



# **OSD Systems Engineering Status and Goals**

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Office of the Deputy Assistant Secretary of Defense  
for Systems Engineering**

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# Better Buying Power 2.0

## A Guide to Help You Think



### Achieve Affordable Programs

- Mandate affordability as a requirement
- Institute a system of investment planning to derive affordability caps
- Enforce affordability caps

### Control Costs Throughout the Product Lifecycle

- Implement “should cost” based management
- Eliminate redundancy within warfighter portfolios
- Institute a system to measure the cost performance of programs and institutions and to assess the effectiveness of acquisition policies
- Build stronger partnerships with the requirements community to control costs
- Increase the incorporation of defense exportability features in initial designs

### Incentivize Productivity and Innovation in Industry and Government

- Align profitability more tightly with Department goals
- Employ appropriate contract types
- Increase use of Fixed Price Incentive contracts in Low Rate Initial Production
- Better define value in “best value” competitions
- Only use LPTA when able to clearly define Technical Acceptability
- Institute a superior supplier incentive program
- Increase effective use of Performance-based Logistics
- Reduce backlog of DCAA Audits without compromising effectiveness
- Expand programs to leverage industry’s IR&D

### Reduce Unproductive Processes and Bureaucracy

- Reduce frequency of higher headquarters level reviews
- Re-emphasize AE, PEO and PM responsibility, authority, and accountability
- Reduce cycle times while ensuring sound investment decisions

### Promote Effective Competition

- Emphasize competition strategies and creating and maintaining competitive environments
- Enforce open system architectures and effectively manage technical data rights
- Increase small business roles and opportunities
- Use the Technology Development phase for true risk reduction

### Improve Tradecraft in Acquisition of Services

- Assign senior managers for acquisition of services
- Adopt uniform services market segmentation
- Improve requirements definition/prevent requirements creep
- Increase small business participation, including through more effective use of market research
- Strengthen contract management outside the normal acquisition chain – installations, etc.
- Expand use of requirements review boards and tripwires

### Improve the Professionalism of the Total Acquisition Workforce

- Establish higher standards for key leadership positions
- Establish stronger professional qualification requirements for all acquisition specialties
- Increase the recognition of excellence in acquisition management
- Continue to increase the cost consciousness of the acquisition workforce – change the culture

***For additional information on Better Buying Power 2.0: <http://bbp.dau.mil/>***



# DASD, Systems Engineering Mission



## **Systems Engineering focuses on engineering excellence – the creative application of scientific principles:**

- To design, develop, construct and operate complex systems
- To forecast their behavior under specific operating conditions
- To deliver their intended function while addressing economic efficiency, environmental stewardship and safety of life and property

***DASD(SE) Mission: Develop and grow the Systems Engineering capability of the Department of Defense – through engineering policy, continuous engagement with component Systems Engineering organizations and through substantive technical engagement throughout the acquisition life cycle with major and selected acquisition programs.***

**A Robust Systems Engineering Capability Across the Department Requires Attention to Policy, People and Practice**

- ***US Department of Defense is the World's Largest Engineering Organization***
- ***Over 99,000 Uniformed and Civilian Engineers***
- ***Over 39,000 in the Systems Engineering (SPRDE) Acquisition Workforce***



# DASD, Systems Engineering




**DASD, Systems Engineering**  
**Stephen Welby**  
**Principal Deputy Kristen Baldwin**




**Systems Analysis**  
**Kristen Baldwin (Acting)**

*Addressing Emerging Challenges on the Frontiers of Systems Engineering*

Analysis of Complex Systems/Systems of Systems

Program Protection/Acquisition Cyber Security

University, FFRDC and Industry Engineering and Research

Modeling and Simulation



**Major Program Support**  
**James Thompson**

*Supporting USD(AT&L) Decisions with Independent Engineering Expertise*

Engineering Assessment / Mentoring of Major Defense Programs

Program Support Reviews

OIPT / DAB / ITAB Support

Systems Engineering Plans

Systemic Root Cause Analysis



**Mission Assurance**  
**Nicholas Torelli**

*Leading Systems Engineering Practice in DoD and Industry*

Systems Engineering Policy & Guidance

Development Planning/Early SE

Specialty Engineering (System Safety, Reliability and Maintainability Engineering, Quality, Manufacturing, Producibility, Human Systems Integration)

Counterfeit Prevention

Technical Workforce Development

Standardization

**Providing technical support and systems engineering leadership and oversight to USD(AT&L) in support of planned and ongoing acquisition programs**



# SE Annual Report to Congress



DEPARTMENT OF DEFENSE  
Systems Engineering  
FY 2012 Annual Report



MARCH 2013

Preparation of this report cost the Department of Defense a total of approximately \$----- in FY 2012-2013.  
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WHS Report Control Symbol DD-AT&L(A)2258

Deputy Assistant Secretary of Defense for Systems Engineering

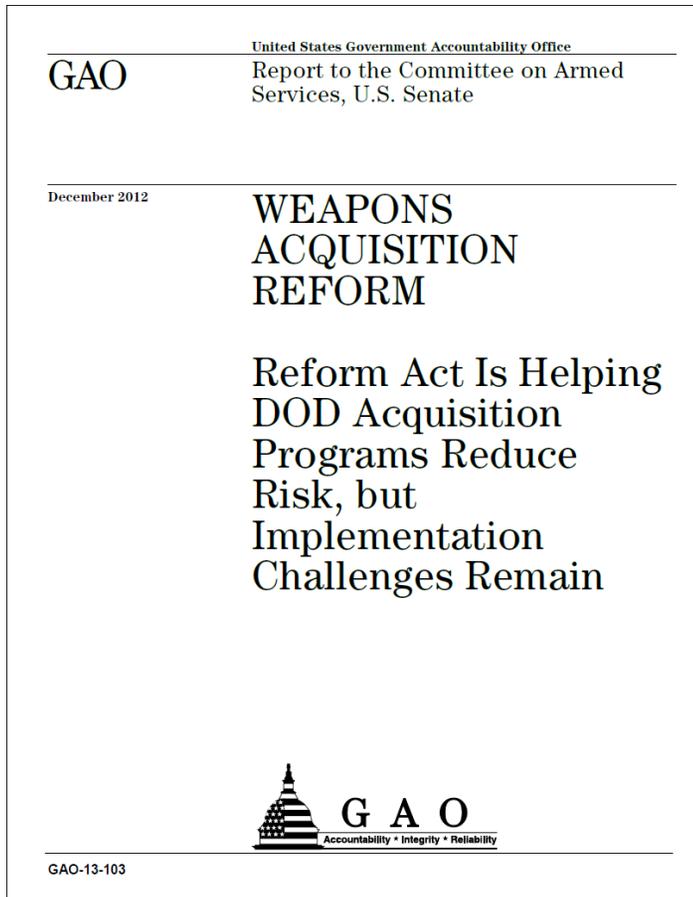
Washington, D.C.

- **FY 2012 SE Annual Report delivered to Congress**
- **Detailed review of DASD(SE) accomplishments in FY12**
- **Review of Service progress and plans implementing key pieces of WSARA to improve SE capabilities**
- **Detailed program by program assessments for 40+ MDAPs**

<http://www.acq.osd.mil/se/docs/SE-FY12-AnnualReport-28March2013-Final.pdf>



# GAO Report 13-103 Findings DASD(SE) Performance



- Completed the development of systems engineering and development planning policy, guidance and performance measures
- Regularly completing MDAP document review and approval and program monitoring and assessments
- Led working group efforts to support Service initiatives to address systemic reliability issues in UAS and rotary wing portfolios
- Led workforce development initiatives to attract and retain a qualified SE workforce and support KLP implementation
- Positively impacted the requirements development and technical and reliability planning for:
  - Joint Lightweight Tactical Vehicle
  - Ground Combat Vehicle
  - Joint Strike Fighter
  - Remote Mine-hunting System
  - Gray Eagle and Global Hawk

<http://www.gao.gov/products/GAO-13-103>



# Top Level FY13 DASD(SE) Goals



- **Continue excellence in SE support to programs and acquisition decisions**
- **Improve consistent program protection plan (PPP) engagement with programs resulting in successful vulnerability mitigation strategies**
- **Advocate for and ensure SE workforce capacity and capability**
- **Provide depth to acquisition policy and processes with SE guidance, practices, and continuous learning opportunities**
- **Advance the state of engineering to meet challenges and enable DoD goals**
- **Maintain quality of technical insight in resource constrained environment**



# FY13 DASD(SE) Objectives



- **Engineering Program Support**
- **Program Protection**
- **Engineering Workforce**
- **Engineering Policy and Guidance**
- **Technical Standards**



# Defense Acquisition Guidebook (DAG) Chapter 4 Systems Engineering Update



- **Improve guidance to fully reflect current policy and DASD(SE) initiatives:**
  - Joint Capabilities Integration and Development System (JCIDS) (Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01H)
  - Process changes as a result of Better Buying Power
  - Systemic root cause analyses findings
  - Department-wide best practice; avoiding Service and domain-specific implementations
- **Improve currency, consistency, usability, and readability—less theory, more utility**
- **Emphasize the role of Systems Engineering in providing balanced solutions (managing cost, schedule and risk) that deliver needed capability to the war fighter**
- **Make Chapter 4 an effective tool for the Program Manager and the Systems Engineering Practitioner**



# The New DAG Chapter 4 Message and Framework



- SE provides balanced approach in delivering a capability to the warfighter
- SE supports program success through systematically increasing maturity and reducing risk over the acquisition life cycle

## 4.1 Introduction

- Systems Engineering Definition
- Why it's important

## 4.2 Systems Engineering Activities in the Life Cycle

- Description of Technical Maturity Points
- By-phase description of key technical activities
- Technical Reviews and Audits

## 4.3 Systems Engineering Processes

- Description of technical and technical management processes
- Design Considerations (include Specialty Engineering)

**Web Version:** <https://acc.dau.mil/dag4>

**PDF Version:** [https://acc.dau.mil/docs/dag\\_pdf/dag\\_ch4.pdf](https://acc.dau.mil/docs/dag_pdf/dag_ch4.pdf)



# New DAG Chapter 4 Major Content Changes



- **Focused on target audience: Program Managers and Systems Engineering practitioners**
- **Consolidated and strengthened Systems Engineering Plan (SEP) Outline content in 4.1.2**
- **Added new content:**
  - 4.1.3 Systems Level Considerations (includes Software)
  - 4.1.5 Certifications
  - 4.1.6 Systems Engineering Role in Contracting
  - 4.3.19 Sustainability Analysis
- **Added detailed SE technical reviews and audits information (4.2.8-4.2.17)**
- **Enhanced Design Considerations section 4.3.18:**
  - Streamlined Parts Management and Standardization
  - Added new subsections: Anti-Counterfeiting; Intelligence; Operational Energy; and Packaging, Handling, Storage, and Transportation (PHS&T)
  - Added guidance for Producibility (under Producibility, Quality, and Manufacturing Readiness)
- **Removed/reduced topics covered in other DAG chapters**
  - Earned Value Management and Integrated Baseline Reviews (IBR) content removed, both found in Chapter 11 Program Management
  - Test and Evaluation content reduced, found in Chapter 9 Test & Evaluation
- **Removed phase-specific systems engineering 'V's**



# Proposed DoD 5000.02 Update



- **Decrease emphasis on “rules” and increase emphasis on process intent and thoughtful program planning**
- **Provide program structures and procedures tailored to the dominant characteristics of the product being acquired and to unique program circumstances, e.g., risk and urgency**
- **Added key decision points between Milestone A and Milestone B**
- **Institutionalize changes to statute and policy since the last issuance of DoD Instruction 5000.02**

Department of Defense Instruction (DoDI) 5000.02 Operation of the Defense Acquisition System



# DoD Counterfeit Prevention Policy (DoDI 4140.67)

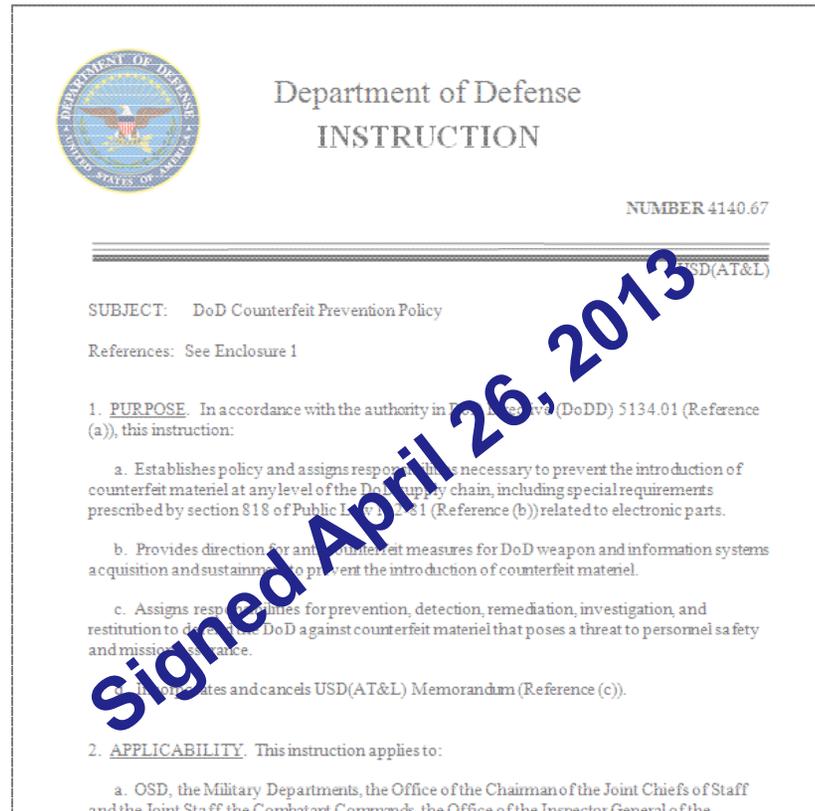


## Purpose:

- Establishes policy
- Assigns responsibilities
- Provides definitions

## It is DoD Policy to:

- Employ a risk-based approach
- Apply early prevention and detection procedures
- Document all occurrences in GIDEP
- Notify criminal investigative organizations
- Seek restitution when confirmed
- Provide education and training



### Counterfeit Materiel Defined as:

“An item that is an unauthorized copy or substitute that has been identified, marked, or altered by a source other than the item’s legally authorized source and has been misrepresented to be an authorized item of the legally authorized source.”

<http://www.dtic.mil/whs/directives/corres/pdf/414067p.pdf>

## Responsibilities:

### **ASD(L&MR):**

- Principal point of contact for anti-counterfeit improvements

### **ASD(R&E):**

- Risk-based procedures to identify critical materiel
- Quality assurance policy
- Supplier qualification criteria
- GIDEP management

### **DPAP**

- Procurement policies

### **DoD Components**

- Identify critical materiel
- Procure from suppliers meeting appropriate criteria
- Conduct materiel testing
- Report in GIDEP



# Proposed Acquisition Rule Changes



- **DFARS case (2012-D055) “Detection and Avoidance of Counterfeit Electronic Parts”**
  - Implements provisions of both FY12 NDAA §818 and FY13 NDAA §833
  - Anticipate publication as a proposed rule in 2013
- **FAR case (2013-002) “Expanded Reporting of Non-conforming Items”**
  - Increases and improves the reporting of non-conforming items (including suspected and confirmed counterfeit) into the GIDEP
  - Anticipate publication as a proposed rule in 2013
- **FAR case (2012-032), “Higher Level Contract Quality Requirements”**
  - Provides for increased contract quality standards
  - Anticipate publication as a proposed rule in 2013



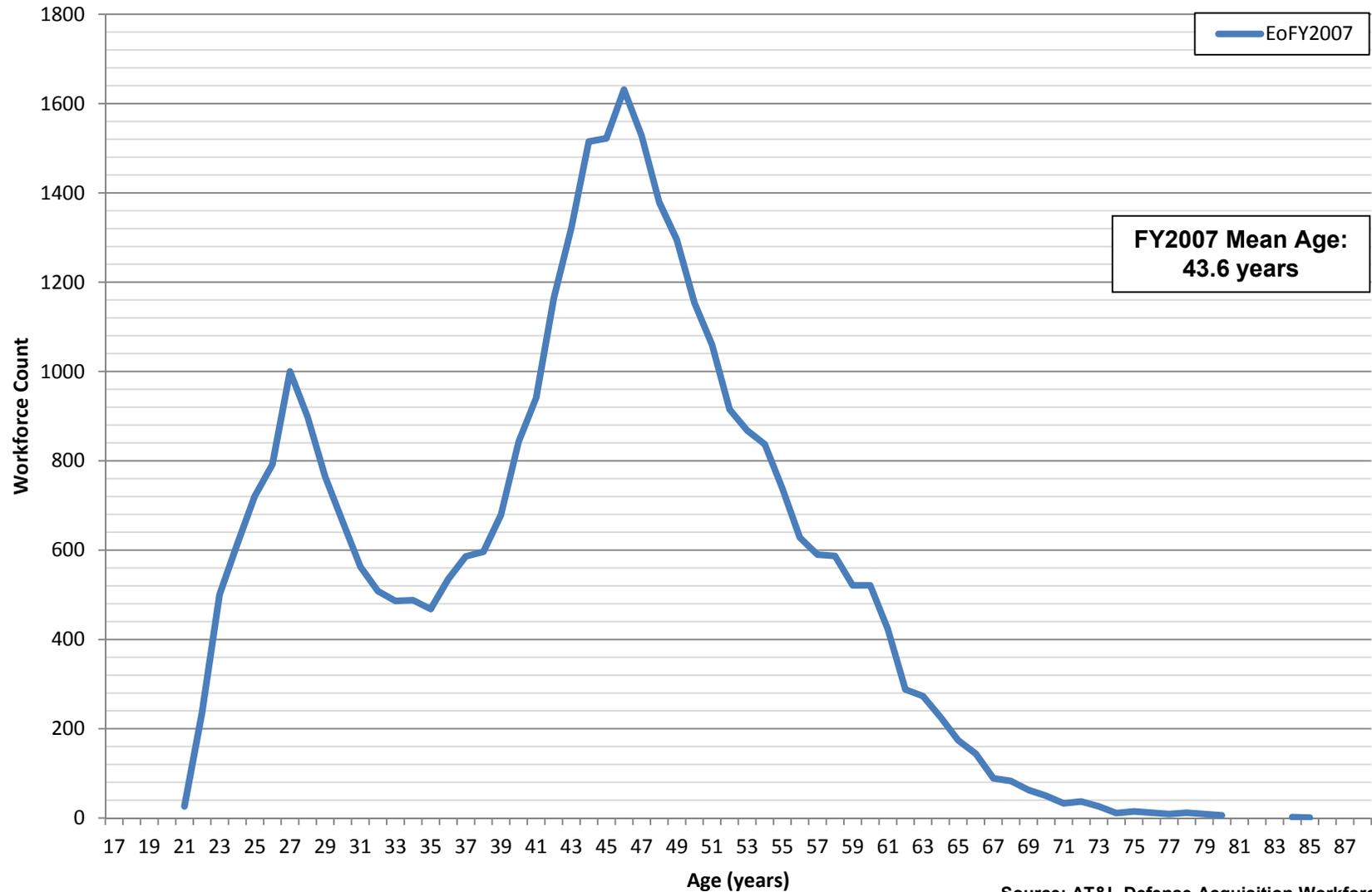
# Growing Great Engineers



- **Depth**
  - Extensive expertise and experiences in one or more engineering disciplines and in one or more product domains
  
- **Breadth**
  - Awareness of and appreciation for other functional areas
  - Understanding of system lifecycle and processes
  - Knowledge of other engineering disciplines and how they integrate into a system solution
  - Knowledge of product domains
  
- **Leadership**
  - Ability to motivate and inspire individuals and teams
  - Comfort in dealing with complexity
  - Focus on underpinning decisions with data
  - Capability to make tough technical decisions



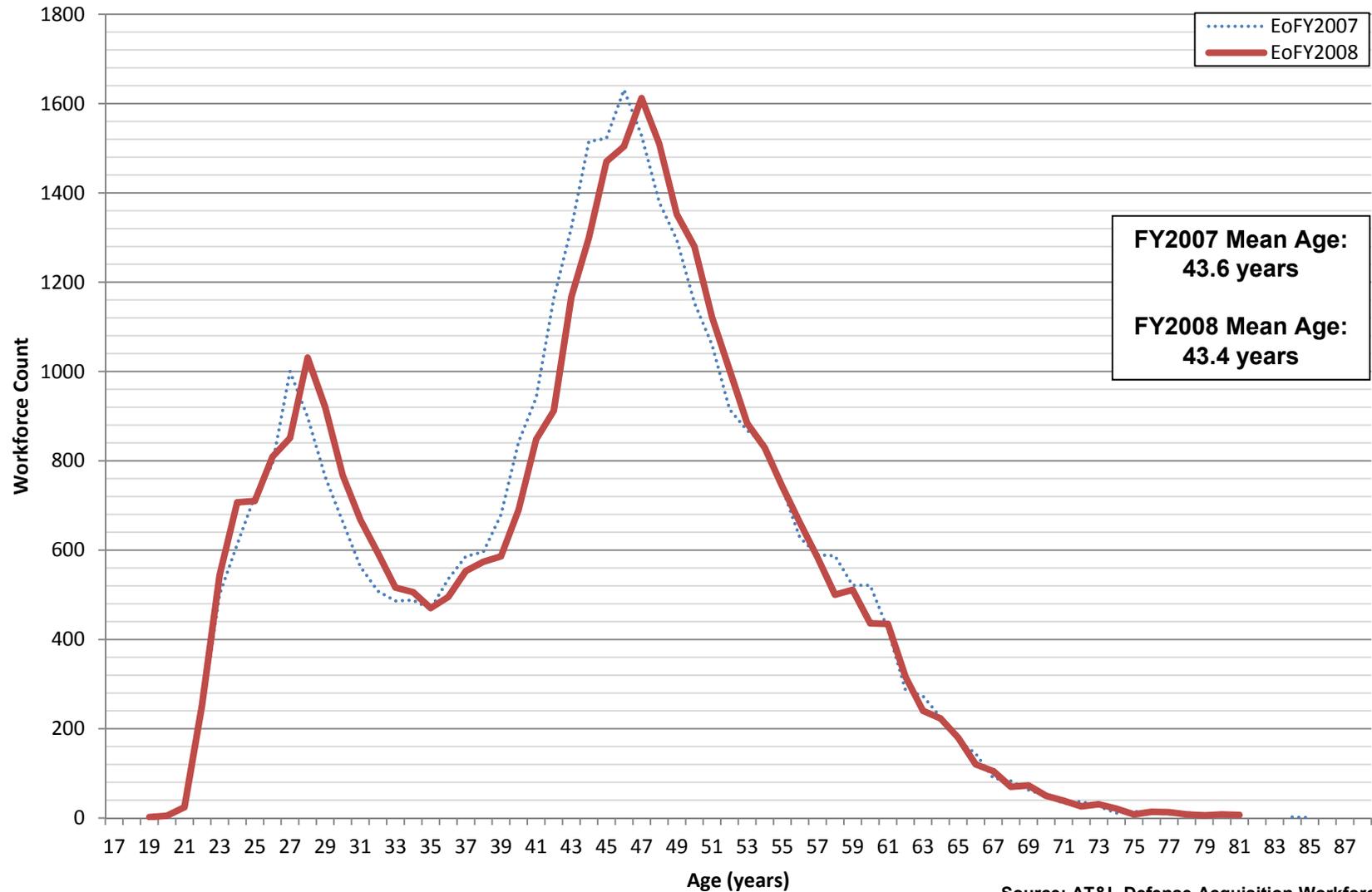
# DoD SPRDE Workforce: Age Demographics



Source: AT&L Defense Acquisition Workforce Data Mart  
SPRDE – Systems Planning, Research, Development and Engineering



# DoD SPRDE Workforce: Age Demographics



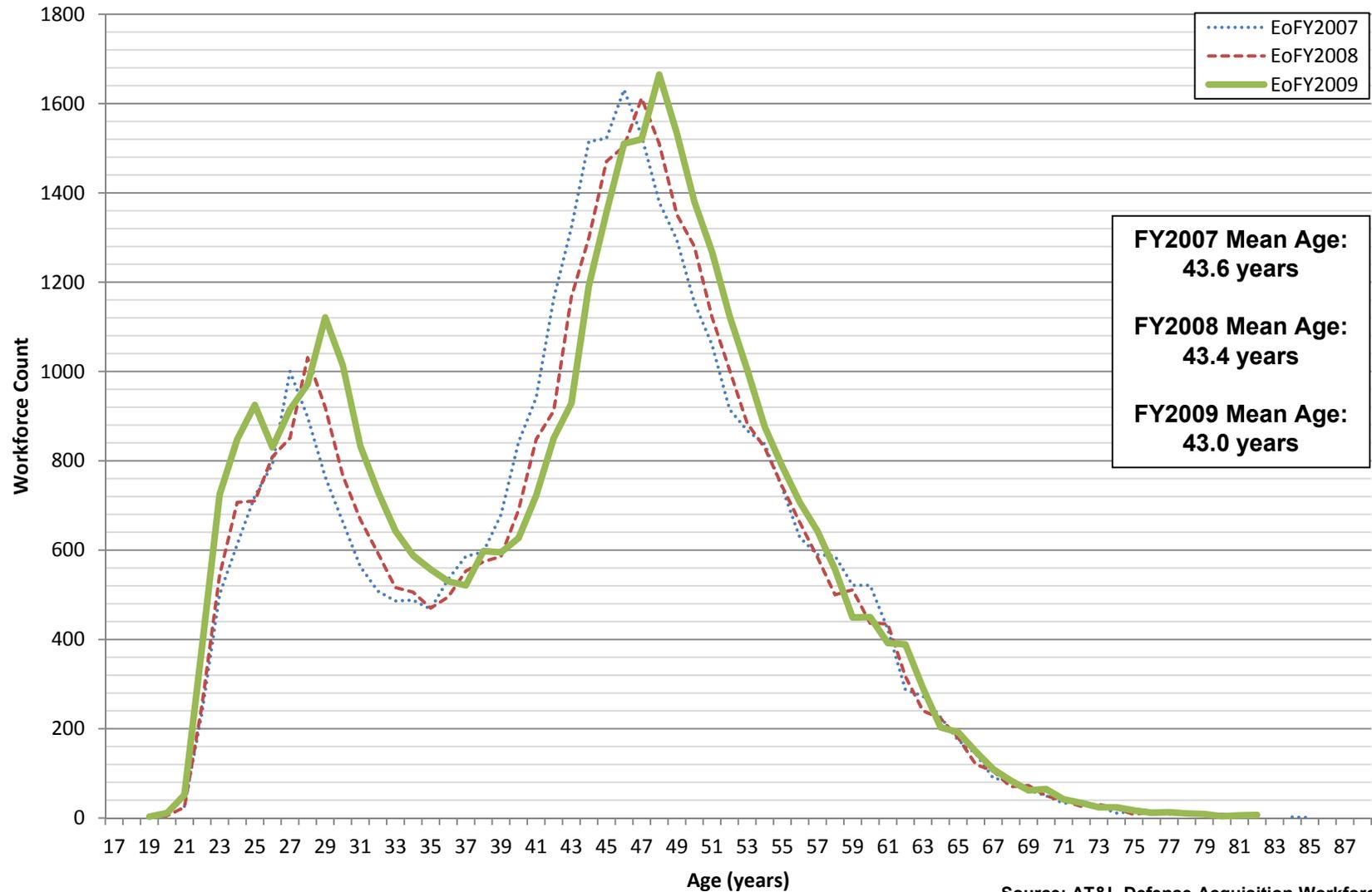
**FY2007 Mean Age:  
43.6 years**

**FY2008 Mean Age:  
43.4 years**

Source: AT&L Defense Acquisition Workforce Data Mart  
SPRDE – Systems Planning, Research, Development and Engineering



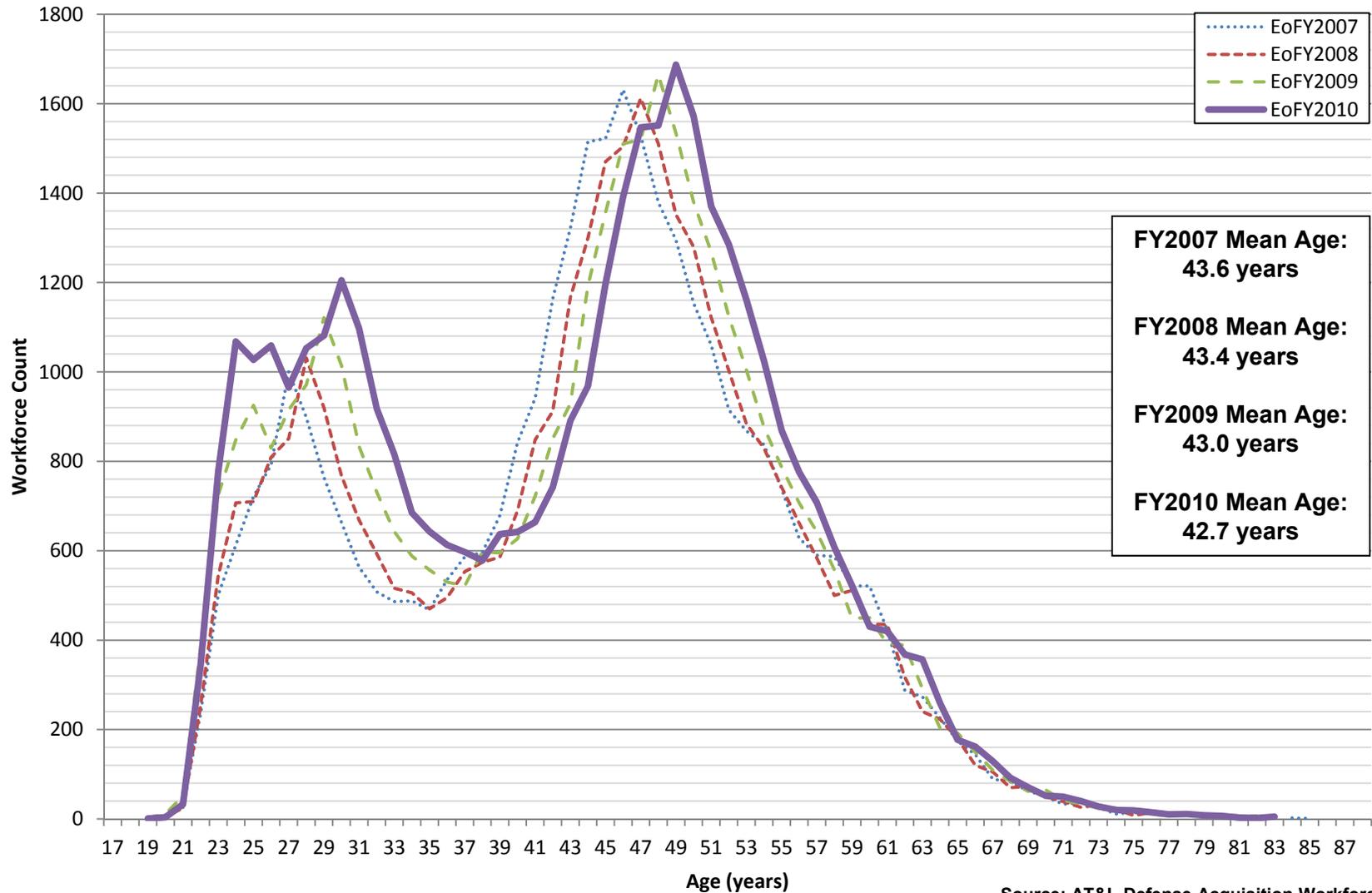
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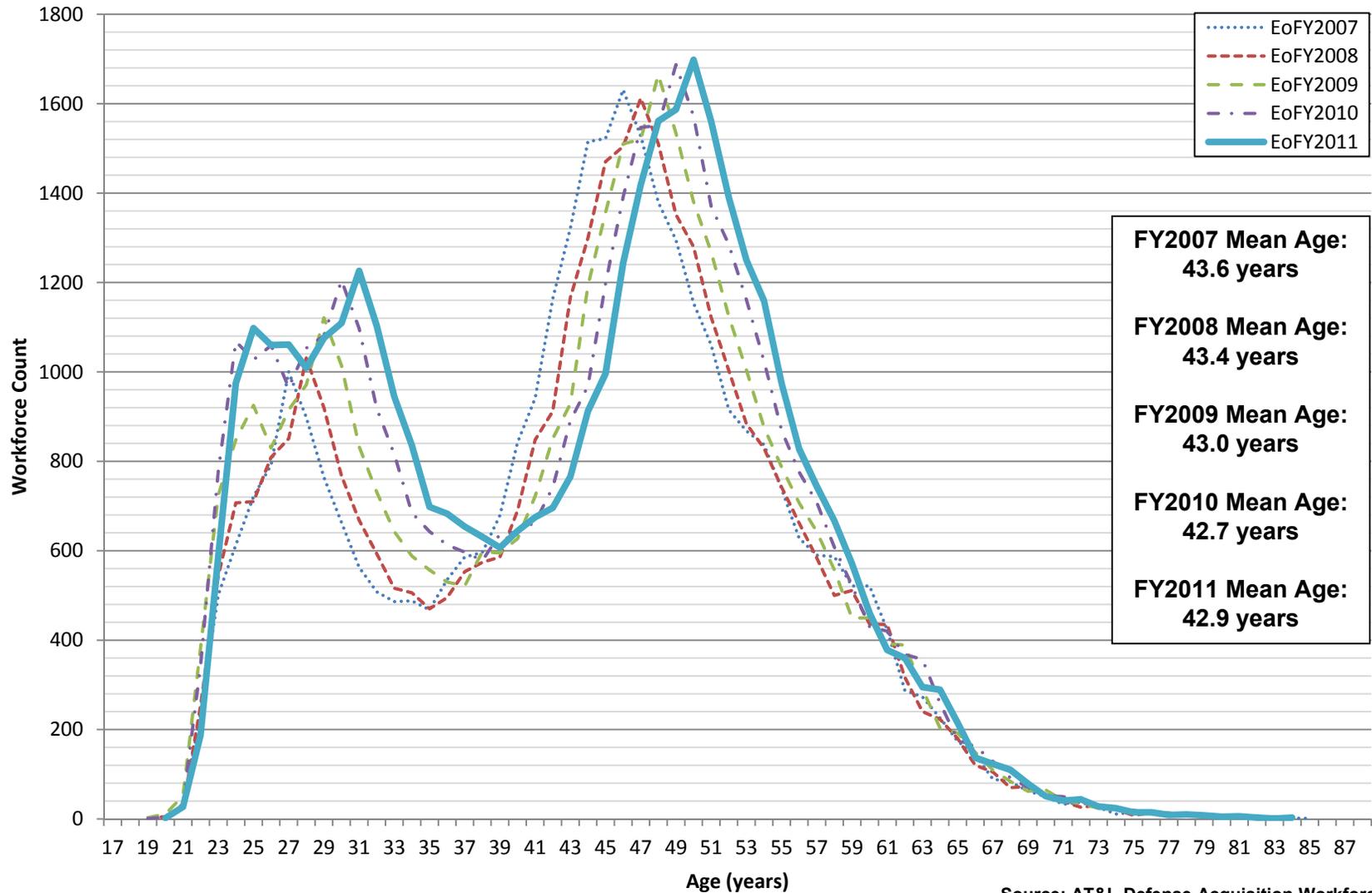
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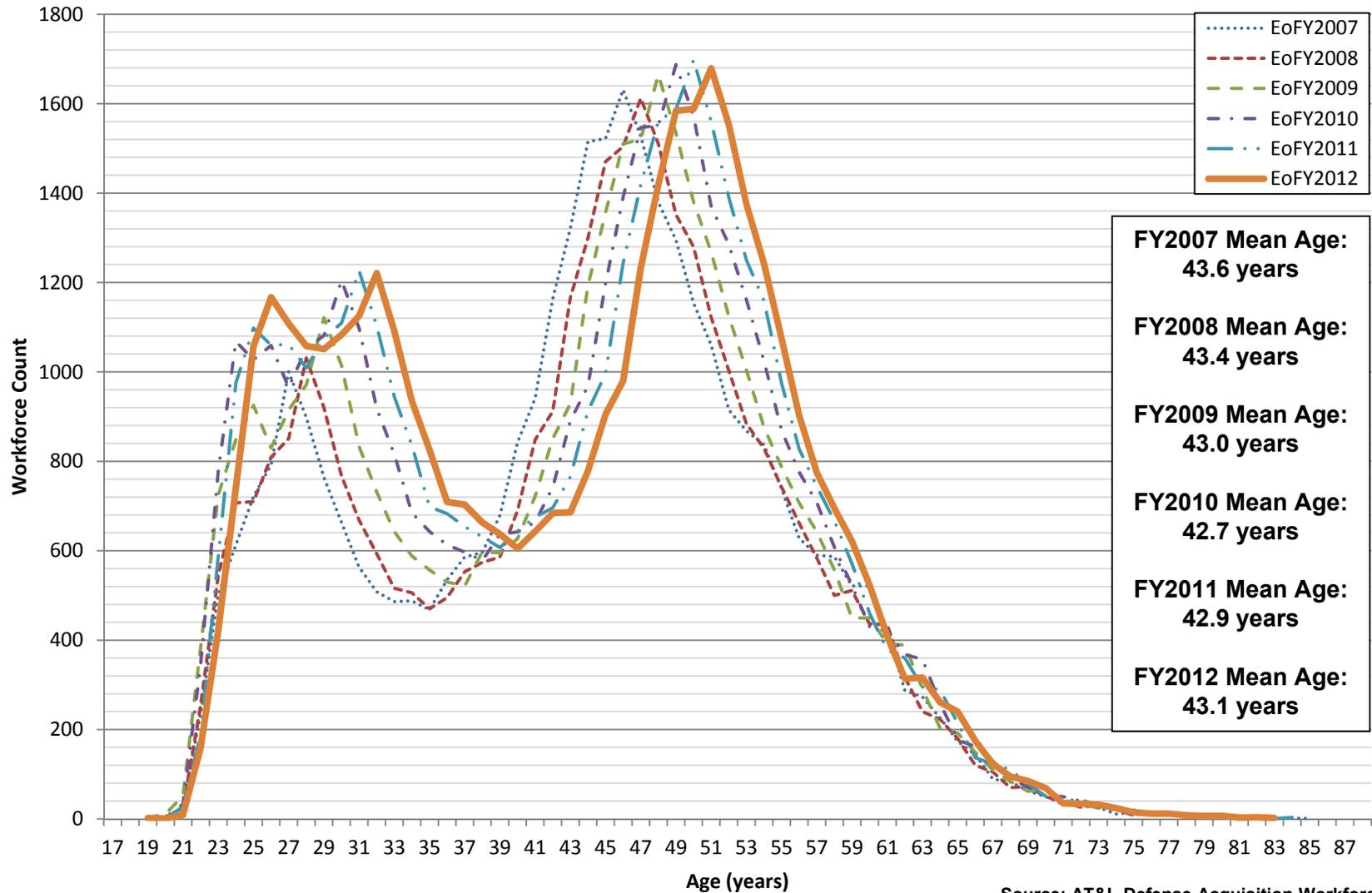
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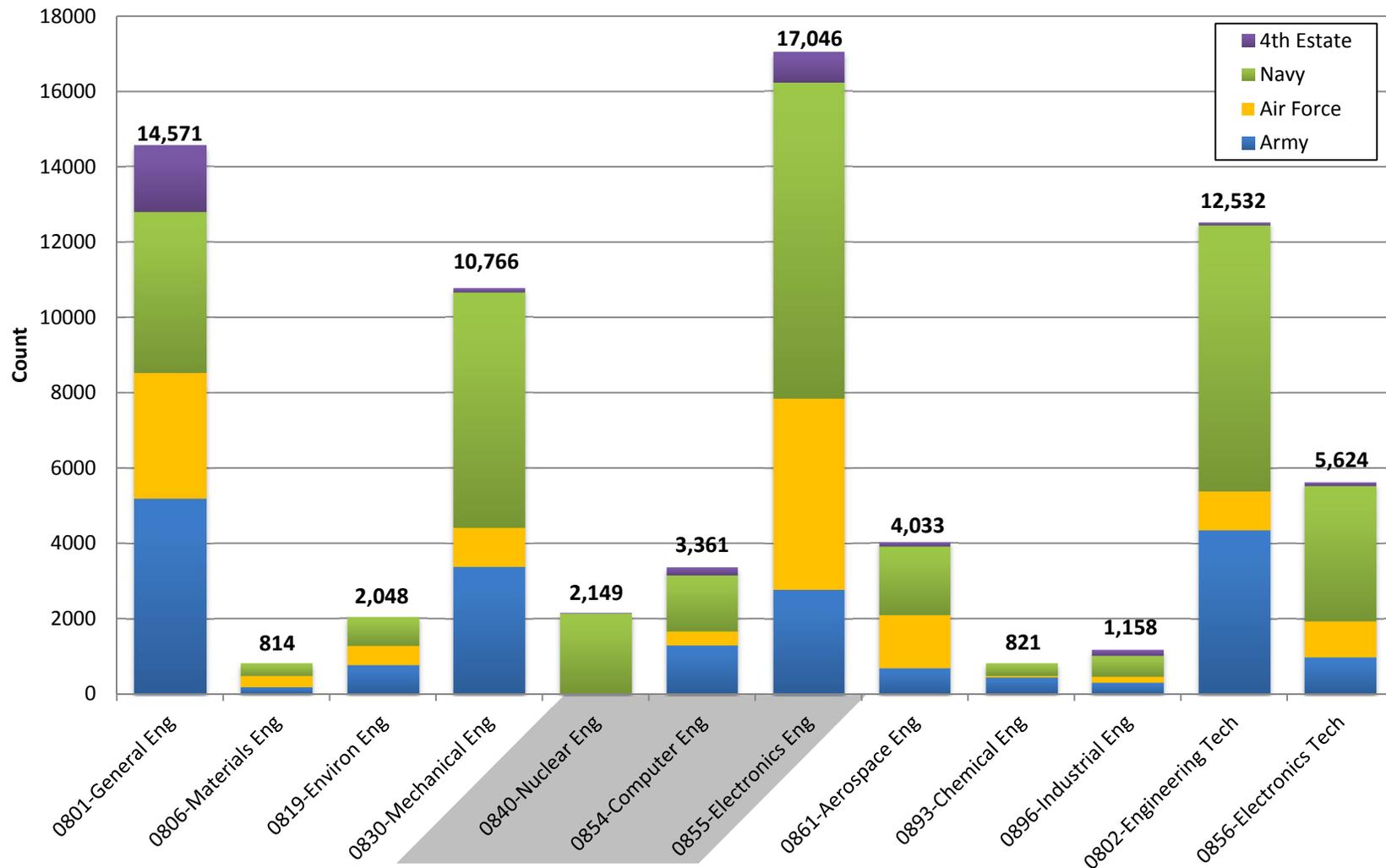


Source: AT&L Defense Acquisition Workforce Data Mart  
SPRDE – Systems Planning, Research, Development and Engineering



# Engineering (Non-Construction) Functional Community by Occupational Series & Component

Total = 74,923



**Notes:**

1. 0840, 0854, 0855 designated "Mission Critical Occupations (MCOs)"
2. Does not include 0801A Acquisition Program Management Function

Occupational Series

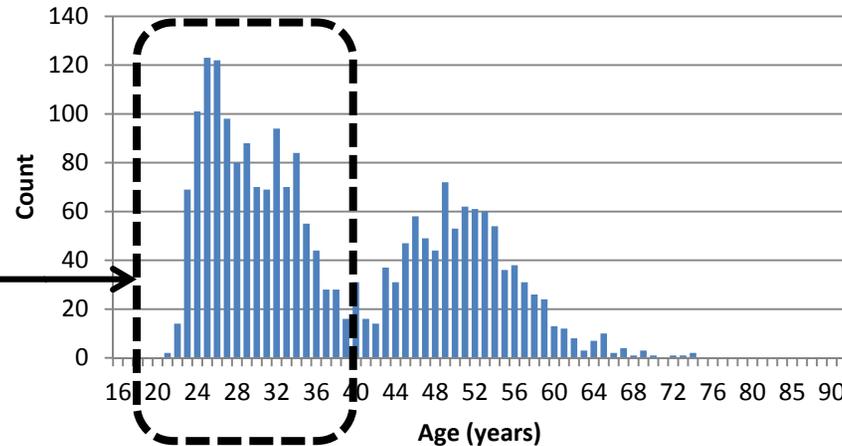
Source: DCPDS, June 30, 2012



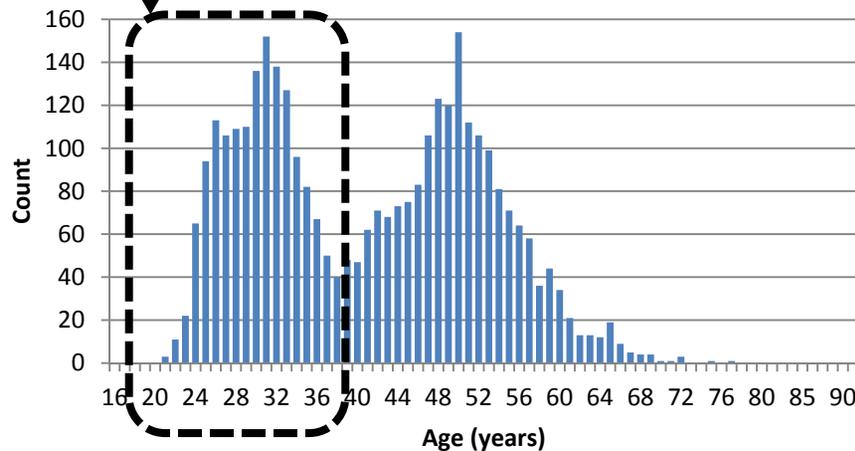
# Mission Critical Occupations: Age by Occupational Series



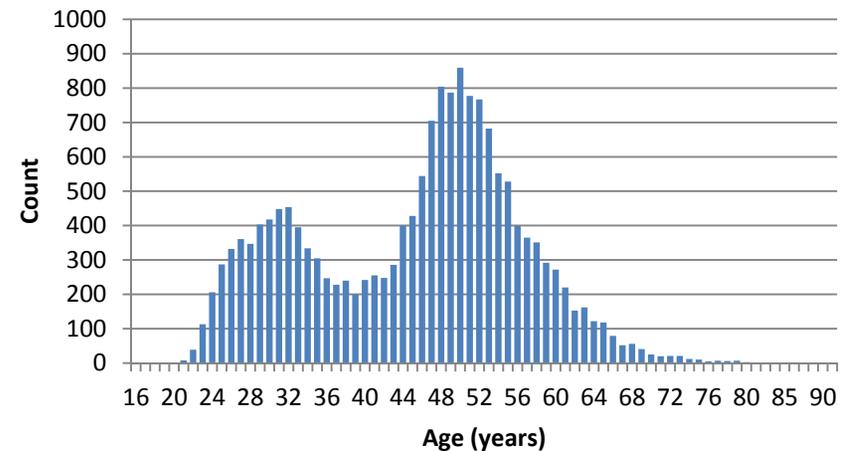
## 0840 - NUCLEAR ENGINEERING



## 0854 - COMPUTER ENGINEERING



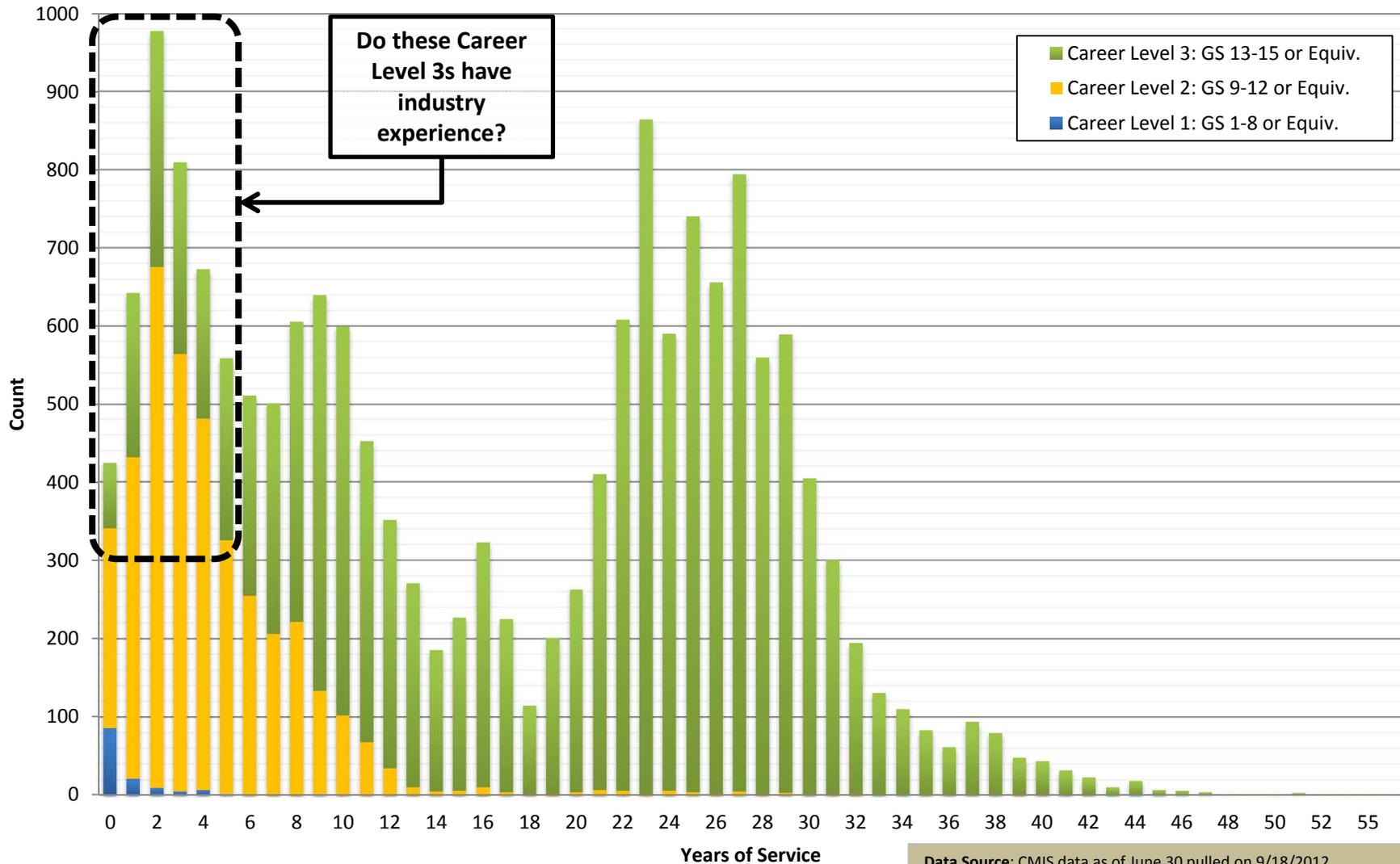
## 0855 - ELECTRONICS ENGINEERING



Source: DCPDS via DRS, June 30, 2012



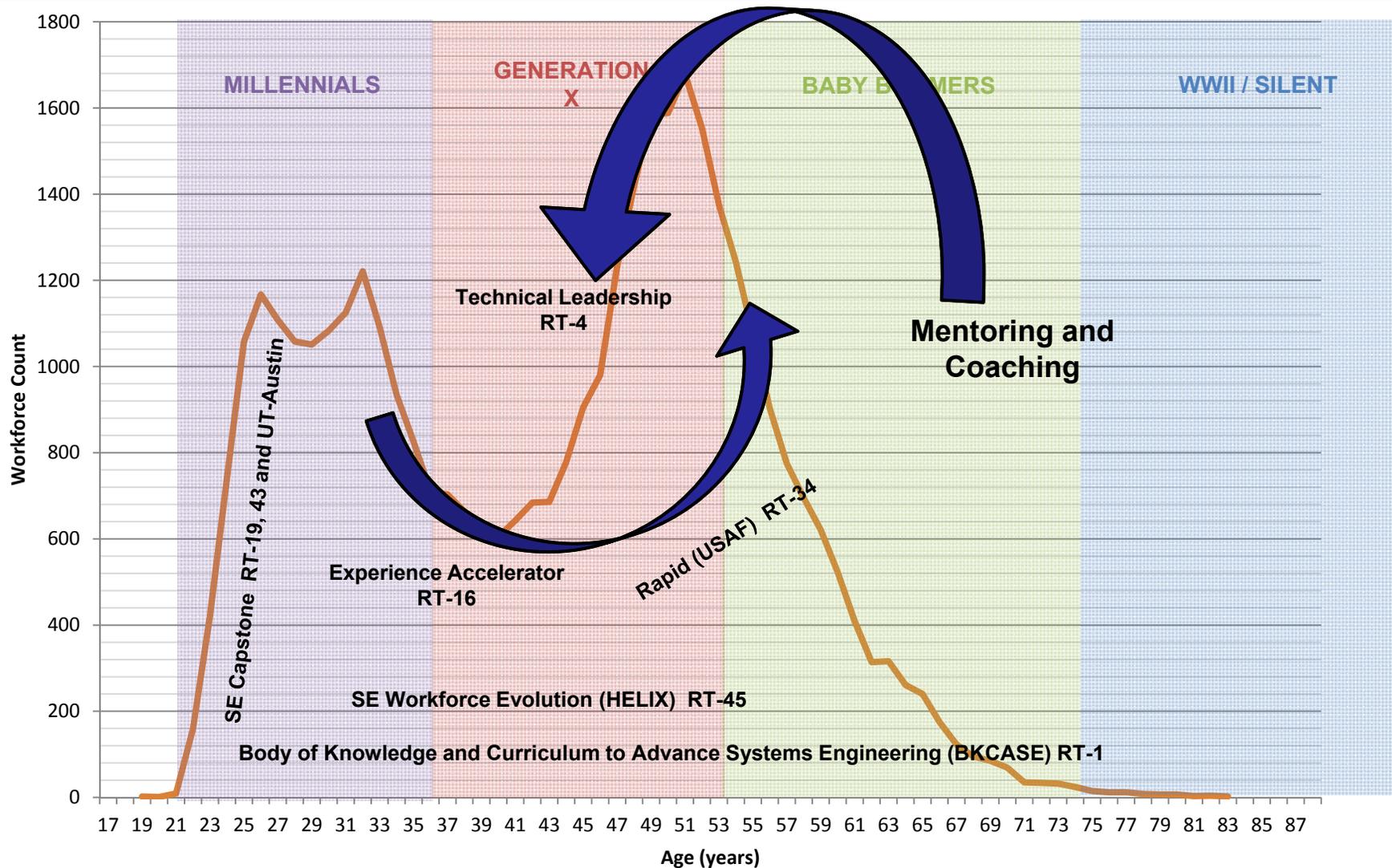
# 0855 – Electronics Engineer Career Level by Years of Service



Data Source: CMIS data as of June 30 pulled on 9/18/2012  
Population: Appropriated Fund excluding employees in SES like pay plans



# Engineering Challenges



Source: AT&L Acquisition Workforce DataMart



# Key Leadership Position Initiative



- **Directed by Sec 820 of PL 109-364 that requires “properly qualified” individuals in key positions on major defense acquisition programs**
- **Further implementation in USD(AT&L)’s 25 Aug 2010 memo, Government Performance of Critical Acquisition Functions**
  - Identifies Program Lead Systems Engineer as a mandatory Key Leadership Position for all MDAP/MAIS programs (Acquisition Categories I and IA) when the function is required based on the phase or type of acquisition program
- **Working with SPRDE FIPT on updating Systems Engineering competencies and determining Key Leadership Position characteristics**

FIPT – Functional IPT

KLP – Key Leadership Position

SPRDE – Systems Planning, Research, Development and Engineering



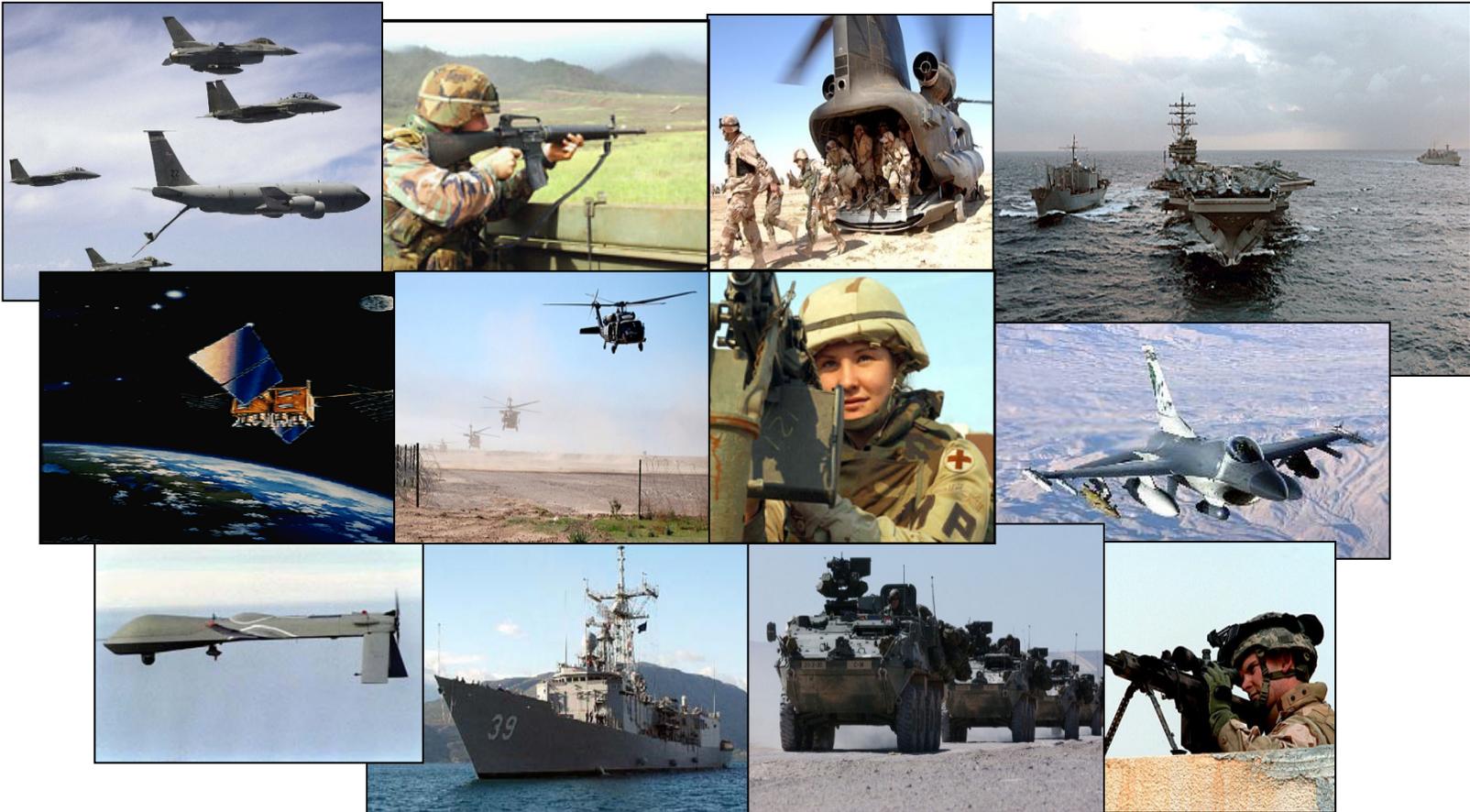
# Summary



- **FY13, FY14 and beyond: shaped by budget uncertainty**
- **Criticality of our Systems Engineering mission has grown**
  - Our work will be even more essential in facing budget challenges
- **We are making an impact**
  - Strong support for System Engineering mission across the Department
- **Dedicated, professional and committed SE staff**
- **Focused on working smarter, as a more tightly integrated team across OSD and the Services**
  - Continue to make a difference for the warfighter and the taxpayer



# Systems Engineering: Critical to Acquisition Success



***Innovation, Speed, and Agility***  
***<http://www.acq.osd.mil/se>***