

MASTER OF SCIENCE IN MANAGEMENT

FOREIGN MILITARY SALES: IMPROVING CONTRACT CLOSEOUT PROCEDURES USING PROCESS INNOVATION

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In 1968, the Foreign Military Sales Act was written with a primary objective of facilitating the common defense by entering into international arrangements with friendly nations. Shrinking defense budgets have shaped an industrial base that is dependent on foreign markets in order to survive. Both the Federal Acquisition Regulation (FAR) and Defense Federal Acquisition Regulation Supplement (DFARS) provide detailed guidance for negotiating contracts with foreign countries and stipulate that U.S. laws apply regardless of foreign policy. The FAR also provides the procedural requirements for the contract closeout process. Often the process is not completed in a timely or proper manner, resulting in noncompliance with contract closeout timeframes, increased backlog, dissatisfied customers and significant monetary ramifications.

The primary purpose of this thesis is to review the management of the contract closeout process and analyze it using process innovation tools. The FAR lists 15 specific Administrative Contracting Officer contract closeout steps that must be completed once a contract is deemed physically complete. Those steps are depicted using KOPeR methodology to identify process pathologies and shortcomings. Further, it develops two redesign alternatives that offer good potential to further streamline the process.

DoD KEY TECHNOLOGY AREA: Other (Acquisition and Contracting)

KEYWORDS: Foreign Military Sales, Contract Closeout Process, Process Innovation

ARAB GULF COOPERATION COUNCIL (AGCC) ECONOMIC INTEGRATION AND FUTURE RECOMMENDATION

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This thesis discusses the historical events that lead to the establishment of the AGCC organization and analyzes the cooperation of the AGCC countries politics, security, economy, as well as defense spending at lower life cycle cost. U.S foreign military sales (FMS) are a good tool to facilitate the arms trades between the U.S and the AGCC countries. The thesis discuss the external and internal threats to the region and the AGCC relations with the West. The AGCC countries must enhance the existing Shield Force and maintain its alliance with the West.

This thesis also discusses the economies of the AGCC countries and indicates that the AGCC countries are still largely oil-based economies. Moreover, the economic characteristics of these countries indicate that they are not ready at their current stage to form a full monetary union. However, these countries are economically qualified for several forms of partial monetary integration, such as an exchange rate

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coordination arrangement, capital market integration. Also, the thesis suggests additional and aggressive economic diversification programs are needed and essential to enhance the development of sustainable economies. Finally, this thesis provides recommendations for exchange rate unification and monetary integration among the AGCC countries to strengthen and move the AGCC forward in the future.

DoD KEY TECHNOLOGY AREA: Other (Economics)

KEYWORDS: Arab Gulf Cooperation Council (AGCC) Security, Political System, Foreign Military Sales, Economic Integration

TOWARD JOINT MEDICAL LOGISTICS 2010 AND BEYOND: PROCESS INNOVATION AND REDESIGN OF CLASS VIII SUPPLY CHAIN AT A MEDICAL LOGISTICS COMPANY

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The purpose of this thesis is to evaluate current Class VIII supply chain procedures at a U.S. Medical Logistics Company (Med Log Co), process map the “as is” baseline process and propose possible “to be” process redesign alternatives that will possibly improve efficiency and produce long-term cost savings. To perform this analysis, the 1st Med Log Co at Camp Pendleton, CA was chosen. The assessment of their “as is” process includes a historical background on medical logistics within the Department of Defense, a comprehensive material logistics literature review, site visits, personnel interviews, process mapping of the baseline “as is” process, and proposal of two redesign alternatives for the “to be” process. A comprehensive analysis was conducted using Thomas Davenport’s Process Innovation Framework and quantitative measurements were obtained using the Knowledge-based Organizational Process Redesign (KOPeR) methodology to diagnosis existing pathologies. KOPeR measurements indicate that the 1st Med Log Co’s existing “as is” process is a fragmented, mostly manual procurement process that can be innovated now using information technology as a process enabler. Our results indicate that by formally injecting the use of electronic mail and shared databases into the “as is” procurement process an immediate impact can be realized. Further efficiency and cost savings can be accomplished by coupling the injection of information technology with a web-based end-to-end procurement process that assigns a case manager to the “to be” process.

DoD KEY TECHNOLOGY AREA: Materials, Processes, and Structures

KEYWORDS: Business-to-Business, Electronic Commerce, Innovation, Logistics, Medical Logistics, Material Management, Process Innovation, Process Mapping

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A COST/BENEFIT ANALYSIS OF PERFORMANCE BASED LOGISTICS AT NAVAL INVENTORY CONTROL POINT MECHANICSBURG AND NAVAL INVENTORY CONTROL POINT PHILADELPHIA

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The purpose of this thesis is to analyze the mechanics of a performance based logistics (PBL) initiative, provide a cost/benefit analysis of PBL initiatives already completed, and finally identify the major benefits and risks common amongst each initiative. This is accomplished by conducting a cost/benefit analysis of the Naval Inventory Control Point (NAVICP) PBL Business Case Analysis (BCA) and examining the customer response time, quality, and risk management aspects of PBL.

The data for this research were gathered from eight PBL BCAs from NAVICP Mechanicsburg and NAVICP Philadelphia. In addition, PBL questionnaires were submitted for several of the cases studied. Key personnel from both commands were interviewed.

This thesis concludes that PBL is an overall cost effective and efficient contract arrangement, but improvements can be made to enhance the assessment and success of PBL. This conclusion was based on the net present value and sensitivity analyses conducted of the eight PBL cases. Sensitivity analysis revealed that the various cost factors affect the net present value of the PBL differently— with the material cost having the largest effect and contract administration cost having the least effect. Lastly, four recommendations were made for further improvements to the PBL process.

DoD KEY TECHNOLOGY AREA: Other (Acquisition and Contract Management, Logistics Support)

KEYWORDS: Performance Based Logistics, Direct Vendor Delivery

COST ANALYSIS OF PUBLIC WORKS MAINTENANCE MATERIAL OPERATIONS

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The Office of Management and Budget Circular A-76 specifies that determining whether commercial activities should be done in-house or under contract to ensure best business practices and cost efficiency is an assurance the American taxpayer deserves. This study examines the maintenance material operations of Public Works to see if 1) they are conducted with best business practices, 2) inventories are optimally stocked based on usage data, and 3) conducting a cost analysis reveals areas for potential improvement. To provide the analysis, existing annual operating costs for labor, material, and overhead were reviewed. An inventory control model was used to calculate high and low limits for a sample of material items based on available usage data. Fifty-three percent of the sampled material items were stocked above or below suggested stocking levels per the inventory control model used. Based on the sample the annual cost to the command of the overstocked items is approximately \$131,000.

DoD KEY TECHNOLOGY AREA: Materials, Processes, and Structures

KEYWORDS: Systems, Cost Analysis, Inventory Control, Maintenance Material Operations

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THE PRICE AND PROGRESS OF COMPLIANCE WITH FEDERAL FINANCIAL MANAGEMENT REPORTING REQUIREMENTS IN DEPARTMENT OF THE NAVY PROPERTY, PLANT, AND EQUIPMENT NONFINANCIAL FEEDER SYSTEMS

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The federal government holds an inherent responsibility to report on its financial management operations and consequent outcomes. The passage of the Chief Financial Officers Act of 1990 and subsequent fiscal reform legislation set forth a mandate for financial accountability through implementation of an integrated financial management system, preparation and audit of consolidated federal financial statements, and institution of government-wide strategic planning and performance measurement. The Department of Defense (DoD) remains the predominant noncompliant agency, and in 1999 acknowledged that archaic data feeder systems never intended to comply with accounting standards or integrate with financial management systems were the major obstacles to conformity. DoD estimates that 80 percent of relevant financial management data comes from these critical nonfinancial feeder systems. This thesis estimates the cost and progress of Property, Plant, and Equipment (PP&E) nonfinancial feeder system compliance within the Department of the Navy (DoN), which controls approximately 50 percent of DoD PP&E assets. Objective assessments of Real and Personal Property initiatives set a framework for examination of alternative strategies to overcome pervasive National Defense Asset reporting deficiencies. This thesis proposes a DoN strategic initiative to define, account for, and report National Defense PP&E in the absence of relevant federal accounting standards.

DoD KEY TECHNOLOGY AREA: Other (Financial Management and Systems)

KEYWORDS: Biennial Financial Management Improvement Plan, Chief Financial Officers Act, Department of Defense, Department of the Navy, Federal Accounting Standards Advisory Board, Federal Financial Management Improvement Act, Financial Reporting, Financial Statements, National Defense Assets, Nonfinancial Feeder Systems, Personal Property, Property, Plant and Equipment, Real Property

THE IMPACT OF TURN AROUND TIME IN BRAZILIAN NAVY INVENTORIES

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This thesis analyzes how the operation of helicopters produced and supported by manufacturers in various countries affect Brazilian Navy repairable inventories levels and costs. The research is based on a scenario where the Brazilian Navy operates 68 helicopters, manufactured by contractors in the U.S., France, England and Italy, and the Brazilian Navy relies on these manufacturers for depot-level maintenance. A simulation model representing the repair process of a group of critical helicopter components and measure the turn-around time (TAT) was developed. A readiness based model was also developed to find the optimal inventory level of the selected group of helicopter components to achieve a desired operational availability under these TATs. The results were applied to a spreadsheet model to find the differences in spare levels and associated costs necessary to operate the helicopter fleet. The research concludes that the helicopter's source has a substantial impact on repairable inventories levels and costs. Furthermore, this impact is large enough to influence decisions in the Brazilian Navy acquisition process of equipment and weapons systems.

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DoD KEY TECHNOLOGY AREA: Other (Manufacturing Science And Technology, Logistics)

KEYWORDS: Inventory Management, Operational Availability, Simulation Modeling, Transportation, Aviation Depot-Level Maintenance

FORECASTING MODEL FOR FUTURE NEEDS REQUIREMENT FOR SPARE PARTS IN FMS SALES

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This research focuses on Italy, Brazil and the Republic of Korea, how each purchased the U.S. Marine Corps' Advanced Amphibious Vehicle (AAV), and how each supports the AAV through the life-cycle requirements. The thesis provides insights through an in-depth analysis of each country's political, economic and defense aspects. A predictive model determines the support requirements on future FMS sales by studying the past. Thus, the Marine Corps can estimate the future requests for spare parts in support of the AAV.

The research identifies political stability, economies of scale, and trust between the foreign government and the seller as the major factors needed to predict decisions about procurement of spare parts through FMS.

DoD KEY TECHNOLOGY AREA: Other (Acquisitions)

KEYWORDS: Foreign Military Sales (FMS), Italy, Brazil, Korea, AAV, AAV, LVT, BPA, Spare Parts, OMFTS, Direct Commercial Sales (DCS)

DEVELOPING AND STRUCTURING A PERMANENT CONTRACTING COMMAND IN THE UNITED STATES MARINE CORPS TO MAXIMIZE THE TRAINING, EDUCATION AND POTENTIAL OF MILITARY CONTRACTING OFFICERS IN ORDER TO BE BETTER PREPARED TO SUPPORT THE OPERATIONAL FORCES AND LEAD THE MARINE CORPS THROUGH THE 21ST CENTURY

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The Marine Corps contracting community continually refines its policies and procedures as a response to the changing environment within which it operates. The objective of this thesis was to develop an innovative contracting command structure to maximize the training, education, potential and retention of the military contracting officers. To accomplish this objective, this thesis identified the historical and statutory basis for Government contracting. It also identified billets for qualified Marine Corps military contracting officers and where potential need currently is recognized. Lastly the roles and responsibilities of the Marine Corps military contracting officers are identified. Based upon this archival research and interviews with members of the contracting community, this thesis developed a framework for an innovative contracting command structure through the use of an integrated systems model. This model establishes the need for additional military contracting officer billets, standardizes the reporting and operational chains of command, and promotes stability. The key findings are that the current system design does not enhance the contracting officers' professional growth and development, aid in retention, or create a path for career progression. This study is a proactive approach to the changing environment of contracting to confront the detrimental findings above.

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DoD KEY TECHNOLOGY AREAS: Manpower, Personnel and Training, Other (Acquisition)

KEYWORDS: Contracting, Military Contracting Officers, Marine Corps Contracting, Contracting Military Occupational Specialty, Contracting Career Path, Contracting Command Structure Model

A COST-BENEFIT ANALYSIS OF A MILITARY THRIFT SAVINGS PLAN

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The transition from defined benefit to defined contribution retirement plans represents the most significant change in both the private sector and civil service employee retirement systems in the last twenty years. The Thrift Savings Plan (TSP), a tax-deferred, defined contribution plan for federal civilian employees, was established in 1986 as part of the Federal Employee Retirement System. This thesis discusses the costs and benefits of a TSP plan for the uniformed services. The objective of the research addresses the costs of a military TSP. Government studies, periodicals, and the Internet were examined to identify the strengths and weaknesses of the federal TSP. Next, a probabilistic spreadsheet model using Monte Carlo simulation was developed to forecast deferred tax revenue, which represents the most significant cost associated with a military TSP. An analysis of the results indicates that the simulations come within 2.6 percent of the initial Department of Defense's forecast. On October 30, 2000, the National Defense Authorization Act for fiscal year 2001 was enacted. This act included a military TSP called the Uniformed Services Payroll Savings Plan. It is recommended that future cost estimates use probabilistic spreadsheet modeling to provide more relevant information to the decisionmaking process.

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

KEYWORDS: Military Personnel, Retirement (Personnel), Cost Estimates, Cost Analysis

ANALYSIS OF MEASURES OF PERFORMANCE AND CONTINUOUS IMPROVEMENT AT THE NAVAL DENTAL CENTER PEARL HARBOR, HAWAII

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The Balanced Scorecard, developed by Robert S. Kaplan and David P. Norton, is a strategic management tool that has been successfully implemented in the private sector. This tool uses a balance of a historical perspective (financial) and three operational perspectives (customer service, internal business processes, and innovation and learning) that allow managers to readily evaluate an organization's performance towards achieving its vision and mission. This study examines the applicability of the Balanced Scorecard concept to Government organizations as a potential strategic management tool. The Government organization chosen to test this applicability was the Naval Dental Center Pearl Harbor (NDCPH) because it was recognized in 1998 for its organizational excellence by receiving the Hawaii State Award of Excellence, and the author's personal experiences onboard NDCPH as comptroller. The study centered on analyzing NDCPH's Mission, Vision, Key Success Factors (KSFs), and performance metrics, for use in developing a proposed Balanced Scorecard framework. This was done by equating the KSFs with Kaplan and Norton's perspectives and then matching appropriate performance metrics to the KSFs. A Balanced Scorecard framework that followed Kaplan and Norton's concept was recommended. The potential for adapting this framework to other Naval Dental Centers was also demonstrated.

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DoD KEY TECHNOLOGY AREA: Other (Strategic Management)

KEYWORDS: Performance Measurement, Strategic Planning, Navy Dentistry

A COST BENEFIT ANALYSIS OF SUPPLYING CONSUMABLE MATERIALS BY READY SUPPLY DEPOT (RSD) VERSUS COMMERCIAL VENDORS

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The purpose of this study is to examine the current Philippine Fleet (PF) method of supplying consumable materials to Fleet units via a Ready Supply Depot (RSD). The study desires to determine the most cost-effective method of delivering the services currently provided by the RSD in order to fully maximize the use of Fleet resources without sacrificing mission effectiveness. This thesis focuses on the cost the Navy pays to the supplier and all direct and indirect costs of the RSD operation. This study compares the total price of each item inventoried at RSD to a similar item sold by commercial vendors in the Cavite City and Manila area. The difference in price is multiplied by past demand to determine the excess cost to consumers of acquiring consumables from RSD instead of directly from commercial vendors. Additionally, results from RSD consumer surveys are used to assess the service benefits provided by RSD, as seen by its customers. The research results show that the compared items are less expensive to the customer when purchased at RSD. However, it also shows that it is more costly for the government to provide these items via RSD. Furthermore, a customer survey indicates that the RSD customers are not satisfied with the selection, quality, availability, and customer service levels present at the RSD. As a consequence, the recommendation is made to eliminate the Ready Supply Depot (RSD) operation and allow the RSD customers to use commercial vendors for their non-military consumable item needs.

DoD KEY TECHNOLOGY AREA: Materials, Processes, and Structures

KEYWORDS: Consumables, Ready Supply Depot, Inventory Management

EMERGENCY SUPPLEMENTAL APPROPRIATIONS: A DEPARTMENT OF DEFENSE PERSPECTIVE

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The increased use of "emergency" supplemental appropriations is gaining awareness within the Department of Defense (DoD) and continues to reflect the pressure of budget caps in the congressional appropriations process. While the defense portion of supplementals has been relatively small since the Vietnam War, emergency supplementals for natural disasters, military contingencies, and peacekeeping have steadily increased since the Persian Gulf War. The primary objective of this study is to focus on the history, policies, and processes of emergency supplemental appropriations and how they impact the DoD budget. Data were obtained by applying a legislative history tracking methodology to over sixty emergency supplemental bills, including all significant dates within the bill process by fiscal year from 1974 to 1999. Analysis of the data support the conclusion that it is imperative that Congress exercise good budgetary discipline and discretion regarding emergency supplemental appropriations. It should require agencies to improve planning for emergencies in order to avoid creating new budgets and mid-year plus-ups. Congress can avoid mortgaging future defense readiness and still support the military's role in global emergency operations. Irrespective of improvements in budget planning, some level of supplemental appropriations will always be necessary to meet true budget emergencies.

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DoD KEY TECHNOLOGY AREA: Other (Federal Policy and Budgeting)

KEYWORDS: Emergency Supplemental Appropriations, Rescissions, Complex Emergencies

THE IMPLEMENTATION OF A KNOWLEDGE MANAGEMENT SYSTEM TO THE ACQUISITION ORGANIZATION AT A MAJOR SYSTEMS COMMAND

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The thesis discusses the potential implementation of a knowledge management system to the contracting organization at a major systems command. In doing so, it examines ongoing DoD and private knowledge-based projects and discusses obstacles, feasibility and benefits of implementation of a knowledge-based system for the acquisition function at a major systems command (SYSCOM). The thesis also makes recommendations for eventual implementation plans. Also included is a discussion of the change in organizational processes made as a result of implementation.

It is envisioned that the thesis could be used as a model for the eventual implementation of a knowledge based system that would support the contracting activities at a major systems command to alleviate future problems with a workforce that is rapidly approaching retirement eligibility and the diminished financial resources available for the hiring of replacement employees.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Acquisition, Knowledge Management, Organizational Systems

BUSINESS PROCESS REFORM AT MARINE CORPS INSTALLATIONS: A SYSTEMS PERSPECTIVE

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The Department of Defense (DoD) has made a conscious decision to find ways to reduce infrastructure costs, and apply the savings to weapons system modernization. Thus the "Defense Reform Initiative" (DRI) and the "Revolution in Business Affairs" (RBA) were created to help achieve needed savings. The Marine Corps, along with the other services, is in the process of changing the way installations are operated because of these initiatives. Better business practices are expected to include efficiency and effectiveness gains through competitive sourcing of goods and services, outsourcing and privatizing functions that are currently done in-house, as well as consolidating like functions within regional (geographical) areas and re-engineering business processes.

This study examines the impact that DoD reform initiatives are having on Marine Corps installations using an organizational systems framework model. Findings indicate that the reform initiatives are being implemented. The reforms are impacting the operation of Marine Corps installations. Marine Corps actions for some of the organizational system elements are incongruent with stated intent. Specific recommendations include: set clear direction by articulating a vision of installation expectations; revise the current installation structure, influence a culture change by revising and clarifying strategic direction; and monitor desired results.

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DoD KEY TECHNOLOGY AREA: Command, Control and Communication

KEYWORDS: Business Reform, Outsourcing, Regionalization, Privatization, Competitive Sourcing, A-76, Re-Engineering, Organization, System

A RETIREMENT PLANNING MODEL USING MONTE CARLO SIMULATION

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Uncertainty exists in retirement planning. The purpose of this thesis was to develop a stochastic retirement planning model to aid military personnel and decision/policy makers in evaluating retirement planning issues from a probabilistic perspective. The stochastic model developed differs from the ubiquitous retirement planning calculators available from many financial institutions and at many finance-related websites in that it accounts for the effects of uncertainty surrounding inflation and investment rates of return during one's investing "lifetime" by using Monte Carlo simulation techniques. The major components of the model are an input/output worksheet, a fund accumulation worksheet, a fund withdrawal worksheet, a probability distribution worksheet and a pay table lookup worksheet. After completing 17 inputs and running a simulation, a user is able to determine the probability of achieving a specific amount of retirement savings as well as the probability associated with how many years the retirement savings, supplemented by military retirement benefits and Social Security, may last. The information gained by using the model allows military personnel to evaluate their current retirement plans and make necessary adjustments. Additionally, the model allows decision/policy makers to evaluate specific military retirement issues in order to determine how changes may affect service members.

DoD KEY TECHNOLOGY AREA: Other (Financial Management)

KEYWORDS: Retirement, Monte Carlo Simulation, Military Benefits, Social Security Benefits, Historical Investment Returns

MODERNIZATION THROUGH SPARES FOR THE ARMY'S LIGHT TACTICAL VEHICLE

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In recent years, the Department of the Army has responded to the Federal Acquisition Streamlining Act of 1994 (FASA) and the Federal Acquisition Reform Act of 1996 (FARA) by implementing several policies and procedures. The policies are designed to cope with the challenge to operate with an ever-shrinking Defense budget and yet provide our warfighters with the weapon systems they need to succeed. One of the strategies employed by the Army to this end is Modernization Through Spares (MTS).

In a 22 January 1996 memorandum sent out by then Assistant Secretary of the Army (Research, Development and Acquisition), Gilbert F. Decker expressed his wishes to test the MTS concept on several programs, including the High Mobility Multi-Purpose Wheeled Vehicle (HMMWV). He illustrated the MTS concept through an example, "While the old strategy may have gotten us a good price on a vacuum tube, for example it is time to begin buying semi-conductor chips with dramatic reductions in life-cycle costs and dramatic improvements in performance and reliability."

This research will analyze how the Program Manager (PM) of Light Tactical Vehicles (LTV) of the U.S. Army Materiel Command (AMC) implements Modernization Through Spares (MTS) for their

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HMMWV program. The objective is to establish the extent to which PM-LTV implements MTS and identify the methods used for MTS implementation in order to comply with the Army's strategy for MTS.

DoD KEY TECHNOLOGY AREAS: Command, Control and Communication, Ground Vehicles

KEYWORDS: Modernization Through Spares, Modernization, Modification, Acquisition Strategy, High Mobility Multi-Purpose Wheeled Vehicle (HMMWV), Light Tactical Vehicle

MULTI-PHASE SOURCE SELECTION STRATEGY ANALYSIS

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This thesis analyzed the use of a multi-phase source selection strategy at the Naval Air Systems Command. Points noted in four case studies were contrasted with policies and practices. Three essential characteristics of the multi-phase source selection strategy are that phases are used to fully understand requirements to the point that program risk is reduced, changes to requirements do not have to be re-competed and no Justification and Approval (J&A) is required for other than full and open competition when going into a follow-on phase considering only offerors from prior phases. Factors identified when the proposed multi-phase source selection strategy is appropriate include a high degree of confidence in the ability to determine a fair price without relying on supplier cost data, a fluid requirement likely to change significantly after exchange of information with potential sources, Government requirements initially stated as objectives, potential to take maximum advantage of commercially available technology, adequate time to fully accommodate exploratory phases prior to or at the start of the program, adequate commitment of funds available to accommodate potential growth in funding requirements during early requirement development phases, two or more sources expected to be capable of meeting the requirements, experienced personnel willing to adopt new strategies and engage in revised behavior patterns available for staffing the program office and organizational willingness to modify regulatory guidance as needed to accommodate the intended strategy.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Source Selection, Naval Air Systems Command, Major System Acquisition, Price-Based Acquisition, Multi-Phase Source Selection, Arsenal Ship, Deepwater, Marine Corps Aviation System Master Plan, Joint Direct Attack Munition

ADOPTION OF THE INTERNET-BASED ELECTRONIC ORDERING SYSTEMS (EOS)-USERS' FACTOR ANALYSIS

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Innovative technologies such as the Internet and World Wide Web are raising hopes of changing the picture of inefficient, complex and costly ordering processes and improving them in terms of quality, flexibility, and lead-time. The market of systems and services to support business-to-business relationships, in particular procurement processes, is one of hottest areas of Internet-commerce today. With most organizations spending at least one third of their overall budget to purchase goods and services, procurement savings hold significant business value. In this thesis, we provide a brief overview of e-commerce technologies, and present the summary of results from a survey study of small and medium organizations. The results are based on a survey of about 35 companies during the period Sep 2000 – Oct

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2000. The survey covers issues related to identifying current adoption factors to moving ordering onto the Internet and current issues that have to be overcome in order to gain wide spread adoption.

DoD KEY TECHNOLOGY AREA: Command, Control and Communication

KEYWORDS: Electronic Commerce, Internet, Electronic Ordering System (EOS)

**A CASE STUDY: IMPLEMENTATION OF THE GOVERNMENT PAPERWORK
ELIMINATION ACT IN THE DOD ACQUISITION PROCESS: ASSESSING
THE IMPACT OF INFORMATION TECHNOLOGY**

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The Paperwork Elimination Act was signed into law on 21 October 1998. The Act is the guidance for Executive Agencies to improve customer service and information exchange through the use of information technology. The purpose of this thesis is to determine the feasibility of the Department of the Navy, specifically the Space and Naval Warfare Systems Command, San Diego (SPAWAR), to implement the Government Paperwork Elimination Act by the mandated 30 October 2003 deadline. This study examines the current paperless contracting system utilized by SPAWAR to determine if it can transition to a complete web based acquisition process. It is the finding of this thesis that, with the right level of funding and management oversight, the requirements of the Government Paperwork Elimination Act can be achieved.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORD: Systems, Defense Procurement

**THE USE OF THE INTEGRATED PRODUCT TEAM IN THE NAVAL TOMAHAWK CRUISE
MISSILE PROGRAM AT THE DEFENSE CONTRACTING
MANAGEMENT AGENCY RAYTHEON**

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This thesis examines the use of the Integrated Product Team (IPT) concept within the Tomahawk Cruise Missile Program at the Defense Contracting Management Agency (DCMA) Raytheon. The study presents a literature review of the IPT philosophy and concepts and an overview of the Tomahawk Cruise Missile Program IPTs. Surveys and interviews focus on the following areas: 1) IPT dynamics; 2) IPT performance; 3) IPT training; and 4) the working relationship between contractor and Government personnel on IPTs.

Overall, team members who have participated in or managed an IPT agree that IPT has added value to the acquisition process by bringing functional disciplines from Government and industry together to exchange ideas and build a successful Tomahawk Program. Only a few team members reported that the IPT process led to problems in the decisionmaking process, alignment of team objectives, and contractor and Government working relationships.

Although both contractor and Government team members have some misunderstandings and preconceived notions about each other, both organizations realize that an effective Government and contractor interface provided by the IPT process is crucial to the success of the Tomahawk Program.

MANAGEMENT

DoD KEY TECHNOLOGY AREA: Materials, Process, and Structures

KEYWORDS: Integrated Product Team, IPT, Acquisition

ASSESSING THE PERFORMANCE AND COST OF LOGISTICS AIRFLEET OPTIONS

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Master of Science in Management-December 2000

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The Chief of Naval Operations (OPNAV) has directed a study to determine the proper airfleet to satisfy the Navy's future logistics needs. The sponsor of the study is OPNAV N78G, the Financial Management Office of OPNAV's Air Warfare Division. The goal of the study is to ensure effective and efficient resource allocation in building an airfleet that will satisfy future peacetime and wartime airlift demand. This thesis supports the OPNAV study by providing a tool for evaluating airlift fleet options on the basis of cost and capability. This decision support tool combines an aircraft assignment model, which determines fleet capability, with a Life Cycle Cost (LCC) model, which calculates the cost of acquiring and operating a given fleet of aircraft. The combined models allow decision makers to specify a fleet mix with desirable performance characteristics, calculate the cost of that fleet, and observe the financial and operational effects of changing either the makeup of the fleet or the acquisition schedule. The thesis combines deterministic and stochastic analysis of historical demand data to assess the demand for aircraft and the capabilities of a chosen fleet mix. The data provided by the sponsor do not include overseas missions; this limits the scope of the study, but does not detract from the methodology. Cost data from Navy and commercial sources are used to develop LCC data for the chosen fleet. The resulting methodology, taken as a whole, provides detailed insight into the effects that fleet mix changes have on airfleet performance and cost. The user can incorporate various priorities (low cost, high capacity, high flexibility) in the selection of a fleet mix and observe the impacts these decisions will have on fleet cost and performance.

DoD KEY TECHNOLOGY AREA: Other (Financial Management)

KEYWORDS: Logistics Airlift, Cost Benefit Analysis, Life Cycle Cost, Monte Carlo Simulation

A POISSON REGRESSION ANALYSIS OF THE ACADEMIC SETBACK IN NAVAL TRAINING DEADTIME

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The dead time in a Naval Training Pipeline is defined as time spent by students enrolled in training doing things other than training. The effect of dead time has been to decrease the utilization of personnel to under 70% in recent times. Four years (1996-1999) of data have been selected for study. The Academic Setbacks for course with CDP identifier 6400 has been chosen for initial work and model building. The methods developed for this case will be applied to Academic Attrition and Instruction Interruption to the extent possible. The exploratory analyses will seek to discover internal temporal patterns of setbacks. The goal is to build methodology for identifying sets of time intervals that exhibit the larger setback and attrition rates.

DoD KEY TECHNOLOGY AREA: Manpower, Personnel and Training

KEYWORDS: Poisson Regression, Training Deadtime, Maximum Likelihood

MANAGEMENT

AUTONOMIC LOGISTICS CAPABILITY OF THE ADVANCED AMPHIBIOUS ASSAULT VEHICLE

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This study examined the feasibility of using on-board sensory data from the Marine Corps Advanced Amphibious Assault Vehicle (AAAV) as inputs to the Marine Corps Asset Tracking Logistics and Supply System, version II+ (ATLASS II+) as a way to improve sustained logistics decision making. It also looks at the possibility of feeding AAAV sensory data to the Optimized Naval Aviation Logistics Command Information System (NALCOMIS) at the Organizational Maintenance Activity (OMA) level. The major finding is that ATLASS II+ cannot fully support AAAV inputs at this time but the logistics system will be capable of such support when the AAAV is fielded in 2006. Another finding is that the Platform Software Interface Subsystem being developed for NALCOMIS could significantly improve the logistical management of the AAAV life-cycle if integrated into ATLASS II+. An additional improvement would result if the Configuration Management Subsystem of NALCOMIS could be integrated into ATLASS II+. Recommendations are made for logistical management practices and logistics policy.

DoD KEY TECHNOLOGY AREA: Command, Control and Communication, Sensors, Ground Vehicles

KEYWORDS: Autonomic Logistics, Sensors, Logistics, Maintenance, Supply, Automated Information Systems

ANALYSIS OF PORT CONGESTION UPON SEALIFT OPERATIONS USING SIMULATION

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Strategic sealift plays a vital role in the U.S. Navy's concept of battlespace sustainment and projecting maritime power. Factors such as port congestion, however, can constrain the ability of sealift system assets to provide sustainment support when and where needed to meet mission objectives. This thesis describes the design and employment of a modeling and simulation framework, the Materiel Transport and Resource Allocation Decision-support System (MTRADS), to assess the potential impact of port congestion on time-critical sealift system operations.

We employ MTRADS to provide advance planning information regarding the expected effects of congestion, alternate force structures, and resource allocation decisions at the port of Pusan, Republic of Korea (ROK), on the ability of the Korean Flag Shipping (KFS) Program to execute an actual TPFDD-based sealift deployment plan generated by the Military Sealift Command (MSC). Our analysis, experimentation, and conclusions indicate certain sealift system or port assets can impose significant constraints on the KFS Program's ability to meet specific closure time objectives. We recommend MSC build upon the foundation MTRADS provides to further explore the potential effects of congestion-specific and other port access and denial issues affecting strategic sealift operations.

DoD KEY TECHNOLOGY AREA: Modeling and Simulation

KEYWORDS: Military Sealift Operations, Military Transportation, Computerized Simulation, Seaports(Facilities), Port Congestion, Korean Flag Shipping Program, Trafficability

MANAGEMENT

COST BENEFIT ANALYSIS FOR THE UNITED STATES NAVY'S CLOSED CIRCUIT TELEVISION SYSTEM

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This thesis provides insight and a possible solution for improving the United States Navy's Closed Circuit Television (CCTV) System and training tape system. The Department of Defense (DoD), and specifically, the United States Navy, can incorporate commercial technologies that would improve the quality of life of its members, the quality of its shipboard training, and reduce the cost of providing CCTV support to deployed personnel.

The Office of Management and Budget (OMB) circulars A-76 and A-94 were used as guidelines to study potential cost savings and reduction measures. Data collection provided in this study consisted of internet and electronic queries, personal interviews, and telephone correspondences.

Results indicated that consolidating DoD media commands and converting to a Digital Video Disc (DVD) technology could reduce overall costs to the Navy and improve product quality. The Navy should validate these exploratory findings and consider implementing the following: consolidate television weekly (TW) and duplication facility (DUPFAC) services, replace existing 8mm players with commercial DVD players, and acquire future recorded media (movies and training films) on DVD.

DoD KEY TECHNOLOGY AREAS: Electronics

KEYWORDS: Closed Circuit Television, Site Television, Digital Video Disc

CONTINGENCY CONTRACTING WITHIN THE DEPARTMENT OF DEFENSE: A COMPARATIVE ANALYSIS

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Contingencies such as regional conflicts, humanitarian and peacekeeping missions, or international or domestic disaster relief missions dictate the immediate deployment of military forces. This rapid deployment of Service members and other military assets requires concurrent deployment of supporting assets such as Contingency Contracting Officers (CCOs). The purpose of this research was to detail and compare the contingency contracting establishments of the Air Force, Army, Navy/Marine Corps, and Defense Contract Management Agency.

The thesis compares and contrasts the regulations governing the contingency contracting operations, the organization structure, contingency contracting support plans, and the training requirements and duties of CCOs of the aforementioned components. All components have adequate structures in place for contingency contracting. However, the research provides several conclusions and recommendations on how the Services could conduct contingency contracting operations more efficiently. Recommendations include the establishment of a contingency contracting chief within the Marine Corps, scenario-based field training within Department of Defense and the Services, and tailored pre-deployment training within each Service. As the Services continuously redefine their missions, they must adapt all subordinate units and organizations to ensure personnel have the training and equipment to meet any contingency.

DoD KEY TECHNOLOGY AREA: Manpower, Personnel, and Training

KEYWORDS: Contingency, Contracting, Contingency Contracting

MANAGEMENT

AN EXAMINATION OF MARFORRES CARDHOLDER AND APPROVING OFFICIAL SELF-MOTIVATION

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The focus of this research was to evaluate the intrinsic task motivation or “the positively valued experiences” (Thomas & Velthouse, 1990) that cardholders and approving officials within the Marine Forces Reserve obtain from performance of the duties associated with the purchase card program. The researcher sought to determine the prevalence of several contributors to intrinsic task motivation and how they affect performance and task satisfaction. The research includes an examination of Government, DoD, and DoN micropurchase program background and procedures with particular emphasis on the purchase card program at MARFORRES. This program background combined with a review of intrinsic motivation literature was used to devise and test a model of cardholder and approving official intrinsic task motivation. A survey was designed to evaluate this model and data were gathered from a sample of 114 cardholders and approving officials from MARFORRES. The results of the research indicate that task criticality, task competence, feedback, and autonomy were contributors to intrinsic task motivation. Autonomy was found to have the strongest relationship with motivation as well as quality of task performance and individual task satisfaction. Recommendations regarding training and streamlining purchase card activities are provided as an aid to decisionmaking in purchase card program management.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Government-Wide Commercial Purchase Card, Intrinsic Task Motivation

AN ANALYSIS OF THE COMPETITIVE STRATEGY IN THE INDUSTRY PROVIDING A DEFENSE SYSTEM OF SYSTEMS

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The change from platform to network centric warfare requires new perspectives of the Defense Industrial Base. Both the 1996 Defense Science Board Report on Vertical Integration and DoD’s 1999 report on Price Based Acquisition recommend that DoD take steps to further understanding of competitive conditions in the defense industry. This thesis explores one method for gaining this insight. The industry is producing the system of systems for DoD, not just platforms. This thesis studies prime contractors for 78 programs which have been determined as the foundation for the future system of systems. By applying the Value-Net business model, it reviews the influences the Department of Defense, International Governments and industries, commercial firms, and suppliers have upon the prime contractors. This analysis identifies growth markets in interoperability development and open system component development. It also identifies competition-induced constraints on weapon system production markets. Through a survey of Defense Contract Management Agency Prime Integrators, it determines the concentration of prime contractor performance in the 78 programs. Based on data from 61 of the 92 prime contractors, it also reveals performance trends, indicating that key players in the industry have established strategies for network centric development. This thesis also shows that using the Value-Net business model is a valid method for understanding competitive influences in the industry for network centric warfare

DoD KEY TECHNOLOGY AREAS: Manufacturing Science and Technology (MS&T)

KEYWORDS: Industrial Base, Competition, System of Systems, Network Centric Warfare, Defense Industrial Base

MANAGEMENT

A PERIODIC REVIEW INVENTORY POLICY FOR SMALL MILITARY HOSPITALS

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We report on potential transportation, administrative, and inventory savings through an extended partnership between military hospitals and commercial prime vendors. We develop a simulated (Q,r) inventory model that incorporates inventory management concepts of optimal reorder points and quantities, and then compare the results to a periodic order policy. We compare the policies with a simulation that considers the effects of integrating inventory management, shipping, and invoice processing with the Prime Vendor. Our results suggest that small military hospital may benefit from a periodic order policy.

DoD KEY TECHNOLOGY AREA: Manufacturing Science and Technology (MS&T)

KEYWORDS: Hospital, Medical, Supply, Inventory, Simulation, Logistics

NAVAL AVIATION AGING WIRING: PROGNOSTIC AND DIAGNOSTIC SOLUTIONS

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The Navy and Marine Corps provide key forward-presence, crisis response and war-fighting capabilities to our nation's leaders and joint commanders. Naval Aviation plays a central role in every naval mission.

Unfortunately, the tools of naval aviation's power, its aircraft, are becoming alarmingly old. The average age of the naval aviation inventory is in excess of eighteen years old. The nerve center of today's sophisticated aircraft, wiring, is also aging and in some cases aging faster than the aircraft themselves. This study was initiated to determine the state of aging aircraft wiring in naval aviation, explore emerging technological solutions to support these systems as they age, and make a recommendation for a course of action.

This thesis provides an overview of the aging wiring problem and performs an analysis of possible technological solutions. Specifically, several prognostic and diagnostic technologies exist in the field of aircraft wiring. This thesis will discuss and evaluate these technologies in terms of ramifications, implementation, costs and benefits. Simple cost and cost savings models for technology application will be formulated using data from the Navy T-45 training program and commercial airlines to make a purchase recommendation to the Naval Air Systems Command's Aging Aircraft Integrated Process Team.

DoD KEY TECHNOLOGY AREA: Air Vehicles

KEYWORDS: Aging Systems, Aging Aircraft, Aging Aircraft Wiring, Prognostic, Diagnostic

MANAGEMENT

A FULL COST ANALYSIS OF THE REPLACEMENT OF NAVAL BASE, GUANTANAMO BAY'S MARINE GROUND DEFENSE FORCE BY THE FLEET ANTI-TERRORISM SECURITY TEAM

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Constrained defense budgets and manpower resources have motivated the United States Marine Corps and the United States Navy to seek initiatives that maximize the efficient use and allocation of these diminishing resources. Once such initiative is the restructuring of the Marine security presence at Naval Station, Guantanamo Bay, Cuba, through the replacement of the 350 man Marine Ground Defense Force with a smaller, rotating unit consisting of two platoons from the Fleet Anti-terrorism Security Team (FAST) Company. FAST would be able to perform the same security mission as effective as the Ground Defense Force with fewer personnel and infrastructure requirements, resulting in both financial and manpower savings. This thesis performs a full cost analysis of this initiative to determine whether any cost savings will be realized. By reviewing and comparing historical cost data and Marine Corps budget estimates, the study determined that there are no real financial savings in executing the proposal. The Marine Corps and Department of the Navy may, however, achieve benefits in better manpower utilization and opportunity cost savings, by exercising this option.

DoD KEY TECHNOLOGY AREAS: Manpower, Personnel and Training, Other (Financial Management)

KEYWORDS: Cost Savings, Opportunity Costs, FAST, Manpower Resources

KEY EMERGING TRENDS IN THE INTERMODAL FREIGHT TRANSPORTATION INDUSTRY

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This thesis addresses the key emerging trends in the intermodal freight transportation industry. Interviews were conducted with a focus on perceptions that the various intermediaries have towards their working relationships with one another, the impact of emerging technologies, and what government policies and regulations should be enacted or repealed in order to improve the industry.

Eight individuals were interviewed representing the following seven intermediaries: 1) Shipper, 2) Ocean Carrier, 3) Port Authority, 4) Railroad, 5) Trucking, 6) Third Party Logistics and Intermodal Management Company, and 7) Drayage. All interviews were taped and then transcribed. A major finding is that the U.S. government, industry, and academia must work in a collaborative effort to develop and maintain educational and internship programs to prepare present and future transportation managers and technicians to become the industry's leaders.

Although dramatic developments in advanced technologies have been the single greatest factor influencing changes in transportation during the past 25 years it is people who manufacture goods, provide transportation services, and ultimately consume the goods produced. Therefore, it is the "human-in-the-loop" who when properly equipped, trained, and experienced will truly revolutionize the commercial intermodal freight transportation industry.

DoD KEY TECHNOLOGY AREA: Other (Logistics)

KEYWORDS: Logistic Systems, Intermodal, Freight, Transportation Industry

MANAGEMENT

A PERFORMANCE MEASUREMENT APPROACH FOR PRICE-BASED ACQUISITION

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The purpose of this thesis is to create a set of core performance metrics that will be used to evaluate how effective price-based acquisition is in the accomplishment of eliminating or reducing the differences between the Department of Defense's acquisition process and the buying practices of the private sector in the procurement of goods and services. A survey of acquisition professionals at various contracting organizations throughout the Services was conducted to gain an insight into the current understanding and use of price-based acquisition in the contracting process. From the literature review and responses to the survey, an analysis was conducted on the current goals, understanding and use of price-based acquisition in the Department of Defense. It was found that the current understanding and use of price-based acquisition is limited in the acquisition process. From the data collected during this research a set of goals and performance metrics were defined for the measurement and evaluation of the primary goals of price-based acquisition.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Contracting, Acquisition Reform, Price-Based Acquisition

FINANCIAL PLANNING MODEL FOR THE ARMED FORCES OF THE PHILIPPINES PROVIDENT TRUST FUND

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Recent developments gave rise to twin problems for the Armed Forces of the Philippines Provident Trust Fund (AFPPTF). Firstly, the AFPPTF, though it has identified the type of assets in its planned portfolio, is not sure how to allocate the assets in the portfolio in order to optimize returns. Secondly, the AFPPTF has no visibility of expected returns in the future years, on which to base its decisions in determining the amount of yearly scholarship assistance. This thesis research aimed to solve these twin problems of the AFPPTF. The research involved two broad steps – data collection and model construction and analysis. Data collection was primarily through literature reviews, archival research, and interviews. The analysis involved simulation through the Monte Carlo method. The model was created using Microsoft Excel spreadsheet, where all the possible variables affecting future portfolio returns and fund balances were linked with the other variables through formulas and equations. These variables, such as initial investment, yearly scholarship and operating expenses, etc., were based on the various yearly cash flows of the AFPPTF. The portfolio returns and yearly fund balances, called “forecasts” in the model, were based on the probability distributions of the historical returns of the assets in the portfolio. Simulation runs, each run involving 5,000 trials, were undertaken to determine the expected portfolio returns and fund balances in a 20-year time horizon. Simulation was also used in determining the optimal asset allocation used in the model. The model may be used by the management of AFPPTF in financial planning by varying certain variables, conducting simulation runs on each variation, creating and analyzing the simulation results, and ultimately making decisions.

DoD KEY TECHNOLOGY AREA: Other (Financial Management)

KEYWORDS: Financial Planning, Optimal Asset Allocation, Monte Carlo Simulation, Trust Fund Management, Armed Forces of the Philippines

MANAGEMENT

MILITARY HEALTHCARE REFORM AND LEGISLATIVE CHANGES FOR FY01

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Healthcare is considered one of the most important non-cash benefits in the military compensation package. However, the Military Healthcare System (MHS) has several significant problems, including inequity in benefits, lack of access to care, growing out-of-pocket cost, and a perceived “promise” of free healthcare for life for military retirees that has not been kept. This thesis examines the MHS and congressional reforms during the 2nd session of the 106th Congress addressing these problems. An expanded background of the MHS benefit is presented, followed by a description of current problems with the MHS. Recommended DoD reform initiatives are reviewed, along with bills addressing MHS initiatives. Changes to the military healthcare benefit passed for FY01 are documented and explained. The research methodology included a review of public records, websites, congressional testimony, reports from relevant congressional committees, JCS, OSD, and DoD healthcare reform proposals, and phone interviews with military healthcare experts. A major new entitlement called TRICARE-For-Life and a retiree pharmacy program were enacted, representing the largest increase in domestic spending in over 30 years to address problems with the MHS.

DoD KEY TECHNOLOGY AREA: Manpower, Personnel and Training

KEYWORDS: Healthcare, Military Healthcare, MHS, DoD Health Programs, TRICARE, Medicare, Healthcare Reform, MHS Reform

ONLINE REVERSE AUCTIONS: A PRICING TOOL FOR GOVERNMENT CONTRACTING

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Reverse Auctions (RA) are the next generation of procurement application software designed to link acquisition reform and common DoD procurement business processes with commercial best practices and advances in electronic commerce. When fully implemented, it will serve the DoD and Federal Government. This research examines RAs and emerging electronic commerce technologies that are revolutionizing the business industry today. Through a literature review and interview process, an analysis of RAs along with eBreviate, a commercial RA contracting venture, and leading RA software applications in e-commerce is presented. Innovation analysis is applied to the data gathered from the research to develop a new process design. As analysis predict that by 2003, business to business e-commerce will grow to \$1.3 trillion and 95% of business industry is going to go to RAs, only an aggressive implementation of innovative technologies today will prepare Government for the procurement needs of tomorrow. It is to this end that this research is conducted, with the intent of fostering innovative change in Government pricing.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORD: Government Contracting, Procurement, Electronic Commerce

MANAGEMENT

ANALYSIS OF THE UNITED STATES MARINE CORPS NORWAY AIR LANDED MARINE EXPEDITIONARY BRIGADE (NALMEB) PROGRAM

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This thesis examines the utility of the Norway Air Landed Marine Expeditionary Brigade (NALMEB) program. The NALMEB is a USMC program established to counter the Soviet threat to NATO. Although the threat that rationalized the program no longer exists, the program has remained intact, continuing to consume over \$7 million annually and an additional \$6.1 million of Norwegian funds. It is slated to receive over \$90 million in procurement funding to modernize the equipment stored in the caves between 2003 and 2008. Additionally, there are over 5,000 pieces of Marine Corps equipment devoted to the program not available for use elsewhere in the Marine Corps. This research examined the political, military, and budgetary factors associated with the program. The methodology included a review of directives regarding the program, the evolution of the USMC mission, national military and security strategy, program evaluations and interviews with officials familiar with the program. The research concludes that the political and military benefits attributed to the program are overstated and the costs of the program are understated in its annual O&M appropriation. Although the program currently provides minimal contributions to the U.S. national military strategy, a revised mission statement and other major program changes could significantly increase its utility. Finally, the research identifies several upcoming opportunities related to U.S. and Norwegian defense planning that provide an opportunity to restructure the program.

DoD KEY TECHNOLOGY AREA: Other (National Security)

KEYWORDS: NALMEB, Prepositioning, Norway, Marine Expeditionary Brigade, MEB

THE IMPACT OF SUBSISTENCE PRIME VENDOR ON THE SUBSISTENCE SUPPLIER BASE

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Acquisition Reform has brought rapid change within the acquisition community. The streamlining of the acquisition process has led to a number of innovations within the contracting discipline. This research will focus on one of these innovations, the Subsistence Prime Vendor (SPV) Program. The SPV program was implemented to reduce the inventories and to improve the quality of food products purchased to support military dining facilities. Under the traditional subsistence inventory system, the Government procured food items directly from manufacturers. The contracting process centered on filling a space in a warehouse. Prime vendor contracting is centered on the end-user. The customer communicates his requirements directly to the assigned prime vendor, and the prime vendor delivers in accordance with terms of the contract and the customer's request. The prime vendor assumes the role as the food distributor with subsistence no longer being procured from food manufacturers and stored in warehouses. As a result, the subsistence supplier base has undergone radical change. The purpose of this thesis is to analyze the impact that the prime vendor concept has had on the subsistence supplier base.

DoD KEY TECHNOLOGY AREA: Material, Processes, and Structures

KEYWORDS: Subsistence Prime Vendor, Acquisition Reform

MANAGEMENT

AN ACTIVITY BASED COSTING ANALYSIS OF THE DEPARTMENT OF THE NAVY'S ENLISTED DETAILING PROCESS

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The Navy Personnel Command assigns over 100,000 Sailors annually utilizing in excess of 200 Detailers. Negotiations commence between Sailor and Detailer via telephone or e-mail approximately nine months prior to the Sailor's expected rotation date from their current assignment. One method to examine where inefficiencies could exist in a process is to conduct an Activity Based Costing (ABC) study. The Activity Based Costing technique measures the cost of specific activities performed by an organization in producing a product or service. This thesis examines the detailing activities of the Administrative, Deck and Supply Rating Branch at the Navy Personnel Command in Millington, Tennessee and assigns relevant costs to the activities performed by a Detailer when assigning Sailors to their next duty station. The findings of the analysis are that approximately 75 percent of a Detailer's available time is used in direct or indirect detailing activities. Depending on the paygrade of the Detailer, this equates to an annualized cost between \$33,112.76 and \$47,853.70 per Detailer. The Detailer spends 25 percent of their time in non-detailing related activities that equates to an annualized cost between \$10,755.10 and \$15,519.55 per Detailer.

DoD KEY TECHNOLOGY AREAS: Manpower, Personnel, and Training, Materials, Processes, and Structures

KEYWORDS: Department of the Navy Personnel Assignment, Activity Based Costing, Department of the Navy Manpower Distribution System

ANALYSIS OF THE CURRENT NAVY ENLISTED DETAILING PROCESS

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America's diverse political climate and flourishing economic conditions have forced the Navy to look inward to combat recruiting and retention shortfalls. The detailing process, if properly managed, can positively affect Navy retention rates. The enlisted detailing process accomplishes its mission: assigning Sailors to billets; however, it may do so without optimizing efficiency or effectiveness. Sailor preferences and command requirements provide crucial insights ensuring the Navy focuses on improving operational readiness, maintaining fleet balance, and retaining quality Sailors. Reviewing the detailing process, stakeholders, and policies reveals concerns with the current detailing system biases and inaccessibility. Four areas of pathology within the system are: policy and procedure issues, information systems concerns, career counseling matters, and detailer considerations. Research indicates that current electronic-based interaction has a positive affect and that additional interaction might continue to positively affect the detailing process.

DoD KEY TECHNOLOGY AREA: Manpower, Personnel, and Training

KEYWORDS: Detailing, Enlisted Personnel, Assignment, JASS, EAIS, Retention, Command Career Counselor

MANAGEMENT

AN ECONOMIC ANALYSIS OF RE-LOCATING THE PHYSICAL EVALUATION BOARD'S FORMAL HEARING PANEL FROM BETHESDA, MD TO PORTSMOUTH, VA

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and

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The Naval Council of Personnel Boards requested an economic analysis of the potential re-location of the their formal Hearing Panel from Bethesda, MD to Portsmouth, VA. The goal of this thesis is to assist the Director, Naval Council of Personnel Boards, by providing a formal economic analysis. OMB Circular A-94 is used as the guideline in conducting this thesis. Therefore, as is prescribed, the net present value model is utilized to present the quantifiable results. In this case, in consideration of the incremental costs and benefits, the net present value of relocating the Hearing Panel is \$403,764. This represents the total net savings that are expected to be realized by moving the hearing panel. Additionally, the analysis indicates the time to recoup the initial investment (payback period) is 1.74 years and the internal rate of return is approximately 57%. Furthermore, there are some other issues (non-quantifiable) that are discussed in this analysis. The quantified results and non- quantifiable issues are presented to assist the decision maker in determining whether or not to relocate the Hearing Panel.

DoD KEY TECHNOLOGY AREA: Other (Financial Management)

KEYWORDS: Economic Analysis, Cost-Benefit Analysis, Re-location, Physical Evaluation Board, Formal Hearing Panel, Incremental Costs

ANALYSIS OF AVIATION DEPOT SUPPLY SUPPORT

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The Office of the Secretary of Defense (OSD) issued a Program Budget Decision (PBD) requesting a study of supply material availability (SMA) and related issues for Naval Aviation Depots (NADEPs).

PBD-405 shows a disparity between percentage levels of supply support for the NADEPs and the current overall fill rates published by the Navy Inventory Control Point-Philadelphia (NAVICP-P) and the Defense Logistics Agency (DLA). This thesis evaluates the effectiveness of SMA and determines if SMA is a valuable measurement tool for NADEPs, determines if supply support has an impact on production, and determines if NADEPs are receiving poor supply support. This thesis evaluates the Air Force and United Airline Services (UAS) depot support to determine any common trends or ways to improve NADEP support. After conducting procedure and policy reviews, interviews and site visits to NADEP North Island, ALC Hill, UAS San Francisco and Defense Supply Center Richmond (DSCR), this research concludes that SMA, in its current formulation, is not effective as a measurement tool to indicate supply effectiveness in terms of operational readiness. Also, this research has determined that there is a major link between poor material support and production cycle time. The study recommends the government review post production

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support plans, pursue standardization, review contract specialist and item manager staffing, and identify and analyze readiness measurement tools.

DoD KEY TECHNOLOGY AREA: Materials, Processes and Structures

KEYWORDS: Material Logistics, Supportability, Material Availability, NADEPs, Air Logistics Centers (ALCs), United Airline Services (UAS)

LOW-RATE INITIAL PRODUCTION (LRIP): ORIGINS, IMPLEMENTATION AND ANALYSIS

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Low-Rate Initial Production (LRIP) provides units to be used in the acquisition system for operational testing and to validate the production process. This thesis examines the evolution of LRIP to identify its primary purposes and the problems that have been encountered during its implementation. To provide this information, historical and current statutory, legislative and regulatory data were reviewed. GAO and DODIG audits and reports provided critical information relating to LRIP problems. It was found that the most important LRIP problems centered on the issue of the appropriate number of units to be produced and the timing of the migration of programs into and out of LRIP. The principal cause of these problems was the absence of clear and definitive legislative and regulatory guidance. New acquisition regulations and a new acquisition model are likely to minimize the ambiguity surrounding the use of LRIP in the acquisition process.

DoD KEY TECHNOLOGY AREAS: Materials, Processes, and Structures, Manpower, Personnel, and Training, Other (Acquisition)

KEYWORDS: Low-Rate Initial Production, Procurement Process, Acquisition History

EXAMINATION OF THE READINESS OF TWO UNITS OF HELLENIC NAVY TO IMPLEMENT ACTIVITY BASED COST MANAGEMENT

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A growing concern in the Hellenic Navy (HN) about doing the best with the resources provided has initiated an interest of adopting “best practice” methods such as Activity Based Cost Management (ABCM) for understanding and controlling cost. The purpose of this thesis is to examine the readiness of two units of the HN, the Naval Logistic Center (NLC) and the Naval Base of Crete (NBC) to implement ABCM. To examine the readiness of those organizations a questionnaire was used. This questionnaire was designed by the Consortium for Advanced Manufacturing - International (CAM-I). Five respondents from each organization were selected to answer the questionnaire. Although the sample size is small, it is considered adequate for a general indication of readiness. Based on respondents’ answers a series of indicators of readiness for a successful ABCM implementation was examined. Major risks to a successful ABCM implementation were identified. Furthermore, managerial actions for facilitating an ABCM implementation from literature are provided. The conclusion is that both organizations could implement successfully an ABCM initiative in the near future if a series of actions takes place.

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DoD KEY TECHNOLOGY AREA: Other (Financial Management)

KEYWORDS: Cost, Activity, Management, Activity Based Cost Management, ABCM, ABC, Hellenic Navy, HN

**USING EFFECTIVE CONTRACTUAL INCENTIVES TO OBTAIN
SUPERIOR CONTRACTOR PERFORMANCE**

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The purpose of this thesis is to provide the reader with the ability to analyze the effectiveness of incentives and to document innovative approaches to incentive contracting that can be applied to Cost Plus Award Fee (CPAF) contracts. While a CPAF contract is a vehicle to obtain products or services needed by the Government, it also acts as a management tool for the awarding entity, which focuses on the impact of meeting or exceeding award criteria. The need for improved procurement effectiveness necessitates the exploration of innovative arrangements. Contracting officers must take advantage of reforms and become innovative in their approach to provide best value in programs. More efficient ways of doing business are available and must be capitalized upon. Changes in the regulations have given the contracting officer the freedom to innovate. They must use this new freedom in order to meet DoD's expanding requirements with increasingly limited resources. The use of innovative incentives to contractor performance is beginning a period of renaissance. Numerous Government entities have embraced the use of innovative arrangements in the effort to get goods and services better, faster, and cheaper. The contracting officer must determine which incentive is most effective for a program based upon numerous variables.

DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Contractual Incentives, Cost Plus Award Fee Contracts, Innovative Agreements

**A MODEL FOR THE EFFECTIVE INTEGRATION OF PAST PERFORMANCE INFORMATION
INTO ORGANIZATIONAL ACQUISITION AND CONTRACTING PROCESSES**

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The need to deliver high quality goods and services in less time and at a lower total cost has resulted in a Revolution in Business Affairs throughout the Federal acquisition community. When the lowest price is not the driving factor during procurements, the Federal Acquisition Regulation allows procurement officials to make trade-offs between cost or price, past performance, and technical merit to ensure the best value to the Government. One of the tools that Government procurement officials have for reducing procurement risk is the ability to request, via the request for proposal, information regarding a supplier's past performance and to use this information in selecting sources of supply.

This thesis investigates the use of past performance information in the Federal acquisition process. It reviews the current policies and best practices for the collection and evaluation of past performance information. It then categorizes and analyzes the past performance protest decisions handed down by the Comptroller General from October 1, 1997, to June 30, 2000. Following the review and analysis, the overall best practices and case principles are linked with the phases of the Federal acquisition process to develop a managerial model that will aid contracting officials in more effectively incorporating the use of past performance information into their acquisition and contracting processes.

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DoD KEY TECHNOLOGY AREA: Other (Acquisition)

KEYWORDS: Past Performance Information, Federal Acquisition Process, Best Practices, GAO Comptroller General Decisions

**TACTICAL SIGNALS INTELLIGENCE IN MARINE FORCES PACIFIC:
BUILDING THE NEW FIRST RADIO BATTALION**

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The reorganization and relocation of First Radio Battalion by Headquarters Marine Corps (HQMC) and Marine Forces Pacific presents a number of logistical and fiscal challenges to coordinate moving manpower and equipment over thousands of miles. This thesis attempts to document and seek solutions to the operational difficulties that have beset the battalion for over 25 years.

First, the battalion's existing tables of organization and equipment have been modified, given the limitations of current structure and expected future operational requirements. Next, the modified tables have been produced as appendices to the thesis to document the finished results. Finally, costs were estimated for personnel transfer and vehicle shipment using the Crystal Ball Microsoft EXCEL spreadsheet add-in. The resulting analyses yield recommendations for relocating and reorganizing the battalion at Camp Pendleton.

DoD KEY TECHNOLOGY AREA: Other (Systems Analysis)

KEYWORDS: Cost Estimation, Systems Analysis, Relocation, Reorganization, Organizational Theory, Resource Allocation

**COST-BENEFIT ANALYSIS OF SINGLE SITING DEPOT LEVEL
MAINTENANCE FOR THE LIGHT ARMORED VEHICLE**

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In 1998, Commander, Marine Corps Logistics Bases established the Executive Planning Group (EPG) to develop and coordinate strategy to enhance the depot's maintenance and supply capabilities in order to increase the competitiveness of their services and provide a direction for future depot operations. One of the initiatives introduced by the EPG was to conduct an analysis to determine if consolidating depot maintenance for the LAV from the current workload scenario at two depots, to a single site, results in the most efficient allocation of resources. Spreadsheet models were used to conduct a comparative cost and savings analysis between the current split workload scenario and a single site scenario at each depot. Costs and savings resulting from data such as infrastructure requirements, transportation, inventory reductions, and reduction in personnel structure requirements were addressed. Additional issues addressed include the impact on readiness and surge capacity. Results vary significantly depending on the selection of depot for single siting. It is shown that single siting at one depot results in annual savings from the current workload scenario, while single siting at the other depot increases annual costs from the current workload scenario.

DoD KEY TECHNOLOGY AREA: Materials, Processes, and Structures

KEYWORDS: Single-Sitting, Consolidation, Transportation, Personnel Reductions, Surge Capacity

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ANALYSIS OF AIRCRAFT MAINTENANCE CANNIBALIZATION WITH RESPECT TO AGING AIRCRAFT WITHIN THE EA-6B COMMUNITY

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Cannibalization is a management tool typically used to overcome failures in the logistics or maintenance support system. However, the effects of cannibalization do not come without a cost. Three highly cannibalized components of the EA-6B aircraft were examined to determine the costs associated with each cannibalization. Additionally, this thesis attempts to identify any correlation between the age of an aircraft and the frequency that its components are cannibalized. To address this issue, maintenance records from 1996 to 2000 were examined. A comparison was made between the components that were cannibalized and those that were not. Other costs were estimated by interviewing maintenance professionals to determine additional labor hours, consumables and flight hours used during the cannibalization. Finally, a regression analysis was performed comparing the number of cannibalizations to the age of the aircraft in order to determine if a relationship existed. The major findings were that cannibalization reduces the mean time to failure and increases its failure rate. Cannibalization also wastes many resources either due to frequency of cannibalization or man-hours required to perform a single cannibalization. Additionally, no statistically significant correlation was found to exist between the age of the aircraft and the number of cannibalizations.

DoD KEY TECHNOLOGY AREA: Air Vehicles, Manpower, Personnel and Training

KEYWORDS: Cannibalization, Aging Aircraft, Aircraft Maintenance

UNITED STATES POLICY AND BUDGETING FOR THE RESERVE COMPONENT

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This study examines the Reserve Component of the United States, focusing on its composition, the Total Force Policy, the funding process and recent funding trends. Because of the increased use of the Reserves, it is important to understand the process of budgeting for the Reserves and how they have fared in the post-Cold War period of constrained resources. Since 1989, the output delivered by the Reserve Component to the Total Force has increase by more than 1300 percent. During this period, inflation-adjusted funding for the Reserve Component has decreased by slightly more than 12 percent. Additional missions in peacekeeping, weapons of mass destruction support teams and space operations have further burdened the Reserves. These new roles are contributing to the use of Reserves in peace. The research concludes that changes must occur to the Total Force Policy, assigned missions and funding for the Reserves to ensure the Reserve Component is a viable component of the Total Force in the future.

DoD KEY TECHNOLOGY AREA: Other (Financial Management)

KEYWORDS: Budgeting, Policy, Reserves, Reserve Component

MASTER OF SCIENCE IN MATERIALS SCIENCE AND ENGINEERING

PRODUCTION OF ULTRA-FINE GRAINS AND EVOLUTION OF GRAIN BOUNDARIES DURING SEVERE PLASTIC DEFORMATION OF ALUMINUM AND ITS ALLOYS

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Equal channel-angular pressing (ECAP) is a recently developed method for deformation processing of material that can produce an ultra-fine grain structure in bulk material through severe plastic deformation. This study will present results on microstructural evolution during repetitive ECAP of pure aluminum. The principal method of data collection was Orientation Imaging Microscopy (OIM). The results of the study indicate that, after one ECAP pass, the structure is inhomogeneous and anisotropic, and consists mostly of deformation-induced features. After repetitive ECAP, the aluminum material exhibited a homogeneous grain size but retained an anisotropic character to the microstructure. After twelve ECAP passes the microstructure consisted mainly of fine grains surrounded by high-angle boundaries but an appreciable fraction of low-angle boundaries remained. This microstructure thus comprises a mixture of deformation-induced and recrystallization features. Further results were also obtained documenting the existence of deformation banding in this material as well as in a rolled aluminum alloy. This phenomenon may be general in nature and associated with severe plastic deformation in aluminum and its alloys.

DoD KEY TECHNOLOGY AREAS: Materials, Processes, and Structures, Manufacturing Science and Technology (MS&T)

KEYWORDS: Equal Channel-Angular Pressing, Ultra-fine Grains, Grain Refinement, Plastic Deformation, Deformation Banding, Misorientation Angle, Orientation Imaging Microscopy, Electron Backscatter Diffraction, Supral 2004, Nano Structures, Severe Plastic Deformation

