The Crow's Nest

ISSUE 2 APRIL 2021

A Quarterly Review of Research & Activities
from the Acquisition Research Program
at Naval Postgraduate School

TABLE OF CONTENTS

Program Updates

The team here at the Acquisition Research Program has been working all hands-on deck this month to prepare for the 18th Annual (and first virtual) Acquisition Research Symposium, coming up May 11-13. Converting this event from its traditional in-person gathering in Monterey to a fully online, interactive experience has given us the opportunity to innovate and add new features. To create the networking and collaboration that has been a hallmark of this event, the symposium will feature a few breakout rooms each day, where participants can enjoy a virtual coffee break or happy hour while connecting with other attendees and presenters. We will also be recording some panels and making them available for on-demand viewing on the ARP YouTube channel

Dave Lewis

beginning in late May. We look forward to seeing many of you in our virtual gathering spaces next month. If you haven't registered yet, head over to www.researchsymposium.com to sign up and check out the program.

We continue to receive requests from sponsors to conduct acquisition research at Naval Postgraduate School. Several offices—including Program Executive Office Information Warfare Systems (PEO IWS); PEO Manpower, Logistics, and Business Solutions (PEO MLB); PEO Ships; the Assistant Secretary of the Navy for Research, Development & Acquisition (ASN RDA); and the Under Secretary of Defense for Acquisition & Sustainment (USD (A&S))—have all funded or are considering funding innovative acquisition research into their most pressing Quadrant II (Important but not Urgent) issues. Topics include:

- ➢ Organizing around outcomes, not programs
- ➢ Assessing best use of "software" money
- ➢ Leveraging artificial intelligence to learn, optimize, and wargame (LAILOW) for Navy ships
- ➢ Cost benefit analysis of commercial product lifecycle models of using digital tools for Navy ship acquisition
- ➢ Cybersecurity, artificial intelligence, and risk management: understanding their implementation in military systems acquisitions
- ➢ Reducing program cost in a monopoly contracting environment

NPS students are in their thesis-finding mode and NPS faculty are building their FY22 research calendars; now is the best possible time to be soliciting research proposals from NPS for 2022 work.

NPS/ARP has teamed with DoD's newly formed Acquisition Innovation Research Center (AIRC) and participated in the formulation of AIRC's first call for acquisition research proposals, sent out on 19 April. Proposal subject requirements are:

- ➢ Workforce Upskilling under Continuous Change.
- ➢ Management and Business Knowledge Representation for Decision-Making.
- ➢ Aligning Workforce and Organizational Incentives for Agility and Innovation.
- ➢ Innovative Test Approaches to Enhance Organizational Agility and,
- ➢ Return-on-Investment from Digital Transformation.

Proposals are due by May 14.

I am excited by AIRC's approach of defining DoD-level acquisition "topics of interest" using pre-identified funding and then awarding research contracts to fulfill those objectives. Strong Congressional and DoD leadership sponsorship is another key benefit of this approach. It complements the NPS/ARP (and other civilian acquisition research programs) approach of seeking sponsor funding for PEO, policy, and SAE topics of interest or concern.

As planned, I have set up a residence in Monterey while keeping my Maryland domicile. I expect to alternate between the two based on demand and need; perhaps a month at each through the year. That will allow me to fully integrate with NPS faculty and staff while also keeping our traditional tight connections with ARP and AIRC research sponsors in the National Capitol Region. I will work out the time zone issue; not a new thing for me!
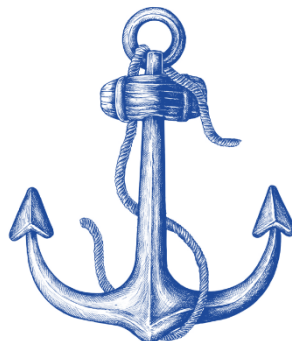
For those wanting to know more about our program and the latest research opportunities, email me at David.h.lewis@nps.edu. And of course, I'll be in panels and breakout rooms at the symposium. Hope to see you there.

Sincerely,

VADM David H. Lewis, USN (Ret.)

Chair of Acquisition

Student Spotlight

December Graduates, Theses, & Awards

In December, **51 students** graduated from NPS with ARP-supported thesis projects. Nineteen of these come from the U.S. Navy, 17 from the Air Force, 11 from the Marine Corps, 2 from the Coast Guard, and 2 from the Army. Working individually or on teams, these students produced 24 thesis reports and garnered a number of awards.
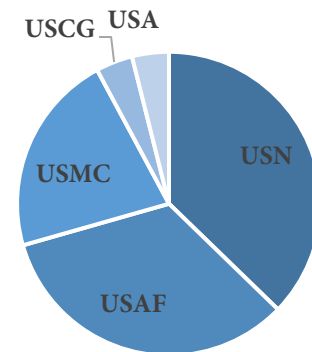
Awards

Nine students were recognized for excellence with awards from the Naval Postgraduate School, the Assistant Secretary of the Air Force (Acquisition), and Naval Supply Systems Command:

LCDR Brandon Stewart, USN

Naval Supply Systems Command Award for Academic Excellence Management

> Thesis: [Analysis of Naval Information Warfare Systems Command (NAVWAR) Contracting Processes using the Contract Management Maturity Model (CMMM)](#)
> — With co-authors LCDR Vincent J. Linley and LCDR Najib Hamdouni, USN
> — *Advisors: Kelly Poree and Dr. Rene G. Rendon*

Capt Alex Pfannenstiel, USMC

The Louis D. Liskin Award for Excellence in Management

> Thesis: [Analysis of Marine Corps Systems Command Contracting Workforce Competency Assessment](#)
> — With co-author Capt Spenser Hayashi, USMC
> — *Advisors: Dr. Rene G. Rendon and E. Cory Yoder*

LCDR Richard Wilson, USN

CDR Philip A. Murphy-Sweet Memorial Award for Excellence in Acquisition

> Thesis: [Can You Hear Me Now? International Wireless Solutions for the DoD](#)
> — With co-author LCDR Aaron J. Shinoff, USN
> — *Advisors: Dr. Nicolas Drew and E. Cory Yoder*

Capt Kevin Yarnell, USMC

RADM Donald R. Eaton Logistics Award for Outstanding Achievement

> Thesis: [Next Generation Logistics Ships (NGLS): Refuel](#)
> — With co-author Capt Barry Loseke, USMC
> — *Advisors: Dr. Aruna U. Apte and Dr. Kenneth H. Doerr*

Capt Anita Naylor, USAF

The Assistant Secretary of the Air Force (Acquisition) Award for Academic Excellence

Thesis: [Improving the Contractor Responsibility Determination Process](#)
— *Advisors: Dr. Daniel Reich and Dr. William Muir*

Capt Jason Passarella, USAF

The Assistant Secretary of the Air Force (Acquisition) Award for Academic Excellence

Thesis: [Research and Analysis of the American Domestic Government Working Dog Industry](#)
— With co-author 1st Lt Robert Paulo O'Campo, USAF
— *Advisors: Maj. Daniel J. Finkenstadt and Lt. Col. William A. Muir*

1st Lt Jonathan Karnes, USAF

Distinguished Professor Kenneth J. Euske Dean's Medal for Innovative Contribution to National Defense, and the Graduate School of Defense Management

Thesis: [Aligning DoD Program Management Competencies with the Project Management Institute Standards](#)
— *Advisors: Dr. Robert F. Mortlock and Raymond D. Jones*

CDR Scott Chirgwin, USN

Rear Admiral Thomas R. McClellan Award for Academic Excellence in the Graduate School of Defense Management

ENS Davis Katakura, USN

Rear Admiral Donald R. Eaton Logistics Award for Outstanding Achievement

Thesis by Chirgwin and Katakura: [An Analysis of Vertical Lift Platforms in Support of Humanitarian Assistance and Disaster Relief Operations](#)
— *Advisors: Dr. Aruna U. Apte and Dr. Kenneth H. Doerr*

OTHER THESES

December graduates completed an additional 16 research theses, listed below by topic area.

LOGISTICS

[Analysis of the Remain In Place Policy](#)
LT Michael A. Hagan Jr, USN and ENS Izack H. Ohman, USN
Advisors: Dr. Robert F. Mortlock and Dr. Eddine Dahel

[Next Generation Logistics Ships: Supporting the Ammunition and Supply Demands of Distributed Maritime Operations](#)

Maj. Richard A. Brown, USMC; Capt. Chad O. Carlson, USMC; Maj. Matthew S. Halligan, USMC

Advisors: Dr. Aruna U. Apte and Dr. Kenneth H. Doerr

[Littoral Combat Ship and Expeditionary Fast Transport: Their Utility as Support Platforms during Humanitarian Aid / Disaster Relief Operations](#)

LT Theodore C. Awa, USN; LCDR Peterjohn T. Gangcuangco, USN; LCDR Kendrick R. Garrett, USN

Advisors: Dr. Aruna Apte and Dr. Kenneth Doerr

[U.S. Marine Corps Expeditionary Advanced Base Operations Operational Contract Support](#)

Capt. Joshua B. Blythe, USMC

Advisors: Kelly Poree and Dr. Keebom Kang

[Exploring the Impact of 3D Printing on Medical Logistics for Class Viii(A) In Operational Environments and Distributed Maritime Operations](#)

LT Elena V. Williams, USN

Advisors: Bryan J. Hudgens and Dr. Kathryn J. Aten

[Preparing the USAF Contracting Career Field for the Next Humanitarian Assistance Disaster Response within the Continental United States](#)

Capt. Geoffrey S. Bender, USAF and Capt. Chase Lehocky, USAF

Advisors: Dr. Deborah E. Gibbons and E. Cory Yoder

CONTRACT MANAGEMENT

[Implementing Category Management across United States Special Operations Command (SOCOM)](#)

Capt. Charlie Mark D. Dacanay, USAF; Capt. Moises Guzman, USAF; Capt. Kelly R. Wright, USAF

Advisors: Dr. William A. Muir and Dr. Daniel J. Finkenstadt

[Analysis of the User Feedback Mechanism in the Army Service Contract Acquisition Process](#)

CAPT Cynthia M. Rodriguez, USA and MAJ Robert J. Puente, USA

Advisors: Dr. Robert F. Mortlock and Kelley Poree

[Analysis of the Purchasing Structure, Roles and Authority within Large, Private-Sector Organizations and its Potential Applications and Benefits within Air Force Contracting](#)

Capt Casey C. Boyle, USAF; Capt Brad M. Rajchel, USAF; Capt Christopher A. Ruiz, USAF

Advisors: Dr. William A. Muir and Dr. Kathryn J. Aten

[USMC Service Contracts: Analysis of Procurement Requests within PR Builder](#)
Capt. John K Murphy, USMC; Capt. Samuel T Perrine, USMC
Advisors: Dr. Spencer Brien and E. Cory Yoder

ACQUISITION MANAGEMENT

[Breaking Barriers to the Future: Exploring use of Burgeoning Commercial Satellite Technology to Enable Coast Guard Operations in Resource-Rich Arctic](#)
LCDR John M. Forster, USCG and CDR Brian S. Lied, USCG
Advisors: Dr. Robert F. Mortlock and Matthew R. Crook

[Bridging the Knowledge Gap: Understanding the Relationship of Corporate Finance and Defense Procurement](#)
Capt. Troy Anderson, USAF; TSgt Seth I Banks, USAF; Capt. Jessica L. Hayes, USAF
Advisors: Dr. Judith M. Hermis and Dr. Robert F. Mortlock

[CH-53K Heavy-Lift Helicopter Program Acquisition Case Study](#)
ENS Alexis Delgado, USN
Advisors: Dr. Robert F. Mortlock and Dr. Mitchell S. Friedman

ACQUISITION WORKFORCE

[Uniformed Military Acquisition Officer Career Path Development Comparison](#)
Maj. Ashley R. McCabe, USMC; LCDR Paveena Ritthaworn USN; LCDR Darian J. Wilder
Advisors: Dr. Robert F. Mortlock and Kelley Poree

[Crafting a New Career Development Path by Adding Increased Emphasis on Operational Tours for Navy Supply Corps Officers at Naval Postgraduate School](#)
LCDR Kathryn L. Newsom, USN; LCDR Michael R. Park, USN; LT Michael T. Zamudio, USN
Advisors: Dr. Mitchell S. Friedman and Dr. Paul Lester

COST ESTIMATING

[Investigating the Relationship Between the Independent Government Cost Estimate and Actual Contract Costs for Knowledge-Based Service Contracts](#)
Capt. Nathaniel F. Buck, USAF; 1st Lt. Charles B. Wilson, USAF
Advisors: Dr. Rene G. Rendon and Dr. Marcus A. Ballard

EVENTS

Our big upcoming event is the 18th Annual Acquisition Research Symposium, offered for the first time as a virtual symposium. Our new hybrid online presence kicked off this quarter with two webinars on topics of special interest to the acquisition research community. We plan to continue this virtual learning and gathering environment with more webinars in the second half of 2021 and for the foreseeable future.

18TH ANNUAL ACQUISITION RESEARCH SYMPOSIUM

The Graduate School of Defense Management at the Naval Postgraduate School announces the 18th Annual Acquisition Research Symposium to be held May 11-13, 2021 as a virtual event.

This symposium serves as a forum for the presentation of acquisition research and the exchange of ideas among scholars and practitioners of public-sector acquisition. Registration is still open for attendees, but attendance will be limited to the first 500 people in the webinar room.

We have a strong lineup of keynote speakers who will kick off the events each day:

Ms. Stacy Cummings
Acting, Undersecretary of Defense for Acquisition and Sustainment

Mr. Frederick J. (Jay) Stefany
Acting, Assistant Secretary of the Navy Research, Development and Acquisition

Vice Admiral Jon A. Hill, USN
Director, Missile Defense Agency

PANELS

- Implications of the Next Administration for the Defense Acquisition System
- Acquisition Modernization
- Ship Maintenance and Acquisition
- Strategies for Awarding Contracts Better, Faster, and Cheaper
- Innovating and Nurturing the Acquisition Workforce
- Blockchain and Predictive Analytics in the Supply Chain
- Risk and Resilience in the Supply Chain
- Accounting for Uncertainty in Cost Estimating
- Trends in Defense Acquisition: Analysis from CSIS and GAO
- Improving Acquisition Performance with Systems Engineering
- The Art and Science of Program Management
- Following the Money in Defense Acquisition
- Enhancing Acquisition with Artificial Intelligence and Cybersecurity
- Better Decision-Making Through Technology
- Logistics in Contested Environment
- Managing Technology Acquisition
- The Digital Transformation of Engineering
- Managing Risk in Software Development and Acquisition
- A Global Perspective on Defense Acquisition
- Principles for Managing Software Acquisition
- Deliver at the Speed of Relevance
- Tools and Strategies for Acquiring Information Technology

Don't miss this opportunity to hear the latest in acquisition research and policy priorities, and to connect with other acquisition experts.

Register at the symposium website: www.researchsymposium.com

Software Acquisition Webinar

On February 3, ARP hosted the webinar "**Innovations in Software Acquisition at the Department of Defense**." Software is part of almost everything the DoD buys, from cloud services and apps to weapons systems. This webinar explained some of the recent changes to acquisition law and policy, including pilot programs at the US Navy in cloud computing and DevSecOps.

Jeff Dunlap, who teaches software acquisition at the Naval Postgraduate School, moderated this webinar with three panelists who have been working to roll out these changes. **Pete Modigliani** from the MITRE Corporation explained how the Adaptive Acquisition Framework, released in 2020, provides a new software pathway designed to match the agile process through which software is developed. **Melissa Merker** discussed pilot projects in cloud computing, a DevSecOps task force, app consolidation, and other digital transformation efforts overseen by her office, the Deputy Assistant Secretary of the Navy for Information Warfare and Enterprise Services. And **Nick Tsiopanas** explained how contracts can be tailored to acquire and pay for consumption-based solutions (think cloud computing and everything as a service), finishing up with a rundown of IT-related provisions in the FY2021 National Defense Authorization Act.

Watch the **recorded webinar** on our YouTube channel.

Artificial Intelligence Webinar

On March 3, ARP hosted the webinar "**Developing Artificial Intelligence in Defense Programs**." AI can be a game changer for DoD, and it requires new acquisition & management approaches. This webinar provides data and analysis from four ARP researchers, with an introduction from moderator **RDML Kurt Rothenhaus**, Program Executive Officer for US Navy's Command, Control. Communications, Computers and Intelligence (C4I) and Space Systems.

Timothy Shives (NPS) presented his research on new analytical and decision-making approaches to managing the acquisition of AI systems—knowledge-value added and integrated risk management methodologies—as complements to the current earned value management approach. **Bonnie Johnson** (NPS) shared research on specific challenges in the systems engineering lifecycle, failure modes that these new types of intelligent systems might be involved in, and strategies to address associated safety risks. **Bruce Nagy** presented research from NAVAIR China Lake on how objective quality evidence can be developed for training data required by machine learning algorithms throughout the five stages of development (requirements, architecture, design, development, and test and evaluation). **Ying Zhao** (NPS) shared her research-driven framework to leverage artificial intelligence to learn, optimize, and wargame (LAILOW) as it applies to three use cases, including how to predict command and control for ships.

Watch the **recorded webinar** on our YouTube channel.

ARP-Administered Research Grants

Grants

The following papers published in 2020 began with support from grants ARP administered on behalf of the Office of the Under Secretary of Defense for Acquisition and Sustainment:

Operational Seakeeping Considerations in LCU Deployment

Jarema Didoszak and Fotis Papoulias

The Landing Craft Utility (LCU) stability criteria currently employed came from traditional open ocean warship stability studies and may not be optimal for the typical coastal transits of these specialized types of vessels. This study examines the intact transverse static and dynamic stability of the LCU to determine more appropriate criteria for short-range transits close to shore. Based on simulation results, the study evaluates the current stability criteria and arrives at new dynamic stability recommendations and operational limits.

A New Learning Curve for Department of Defense Acquisition Programs: How to Account for the "Flattening Effect"

John Elshaw; Clay Koschnick; Dakotah Hogan; Jonathan Ritschel; Adedeji Badiru │ Air Force Institute of Technology

Traditional learning curve theory assumes a constant learning rate regardless of the number of units produced; however, a collection of theoretical and empirical evidence indicates that learning rates decrease as more units are produced in some cases. These diminishing learning rates cause traditional learning curves to underestimate required resources, potentially resulting in cost overruns. This research confirmed that Boone's Learning Curve is more accurate in modeling observed learning curves using production data of 169 Department of Defense end-items.

Understanding the Incentives for Small Businesses to Participate in the Acquisition Process for R&D Intensive Products

Vivek Bhattacharya, Northwestern University

This report studies the incentives that small businesses face when they participate in the procurement process for R&D-intensive products through the DOD Small Business Innovation Research (SBIR) program. Using contract-level data, this report concludes that there are likely strong internal incentives within the SBIR program, suggesting that the DOD could incentivize more firms to enter the procurement process by changing the structure of the SBIR program itself rather than changing the broader defense procurement ecosystem.

[Understanding Acquisition Speed for the Defense Department's Costliest and Most Complex Programs](#)
Morgan Dwyer, Center for Strategic and International Studies

Acquisition reform occurs in cycles, and the most recent cycle prioritized acquisition speed. Despite this recent focus, the acquisition research community lacks a comprehensive understanding of how quickly the Defense Department has historically fielded major defense acquisition programs (MDAPs), what factors drive that speed, and how future schedule estimates can be improved. To address these gaps, this project leveraged a database which contained over 200 MDAPs that were initiated between 1963 and the present. Using this data, the report describes how various programmatic, technical, and strategic factors affect acquisition speed. Based on these observations, the report also suggests how MDAP schedule estimates can be improved in the future.

[Acquisition Requirements and Root Cause Analysis: A Data-Centric Perspective with Data Governance, Data Analytics, and Data Quality](#)
Richard Wang, University of Arkansas at Little Rock

The cyclical relationship between the acquisition community and contractors does not function in the same manner as the free market, where pressures self-regulate supply and demand. This research analyzes data from employment and Federal contracts to determine how acquisition contracts affect local employment. The results show that locations of large Navy awards rank above 70% of other locations in the country in terms of the magnitude of employment increases. When small contractors have relatively large reductions in DoD contracts, employment rates fall.

[China's Efforts in Civil-Military Integration, Its Impact on the Development of China's Acquisition System, and Implications for the U.S.](#)
Tai Ming Cheung and Eric Hagt, University of California at San Diego

Under the leadership of Xi Jinping, China is significantly stepping up its efforts to pursue military-civil fusion (MCF) as an integral component of its whole of whole of nation development strategy of building a technologically advanced and militarily powerful state within the next 1-2 decades. This paper examines the making, nature, and implementation of Xi's grand MCF undertaking through an innovation systems perspective. This analytical perspective highlights the barriers to implementing the MCF project, particularly as it moves beyond central level planning to execution within a complex subnational political economy, as well as the implications for the United States and its defense acquisition base.

[Developing Standard EMD Cost Factors For Major Defense Acquisition Program (MDAP) Platforms](#)
Jonathan Ritschel, Edward White, Matthew Markman | Air Force Institute of Technology

Major Defense Acquisition Program (MDAP) cost estimators use factors as one of their common estimating techniques. This study identifies 443 new Engineering and Manufacturing Development (EMD) cost factors that can improve accuracy of cost estimates for major defense acquisition programs (MDAPs). It also identifies which factors most closely correlate to program cost, helping analysts focus their attention in the most useful areas. One of the best indicators is contract type.

Peer-reviewed publications

This quarter, research initiated under an ARP-supported grant was accepted for publication in a peer-reviewed journal:

Amir Etemadi and John Kamp, "**Market and Contractor Factors Affecting Rapid Acquisition Strategies**," *INCOSE Systems Engineering*, forthcoming.

Faculty Research & Publications

Research sponsored by the Acquisition Research Program continues to make significant contributions to how we understand the data, people, and culture of defense acquisition. This quarter we celebrate numerous successes from NPS faculty who are in the Graduate School of Defense Management, have been supported by ARP, or both.

Faculty Awards

In the recently completed Winter Quarter, **Dr. Eddine Dahel** received the Graduate School of Defense Management Executive Master of Business Administration Teaching Excellence Award. Dr. Dahel teaches and researches on supply chain management, green procurement management, mathematical modeling, and product recovery and re-manufacturing.

Eddine Dahel

Faculty Technical Reports Sponsored & Published by ARP

In the past quarter, ARP supported and published four technical reports from faculty in the Graduate School of Defense Management and the Graduate School of Operational and Information Sciences at Naval Postgraduate School. These reports can be found online in ARP's Defense Acquisition Innovation Repository.

Dr. Sae Young Ahn and Dr. Amilcar A. Menichini, Retention Analysis Modeling for the Acquisition Workforce II. *Funded by Director Acquisition Talent Management, ASN (RDA).*

This technical research report is the second in a proposed series of three linked studies to provide a cutting-edge modeling and simulation tool that leverages the increase in availability of acquisition workforce (AWF) data and the large increases in computing power in the last decades. We simulate how various modifications in personnel policies, such as changes in salary structure and bonuses, would have affected the labor market decisions of the workforce. In particular, our model takes into account civilian positions the AWF may move into upon the decision to separate from DoD, allowing a more accurate prediction of the impact of monetary personnel policies, which must be evaluated in relation to what the worker could realistically earn in the civilian sector. In doing so, the model can help the AWF leadership in achieving the desired workforce size and structure.

Dr. Thomas J. Housel, Dr. Johnathan Mun, Dr. Raymond Jones, and Dr. Timothy Shives, [Acquiring Artificial Intelligence Systems: Development Challenges, Implementation Risks, and Cost/Benefits Opportunities.](#) *Funded by Program Executive Officer, Integrated Warfare Systems (PEO IWS).*

Given the potential for high-risk failures of AI system acquisitions, it is critical for the acquisition community to examine new analytical and decision-making approaches to managing the acquisition of these systems in addition to the existing approaches (i.e., Earned Value Management, or EVM). This research provides a set of analytical tools for acquiring organically developed AI systems through a comparison and contrast of the proposed methodologies that will demonstrate when and how each method can be applied to improve the acquisitions lifecycle for AI systems, as well as provide additional insights and examples of how some of these methods can be applied.

Dr. Spencer T. Brien, [An Analysis of Turnover among the Civil Service Components of the Department of Defense Acquisitions and Medical Workforces.](#) *Funded by Director Acquisition Talent Management, ASN (RDA).*

This research identified turnover trends among the civil service medical healthcare workforce and the civilian component of the defense acquisitions workforce. The focus on the civilian medical workforce is notable because the Defense Health Agency is currently undergoing a significant reorganization. The preliminary statistical analysis illustrated similar overall, but also highlighted how the acquisitions workforce benefits much more from midcareer appointments. This surge of older appointees flowing into the workforce from uniformed services also affects the outflow years later as these employees retire.

Latika Hartman, Rene G. Rendon, and Joshua D. Cissell, [Contracting in Non-Competitive Environments: Experiences of Contracting Officers.](#) *Funded by Director Acquisition Talent Management, ASN (RDA).*

In this report, we review and discuss survey findings of contracting personnel operating in sole-source environments. We surveyed a small group of Air Force contracting personnel at the F-22 program office to understand their views on contracting. We found that 90% of respondents feel they operate at a negotiating disadvantage in sole-source contracts due to the sole-source environment and their informational disadvantage compared to their private counterparts. This suggests specific training on their contracts would be more valuable than general training on business acumen.

Professor Profile

Dr. Rene G. Rendon is a prolific acquisition research faculty member in the Graduate School of Defense Management. He joined NPS in July 2004 after retiring from the U.S. Air Force, where he served as an acquisition contracting officer. He teaches courses in the contract management curriculum, including Principles of Acquisition and Contract Management, Defense Systems Contracting, and Acquisition and Contracting Policy. He has also taught Contracting for Services and Strategic Purchasing.

Rene has published dozens of articles, several book chapters, and 25 technical reports supported by ARP. He co-edited the textbook *Management of Defense Acquisition Projects* with Dr. Keith Snider (current

Dean of the Graduate School of Defense Management), now in its second edition. This textbook features chapters authored by other acquisition faculty members of the GSDM. He won the Excellence in Contract Management Research and Writing Award from the National Contract Management Association three times in the past 15 years, and once received NCMA's award for Most Outstanding Article in Contract Management. At NPS, he has been recognized with the Research Excellence Award from the Graduate School of Business and Public Policy as well as the Richard W. Hamming Teaching Award. Rene has advised 272 NPS students who have completed 130 theses, 74 of which received funding from ARP.
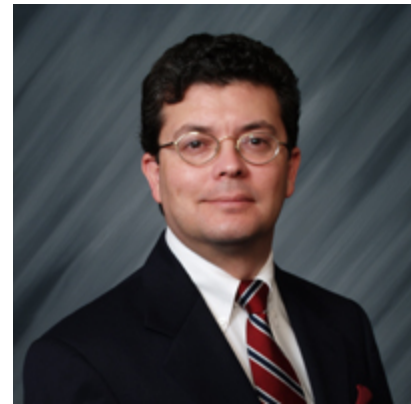
Rene Rendon

We asked Rene to tell us more about his work, the role ARP has played in his research career at NPS, and the latest trends he sees in acquisition research.

How did you get into the field of acquisition/contract management?

> My first Air Force assignment was as a Missile Combat Crew Commander for the Minuteman ICBM force in Minot AFB, North Dakota. Back then acquisition officers were expected to complete an operational tour as part of their acquisition career path. In some of my later assignments, I served as a warranted contracting officer for the Peacekeeper ICBM, Maverick Missile, C-20 (Gulfstream IV), and the F-22 Raptor. I also had an Education With Industry assignment as a supply chain manager working at the NCR Corporation world headquarters in Dayton, Ohio. I finished my career at the Space and Missile Systems Center, where I was the Director of Contracting for both the Space-Based Infrared Satellite System and the Evolved Expendable Launch Vehicle space launch services program.

> When I began teaching and researching at NPS, it was natural that my 22 years of acquisition experience would inform my research interests, which are organizational process capability and workforce competency management.

How does your research impact current acquisition or operational processes?

Before I retired from active duty, the Air Force sponsored my doctoral education and research, which analyzed the contract management process capability of the Space and Missile Systems Center at Los Angeles AFB. This research led me to develop the contract management maturity model (CMMM), a subject of some of my early research projects at NPS. My findings from these process assessments have shown that post-award contract management processes have lower process capability than pre-award. This may result from the lack of management support for post-award contracting activities.

My current research projects analyze the DOD contracting workforce competencies based on recent competency changes directed by Congress and soon to be implemented by the DoD. I am currently conducting workforce competency assessments for Marine Corps and Army acquisition communities based on the new DoD contracting competency framework.

How has ARP supported your research and professional development?

I was fortunate to have funding support from ARP from the start. Since 2005 I have published 25 technical reports supported by ARP and published in the Defense Acquisition Innovation Repository, with variations of this research receiving publication in other venues. ARP gave me the opportunity to continue the CMMM research stream with other Air Force, Navy and Army acquisition communities, as well as other government agencies and major defense companies. I have also presented my research nearly every year at the annual acquisition research symposium, an excellent forum for the exchange of ideas and networking among scholars with similar research interests.

You're on the editorial board for a few peer-reviewed journals in the acquisition field. What trends have you noticed about defense acquisition research over the past 3-5 years?

I serve as the Editor-in-Chief of the Journal of Contract Management (JCM), which is the peer-reviewed journal of the National Contract Management Association. I am also a reviewer for the Journal of Public Procurement, International Journal of Procurement Management, and other peer-reviewed journals. The research trends I have seen in the JCM as well as other acquisition-related journals have focused on the application of artificial intelligence (AI) and robotic process automation (RPA) to acquisition and contracting processes. I am also seeing an increased emphasis on research related to risks and opportunities resulting from using non-traditional contracting methods such as Other Transaction Authorities.
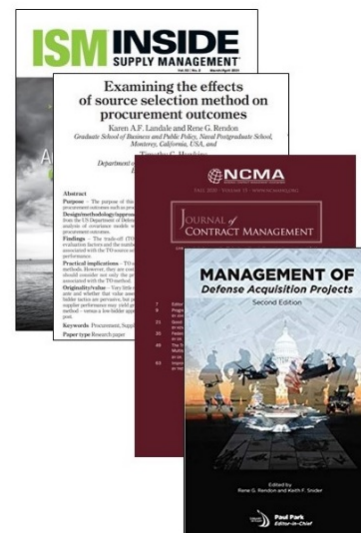
You've advised a number of student thesis projects. What advice would you give students considering research in acquisition?

DoD acquisition is a microcosm of the changes occurring in the US industry and the global marketplace. Because of that, defense acquisition is a target-rich environment when it comes to research topics and problems to be analyzed. The key to successful thesis research is developing a valid problem statement and research question and determining the data needed for the required analysis to answer that question. Even more important is getting access to the needed data to conduct the investigation and analysis. Some DoD agencies are reluctant to provide access to specific databases, especially those related to defense acquisition programs and organizations. Of course, there are some public-facing databases, but, based on my experience, although those databases are for public consumption, they may not necessarily contain current and accurate data. Thesis students should determine their data needs early in the research planning process and then determine if access to the needed data will be granted. Students should also have a back-up research plan if access to the data is not granted.

Put on your predicting hat: What kind of information and analysis do you think will be most needed by the defense acquisition community in the next 5 years?

The increasing use of artificial intelligence (AI) and robotic process automation (RPA) to replace rudimentary acquisition processes and tasks will result in increased efficiencies within the acquisition workforce. This increased efficiency will result in opportunities for the workforce to focus more time on complex tasks of a higher importance, for example, the strategic part of acquisition and contracting to include innovation and creativity. Additionally, the use of AI and RPA will enable the development of a technology-driven data analytics environment which will provide opportunities for enterprise-wide sourcing solutions, instead of our traditional single individual contracts, duplicated across defense departments and federal agencies. All of these

This increased efficiency will result in opportunities for the workforce to focus more time on complex tasks of a higher importance, for example, the strategic part of acquisition and contracting to include innovation and creativity.

changes will require the acquisition workforce to collect, share, and effectively leverage data in the pursuit of acquisition innovation and creativity. Research and analysis that will help DoD acquisition agencies succeed in this data analytics environment will be most needed by the defense acquisition community.

Faculty Peer-Reviewed publications

The following faculty research reports were recently accepted for publication at peer-reviewed journals:

- **Daniel Finkenstadt** and Robert Handfield (2021). "Blurry Vision: Supply Chain Visibility for Personal Protective Equipment during COVID-19." Journal of Purchasing and Supply Management, 27/2.

- **David Lewis** (2021). "Innovation, Interrupted". The Naval War College Review. Forthcoming.

- **Francoise Melese** (2020). "New Insights in Defense Management from Transaction Cost Economics." Armed Forces Comptroller, 65/4, pp. 36-8.

- **Robert F. Mortlock** (2021, Winter). "Been there, done that: who is the customer?" Army AT&L, 135-140. https://asc.army.mil/web/news-been-there-done-that-who-is-the-customer/