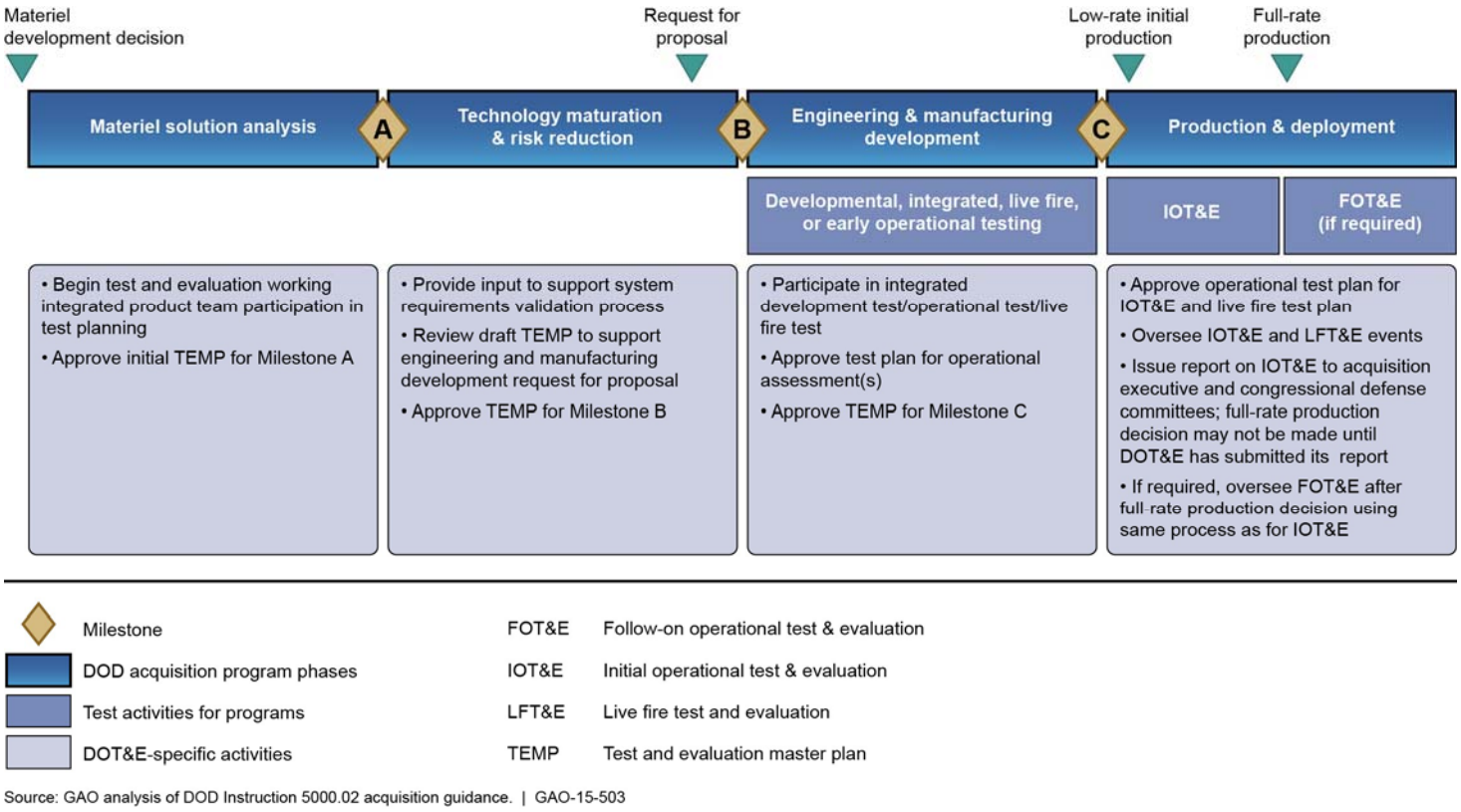
BACKGROUND

In its Joint Explanatory Statement accompanying FY15 NDAA, Congress directed GAO to review DOT&E's oversight activities to include:

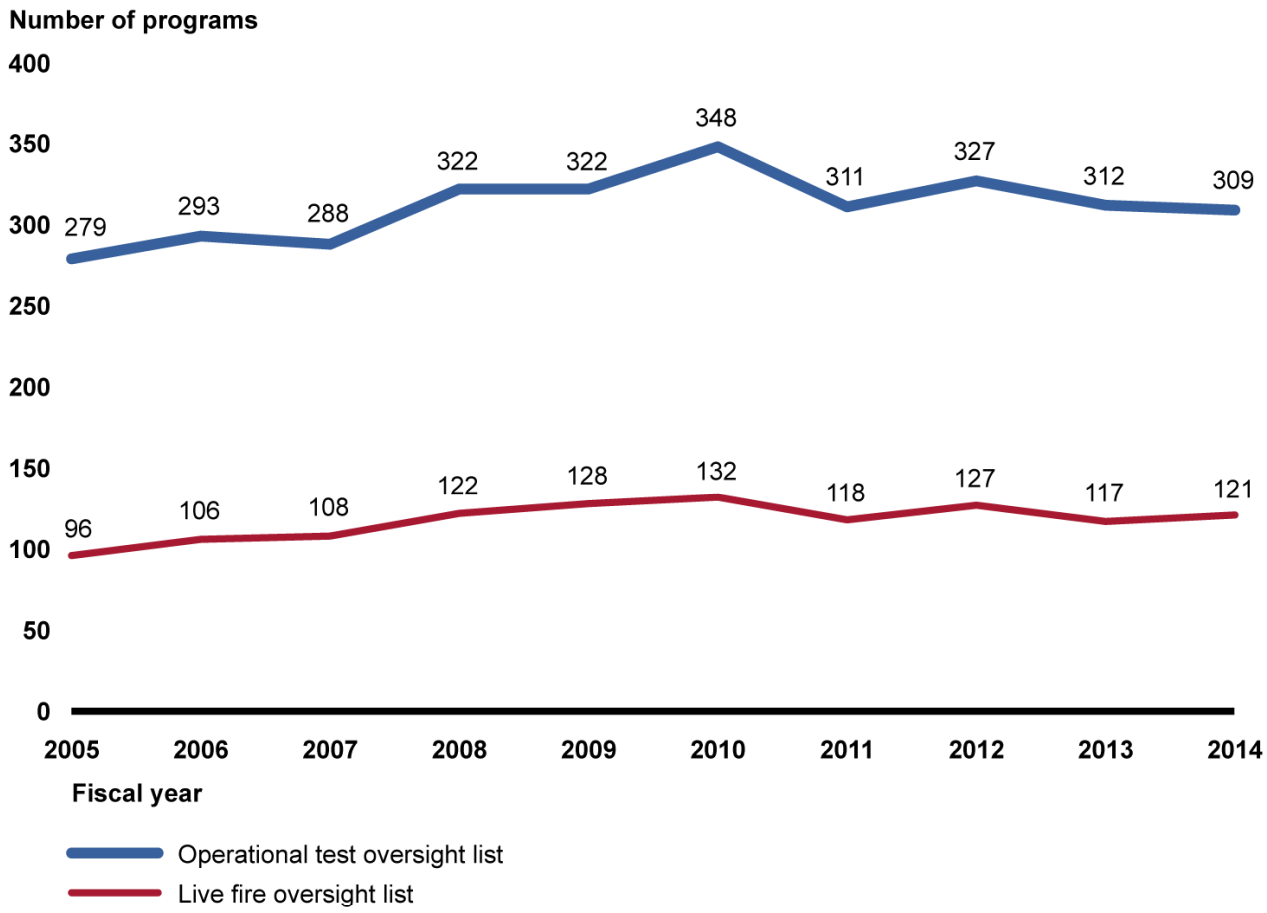
- the extent to which DOD acquisition programs have had significant disputes, if any, with DOT&E over operational testing, and
- the circumstances and impact of identified disputes.

DOT&E ROLE



Source: GAO analysis of DOD Instruction 5000.02 acquisition guidance. | GAO-15-503

OUR UNIVERSE



Source: GAO analysis of DOT&E annual reports for fiscal years 2005-2014. | GAO-15-503

INHERENT TENSION

- Programs have many diverse S/H and priorities
- OT is focused on evaluating effectiveness, suitability, other “ilities” of weapon system
- Concurrency complicates things
- Timing of funding for OT is often difficult
- Withheld TEMP approvals and iterative process creates uncertainty

RELATIVELY FEW DISPUTES

- 454 programs from 2010 to 2014
- 42 significant disputes
- Overwhelming majority are resolved with no formal intervention
- Drill down on 10 cases where disputes were the most significant to each of the military services
- 3 programs had considerable cost or schedule impact and required formal involvement from DOD leadership.

PREDOMINANTLY 5 FACTORS

- Poorly defined requirements
- Relevant vs realistic test environments
- Differing ideas on test assets needed
- Timing and extensiveness of live fire test
- Disagreement with characterization of test results

10 CASES

- CVN 78
- DDG-51 Flight III/AN-SPY-6 Radar, Aegis Mod
- Automated Biometrics ID System
- Enhanced Combat Helmet
- F-35 EWIIP
- G/ATOR
- P-8A Poseidon
- Paladin Integrated Management
- 3DELRR

3 OUTLIERS

- F-35 EWIIPS – 2012, DOT&E ID'd shortfalls in program's EW test capabilities v current threats. Significant new investments in test assets and facilities were required.
- CVN 78 – Due to budget concerns, the program sought to defer FSST, arguing that it had "lessons learned from past tests. DOT&E provided info to show that component testing was insufficient
- DDG-51 – Dispute over whether an unmanned test ship was needed to complete radar and Aegis testing

CVN-78

The Director, Operational Test and Evaluation (DOT&E) has been engaged with the Navy in a dispute over whether to conduct the full ship shock trial (FSST) on CVN 78—the first of the new class of nuclear-powered aircraft carriers—as previously agreed to in the program's alternative Live Fire Test and Evaluation Management Plan signed by the Navy and DOT&E in 2007, or to defer it to the follow-on ship (CVN 79) as the Navy decided in 2011 due to technical, schedule, and budgetary concerns. FSST is a test that employs an underwater charge at a certain distance from the carrier to identify survivability issues for the ship and its key systems. Early discovery of issues may then be used to implement fixes while follow-on carriers are still being built to assure their survivability and reduce risk to sailors. The Navy believes lessons learned from FSSTs on other ships, when combined with shock testing being performed on individual ship components and equipment, reduce the need to complete FSST on CVN 78. DOT&E provided memoranda to the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD (AT&L)) and the Navy that documented the findings from previous FSST events for other ships and concluded that those results made component-level testing and past FSST results insufficient to assess survivability of the new carrier class.

Impact: Completing FSST on CVN 78 could delay deployment of the carrier 1-6 months based on current estimates. The Navy has stated that any deployment delay would further delay returning its fleet size to the congressionally-mandated 11 carriers. DOT&E has emphasized that, regardless of any change to FSST, a carrier fleet size shortfall will exist for at least 5 years—the shortfall has existed since the CVN 65 carrier was decommissioned in 2012—and the 5- to 7-year delay associated with deferring the test to CVN 79 would reduce the potential to discover survivability problems early and fix them. In addition, as we recently found in a review of the carrier program, CVN 78 has faced construction challenges and issues with key technologies that increase the likelihood the carrier will not deploy as scheduled or will deploy without fully tested systems.[1]

Resolution status: DOT&E and the Navy have been unable to resolve this dispute. In May 2015, the Navy revised its position on the FSST, presenting a plan to USD (AT&L) to conduct the test on CVN 78, but not until sometime after the ship's first deployment. The Navy stated this would preserve the ability to deploy CVN 78 and meet the 11-carrier fleet requirement at the earliest opportunity. DOT&E disagreed with the Navy's new plan to complete FSST after deployment and reiterated that completing testing before deployment is the only way many shock-related survivability issues can be found and addressed before the ship and crew deploy into an active theater of operations. DOD leadership is expected to resolve this dispute later in 2015.

DDG-51

The Navy and the Director, Operational Test and Evaluation (DOT&E) have an ongoing dispute over the need to use an unmanned self-defense test ship (SDTS) to accomplish operational testing of the next Aegis combat system and AN/SPY-6 radar on the DDG 51 Flight III Destroyer—a multi-mission ship designed to defend against air, surface, and subsurface threats. DOT&E expects these systems to be tested together to ensure operationally realistic testing and an end-to-end assessment of the ship's capability; an approach which has been used for other Navy surface ship programs. DOT&E disapproved test and evaluation master plans for the Aegis and AN/SPY-6 programs because the Navy did not include the use of the SDTS. DOT&E's analysis concluded that a SDTS, equipped with the Aegis and AN/SPY-6 systems, is needed for close-in live fire testing against most classes of anti-ship cruise missile threats, including supersonic, maneuvering threats—a manned ship cannot be used because of safety concerns. DOT&E also emphasized that past testing using an unmanned SDTS led to the discovery of combat system deficiencies that could not have been found by using constrained testing approaches against manned ships. Navy officials believe their test approach, which relies on collecting data from multiple sources—live fire end-to-end testing of selected targets on a tactical manned ship, limited missile intercept testing using the existing SDTS, and land-based test sites—achieves a better balance between cost and risk. DOT&E officials emphasized that the Navy's test approach will not provide the data needed to validate modeling and simulation and is insufficient to demonstrate ship self-defense capabilities and survivability against operationally realistic threats. In particular, DOT&E stated the proposed live fire testing on the tactical manned ship and land-based testing are constrained considerably because of safety restrictions, and the Navy's proposed missile intercept testing using the existing SDTS does not provide the needed data because it uses different combat and launching systems than those intended for the DDG-51 Flight III Destroyer.

Impact: Preliminary estimates suggest the additional cost of using SDTS for operational testing would be $320-$470 million, with DOT&E officials noting the actual cost is likely to be somewhere in the middle of that range. The Navy has not determined the difference in total test cost if SDTS is used versus some alternative approach, but has estimated the cost of the modeling and simulation suite to support testing at $86.7 million over the next 5 years. DOT&E estimates that about $230 million of the test cost with SDTS could potentially be recovered by the Navy if the systems installed on the SDTS are removed after testing and integrated on a future DDG-51 Flight III ship.

Resolution status: DOT&E and the Navy have not resolved this dispute. The Office of Cost Analysis and Performance Evaluation within the Office of the Secretary of Defense is expected to complete an analysis in June 2015 on the cost to upgrade an existing SDTS, which is intended to inform a decision by the Deputy Secretary of Defense on whether a SDTS will be used for initial operational test and evaluation.

F-35 EWIIPS

In early 2012, the Director, Operational Test and Evaluation (DOT&E) identified shortfalls in DOD's electronic warfare test capabilities that posed problems for operationally testing the Joint Strike Fighter, the next generation fighter aircraft. Specifically, a threat assessment report outlined current threats that raised questions regarding the performance of the Joint Strike Fighter aircraft and other systems when employed against those threats. DOT&E indicated that additional investment was needed to upgrade outdoor test range assets, anechoic chambers (a room designed to completely absorb reflections of electromagnetic waves), and electronic warfare programming labs in order to test against updated threats as required. Joint Strike Fighter officials agreed that the aircraft should be tested against current threats, but emphasized that the program should not have to fund these test infrastructure improvements. To assess the issue further, the Office of the Secretary of Defense commissioned a study of electronic warfare test infrastructure needs.

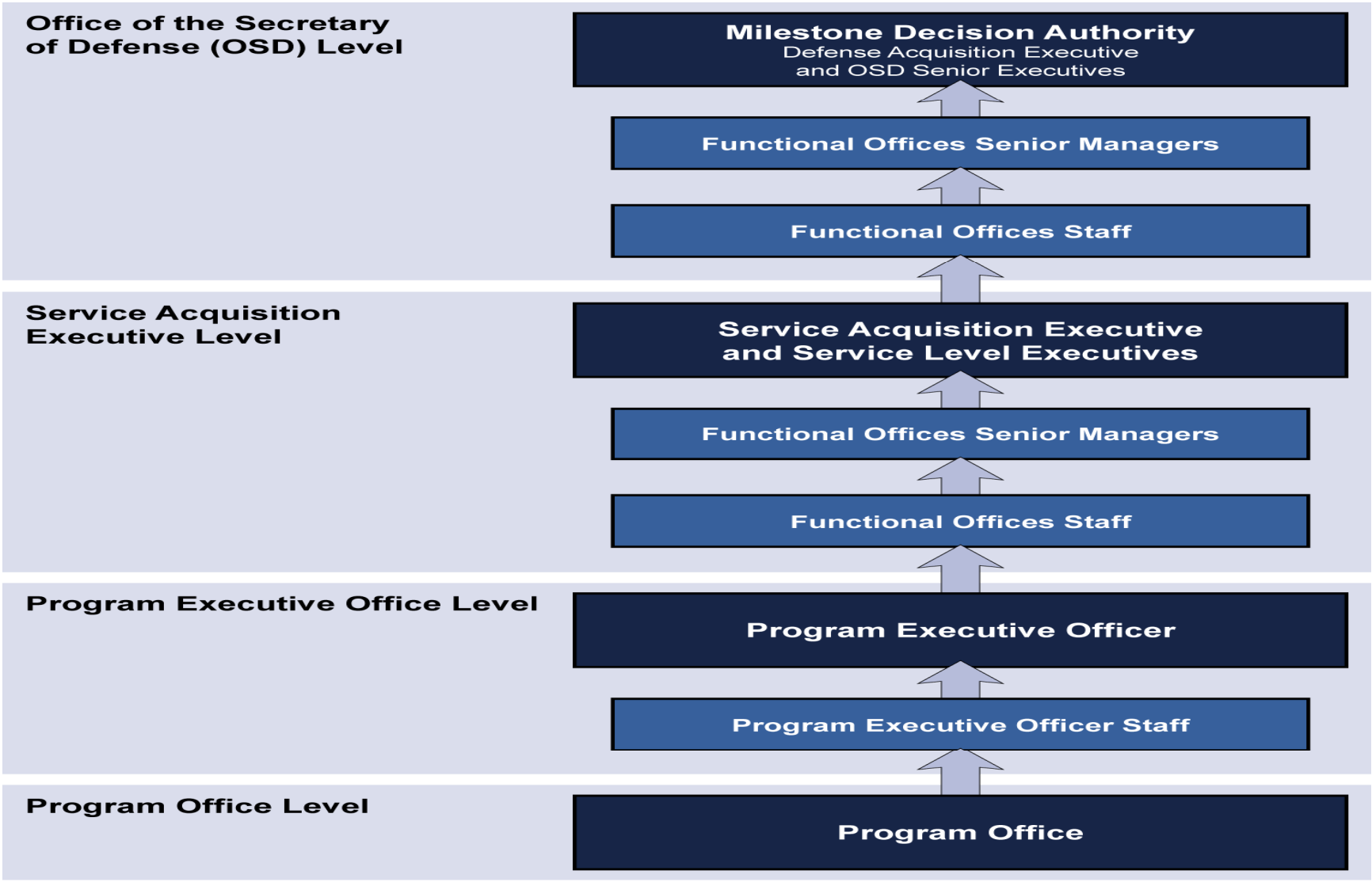
Impact: The Office of the Secretary of Defense study validated DOT&E's concerns, concluding that test infrastructure improvements were needed to support testing of the Joint Strike Fighter and a number of other systems being developed.

Resolution status: In response to the study, the Secretary of Defense signed a Resource Management Decision in September 2012 that established the Electronic Warfare Infrastructure Improvement Program to acquire and upgrade electronic warfare test capabilities that are intended to support operational testing for the Joint Strike Fighter and other systems. The decision provided about $491 million outside of the Joint Strike Fighter program funding for the Electronic Warfare Infrastructure Improvement Program. Plans for the program include procuring 22 emitters to support the full range of testing needs. Joint Strike Fighter program officials said they expect to begin testing with whatever assets are available to meet the test schedule.

DOD Needs to Shift from Managing the Administrative Process to Managing Product Development

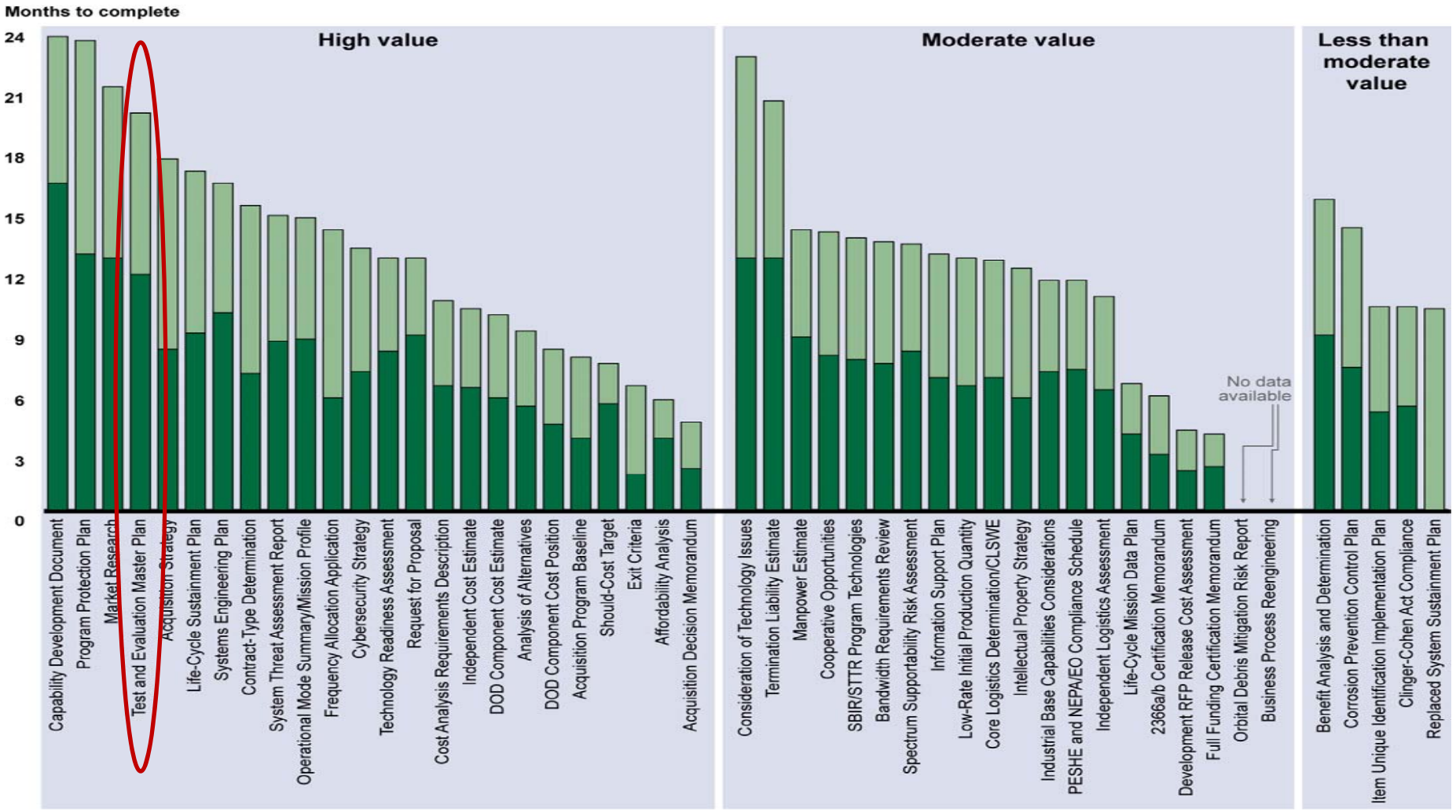
- DOD's acquisition process has become bogged down with documentation and internal reviews -- diverting resources from program management
- Programs spend considerable time and resources preparing milestone documentation many of which acquisition officials do not highly value
- The real focus should be on ensuring knowledge needed to establish an executable business case (customer needs, systems engineering, proper testing and available resources) is captured, documented, and available to decisionmakers AT THE OUTSET OF THE PROGRAM
- Reviews and documents should be focused on providing demonstrable evidence that the product's development is on track and the program's business case remains solid

Review Levels For Milestone Documents



Source: GAO presentation of DOD data. | GAO-15-192

Average Time Needed to Complete Documentation Requirements Grouped by the Value Acquisition Officials Considered Milestone B and C Requirements (24 DOD Programs)



CLSWE	Core Logistics and Sustaining Workloads Estimate
PESHE	Programmatic Environment, Safety, and Occupational Health Evaluation
NEPA/EO	National Environmental Policy Act/Executive Order 12114
RFP	Request for Proposal
SBIR/STTR	Small Business Innovation Research/Small Business Technology Transfer

Source: GAO analysis of DOD data. | GAO-15-192

Knowledge Based Acquisition Supports Successful Weapon System Testing

- Test-readiness issues often identified in DOT&E's annual report are symptomatic of a lack of knowledge at the start of development
- Knowledge increases certainty and predictability when establishing an acquisition strategy and making a business case
- Knowledge based acquisition BEGINS with a clear understanding of requirements and available resources
  - Identify and define operational gaps / requirements
  - Refine and clearly understand requirements using systems engineering
  - Trade requirements and resources (technology, time & funding) to get a match
  - Build and present an executable acquisition strategy (business case)
- Testing is an important part of a knowledge based process because it demonstrates that technology, design, and manufacturing knowledge have been achieved and the system is ready for the warfighter