service level in terms of prolonging FFV shelf life under what circumstances, and to identify those additional considerations that affect shelf life during transportation. The entire transportation process from the Continental United States (CONUS) through final delivery to the customer is documented and analyzed, and recommendations for its improvement included.

**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

**KEYWORDS:** Shipment of Fresh Fruits and Vegetables, Guam, Controlled Atmosphere Shipping, Transportation, Perishables

### **FEMALE HEALTH AND PHYSICAL FITNESS AT THE NAVAL ACADEMY**

**Trevis L. Stamper-Lieutenant, United States Navy**

**B.A., Otterbein College, 1991**

**Master of Science in Leadership and Human Resource Development-September 1998**

**Advisors: Gregory G. Hildebrandt, Department of Systems Management**

**David W. Armstrong, Midshipmen Health Studies United States Naval Academy**

**Second Reader: Reuben T. Harris, Department of Systems Management**

Stress related health disorders may be an indication that some female midshipmen at the Naval Academy are making exceptional efforts to meet specified physical performance standards. The stress at the service academies is much higher than in many civilian occupations and may increase the risk of females developing gender related health problems such as amenorrhea, bone loss, and eating disorders. The purpose of this research is to shed some light on ways in which gender related health problems can be decreased while improving the overall quality of midshipmen at the Naval Academy. First, a comparison of male versus female exercise patterns and performance is provided. In order to identify risk factors, hypotheses testing procedures are used to examine the relationship between female health disorders and selected explanatory variables. Recognizing risk factors early can also reduce the risk of gender related problems long after midshipmen have graduated. Lessening the amount of injuries now can prevent health problems that develop by middle age, and will also help reduce the cost of medical compensation later in an officer's life.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Female, Health, Physical Fitness, Naval Academy

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## 1998 THESIS ABSTRACTS

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### **HANDHELD COMPUTER APPLICATIONS IN THE NAVY COMMAND ENVIRONMENT**

**Robert D. Surovchak-Lieutenant, United States Navy**

**B.S., Pennsylvania State University, 1990**

**Master of Science in Information Technology Management-March 1998**

**Advisors: Rudolph Darken, Department of Computer Science**

**Douglas E. Brinkley, Department of Systems Management**

As society becomes increasingly information-oriented, the drive for more capable machines to retrieve, store, process, and present such information anywhere, at anytime becomes paramount to success. This is true of United States Navy and Marine Corps officers who must manage large amounts of information while operating in remote areas. Today's very small, portable computers known as "palmtops" are capable of running powerful scaled-down versions of contemporary operating systems. When coupled with a transmission medium, palmtops represent a portable computer that can be used to communicate and process information in ad hoc environments. The Naval Postgraduate School Staff Officer Palmtop Computer Project is designed to analyze the effectiveness of Windows CE-based palmtop computers as an aide to professional Naval officers. The study project provides Naval officers with a popular palmtop computer and allows them to use the device for a four-week period. During this time participants are encouraged to use the palmtop for work and personal information tasks. The primary complaints with these devices are ergonomically oriented. There is no convenient and reliable method of data entry and they cannot be easily carried while in uniform. Results from the study indicate that current Windows CE "handheld PCs" are not appropriate for use in this capacity. Recommendations for more useful portable personal computers complete this research.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Human Systems Interface

**KEYWORDS:** Mobile Computing, Handheld Computers, Palmtop Computers, Windows CE

### **INVESTIGATION OF INTEGRATED PRODUCT AND PROCESS DEVELOPMENT (IPPD): A CASE STUDY OF THE MARINE CORPS ADVANCED AMPHIBIOUS ASSAULT VEHICLE (AAAV)**

**Travis L. Sutton-Captain, United States Marine Corps**

**B.S., Purdue University, 1992**

**Master of Science in Management-March 1998**

**Advisors: Susan P. Hocevar, Department of Systems Management**

**Michael W. Boudreau, Department of Systems Management**

Both Industry and Government Executives agree that collocation is a successful method of organizing Integrated Product Teams (IPTs) for Integrated Product and Process Development (IPPD). While some research has addressed benefits and challenges of implementing collocated-IPTs within Government and Industry organizations, there is a lack of clarity on specific benefits and challenges of collocated-IPTs in a team-based organization. This study examines full-time members' views of collocation regarding the Marine Corps' Advanced Amphibious Assault Vehicle's (AAAV's) program. The AAAV program is the first major defense acquisition program (MDAP) in the Department of Defense (DoD) to collocate all appropriate full-time employees representing the Government Civilian, General Dynamics—the Contractor, subcontractors, and Marines—the customer. Research methods used to gather data consisted of phone and face-to-face interviews, and a survey. The interviews solicited elaboration on two main issues: specific examples of benefits and challenges of collocation. The survey identified the impact of collocation on specific management processes. Findings show collocation as having a positive impact with strongest areas including: "identifying potential problems," "liaison with customer," and "reducing project cycle time." The results suggest lessons to expand the benefits of collocation on AAAV's performance, and offers a benchmark for other programs implementing collocated-IPTs.

**DoD KEY TECHNOLOGY AREA:** Human Systems Interface

**KEYWORDS:** AAAV Collocation of IPTS

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## 1998 THESIS ABSTRACTS

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### **MIGRATING FROM WIN NT 4.0 TO WIN NT 5.0 IN THE MARINE CORPS ENTERPRISE NETWORK (MCEN)**

**Douglas B. Thiry-Captain, United States Marine Corps  
B.S., United States Naval Academy, 1989**

**Master of Science in Information Technology Management-September 1998  
and**

**Robert A. Rowlette-Captain, United States Marine Corps  
B.A., University of Florida, 1988**

**Master of Science in Information Technology Management-September 1998**

**Advisor: Doug Brinkley, Department of Systems Management**

**Second Reader: Bert Lundy, Department of Computer Science**

The purpose of this study is to provide the United States Marine Corps (USMC) with an analysis of Windows NT 5.0 Network Operating System (NOS). This analysis will assist the Network Operations Center (NOC) in preparation for the eventual migration of Windows NT 5.0 into the Marine Corps Enterprise Network (MCEN).

NT 5.0 offers some significant enhancements over earlier versions. Active Directory provides a unified platform to manage NOS resources by storing user information, network shares and policies. NT File System (NTFS) version 5 permits dynamic allocation of primary storage space to each user. NT 5.0 also improves network security by incorporating use of the Kerberos Version 5 protocol, providing integrated security for authentication and file encryption.

A top-down migration strategy should be incorporated by the NOC. Particularly important is how the NOC builds the Domain Naming Service (DNS) conventions for the MCEN. This will require every subordinate unit to adhere to the naming convention of its chain of command.

Migrating from Banyan Vines to Windows NT presents a significant change to the organization. An effective Change Management strategy can assist members of the organization in understanding the sense of loss and uncertainty that occur in times of transition, and to deal with these changes effectively.

**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Computing and Software, Manpower, Personnel, and Training

**KEYWORDS:** USMC, Marine Corps Enterprise Network, MCEN, Network Operations Center, NOC, Network Operating System, NOS, WIN NT 5.0, NT, Change Management

### **STUDY OF NAVY AND MARINE CORPS PRISON INMATES AFFILIATED WITH GANGS AND EXTREMIST GROUPS: TRENDS AND ISSUES FOR ENLISTMENT SCREENING**

**Kathryn E. Tierney-Lieutenant, United States Navy  
B.S., Iowa State University, 1988**

**Master of Science in Management-March 1998**

**Advisors: Mark J. Eitelberg, Department of Systems Management**

**Martin F. Wiskoff, Defense Personnel Security Research Center**

This thesis examines self-identified gang members and extremists incarcerated in Navy and Marine Corps brigades and disciplinary barracks. Information was gathered from interviews conducted with inmates. The interviews focused on several key issues, including reasons for enlisting in the Navy and Marine Corps; truthfulness with recruiters concerning certain illegal activities prior to enlistment, including juvenile arrests and convictions; the nature and severity of crimes for which members were convicted, including links with gangs or extremist groups; and reasons for lack of assimilation and acculturation into military service.

This thesis also provides background information on present enlistment screening procedures, current Department of Defense policies concerning gangs and extremist groups, and demographic data on the characteristics of self-admitted gang members who are incarcerated in a Navy brig. Common themes that emerged from the interviews are presented, and selected summaries are included in an appendix. In addition, the study examines enlistment screening procedures for



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## 1998 THESIS ABSTRACTS

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identifying applicants who have gang or extremist group affiliations and recommends a number of areas for further research.

**DoD TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Recruiting, Manpower Supply

### **COST-BENEFIT ANALYSIS FOR OUTSOURCING MEDICAL TREATMENT FOR ALL ACTIVE DUTY MEMBERS ON THE MONTEREY PENINSULA**

**Darryl M. Toppin-Lieutenant, United States Navy**

**B.S., University of Utah, 1991**

**Master of Science in Management-September 1998**

**Advisors: Paul J. Fields, Department of Systems Management**

**O. Douglas Moses, Department of Systems Management**

Due to downsizing, many activities within the Department of Defense (DoD) have turned to outsourcing as a means to complete their given missions with their shrinking or limited resources. The primary objective of this thesis was to analyze the various outsourcing options available to California Medical Detachment (CMD) to provide medical services for active duty personnel on the Monterey Peninsula. Three alternative options were identified and evaluated in terms of five criteria: Cost, Accessibility, DoD control, customer service and flexibility of system processes. To address these issues, interviews were conducted with key personnel familiar within the command structure of CMD and the Presidio of Monterey Health Clinic (POMAHC). Financial documents and policy statements were reviewed. The findings were that the current system of providing care through POMAHC was the most practical option in accordance with the five criteria.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Cost-Benefit Analysis for Outsourcing all Medical Treatment for all Active Duty Personnel on the Monterey Peninsula

### **ANALYSIS OF FIRST PRICE SEALED BIDDING (FPSB) USING GAME THEORY**

**Suat Tozendemir-Lieutenant Junior Grade, Turkish Navy**

**B.S., Turkish Naval Academy, 1990**

**Master of Science in Management-December 1997**

**Advisors: Katsuaki L. Terasawa, Department of Systems Management**

**Mark W. Stone, Department of Systems Management**

This thesis analyzes the First Price Sealed Bidding (FPSB) procurement method using computer simulations. The First Price Sealed Bidding is a static Bayesian Game with incomplete information. These games have a well-defined Bayesian Nash equilibrium. Using this theory, this study found the bidders' equilibrium strategies. The equilibrium strategy is the strategy that maximizes bidders' profit simultaneously. Some assumptions have been made to be able to construct a model for the FPSB. Then, the model was transformed into computer simulation code using Visual Basic programming language. Two different simulation programs used to experiment with several scenarios under uniform and triangular production cost distributions. The simulation showed the bidders' behavior and identified factors affecting the bidders' decision while preparing their bids. The most influential factors found to be production cost distributions and number of bidders. Concluding observations concerning both buyers and bidders present the results derived from the analysis of experiments.

**KEYWORDS:** First Price Sealed Bidding, Game Simulation, Game Theory, Static Games with Incomplete Information

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition and Contracting)

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## 1998 THESIS ABSTRACTS

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### **THE EVOLUTION OF THE FLEET HOSPITAL PROGRAM: FROM THE COLD WAR ERA TO THE NAVAL EXPEDITIONARY MEDICAL SUPPORT SYSTEM**

**Joseph Triplett, Jr.-Lieutenant, United States Navy**

**B.S., Southern Illinois University, 1989**

**Master of Science in Management-December 1997**

**Advisors: Richard B. Doyle, Department of Systems Management**

**Frank J. Barrett, Department of Systems Management**

The global security environment has changed significantly since the original concept of fleet hospitals was developed. This thesis examines the process used to plan and budget for fleet hospitals, and examines the events that shaped the configuration and billet structure of fleet hospitals. Evidence for this thesis was taken from reports from DoD, GAO and Congress, congressional testimony, studies conducted by the Center for Naval Analyses, journal articles, after action reports and pertinent DoD directives and manuals. Additional data were obtained through interviews with key officials involved in resourcing and managing the Fleet Hospital Program and training personnel assigned to augment fleet hospital platforms. The thesis concludes that planning and budgeting for fleet hospitals is dependent on the structure of the THCSRR model. The establishment of Single Sourcing Hospitals to deploy as fleet hospital units is intended to enhance fleet hospital operational performance by capitalizing on working relations developed delivering the peace time benefit. As the Cold War ended and more accurate methods for estimating casualty rates emerged, the requirement for fleet hospitals decreased from 17 to 10. Shifts in Navy and Marine Corps doctrine to lighter, faster and more flexible maneuvers have led to the development of NEMSS.

**KEYWORDS:** Fleet Hospital Program, Naval Expeditionary Medical-Surgical Suite

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

### **NAVY RECRUIT TRAINING AS A GENDERING PROCESS**

**Lisa M. Truesdale-Lieutenant, United States Navy**

**B.A., Cornell University, 1990**

**Master of Science in Management-March 1998**

**Advisor: George W. Thomas, Department of Systems Management**

This thesis studies Navy recruit training as a gendering process, and it examines female and male recruits' gendered experiences at Recruit Training Command (RTC) Great Lakes, Illinois. Gender is a prominent social construct for individuals and organizations. Both individuals and organizations are gendered and create gender. The phrase, "gendering process," refers to an organization's production of gender. The primary research question is: Can the military socialization experience of Navy recruit training be understood as a gendering process, specifically as a process for producing masculinity? A psychometric inventory of gender role attributes, the Bem Sex Role Inventory (BSRI), was used to measure the difference in starting and ending recruits' self assessment of femininity and masculinity. Results from the BSRI indicated that Navy recruit training is a gendering process for both female and male recruits. Structured interviews with RTC officer and enlisted personnel provided additional insight into the gendering nature of the military socialization experience of Navy recruit training. These results offer a powerful, analytical lens for viewing and assessing such personnel processes as attrition, retention, promotion, and occupational selection for women and men in the Navy. They also provide a useful framework for understanding the status of women and men in the Navy.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Gender, Basic Training, Recruit Training, Women in the Military

## 1998 THESIS ABSTRACTS

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### **PROCESS REDESIGN OF THE NORWEGIAN NAVY MATERIEL COMMAND'S REPLENISHMENT OF INVENTORY ITEMS**

**Bernt E. Tysseland-Lieutenant Commander, Royal Norwegian Navy**

**Master of Science in Management-December 1997**

**Advisors: Keebom Kang, Department of Systems Management**

**Kevin R. Gue, Department of Systems Management**

The Norwegian Navy Materiel Command must keep inventory in order to serve its customers. Service level is established as a measure of effectiveness on delivery from inventory. Long replenishment lead-time, with variability in both lead-time itself and lead-time demand, make it hard to achieve the desired service level. The lead-time becomes costly, both in form of holding cost of safety stock and in form of stock-outs.

Current inventory control policy used at the Materiel Command is presented, and compared to theoretical inventory control models. Computer simulation is used to measure current administrative lead-time at the Norwegian Navy Materiel Command. Two proposals for redesign of existing replenishment process are built as simulation models, and the effect on administrative lead-time and associated variability is measured. The first proposal is to consolidate two separate procurement offices into one. The second proposal is to introduce, and use electronic commerce in the replenishment process.

It is concluded that both redesign proposals will reduce administrative lead-time, variability and hence cost. Benefits from an introduction of electronic commerce will yield a yearly cost saving of at least 4,500,00 Norwegian Kroner, which is more than four times the savings of consolidation.

**KEYWORDS:** Inventory Control, Inventory Models, Business Process Reengineering, Electronic Commerce, Internet, Computer Simulation, Norwegian Navy Materiel Command

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Modeling and Simulation

### **DEFENSE ACQUISITION SYSTEM AND ITS CHALLENGES FROM THE PROGRAM MANAGER'S POINT OF VIEW**

**Ertugrul Uzunoglu-Lieutenant Junior Grade, Turkish Navy**

**B.S., Turkish Naval Academy, 1992**

**Masters of Science in Management-September 1998**

**Advisors: Brad Naegle, Department of Systems Management**

**Sandra M. Desbrow, Department of Systems Management**

The Defense Acquisition System acquires weapon systems and other items used by armed forces to meet threats to national security in a rapidly changing internal and external environment. Over the last decade, many improvements have been implemented in the Defense Acquisition System. Some have been extremely effective, and others less effective, but the dynamic environment and desire to be perfect lead to continuous change.

This thesis analyzes the Defense Acquisition System and its challenges from a program manager's (PM) perspective and presents a snapshot of the current system by means of a comprehensive review of the system and a survey of acquisition managers.

The major conclusion drawn from this research is that the uncertainty of the environment and the unstable/lack of funding are the main sources of the challenges. Rigid controls placed on all the resources are detracting the program manager from his/her primary function of managing the program. Therefore, effective communication and cooperation between interested parties and an increased empowerment of the PM will increase the efficiency and effectiveness of the Defense Acquisition System.

**DoD KEY TECHNOLOGY AREA:** Other (System Acquisition Management)

**KEYWORDS:** Defense Acquisition System, Defense Acquisition Management, Acquisition Reform, Program Manager

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## 1998 THESIS ABSTRACTS

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### **A COST-BENEFIT ANALYSIS OF POWER QUALITY MANAGEMENT IN THE AVIONICS REPAIR FACILITY**

**Brad E. Valdyke-Major, United States Marine Corps**

**B.S., Georgia Institute of Technology, 1985**

**Master of Science in Management-March 1998**

**Advisors: Katsuaki L. Terasawa, Department of Systems Management**

**Keebom Kang, Department of Systems Management**

This thesis focuses on improved aviation readiness and reductions in pipeline investment and repair costs brought about by a power quality management program. Using cost-benefit analysis, it isolates the effects of an implemented program at an Aircraft Intermediate Maintenance Department in order to quantify and compare the costs of implementation and the benefits gained. Specific attention is given to reduction of repair cost of Automatic Test Equipment, and reduction of repair Turn-Around-Time of repair processes utilizing Automatic Test Equipment. The analysis identified three-year savings of up to \$1,135,134 through the application of a power quality management program at one repair location. The analysis demonstrates the savings achievable from the management of power quality in processes using sensitive electrical equipment.

**DoD KEY TECHNOLOGY AREA:** Electronics

**KEYWORDS:** Electronics, Repair Turn-Around-Time, Cost-Benefit Analysis

### **BARGAINING TACTICS AND STRATEGY IN A GOVERNMENT/CONTRACTOR BILATERAL MONOPOLY**

**Dennis Gerard Van Veen-Lieutenant, United States Navy**

**B.S., University of Florida, 1985**

**Master of Science in Management-March 1998**

**Advisor: David V. Lamm, Department of Systems Management**

**Second Reader: Katsuaki L. Terasawa, Department of Systems Management**

The purpose of this research is to examine potential bargaining strategies and tactics which might be used to respond to an offer perceived as unfair or unreasonable from a sole source offeror. Initially, a sole source offeror normally has considerable bargaining leverage over the Government. Pricing data needed to properly evaluate the seller's quotation may be incomplete, inaccurate, or unavailable. Urgent and compelling need may require accelerating the procurement process.

Using bargaining theory and the classic economic paradigm of bilateral monopoly as a foundation for the research, potential bargaining strategies and tactics were evaluated through a survey of 62 Department of Defense contracting specialists.

A primary conclusion of the research is that attaining a bargaining agreement that reflects a fair and reasonable price under bilateral monopoly conditions is not possible unless the Government possesses adequate information to accurately assess the fairness and reasonableness of the offered price.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition and Contract Management)

**KEYWORDS:** Bargaining Theory, Bargaining, Negotiations, Strategy, Tactics, Bilateral Monopoly, Sole Source Contracts, Purchasing, Contracting

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## 1998 THESIS ABSTRACTS

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### A DECISION SUPPORT SYSTEM FOR THE LOCATION OF NAVAL SURFACE RESERVE UNITS

Laura Leigh Venable-Lieutenant Commander, United States Naval Reserve

B.S., College of William and Mary, 1973

Master of Science in Management-March 1998

Advisors: William R. Gates, Department of Systems Management

Mark A. Murphy, Defense Resources Management Institute

This thesis analyzes the process needed to evaluate potential Naval Reserve unit locations from the perspective of cost, manpower, support for the active Navy, and Reserve facility support capability. The research suggests the feasibility of a PC-based Decision Support System to assist Commander, Naval Surface Reserve Force improve the effectiveness and efficiency of the unit location decision.

A comparative decision model was developed based on Multi-Attribute Utility Theory. Design of a Spatial Decision Support System was proposed to incorporate a commercial mapping engine, the formal unit location decision model, and a commercial decision model solver. Since the proposed Decision Support System can provide flexibility, increase the number of decision factors considered, and reduce decision processing time, software development and construction of a Reserve unit Decision Support System prototype is recommended.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Decision Support System, Naval Reserve Unit Location

### CIVIL RESERVE AIR FLEET ENHANCEMENT PROGRAM: A STUDY OF ITS VIABILITY IN TODAY'S ENVIRONMENT

William S. Wales-Lieutenant Commander, United States Navy

B.S., Old Dominion University, 1985

Master of Science in Management-March 1998

Advisors: David G. Brown, Department of Systems Management

Susan P. Hovevar, Department of Systems Management

During the 1970s and 1980s, there existed a gap between the strategic mobility requirement and the nation's cargo airlift assets to meet this requirement. Consequently, the Military Airlift Command (MAC) developed and implemented the Civil Reserve Air Fleet Enhancement Program (CEP) to bridge this gap. Civilian airlines were given monetary and other incentives to modify their existing wide-body passenger aircraft enabling them to carry military-sized cargo in the event of military necessity. This study examines the National Defense Airlift System, the concept behind the CEP's development and reasons for its failure. It also discusses whether the current military, Congressional, and airline environments are conducive to a revitalization of the CEP. It was determined that the current environments do not favor a re-birth of the CEP. However, if a CEP were deemed necessary to meet a potential future gap in the strategic mobility requirement, actions could be taken by MAC, Congress, and airlines to aid its success. Some of these actions are: developing adequate incentives enticing airline participation, ensuring even distribution of enhanced aircraft among CEP participants, investigating use of medium-sized aircraft, investigating benefits of placing financial liens on enhanced aircraft, and reducing Civil Reserve Airfleet (CRAF) activation concerns among participants.

**DoD KEY TECHNOLOGY AREA:** Other (Strategic Mobility)

**KEYWORDS:** Civil Reserve Air Fleet, CRAF, CRAF Enhancement Program, Strategic Mobility, Defense Transportation

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## 1998 THESIS ABSTRACTS

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### **AN EVALUATION OF THE PRODUCTION RECRUITING INCENTIVE MODEL VERSUS QUOTA-BASED RECRUITING USING MONTE CARLO SIMULATION**

**Patrick L. Ward-Lieutenant Commander, United States Naval Reserve**

**B.A., Rutgers University, 1982**

**Master of Science in Management-December 1997**

**Advisors: Katsuaki L. Terasawa, Department of Systems Management**

**William R. Gates, Department of Systems Management**

In recent years, the United States Navy has actively sought new and better ways of making the recruiting process more efficient. Towards this end, the Production Recruiting Incentive Model (PRIME) was developed at the Naval Postgraduate School.

This thesis evaluates recruiter production and incentives in the Navy's quota-based recruiting system against the PRIME system using Monte Carlo simulation techniques in two spreadsheet models. The first spreadsheet model compares three distinct quota scenarios against PRIME in three separate recruit market conditions. The second model evaluates the two systems as the variance of the recruit market changes.

This study produces two main findings: First, in all cases, PRIME proves to be a superior recruiting system than its quota-based rival; Second, the simulation quantitatively illustrates the inherent flaws of quota-based recruiting. The author recommends that the Navy replace the current quota-based system with the more efficient PRIME system.

**KEYWORDS:** Recruiting, Quota-Based Recruiting, Recruiting Incentives PRIME, Monte Carlo Simulation

**DoD KEY TECHNOLOGY AREA:** Other (Recruiting)

### **ANALYSIS OF DISPUTES RELATIVE TO DEPARTMENT OF THE NAVY (DoN) SERVICE AND SUPPORT CONTRACTS**

**Thomas C. Wardwell-Lieutenant Commander, United States Navy**

**B.S., United States Naval Academy, 1986**

**Master of Science in Management-December 1997**

**Advisors: Sandra M. Desbrow, Department of Systems Management**

**David A. Smith, Department of Systems Management**

The primary purpose of this thesis is to analyze recent court decisions relating to disputes in Department of the Navy service and support contracts as a means to identify potential weaknesses in Department of the Navy contracting norms and execution practices. This thesis identifies patterns in the formation and administration of those contracts that can be avoided, with the potential effect of reducing the number of litigated service and support contract disputes between the Department of the Navy and commercial service providers. Finally, this thesis offers recommendations to Navy Contracting Officers and contracting activities to help provide for more effective and efficient service and support contracting services within the Department of the Navy.

**KEYWORDS:** Contract Disputes, Service and Support Contracts

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition and Contracting)

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## 1998 THESIS ABSTRACTS

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### **THE FAR PART 15 REWRITE POLICY AND ITS IMPACT ON FULL AND OPEN COMPETITION**

**Todd E. Washington-Lieutenant Commander, United States Navy**

**B.B.A., University of Texas at Austin, 1986**

**Master of Science in Management-June 1998**

**Advisors: Sandra M. Desbrow, Department of Systems Management**

**David A. Smith, Department of Systems Management**

In 1997, the FAR Part 15 Contracting by Negotiation underwent a comprehensive rewrite. This thesis analyzed the major policies and influences that gave rise to these new rules, and determined the legislative and executive intent concerning its implementation. The key issues created or remaining unanswered by the new policy were identified and analyzed to determine their likely affect on competition in the competitive negotiation process. Similarly, the advantages and disadvantages of the rewrite at the working level for both Government and industry were discussed. From the research, it was determined that competition is unlikely to suffer from the new policy, and in fact, is expected to increase due to lower Bid and Proposal (B&P) costs and more commercial-like processes that will lower barriers to entry. The Federal procurement process will benefit not only from lower prices and reduced acquisition costs, but should also enjoy dramatically reduced procurement cycle time. In terms of possible negative affects, industry is somewhat uncertain about the fair and equitable application of the new rules. The ability to reduce the competitive range for efficiency and "communications" are seen as actions demanding a high degree of contracting officer judgment and fairness. The research methodology could be used to analyze the impact of other legislative or executive policy on implementation at the working level.

**DoD KEY TECHNOLOGY AREA:** Other (Contracting, Acquisition Policy)

**KEYWORDS:** Acquisition Policy, Acquisition Reform, Negotiated Procurement, Source Selection, Federal Acquisition Regulation

### **ESTABLISHMENT OF A DOLLAR THRESHOLD TO PRECLUDE CREDIT CARD RECONCILIATION**

**Kevin D. Waskow-Lieutenant Commander, United States Navy**

**B.A., Wartburg College, 1982**

**Master of Science in Management-June 1998**

**Advisor: Lee E. Edwards, Department of Systems Management**

**Second Reader: James Kerber, Department of Systems Management**

The government credit card program was instituted to streamline the federal acquisition process for material that costs less than \$2,500 (small purchases). However, the reconciliation procedures were not streamlined. All dollar value discrepancies between the bank's Statement of Account (SOA) and the cardholder's purchase order files had to be resolved.

Action by the cardholder to resolve discrepancies, regardless of dollar value, was required. The establishment of a minimum dollar threshold to preclude reconciliation action further streamlined the process and produced cost savings. The Department of Defense Financial Management Regulations did not prohibit the establishment of a threshold. However, Naval Supply Systems Command, card program manager for Department of Navy, required discrepancies to be reconciled to the penny (\$ .01).

To identify savings, Notification of Invoice Adjustment forms were analyzed and interviews conducted with Naval Postgraduate School credit card personnel. The data were utilized to calculate labor costs. Establishment of a threshold resulted in labor savings of \$2,500 per year and a twenty-five percent reduction in labor hours. A reduction in labor hours might result in future savings, if the cardholders perform other non-reconciliation functions, and some positions are eliminated.

## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREA:** Other (Government Credit Card Program)

**KEYWORDS:** Government Credit Card, Reconciliation of the Statement of Account, Department of Defense Financial Management Regulations

**ANALYSIS OF THE DIGITAL VIDEO BROADCAST STANDARD  
FOR USE IN THE GLOBAL BROADCAST SERVICE ARCHITECTURE**

**Robert M. Wellborn-Captain, United States Army**

**B.A., New Mexico State University, 1987**

**Masters of Science in Information Technology Management-March 1998**

**Advisor: Paul H. Moose, Command, Control, and Communications Academic Group**

**Second Reader: Michael W. Boudreau, Department of Systems Management**

The demand for robust, space based, communication systems, for the Department of Defense, continues to increase. The proposed architecture for the Global Broadcast Service (GBS) will meet many of these demands. GBS is a Department of Defense CONUS-based Direct Broadcast Satellite (DBS) project utilizing commercial-off-the-shelf components for the transmission and reception of video, Internet Protocol (IP) and Asynchronous Transfer Mode (ATM) data transmissions. The satellite transmission standard plays a key role in the success of the GBS program. In November 1997 the GBS prime contractor, Hughes Information Systems, announced the use of the Digital Video Broadcast (DVB) standard as the satellite transmission standard for GBS.

This thesis presents an independent evaluation supporting the use of the DVB standard within the GBS architecture. Data contained in this thesis evaluates the theoretical effectiveness of the GBS system while using the DVB transmission standard. This thesis contains a comparison of the DVB supporting documentation against the GBS requirements documentation. The conclusions of this thesis strongly support selection of the DVB standard as the satellite transmission standard for GBS.

**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Manufacturing, Science and Technology, Space Vehicles

**KEYWORDS:** Global Broadcast Service, Command, Control, and Communication Systems, Direct Broadcast Satellites, Digital Video Broadcast (DVB)

**THE PEARL HARBOR NAVAL SHIPYARD AND INTERMEDIATE MAINTENANCE  
FACILITY CONSOLIDATION: A REVIEW OF PERFORMANCE MEASURES**

**James R. White-Commander, United States Navy**

**B.S., Florida Institute of Technology, 1978**

**Master of Science in Management-June 1998**

**Advisors: Joseph G. San Miguel, Department of Systems Management**

**John Mutty, Department of Systems Management**

An important step in the Navy's Regional Maintenance Program is the consolidation of Pearl Harbor Naval Shipyard and the Naval Intermediate Maintenance Facility to improve maintenance operations. Final approval to continue operation as a consolidated organization is scheduled for FY 2000. To gain approval, the Navy must demonstrate to the Office of the Secretary of Defense (OSD) and the Congress that the consolidation has been successful in improving maintenance operations. This thesis evaluated five metrics proposed by the Naval Sea Systems Command (NAVSEA) and the Naval Audit Service (NAS) to measure performance of the consolidation. The process of developing a strategic plan and a performance measurement system (PMS) was explained. The "Balanced Scorecard" framework was used to present the five metrics in a comprehensive PMS. The five proposed metrics, "cost per unit of output," "quality," "production efficiency and resource utilization," "CSMI backlog," and "schedule adherence," were evaluated as useful measures of performance. Ten additional metrics were developed that provide managers further evaluation tools to measure improvements in maintenance



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## 1998 THESIS ABSTRACTS

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operations. Of the ten, only "total asset turnover," the "days worked ratio," and "revenue/cost per employee," are recommended for inclusion with the original five metrics for OSD and Congressional review.

**DoD KEY TECHNOLOGY AREA:** Other (Maintenance Operations)

**KEYWORDS:** Performance Measurement, Regional Maintenance, Consolidation, Strategic Planning

### **STRATEGY AND GUIDELINES FOR TRANSITIONING A HELICOPTER SQUADRON TO THE DEFENSE MESSAGING SYSTEM WITHIN THE IT 21 CONCEPT**

**Quentin G. Wheeler-Lieutenant Commander, United States Navy**

**B.S., North Carolina A&T State University, 1984**

**Master of Science in Information Technology Management-March 1998**

**Advisors: Douglas E. Brinkley, Department of Systems Management**

**William Haga, Department of Systems Management**

IT 21 is the Navy's program to establish standards for fleet units to have the necessary computing infrastructure to support emerging and future requirements. One of the cornerstones of next century's command and control system is the Defense Messaging System (DMS) which replaces AUTODIN. This thesis gathers existing program information and literature, filters the information, and provides the relevant information in one source. The result is a strategy and methodology that achieves DMS and IT 21 objectives. It recommends an architecture that is flexible for future growth, provides group collaboration opportunities, and maximizes shared databases. Additionally, a strategy for purchasing network components and DMS training is recommended.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Command, Control, and Communications

**KEYWORDS:** Defense Message System, IT 21, Implementation Strategy, Organizational Change

### **CHALLENGES AND ISSUES FOR U.S. PORTS: IMPACT OF THE NEXT GENERATION CONTAINERSHIPS AND CARRIER ALLIANCES ON COMMERCIAL PORTS AND MILITARY OPERATIONS**

**Clifford M. Wilborn-Lieutenant Commander, United States Navy**

**B.S., Savannah State University, 1987**

**Master of Science in Management-December 1997**

**Advisors: David G. Brown, Department of Systems Management**

**Donald R. Eaton, Department of Systems Management**

The emergence of the next generation containerships (mega ships) and global shipping line alliances will bring about fundamental changes in the operational framework and infrastructure of many U.S. ports. By all indications the end result will be more a streamlined and competitive container industry where ocean carriers will operate with load center and feeder port configurations. For many ports, this new environment will dictate addressing the problems of inefficiencies in productivity, landside access congestion, and dredging in order to remain competitive. From the military perspective, the changing environment and problems facing the ports may limit accessibility and availability at the nation's strategic seaports.

This thesis examines the issues of the changing port environment and impact on military throughput. It also explores the automation and technological concepts available or being developed which can improve military efficiency.

**KEYWORDS:** Defense Transportation System, Deployment, Logistics, Mobilization

**DoD KEY TECHNOLOGY AREA:** Other (Military Port Operations)

## 1998 THESIS ABSTRACTS

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### **THE EFFECTS OF THE SINGLE PROCESS INITIATIVE ON AEROSPACE SUBCONTRACTORS**

**Anthony A. Winicki-Captain, United States Marine Corps**

**B.A., Loyola Marymount University, 1985**

**Master of Science in Management-June 1998**

**Advisors: Jeffrey R. Cuskey, Department of Systems Management**

**Mark W. Stone, Department of Systems Management**

The purpose of this study was to identify and discuss the difficulties aerospace subcontractors have faced since the implementation of the Single Process Initiative (SPI). In addition, the thesis provided recommendations to address these difficulties and promote greater industry participation in the SPI. The research determined that aerospace subcontractors have experienced increased costs and/or administrative burdens due to prime contractors utilizing the block change process.

The methodology used to identify the apparent inequities faced by the subcontractors was a review of current literature and 40 telephone interviews with representatives of aerospace prime contractors and subcontractors. The interview questions either complimented the information garnered from the literature or asked the respondents to provide personal opinions about the SPI. The questionnaires were compared to one another, analyzed and recommendations were generated.

Specifically, the recommendations included; continue to promote the use of the SPI, open lines of communications between prime contractors and subcontractors through teaming, the Management Council should identify the best possible practices in each proposal, more realism needed with Rough Order of Magnitude estimates, and the Government should better categorize SPI proposals and ensure more timely recommendations from key stakeholders during the proposal approval process.

**DoD KEY TECHNOLOGY AREA:** Other (Defense Acquisition Initiatives)

**KEYWORDS:** Single Process Initiative, Contracting, Acquisitions, Aerospace Subcontractors

### **THE IMPACTS OF ACADEMIC BACKGROUND ON SUBMARINER PERFORMANCE, RETENTION, AND PROMOTION**

**Eric P. Woelper-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1991**

**Master of Science in Management-March 1998**

**Advisors: Stephen L. Mehay, Department of System Management**

**William R. Bowman, Department of Economics, United States Naval Academy**

This thesis analyzes the relationship between pre-commissioning academic background and submarine officer performance. Four measures of officer performance are used: (1) probability of completing the nuclear training pipeline; (2) probability of receiving an early promotion recommendation on greater than 75 percent of LT fitness reports; (3) probability of remaining in the Navy for 10 years of commissioned service (until the 04 board); and (4) probability of promoting to Lieutenant Commander. Navy Promotion History files, Officer Data Cards, Fitness Report files, and Loss files are used to statistically analyze the impacts of college grades and major, college quality, and commissioning source on submariner performance and retention. Non-linear maximum likelihood techniques are used to estimate the four performance models. The findings reveal that good grades and engineering majors have a significant positive impact on all four-performance measures including retention. There are exceptions among OCS graduates. Grades have an insignificant effect on the probability of completing the training pipeline and of remaining in the Navy until the 04 board. Also, non-technical majors are more likely to remain in the Navy than engineering majors. United States Naval Academy (USNA) graduates fare best on all performance measures with the exception of completing the training pipeline. ROTC graduates generally fare better than OCS graduates. Among ROTC and OCS graduates, greater college selectivity leads to higher performance but lower retention rates for OCS graduates. There is no difference in retention rates for ROTC graduates with respect to college selectivity.

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## 1998 THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Submarine Officer Performance, Retention, and Promotion

### **TECHNOLOGY ASSESSMENT OF THE INSPECTION READINESS PLAN IN CHEMICAL WEAPONS CONVENTION CHALLENGE INSPECTIONS**

**Anthony R. Woodley—Lieutenant, United States Navy  
B.S., Norfolk State University, 1989**

**Master of Science in Information Technology Management—September 1998**

**Advisor: James J. Wirtz, Department of National Security Affairs**

**Second Reader: William J. Haga, Department of Systems Management**

This thesis identifies current Information Technology initiatives to help improve the Navy's Inspection Plan for Chemical Weapons Convention (CWC) Challenge Inspections. The CWC is an intrusive inspection. The Challenge Inspection allows for a team of international inspectors to inspect on very short notice a naval facility suspected of violating the CWC.

This thesis begins with a review of the CWC Challenge Inspection timeline. It then describes the Navy's Inspection Readiness Plan for CWC Challenge Inspections as well as the Navy Tiger Team that is sent to naval facilities to assist the Commanding Officer and base personnel during inspections. One of the initiatives evaluated by this analysis is the use of current information technology. To ascertain the feasibility of using current information technology in the CWC Challenge Inspection process, this thesis reviews Tiger Team inspection equipment, conducts interviews with Tiger Team personnel, and assesses the latest commercial information technology. This thesis concludes with recommendations of commercial information technology products for inclusion into the CWC Challenge Inspection process.

**DoD TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** CWC Challenge Inspection, Chemical Weapons Convention, Information Technology

### **FACTORS AFFECTING NEGOTIATOR ORIENTATION**

**Michael Eric Wooten-Major, United States Marine Corps  
B.A., Chapman University, 1986**

**Master of Science in Management—December 1997**

**Advisors: Mark W. Stone, Department of Systems Management**

**Katsuaki Terasawa, Department of Systems Management**

Selected negotiation process models are presented through this conceptual work, which proposes to detect and identify those behaviors, processes, and structures affecting the dynamics of the negotiation process. The factors identified in this work have been drawn primarily from similar studies examining the forces which promote either competitive or cooperative orientations in negotiators. This study reports the results of an extensive survey of the literature and interviews of experts in deciding which of these factors also engender position-based and interest-based orientations in negotiators. The researcher proposes an original model which shows that in this dynamic: (1) a specific pattern of cyclical transactions characterizes the negotiator's orientation, and (2) the parties to a conflict can be seen as shifting between a position-based orientation and an interest-based orientation as certain conditions emerge. Additionally, the researcher's model suggests that negotiation can be defined as a cyclical process of transactional exchanges among a set of parties seeking to fulfill their sets of needs through social influence. Studies in management, psychology, organizational behavior, conflict resolution, and systems dynamics provide the theoretical underpinnings of the model.

**KEYWORDS:** Negotiation, Interest-Based Bargaining, Conflict Management

**DoD TECHNOLOGY AREA:** Other (Negotiation)

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## 1998 THESIS ABSTRACTS

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### **WEB-CENTRIC SYSTEMS IN SUPPORT OF ARGUMENTATION, NEGOTIATION, AND ORGANIZATIONAL MEMORY**

**Carl M. Wright-Captain, United States Marine Corps**

**B.S., Augsburg College, 1990**

**Master of Science in Information Technology Management-December 1997**

**and**

**Randal R. Vickers-Captain, United States Army**

**B.S., Texas A&M University, 1986**

**Master of Science in Information Technology Management-March 1998**

**Advisors: Tung X. Bui, Department of Systems Management**

**Suresh Sridhar, Department of Systems Management**

The purpose of this thesis is to propose and demonstrate a new negotiation and argumentation medium. This medium will take advantage of the latest in Web technologies while conducting a detailed analysis and design of a prototype Web-based decision support system to support on-line argumentation, claims, and team decisions. The information obtained from the application will be stored in an ODBC database, to be used as part of the organizational memory. Organization memory will significantly enhance an organization's ability to utilize historical data in conjunction with current decision making requirements. The findings in this study strongly support the strengths of the action-resource based argumentation system (ARBAS) model and indicate that future research and application development would significantly advance the fields of web-based negotiation and argumentation. A Web-centric prototype developed during this research can be viewed at [<http://www.cimnet.nps.navy.mil/thesis>].

**KEYWORDS:** ARBAS, Argumentation, Browser, Cold Fusion, Corporate Knowledge, Database, Decision-Making, Intranet, Negotiation, Organizational Memory, Web Browser, Web-Centric

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Human Systems Interface, Manpower, Personnel, and Training

### **THE GOVERNMENT PURCHASE CARD UNDER THE FEDERAL ACQUISITION STREAMLINING ACT (FASA) OF 1994: A SMALL BUSINESS PERSPECTIVE**

**Adorado B. Yabut, Jr.-Lieutenant, United States Navy**

**B.B.A., National University, 1986**

**Master of Science in Management-December 1997**

**Advisors: James L. Kerber, Department of Systems Management**

**Katsuaki L. Terasawa, Department of Systems Management**

This thesis examines the effect of recent government acquisition reform initiatives on the small business establishment. Specifically, this thesis investigates the consequences of the Federal Acquisition Streamlining Act of 1994 and the use of the Government Purchase Card on government contracting using Simplified Acquisition Procedures to the small business concern. It analyzes micro-purchase and small business set-aside transactions to understand the significant factors influencing the awarding of the government contract from a small business perspective. The thesis identifies and recommends business strategies that a small business concern can implement to improve its opportunities for conducting business with the federal government.

**KEYWORDS:** Government Purchase Card, Federal Acquisition Streamlining Act (FASA), Small Business Concern

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition)

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## 1998 THESIS ABSTRACTS

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### **NAVAL RESERVE FORCE: COST AND BENEFIT ANALYSIS OF REDUCING THE NUMBER OF NAVAL SURFACE RESERVE FORCE OPERATING BUDGET HOLDERS**

**Eric Coy Young-Lieutenant Commander, United States Naval Reserve  
B.S., Angelo State University, 1984**

**Master of Science in Management-December 1997**

**Advisor: Katsuaki L. Terasawa, Department of Systems Management**

**Second Reader: James L. Kerber, Department of Systems Management**

The Quadrennial Defense Review 1997 recommended reductions of civilian and military personnel associated with infrastructure. The Naval Reserve Force is aggressively pursuing options to reduce excess infrastructure within the Navy. This thesis examines one of Commander Naval Surface Reserve Force's initiatives for reducing the current number of Operating Budget Holder's Comptroller Departments without sacrificing efficiency and effectiveness of operations. The central objective of this research was to determine whether excess capacity existed in these Comptroller Departments. To address this issue, interviews were conducted with key financial personnel assigned to the Naval Reserve Force. Additionally, a questionnaire was distributed to fifty percent (5 of 10) of the Comptrollers to obtain information on manpower requirements, department operating procedures, and department task requirements. The primary finding is that Naval Surface Reserve Force Operating Budget Holder's comptroller organizations could be reduced from ten to seven and continue to operate efficiently and effectively. The analysis concluded that enough excess capacity exists in the comptroller organizations to manage nine additional Naval Reserve Centers.

**KEYWORDS:** Operating Budget Holders, Comptroller, Infrastructure Reductions, Naval Reserve Force

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

### **THE IMPACT OF WEB TECHNOLOGY ON CUSTOMER INFORMATION FLOW**

**Warren Yu-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1990**

**Master of Science in Management-March 1998**

**Advisors: William J. Haga, Department of Systems Management**

**Susan P. Hocevar, Department of Systems Management**

Customer and employee surveys indicate that the Naval Postgraduate School's Housing Welcome Center is stymied by an information bottleneck at the junction of its counselors and customers. Incoming classes decry housing for its poor communication and lack of information. Housing counselors, ever aware of customer satisfaction, spend too much time transacting routine information rather than helping families solve unique problems. This study examines how World Wide Web technology can widen the bottleneck of poor communications between counselor and customer so as to facilitate both information transactions and problem solving. To provide an analysis of the effectiveness in meeting housing customer needs, this study gauges housing customer satisfaction and determines those elements that customers believe constitute a great housing office. An employee survey, a counselor focus group, and archival research further demonstrate the dichotomy between where effort is expended and where it is needed. Customer communication and information expectations cannot be met under the current system. Analysis of qualitative and quantitative data demonstrate that the NPS Housing Welcome Center can overcome its information bottleneck by exploiting the technological advances of the World Wide Web and becoming a hub of information resources.

**Dod KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** World Wide Web, WWW, Customer Service

## 1998 THESIS ABSTRACTS

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### **A CASE STUDY OF THE NON-VIOLENT INMATE LABOR PROGRAM USED TO SUPPLEMENT OPERATING COSTS AT THE FLEET AND INDUSTRIAL SUPPLY CENTER OAKLAND, CALIFORNIA**

**Gregory J. Zacharski-Lieutenant, United States Navy**

**B.A., University of Illinois at Chicago, 1990**

**Master of Science in Management-June 1998**

**Advisors: James L. Kerber, Department of Systems Management,**

**Kenneth J. Euske, Department of Systems Management**

Shrinking budgets are forcing many DoD facilities to defer maintenance and reduce non-mission critical operations. This thesis provides a detailed presentation of the nonviolent inmate labor program utilized by the Fleet and Industrial Supply Center Oakland, California to reduce routine operating costs. The inmate labor program is examined to identify costs, benefits, obstacles, and potential for future use at other DoD installations. This thesis was accomplished through interviews of individuals familiar with the FTSC Oakland non-violent inmate labor program and the review of documents, correspondence and literature pertaining to the program. A chronology of events was constructed, key participants identified, and quantitative and qualitative evaluations of the inmate labor program are presented. The non-violent inmate labor program at FISC Oakland operated for over five years, providing nearly eight million dollars of supplementary labor to the facility, relieving a constrained operating budget.

**DoD KEY TECHNOLOGY AREA:** Other (Operating Costs)

**KEYWORDS:** Fleet and Industrial Supply Center Oakland California, Labor Costs, Inmate Labor

### **BATTLE STATIONS: AN ANALYSIS OF DESIGN, DEVELOPMENT, IMPLEMENTATION, AND TRAINING EFFECTIVENESS**

**Christopher J. Zayatz-Lieutenant, United States Army**

**B.S., Penn State, 1990**

**Master of Science in Management-March 1998**

**Advisors: Bernard J. Ulozas, Navy Personnel Research and Development Center**

**James E. Suchan, Department of Systems Management**

Since the implementation of the Battle Stations program in July 1996 into the recruit training pipeline at Recruit Training Center Great Lakes, it has received much publicity and many accolades from notable military and civilian leaders. They claim that Battle Stations has advanced recruit training further and has meet the changing cultural environment of recruits and the Navy better than any other training program in recent history. The Navy also declares Battle Stations as a rite of passage for Sailors, similar to the Marine Corps' recruit training event, The Crucible. This thesis examines the creation, implementation, and outputs of the Battle Stations program to determine its overall effectiveness as a training program and as a rite of passage. Literature reviews on instructional systems design and rites of passage were conducted to compare it to the Battle Stations program. As a result, Battle Stations was determined to be questionable as a functional training program with little background research performed on design and implementation rationale, and minimally effective as a rite of passage. The Navy should conduct a formal training analysis utilizing models and criteria presented in this thesis to properly determine what changes should be conducted or even if a Battle Stations-type program is needed to meet the Navy's boot camp concerns.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Battle Stations, Training, Manpower Policy Issues, Leadership

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