

SYM-AM-19-035



**PROCEEDINGS
OF THE
SIXTEENTH ANNUAL
ACQUISITION RESEARCH
SYMPOSIUM**

**WEDNESDAY SESSIONS
VOLUME I**

**Acquisition Research:
Creating Synergy for Informed Change**

May 8–9, 2019

Published: April 30, 2019

Approved for public release; distribution is unlimited.

Prepared for the Naval Postgraduate School, Monterey, CA 93943.



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

Is the Army Acquisition Workforce Surfing the Federal Retirement Wave to a Soft Landing?

Daniel E. Stimpson—PhD, is an Operations Research Systems Analyst (ORSA) at the U.S. Army Director of Acquisition Career Management (DACM) Office and Associate Professor at George Mason University (GMU). He holds a master's degree and a PhD in operations research from the Naval Postgraduate School and George Mason University, respectively. Before joining the Army DACM office, he retired from the Marine Corps after 24 years of both enlisted and officer service. He has also been an ORSA with the Center for Naval Analyses, the GMU research faculty, the Joint Improvised Explosive Device Defeat Organization (JIEDDO), and Headquarters Marine Corps (HQMC).

Marko J. Nikituk—is the Army Acquisition Workforce Analysis and Planning Branch Chief in the Army DACM Office. He is an Army Acquisition Corps member with 15 years of acquisition experience. He is Level III Certified in Program Management and Information Technology Management. He earned a master's degree in information technology management from the Naval Postgraduate School, and a bachelor's degree in electrical engineering from the U.S. Military Academy. He is a retired Infantryman, with duty in the Program Executive Office Enterprise Information Systems, the Army DACM Office, the Army CIO/G6, Army Programming Analysis & Evaluation (PA&E), and the Deputy Under Secretary of the Army for Business Transformation.

Miesha L. Purcell—is an Operations Research Analyst (ORSA) at the Army DACM Office. She has worked with and maintained the data in the Career Acquisition Personnel Position Management Information System (CAPPMS) for more than eight years. She holds a bachelor's degree in computer science from Columbus State University and a master's degree in information technology systems from George Washington University. Before joining the Army DACM Office, she worked as a software engineer at ArgonST.

Abstract

For several years, attrition in the defense acquisition workforce has been a serious and persistent concern among stakeholders inside and outside of government, especially attrition related to baby boomer retirement. The primary concern relates to the risk of losing critical skills and experience required to maintain and improve enterprise effectiveness. The Army Director of Acquisition Career Management (DACM) defines retirement “brain drain” as generational retirement with the potential to create a talent vacuum.

While change is inevitable and institutional transitions usually involve turbulence and friction, to date the Army Acquisition Workforce (AAW) has maintained its base of experienced workforce members and made steady progress improving workforce balance despite the rising retirement wave.

This paper presents highlights of recently completed comprehensive data analysis that provides a view of recent trends within the AAW's 14 career fields. We also demonstrate the importance of proper problem-framing in developing an accurate understanding of the current state of the AAW and what dynamics led to it.

Introduction

For more than a decade, stakeholders inside and outside of government raised concerns about potential severe negative effects related to generational retirement of baby boomers (Defense Acquisition University, 2007; Gates, et al., 2008; Hogan, Lockley, & Thompson, 2012; Professional Services Council, 2016; Gates et al., 2018). A primary concern relates to the loss of the critical skills and experience required to maintain and improve enterprise as a high volume of seasoned employees exit the workforce. To the



extent this occurs, the Army Director of Acquisition Career Management (DACM) defines retirement “brain drain” as generational retirement with the potential to create a talent vacuum (Techopedia.com, n.d.).

Baby boomers, born between 1946 and 1964, are now between ages 54 and 74. With federal retirement eligibility beginning at age 55 (depending on a person’s federal years of service [YoS]), today nearly 100% of baby-boomer federal employees are within the retirement eligibility window.

Effectively managing the current retirement situation for the AAW’s demographically diverse civilian and military workforce is a critical function of Army DACM Office efforts under its Human Capital Strategic Plan (HCSP; U.S. Army, n.d.). This requires a comprehensive understanding of recent accession and separation patterns that led to the current state of the AAW and implications these suggest for the path ahead.

U.S. Population Distribution

As Figure 1 shows, since the last baby boomers were born in 1964, the demographics of the United States changed considerably. The left side of the figure shows the U.S. birthrate for the two decades before 1964 grew the base of the U.S. population pyramid,¹ resulting in the characteristic shape of an expanding population. In contrast, the 2018 population pyramid (middle chart) has nearly vertical edges tapering to a slightly narrower base. This is characteristic of a decreasing birth rate, which in a closed society would indicate a shrinking population. But, in fact the U.S. population is increasing due to immigration. Finally, the right side of Figure 1 shows the U.S. Census Bureau projection for the U.S. population to continue growing through the next 10 years, maintaining its population pyramid shape consistent with low birthrates, long life expectancies, and continued immigration (Colby & Ortman, 2014; Colby & Ortman, 2015).

¹ A population pyramid is the combination of vertically oriented, back-to-back male and female histograms of the population counted according to age.



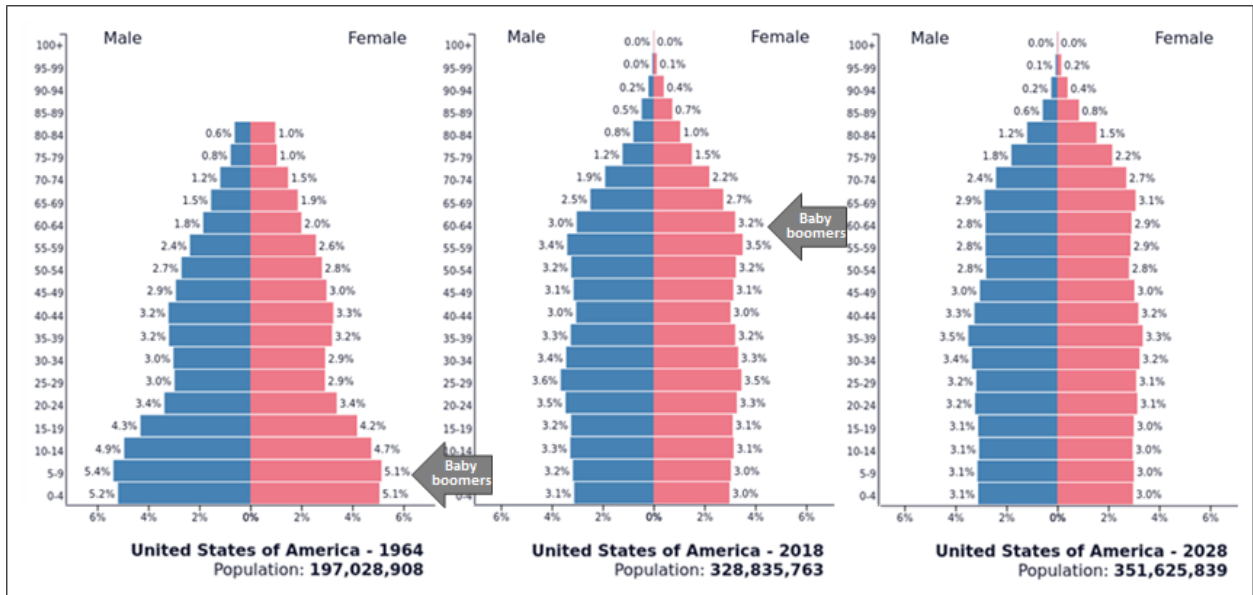


Figure 1. Population Pyramids for United States of America (Population Pyramid, n.d.)²

Importantly, the diagrams in Figure 1 show no significant age distribution imbalance in the current or projected U.S. population, which is the primary context for AAW recruiting and retention. So while personal choices related to accepting employment and worker mobility are complex phenomena involving factors such as overall job satisfaction, perceived opportunities, personal skills, employer demand, geography, and timing, U.S. population age distributions cannot be blamed for AAW age imbalances that may currently exist or develop in the foreseeable future.

Army DACM's Human Capital Strategic Plan (HCSP)

The 2002 President's Management Agenda recognized the potential for a significant institutional brain drain as the result of baby-boomer retirement. The agenda also recognized the need for better recruiting, retention, and reward programs for federal workers. Toward this end, the Department of Defense (DoD) generated a department-wide strategic human capital plan followed by the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L])³ strategic human capital plan for the Defense Acquisition Workforce (Gates, et al., 2008). The current DoD Acquisition Workforce Strategic Plan—FY 2016—FY 2021 (AWSP) is the latest in the series of updates since 2002.

The DoD's AWSP reports that overall, Acquisition Workforce (AWF) gains exceeded losses from FY 2008 through FY 2015 with significant improvement in the pending

² Age is on the vertical axis.

³ On February 1, 2018, the fiscal year 2017 National Defense Authorization Act eliminated the USD(AT&L) position to re-establish the position of Under Secretary of Defense for Research and Engineering (USD[R&E]) and create the new position of Under Secretary of Defense for Acquisition and Sustainment (USD[A&S]).



retirements “bathtub,”⁴ better posturing the workforce for the high level of retirements the plan expects. Further, the AWSP expresses concern about the potential for losing critical AWF experience and capacity as the current workforce ages and retires (DoD, 2016).

The AWSP also sets forth four strategic goals, with Goal 2 being to “shape and develop the AWF to meet current and future mission area demands” (DoD, 2016). Within this effort, the Army DACM developed a Human Capital Strategic Plan (HCSP) which establishes five of its own goals to institutionalize the human capital planning process and develop the next generation of Army acquisition leaders. The first of these is to “shape the Army acquisition workforce to achieve current and future acquisition requirements” which fits squarely under the AWSP’s Goal 2.

Goal 1 of the Army DACM’s HCSP encompasses five broad categories:

- Labor supply
- Labor demand
- Recruiting the workforce
- Managing workforce separation
- Steering labor supply to fit labor demand

Thus, this goal is intentionally forward-looking with the intent of setting the conditions for mission success with proactive policies and planning. This requires reliable projections of future workforce demographics and dynamics, based on well understood cause-and-effect relationships. To develop these, the DACM Office works to gain accurate understandings of past workforce dynamics and current trends across the AAW as a foundation for its ongoing predictive modeling effort.

Data and Definitions

The Army DACM’s Career Acquisition Personnel and Position Management Information System⁵ (CAPP MIS) maintains the data used in this study. CAPP MIS includes direct feeds from the Defense Civilian Personnel Data System (DCPDS) and provides, among other information, every employee’s age, duration of federal employment, duration of acquisition experience, acquisition certification status, command assignment, and geographic location.

For this analysis, we compared annual individual civilian personnel records on September 30 each year from 2012 through 2018⁶. From these we categorize each employee as a “join,” “stay,” or “loss” according to the annual snapshots in which they appear. If an employee appears in two consecutive records, we define them as “stayed” in the AAW for the fiscal year (FY) spanned by the two data snapshots. If an employee record appears in a prior year snapshot, but not in a later one, we counted them as a “loss.” Likewise, if an employee appears in a later snapshot, but not in the previous one, we

⁴ “Bathtub” is a term used in the acquisition community to describe imbalances in workforce experience, i.e., a severe shortage of procurement professionals with between 5 and 15 years of experience (Acquisition Advisory Panel, 2007).

⁵ CAPP MIS provides quarterly feeds to Defense Manpower Data System (DMDC).

⁶ All data are according to CAPP MIS on March 31, 2019.



counted them as a “join.” This methodology means migrations within the AAW (changes of employment command or location) are not considered.⁷

From these data, five primary measures are calculated as of the beginning of each FY:⁸

- Age: Calculated using the Date of Birth field in DCPDS
- YoS: *Years of service* are determined according to the Service Computation Date in DCPDS
- YRE: *Years until retirement eligible* are calculated according to FERS retirement eligibility criteria based on the minimum retirement age, and years of service (YoS) for individuals with 100% earned benefit⁹ (Office of Personnel Management, 2019). For year-over-year comparison we round to an integer value, so YRE = 0 means an individual became retirement eligible (RE) within the FY spanned by applicable data snapshots. If YRE < 0, then an individual is RE for the entire FY. While YRE > 0 means an individual is not RE at any time in the applicable FY.
- YAE: *Years of acquisition experience* counts the total number of years of work experience an individual has within the AAW in any Acquisition Career Field (ACF). Individuals self-report their acquisition experience in other agencies, military, or contractor roles.
- RE: We categorize joins, stays, and losses as retirement eligible if they become retirement eligible at any time during a given FY. Therefore, it is important to note the number of RE reported in this analysis is an annual total and values are higher than those commonly reported in single point-in-time (snapshot) counts. We emphasize this difference throughout this paper with the use of the word “annual” to describe the findings (e.g., we discuss annual losses and annual RE gains).

One challenge of AAW trend analysis is the constantly changing size of the workforce Figure 2 shows the scale of these changes which vary by Acquisition Career Field. Year-over-year variations result from the changes in service acquisition and program requirements, employee choices, and career field recoding. Recoding occurs when positions are either created or eliminated according to mission and command priorities. The most significant AAW recoding since FY13 is the large increase of Facility Engineers between FY17 and 18 which occurred due to U.S. Army functional leader policy decisions (shown in Figure 2).

⁷ Stay = Continuation, Loss = Attrition, and Gain = Accession.

⁸ In order to use the most recent value recorded, all data are standardized to the beginning of the applicable FY as follows: Joins and Stays data are read from the later year data snapshot and data field entries are converted the beginning of the FY (e.g., Age(FY14) = Age(FY15)-1). Losses are recorded in the previous year snapshot only, so their values are read from the prior FY snapshot without adjustment.

⁹ While retirement eligibility depends on each individual’s retirement plan, more than 96% of the AAW is currently under FERS.



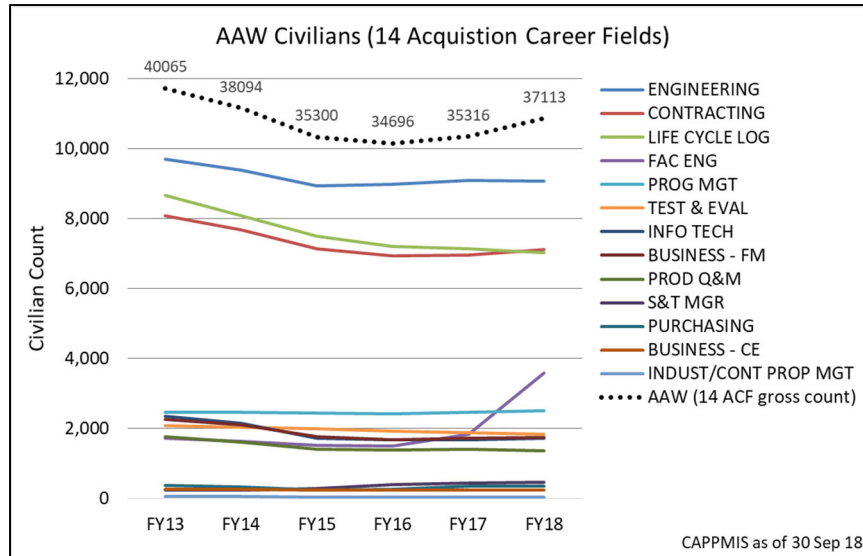


Figure 2. Count of AAW Civilian Personnel in Each Army ACF (at Beginning of FY)

The Bathtub Effect

The term *bathtub effect* describes the phenomenon of simultaneously having an excessive number of senior acquisition professionals, many in and near retirement eligibility, and an underrepresentation of mid-level employees to succeed them when they retire (Acquisition Advisory Panel, 2007; Hogan et al., 2012).

For more than 20 years, an ongoing concern of senior leadership is the bathtub effect phenomenon among the civilian AW. In 2000, the USDs for AT&L and Personnel and Readiness (P&R) stated that “after 11 consecutive years of downsizing, we face serious imbalances in the skills and experience of our highly talented and specialized civilian workforce. Further, 50 percent will be eligible to retire by 2005. In some occupations, half of the current employees will be gone by 2006” (USD[AT&L]; USD[P&R], 2000). Because this condition has persisted, it has been repeatedly highlighted since.

For example, in 2005 the Defense Acquisition University (DAU) found that 76% of the AT&L workforce were baby boomers or older (Defense Acquisition University, 2007). Again in 2007, the Acquisition Advisory Panel reported to the U.S. Congress that

During the 1990s, the federal AW was significantly reduced and hiring virtually ceased, creating what has been termed the Bathtub effect, a severe shortage of procurement professionals with between 5 and 15 years of experience. The impact of this shortage is likely to be felt more acutely soon, as half of the current workforce is eligible to retire in the next four years. (Acquisition Advisory Panel, 2007)

A 2009 RAND study concluded that the number of DoN retirement-eligible AW personnel would increase by 2012 and remain above average for at least seven years (Gates, 2009).

Thus, senior defense acquisition leaders maintained focus on filling the bathtub as a persistent theme by codifying it into strategy documents and addressing it in policy decisions.



Figure 3 shows the civilian AAW age and RE distributions at the beginning of both FY13 (dashed line) and FY18 (solid line). Comparing these distributions immediately highlights the importance of how we frame the RE situation. On the left-hand side is the “Age-frame” and on the right side is the “YRE-frame.” Each entails a very different perception of the state of the AAW. The age distribution is distinctly bimodal in both FY13 and FY18, with the FY18 mode near 55 years of age, i.e., the beginning of federal retirement eligibility. This peak indicates a significant “bow wave” as 29% of the “stay” population was at least 55 years of age in FY18. This view from the age-frame makes the potential for an AAW brain drain appear acute and critical.

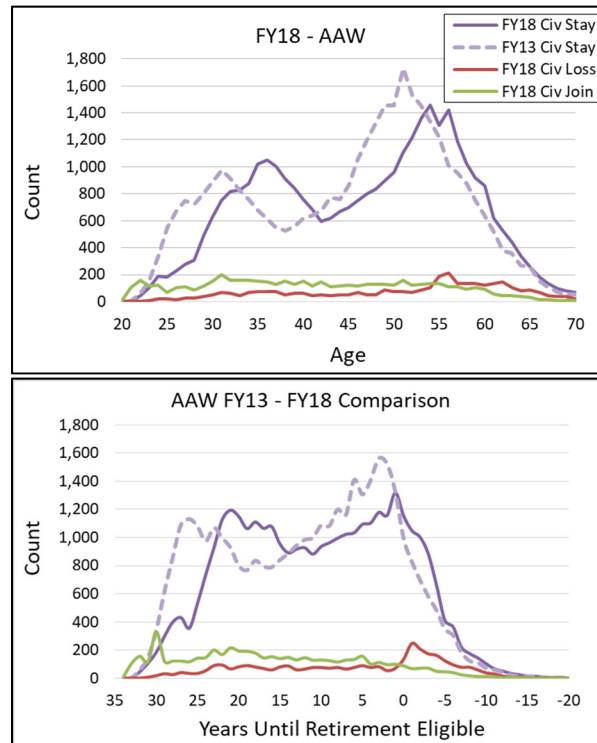


Figure 3. AAW Civilian Employee Age and Retirement Eligibility Distribution Comparisons (September 30, 2012, and September 30, 2018)

The right-hand side of Figure 3 shows the YRE distribution. Like the age distribution, the YRE distribution is distinctly bimodal, but the leading peak height is nearly equal to the trailing peak. And the bathtub ($5 \leq YRE \leq 15$) is not nearly as deep. When comparing FY13 to FY18, we see that there has been a leveling of the employee distribution while the “bathtub” has been filling. Thus, unlike what we see in the age-frame, this view shows workforce balance has improved over the six-year period.

Figure 4 shows the development of these changes over time as a series of six YRE distributions for AAW joins and losses. This reveals an important dynamic. First, in FY13 and FY14 the red lines (losses) exceeded the green lines (joins), across most of the YRE distribution. From FY16 through FY18 this pattern inverted with joins exceeding losses across the whole not-RE population (i.e., $YRE < 0$). This difference increased each year after FY15, providing positive feedback to intentional DACM workforce shaping efforts ranging from improved employee engagement to targeted hiring and retention efforts, as well as position recoding. Further, these charts show results are both wide-spread and sustained.



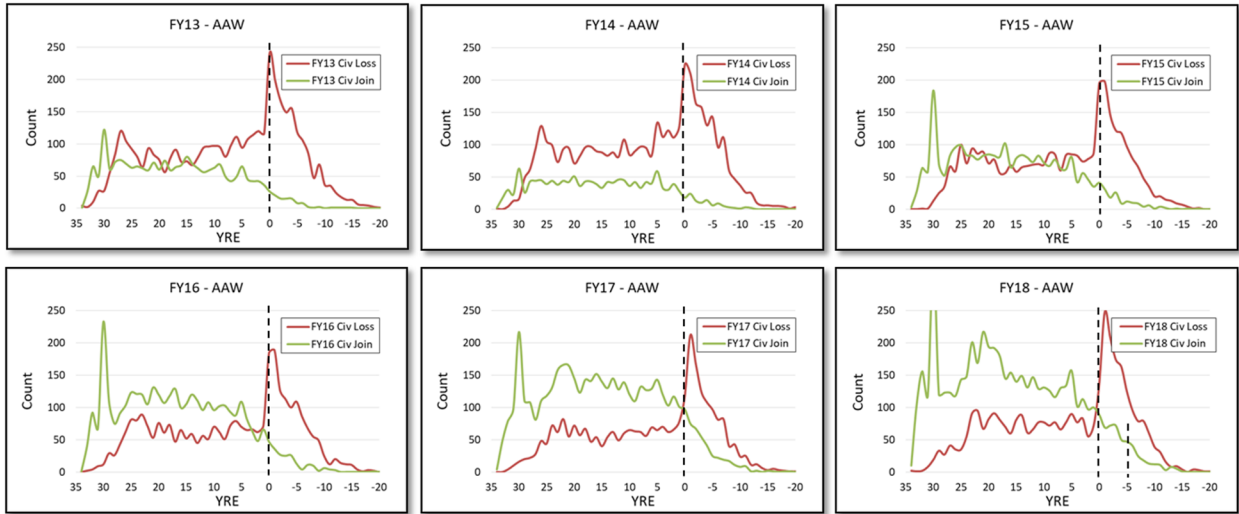


Figure 4. Historical Joins and Losses by YRE, FY13 Through FY18

Figure 5 aggregates the data displayed in Figure 4. This representation reveals several other important outcomes of the recent AAW join and loss patterns. First, total annual AAW losses (the solid red line) were lower in FY18 than in FY13, even after increasing from FY17 to FY18. As shown, declining losses among employees who were not-RE drove down the decrease in total annual losses. These were the majority of losses in all years (66% in FY13 and 59% in FY18). This is a decrease in annual not-RE losses of 665 (from 2660 in FY13 to 1995 in FY18) against a generally consistent number of annual RE losses which increased by 50 (or 3.7%) from FY13 to FY18 (1356 and 1406 annual losses respectively).

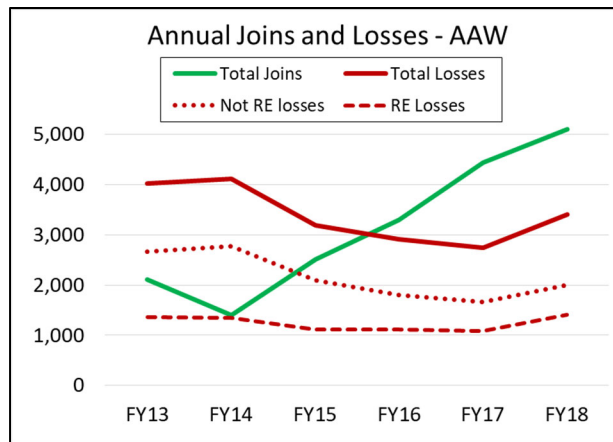


Figure 5. AAW Join and Loss Rates

Figure 5 also shows annual losses increased from FY17 to FY18 in both RE and not-RE categories (see the two dashed lines). It is too early to know whether this change indicates normal variation or a trend reversal, so we will continue to collect data and assess this. The latter case appears likely for reasons we will discuss in the next section. Finally, the dramatic change in number of joins (green line in Figure 5) is clearly evident as annual joins increased from 2115 in FY13 (about 50% less than total annual losses) to 5104 in FY18 (about 50% more than total annual losses).

These figures illustrate the importance of not focusing solely on the retiring workforce, as the majority of attrition occurs among those not in the RE window.



Consequently, successful recruiting and retention in the early career population are proving effective workforce shaping and preservation drivers for combating the bathtub effect and more than compensating for FY17 and FY18 retirement flows.

AAW Retirement Rate

The green bars in Figure 6 show how the annual number of RE employees remained essentially unchanged FY13–FY15, but then began increasing from 6521 during FY15 to 7910 during FY18. As a percentage, those RE increased at about 1% per year from 16.1% of the AAW during FY13 to 21.3% during FY18 (this is shown by the green line). Meanwhile, the red bars show that annual losses from this group (RE losses) remained consistent during the same period. In fact, despite the increasing RE population during FY16 and FY17, RE losses continued decreasing until FY17, when the trend reversed, bringing FY18 RE losses back to about the FY13 level. Further, as a percentage of the RE population (red line), these losses decreased from 23.1% in FY13 to 18.8% in FY18.

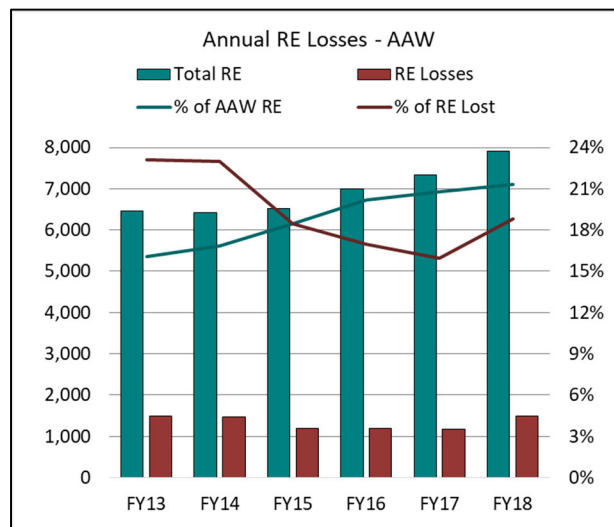


Figure 6. AAW Retirement Eligible Population Trends

The combined effect of these two trends suggests that retirement “pressure” is building in the civilian AAW population as the number retirement eligible has been increasing, while the number in this group actually leaving the workforce has not. This is why we expect the reversal from decreasing to increasing RE-losses between FY17 and FY18 is not likely attributable to normal variation, but will continue through FY19 and for as long as the RE population remains elevated.

These RE employee counts simply tell us who is eligible to retire according to the federal criteria, but they don’t tell us anything about who is retiring and what intellectual capital and expertise is leaving with them. While sheer numbers always matter, it is important to examine who is retiring, because job skills and relevant expertise are critical considerations for assessing potential retirement brain drain impacts.

AAW Retirement Brain Drain

Acquisition expertise is not something we can easily measure from the available data. But, all else being equal, increased job experience generally correlates with increased job expertise. Under this assumption, we use YAE as a proxy measure of expertise and intellectual capital as a gauge of brain drain. While this is a coarse measure, we find it helpful in evaluating the gross effects of workforce gains and losses on the overall AAW



experience base. Additionally, since YAE is specific measure to the Army’s acquisition enterprise, it is a proxy for the question at hand. We acknowledge that counting total years invested in the enterprise has the inherent weakness of only capturing acquisition experience broadly, without any specificity of expertise in any particular skillset, ACF, or acquisition program. But, just as comparing the age-frame to the YRE-frame provides important insights into the flow of retirees, we find comparing the YoS-frame to the YAE-frame helps us better understand likely impacts related to overall workforce expertise and brain drain.

The left-hand side of Figure 7 shows the stratified AAW distribution according to employee’s federal YoS, with a breakout of those RE and near-RE¹⁰ underneath. Juxtaposed, on the right-hand side, are charts showing the AAW distribution according to employee YAE, stratified by the same RE categories. According to YoS distribution on the left side, there is a clear retirement “bow wave” between 30 and 40 YoS (shown in in red and yellow). But, the YAE-frame on the right side reveals that the experience distribution of the pending AAW retirements is much more uniformly distributed (compare the second charts down on each side). Thus, the retirement wave is significantly less sharp when accounting for acquisition-specific experience leaving the AAW.

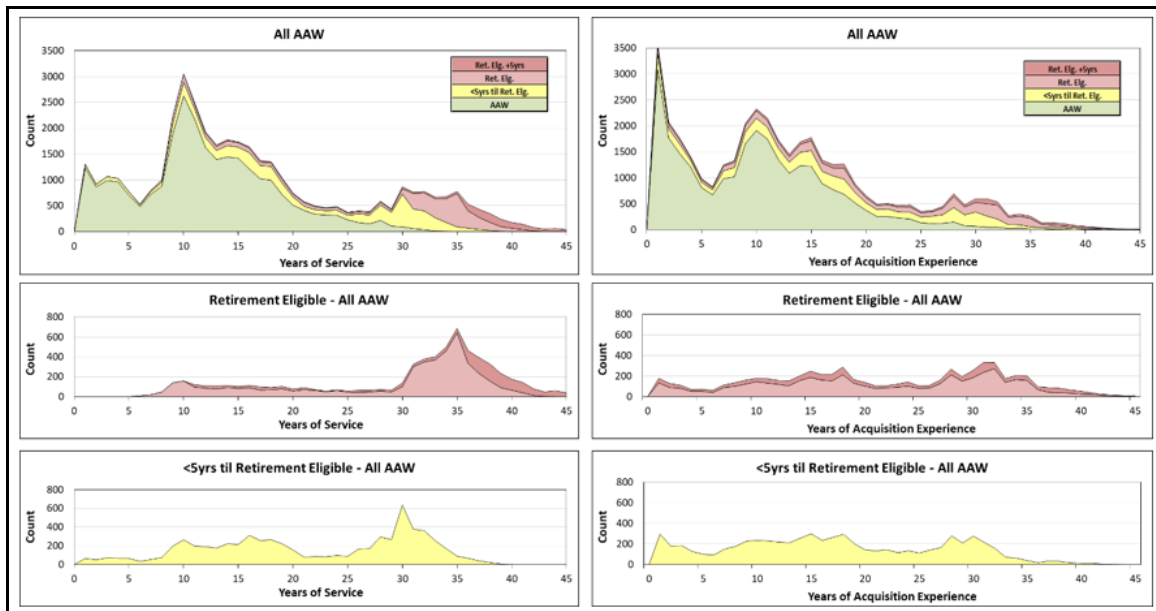


Figure 7. Workforce Retirement Eligibility Distributions

This comparison emphasizes the intuitive understanding that age does equal experience and federal workforce experience does not equal acquisition expertise. This is to say, not all workforce losses have equal impact on AAW intellectual capital. Each individual retirement, even with the same age and YoS, entails a unique skillset and experience for which the workforce must compensate when it is gone. Thus, since the Army hires many AAW employees in later career stages without previous acquisition experience, the total YAE they accrue are less than their age and YoS might suggest. When we measure this

¹⁰ Near-RE are those within five years of RE.

directly, we see the total annual AAW expertise-loss is significantly smoother than the Age and YoS perspective implies.

Total AAW Acquisition Experience

We can measure experience gained and experience lost in the AAW by summing the total YAE. As such, each person who joins or leaves the AAW carries with them some number of YAE. Also, every member that remains in the AAW gains one YAE for every year they remain. From this we can make a simple calculation. For example, if the AAW has 39,000 civilian members that remain, then total AAW YAEs increase by 39,000 during that year. Then, so long as the sum of these 39,000 YAE and the YAEs of those joining is greater than the YAE of those leaving the workforce, the workforce does not suffer any loss of acquisition experience, that is, brain drain.

In FY13, the AAW had 40,100 civilian employees and 443,800 total YAE. In FY18, there were fewer civilian employees, 37,100, but more total YAE, 471,600 years. The red and green bars in Figure 8 show the YAE for AAW joins and losses during these years, while the black line shows mean YAEs, which increased from 11.1 in FY13 to 12.7 in FY18. It is also important to note that the green bars in Figure 8 show that employees joining the AAW were not beginning with zero YAE. Rather, those joining had significant acquisition experience. During FY18, 30% of those joining the AAW had previous YAEs, averaging 7.1 years.

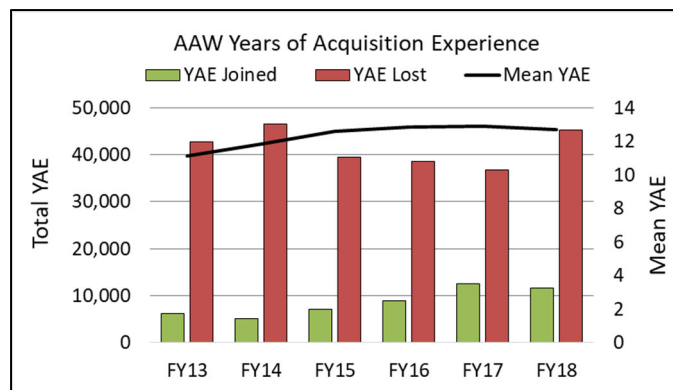


Figure 8. Cumulative AAW Years of Acquisition Experience

As an additional brain drain measure, we suggest 10 YAE is an important benchmark for the attainment of full job proficiency or acquisition expertise. Recent workforce survey results and academic research support this assumption. In 2017, MITRE reported workforce survey results from 250 DoD support personnel where 92% of respondents stated 10 or more years of work experience are required to become fully proficient in acquisition¹¹ (Murphy & Bouffard, 2017). This result is consistent with many human psychology findings that assert “experts are made, not born” and that skill mastery requires thousands of hours of specific, sustained practice and skill development (Ericsson, Krampe, & Clemens, 1993; Ericsson, Charness, & Felto, 2006; Ericsson, Prietula, & Cokely, 2007).

¹¹ 68% of respondents believed it takes 10 years, 18% believed it takes 15 years, 10% believed 20+ years.



Figure 9 displays the percentages of the annual join, stay, and loss populations with more 10 YAE. According to this measure, the percentage of “experts” staying in the AAW increased sharply between FY13 and FY18, from 41% to 52% respectively. Additionally, while the percentage of annual RE expert losses increased, the level remained consistently below the percentage staying. Further, this relationship remains across 11 of the AAWs 14 ACFs (which comprise 85% of the AAW).¹² These findings provide positive indication that the AAW is not suffering a damaging level of brain drain, even though considerable expertise is leaving every year.

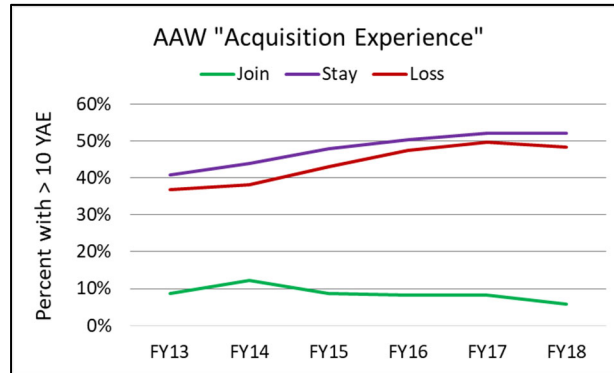


Figure 9. Percent of AAW With More Than 10 YAE by Employee Category

This outcome is expected in light of the increasing join rate relative to the loss rate shown in Figure 9 as these trends translate into increased employee tenure. It is also consistent with 2018 survey results where leaders across the federal acquisition enterprise reported generally increasing workforce skills (Professional Services Council, 2018).

Career Field Patterns and Trends

Because no career field or command is average, policy makers realize limited value from aggregated statistics that may miss important features within individual sub-populations. For example, Figure 10 is a side-by-side display of the primary measures presented in this paper to allow comparison of the Engineering and Contracting ACFs. Several important features are evident when assessing the brain drain potential of each.

¹² Facility Engineering (≈5000 members with ≈1700 newly recoded position during FY 18), S&T Manager (≈500 members), and Purchasing (≈300 members) are the exceptions.



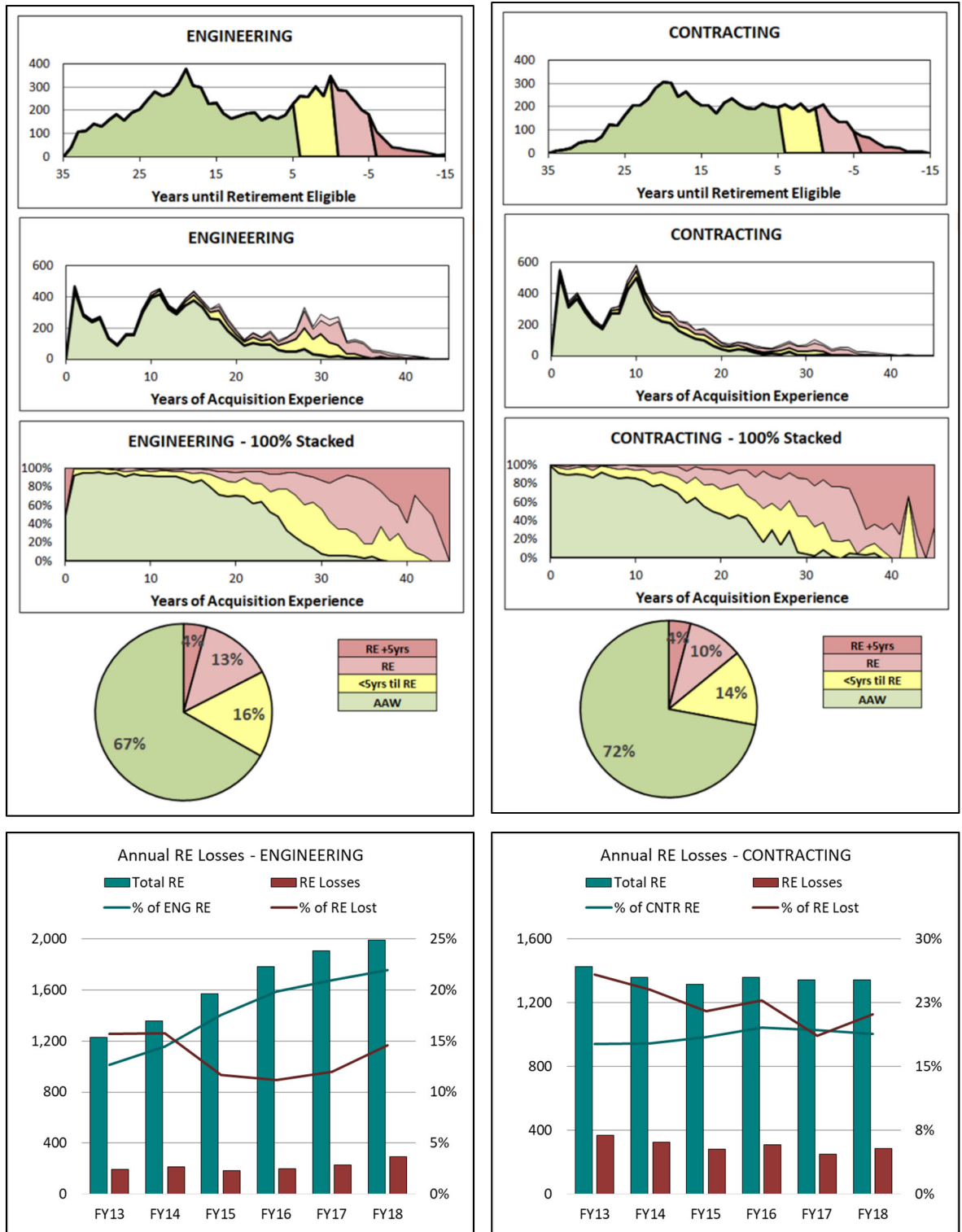


Figure 10. AAW Engineering-Contracting Career Field Comparison

We note the following indications of high brain drain potential in the Engineering ACF (left side of Figure 10):



1. Expected higher than average near-term retirement rate because:
 - a. 34% of AAW engineers are RE or near-RE (pie chart)
 - b. The RE Engineering population increased rapidly since FY13 (from 12.7% in FY13 to 21.9% in FY18, green line in bottom chart)
 - c. The RE loss rate increased in FY17 and FY18 (from 11.1% in FY16 to 14.6% in FY18, red line in bottom chart)
2. Expected higher than average near-term RE experience loss because:
 - a. The RE and near-RE population is heavily concentrated at YAE>25 (second chart from top)
 - b. Underrepresentation of personnel with 5 and 20–25 YAE (second chart from top)
3. Engineering is the largest AAW career field (>9000 members) and 97% hold STEM degrees

For these and other reasons outside the scope of this paper, we assess Engineering as having the highest retirement brain drain potential of the AAW's 14 ACFs. The factors leading to Engineering's current condition developed over many years, but mainly occurred because of its historically low early and mid-career attrition. Accordingly, sustained lower than typical attrition, especially during early career phases, means retiring engineers currently have higher than average tenure than those retiring from other ACFs.

We note the following in the Contracting ACF (right side of Figure 10):

1. Expected moderate near-term retirement rate because:
 - a. Favorable, unimodal YRE distribution with mode at 20 YRE (top chart)
 - b. 29% of AAW contractors are RE or near-RE (pie chart)
 - c. RE population has been stable since FY13 (changing from 17.7% in FY13 and FY14 to 18.8% in FY18, green line in bottom chart)
 - d. The declining RE loss rate reversed in FY18, but remains down (from 25.8% in FY13 to 21.1% in FY18, red line in bottom chart)
2. Expected moderate near-term RE experience loss because the RE and near-RE population is spread across YAE (second chart from top)
3. Contracting is the second largest AAW career field (\approx 7000 members)

We assess Contracting as having a low retirement brain drain potential. The dynamics in this ACF are very different from those among engineers as they typically exhibit high early and mid-career attrition so that they have far fewer high tenure employees in the RE population.

Figure 11 displays a summary of our retirement brain drain assessment for all 14 AAW ACFs. The retirement brain drain potential is highest in the Engineering, Test & Evaluation, and Life Cycle Logistics career fields. Together, these career fields have about



18,000 employees who hold 60% of the science, technology, engineering, and mathematics (STEM) degrees¹³ in the AAW.

Priority	Career Field	Retirement Brain Drain Potential	Population (Civ Only)
1	ENGINEERING	High	9095
2	TEST AND EVALUATION	High	1907
3	LIFE CYCLE LOGISTICS	High	6944
4	PROGRAM MANAGEMENT	Moderate	2498
5	BUSINESS - FINANCIAL MANAGEMENT	Moderate	1775
6	PRODUCTION, QUALITY & MANUFACTURING	Moderate	1371
7	FACILITY ENGINEERING	Moderate	5955
8	CONTRACTING	Low	7227
9	INFORMATION TECHNOLOGY	Low	1862
10	PURCHASING	Low	273
11	SCIENCE & TECHNOLOGY MANAGER	Low	489
12	BUSINESS - COST ESTIMATING	Low	254
13	INDUSTRIAL/CONTRACT PROPERTY MANAGEMENT	N/A	50
14	ACQUISITION ATTORNEY	N/A	7

Figure 11. Retirement Brain Drain Potential Assessment Summary¹⁴

Conclusion

This paper’s primary focus is understanding the character of the retiring population in order to understand implications related to brain drain from ongoing baby boomer retirement. This is only one of many important workforce management issues for policy makers to consider in crafting comprehensive strategies and policies. With nearly all AAW baby boomers now retirement-eligible, the often-threatened retirement wave is upon us. Even so, our assessment of the AAW is consistent with other results documenting the successful growing and balancing of the DoD AW (DAW) over the past decade (Gates et al., 2018).

We have shown that problem framing is critical to proper understanding of the retirement brain drain dynamic. Specifically, the YRE-frame and the YAE-frames provide more meaningful understanding of the brain drain potential across the workforce than the Age-frame and YoS-frame. Together these better capture the quantity and distribution of acquisition specific experience entering and leaving the workforce. Therefore, despite expected ongoing baby boomer retirements and increased near-term retirement rates, the AAW has been able to maintain its end strength, improve its workforce balance, and grow its

¹³ STEM degrees are defined according to National Center for Education Statistics categories.

¹⁴ Industrial/Contract Property Management and Acquisition Attorney career fields are too small to be assessed in aggregate.



experience base to enable critical Army DACM initiatives related to acquisition program success and leader succession.

Future Work

As the Army DACM continues executing the HCSP to shape the future rather than react to it, accurate readings of workforce dynamics are needed to enable continuous fine tuning. This will require increased measurement detail in areas such as acquisition expertise. In turn, efforts to improve acquisition expertise raise additional research questions. For example, DAW training certification rates have increased significantly in the last decade (USD[AT&L], 2016). The DACM is interested in better understanding the impact of this trend on mission effectiveness. Hence, we seek to assess research questions such as the following: How much does training translate into improved job performance? What training is most effective for increasing needed expertise? Answering cause-and-effect questions like these are critical to optimizing training resource allocation and driving improved mission effectiveness.

Other cause-and-effect relationships important to the Army DACM within the HCSP include measuring the effectiveness of communication channels on workforce engagement, measuring workforce engagement effects on worker retention, and measuring effects of workforce culture on leadership development.

Finally, we are pursuing increased specificity—for example, identifying and measuring precise recruiting and retention drivers of the best performing and highest potential employees, rather than the aggregated employee pool.

References

- Acquisition Advisory Panel. (2007). *Report of the acquisition advisory panel to the office of federal procurement policy and the United States Congress*. Washington, DC: U.S. Office of Management and Budget.
- Colby, S. L., & Ortman, J. M. (2014). *The baby boom cohort in the United States: 2012 to 2060*. Washington, DC: U.S. Census Bureau. Retrieved from <https://www.census.gov/content/dam/Census/library/publications/2014/demo/p25-1141.pdf>
- Colby, S. L., & Ortman, J. M. (2015). *Projections of the size and composition of the U.S. population: 2014 to 2060*. Washington, DC: U.S. Census Bureau. Retrieved from <https://www.census.gov/content/dam/Census/library/publications/2015/demo/p25-1>
- Defense Acquisition University. (2007). *Defense acquisition structures and capabilities review*. Fort Belvoir, VA: Author.
- DoD. (2016). *Acquisition workforce strategic plan FY2016–FY2021*. Washington, DC: Author.
- Ericsson, A. K., Charness, N., & Felto, P. J. (2006). *The Cambridge handbook of expertise and expert performance* (Cambridge handbooks in psychology). Cambridge, England: Cambridge University Press.
- Ericsson, A. K., Krampe, R. T., & Clemens, T.-R. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100(3), 363–406.
- Ericsson, A. K., Prietula, M. J., & Cokely, E. T. (2007, July–August). The making of an expert. *Harvard Business Review*, 85(7/8), 114. Retrieved from <https://hbr.org/2007/07/the-making-of-an-expert>

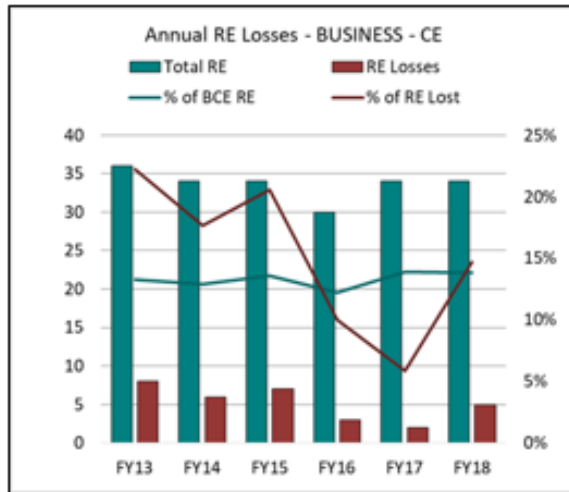
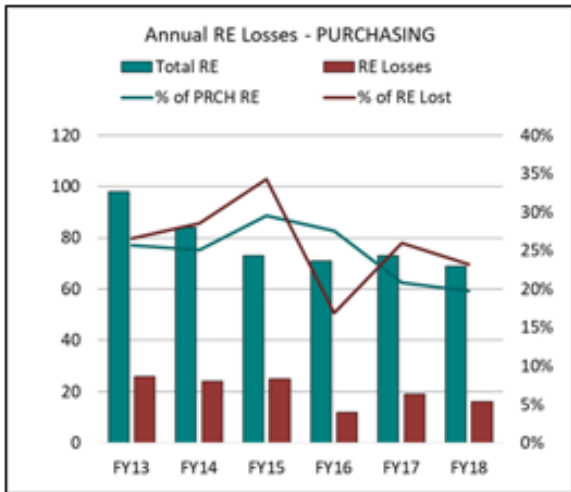
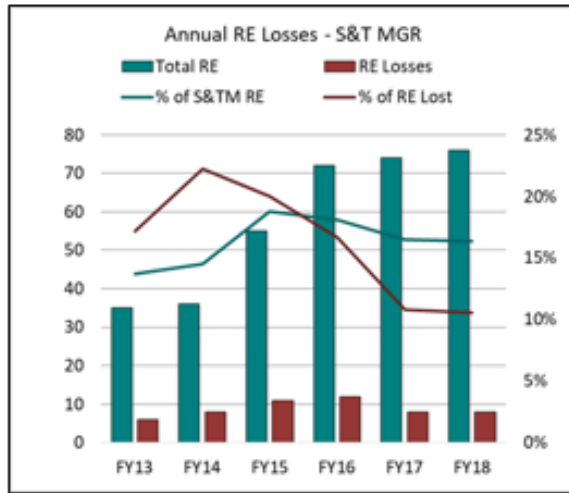
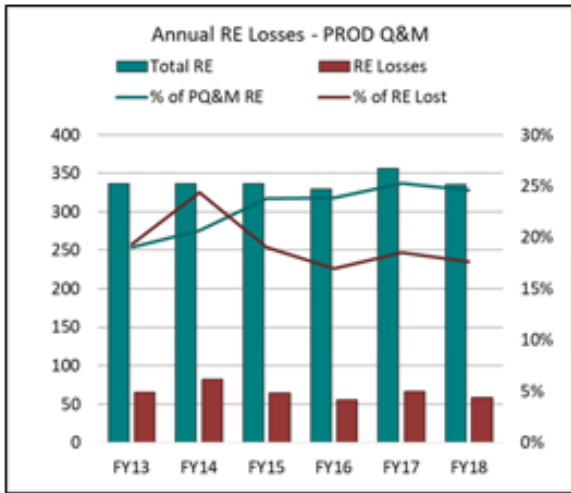
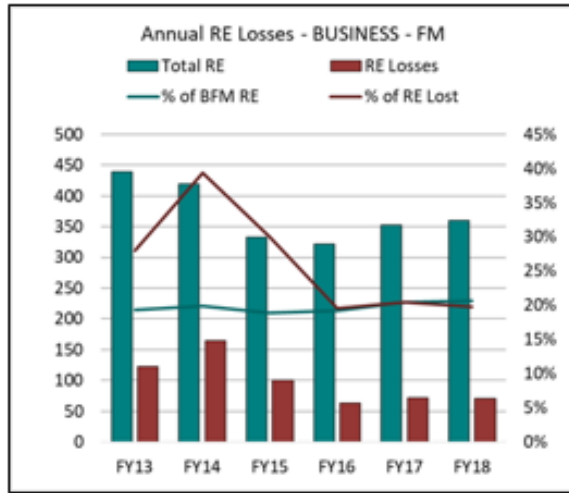
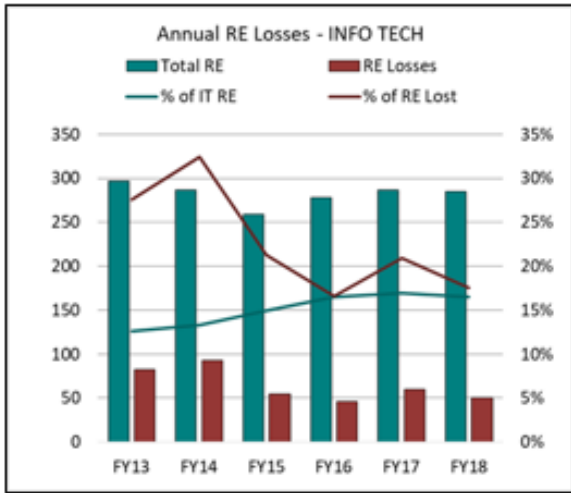


- Gates, S. M. (2009). *Shining a spotlight on the defense acquisition workforce—Again*. Santa Monica, CA: RAND Corporation.
- Gates, S. M., Keating, E. G., Jewell, A., Daugherty, L., Tysinger, B., & Masi, R. (2008). *The defense acquisition workforce: An analysis of personnel trends relevant to policy, 1993–2006*. Santa Monica, CA: RAND Corporation. Retrieved from http://www.rand.org/pubs/technical_reports/TR572.html
- Gates, S. M., Phillips, B., Powell, M. H., Roth, E., & Marks, J. S. (2018). *Analysis of the Department of Defense acquisition workforce: Update to methods and results through 2017*. Santa Monica, CA: RAND Corporation. Retrieved from http://www.rand.org/pubs/technical_reports/TR572.html
- Hogan, B., Lockley, L., & Thompson, D. (2012). *Shaping the Navy's Acquisition Workforce* (MBA professional report). Monterey, CA: Naval Postgraduate School. Retrieved from <https://apps.dtic.mil/docs/citations/ADA562791>
- Murphy, C., & Bouffard, A. (2017). Understanding defense acquisition workforce challenges. In *Proceedings of the 14th Annual Acquisition Research Symposium*. Monterey CA: Naval Postgraduate School. Retrieved from <https://apps.dtic.mil/docs/citations/ADA562791>
- Office of Personnel Management. (2019, March 29). FERS information. Washington, DC: Author. Retrieved from <https://www.opm.gov/retirement-services/fers-information/eligibility/>
- Population Pyramid. (n.d.). *Population pyramids of the world from 1950 to 2100*. Retrieved from <https://www.populationpyramid.net/united-states-of-america>
- Professional Services Council. (2016). *Aligning for acquisition success: Overcoming obstacles to results*. Washington, DC: Grant Thornton. Retrieved from <https://contractingacademy.gatech.edu/wp-content/uploads/2016/06/Acquisition-Policy-Survey-2016-1.pdf>
- Professional Services Council. (2018). *Aligning for acquisition success: Optimism amid adversity*. Washington, DC: Grant Thornton. Retrieved from <https://www.grantthornton.com/-/media/content-page-files/public-sector/pdfs/surveys/2018/2018-PSC-Acquisition-Survey.ashx>
- Techopedia.com. (n.d.). Brain drain. Retrieved from <https://www.techopedia.com/definition/30085/retirement-brain-drain-rbd>
- U.S. Army. (n.d.) *Army Acquisition Workforce Human Capital Strategic Plan (HCSP)*. Retrieved from <https://asc.army.mil/web/hcsp>
- USD (Acquisition, Technology, & Logistics). (2016). *Performance of the defense acquisition system: 2016 annual report*. Washington, DC: DoD. Retrieved from <https://apps.dtic.mil/docs/citations/AD1019605>
- USD (Acquisition, Technology, & Logistics); USD (Personnel & Readiness). (2000). *Shaping the civilian acquisition workforce of the future*. Washington, DC: Office of the Secretary of Defense. Retrieved from <http://www.acq.osd.mil/dpap/Docs/report1000.pdf>



Appendix: Career Field Summary Charts







ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL
555 DYER ROAD, INGERSOLL HALL
MONTEREY, CA 93943

www.acquisitionresearch.net