Navy's Optimized Fleet Response Plan

Information Provided to Congressional Committees

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Source of Work and Objectives

- House Report 114-102, accompanying a bill for the National Defense Authorization Act for Fiscal Year 2016, included a provision that GAO review matters related to the Navy's Optimized Fleet Response Plan (OFRP).[1] This briefing describes our work on:
  1) the extent of maintenance overruns and their impact on the Navy;
  2) the Navy's goals and progress in implementing the OFRP; and
  3) challenges faced by public and private shipyards supporting the implementation of the OFRP.
- House Report 114-102 also included a provision that GAO review matters related to the Navy's security procedures at shipyards.[2] This briefing also describes our work on the impact that Navy installation and personnel security protocols, procedures, and policies have on the ability of contractor personnel to support Navy sustainment.

[1] *See* H.R. Rep. No. 114-102, at 114-15 (2015).
[2] *See id.* at 223-24.

Scope and Methodology

- To describe the extent of maintenance overruns and their impact on the Navy, we analyzed ship maintenance data from fiscal years 2011 to 2015, which include availabilities conducted before and after OFRP implementation, to ascertain the extent to which maintenance availabilities have been completed on time. We also interviewed Navy officials and analyzed Navy documents to understand the effects that maintenance schedule delays have on the Navy. We limited the scope of this objective to maintenance availabilities for Navy ships in carrier strike groups, since they have been the first to implement and have the most experience with the optimized schedule.
- To provide information on the Navy's goals and progress in implementing the OFRP, we analyzed Navy documents on the goals, benefits, and challenges associated with maintenance, training, deployment, and sustainment and interviewed Navy and Marine Corps officials about the development and implementation of the OFRP.
- To describe the challenges faced by public and private shipyards supporting the implementation of the OFRP, we analyzed ship maintenance data from 2011 to 2015, as well as shipyard workforce demographic data. We also interviewed Navy and industry officials and visited public and private shipyards involved in maintaining aircraft carriers, cruisers, and destroyers to obtain data and perspectives on the benefits and challenges associated with the OFRP implementation and any steps the shipyards are taking to mitigate those challenges.[3]

[3]We conducted site visits to public shipyards (Norfolk Naval Shipyard in Portsmouth, VA, and Puget Sound Naval Shipyard and Intermediate Maintenance Facility in Bremerton, WA) and private shipyards involved with Carrier Strike Group maintenance to obtain data and perspectives on the benefits and challenges associated with the OFRP implementation.

Scope and Methodology *(continued)*

- To determine the impact that Navy installation and personnel security protocols, procedures, and policies have on contractor personnel's ability to support Navy sustainment, we interviewed Navy and industry officials to understand their perspectives on any effects or issues that Navy security processes and procedures have on contractors' ability to complete work on time.
- We analyzed aircraft carrier, cruiser, and destroyer maintenance availability data for fiscal years 2011 through 2015. We limited our data collection to these years based on discussions with Navy officials and the limited reliability of data prior to fiscal year 2011. To assess the reliability of the data we used, we obtained information and interviewed Navy officials about their data-collection processes and procedures, data quality controls, and overall perceptions of data quality. After assessing the data, we determined that they were sufficiently reliable for the purposes of reporting the timeliness, lost operational days, growth and new work, and cost of maintenance availabilities.
- We obtained the views of officials from United States Fleet Forces Command and Naval Sea Systems Command on a draft of this briefing. Navy officials generally agreed with our observations and also provided technical comments, which we incorporated as appropriate.

Scope and Methodology *(continued)*

Defense Offices we contacted:

- Carrier Planning Activity
- Chief of Naval Operations, Fleet Readiness Division
- Commander, Naval Air Force Atlantic
- Commander, Naval Surface Forces Atlantic
- Commander, Navy Regional Maintenance Centers
- Marine Corps Forces Command
- Marine Corps Headquarters
- Mid-Atlantic Regional Maintenance Center
- Naval Sea Systems Command 04, Logistics, Maintenance, and Industrial Operations
- Norfolk Naval Shipyard
- Puget Sound Naval Shipyard and Intermediate Maintenance Facility
- Surface Maintenance Engineering Planning Program
- United States Fleet Forces Command
- USS *Nitze* (DDG 94)

Private Industry we contacted:

- BAE Systems Norfolk Ship Repair
- Colonna's Shipyard
- General Dynamics NASSCO – Bremerton
- General Dynamics NASSCO – Norfolk
- Marine Hydraulics International
- Pacific Ship Repair and Fabrication
- Puget Sound Ship Repair Association
- Técnico Corporation
- Virginia Ship Repair Association

Introduction

- Over the past decade, high operational tempo has reduced the predictability of ship deployments for sailors and for the industrial base that supports ship repair and maintenance. For example, carrier strike group deployment lengths have increased from an average of 6.4 months between 2008 – 2011and 8.2 months between 2012 – 2014, to 9 months for three carrier strike groups in 2015.
- Increased deployment lengths have resulted in declining ship conditions and materiel readiness, and in a maintenance backlog that has not been fully identified or resourced, according to Navy officials.
- The declining condition of ships has increased the duration of time that ships spend undergoing maintenance in the shipyards, which in turn compresses the time available in the schedule for training and operations.
- To address these issues, the Navy began implementing a revised operational schedule in November 2014 referred to as the Optimized Fleet Response Plan (OFRP).

Introduction *(continued)*

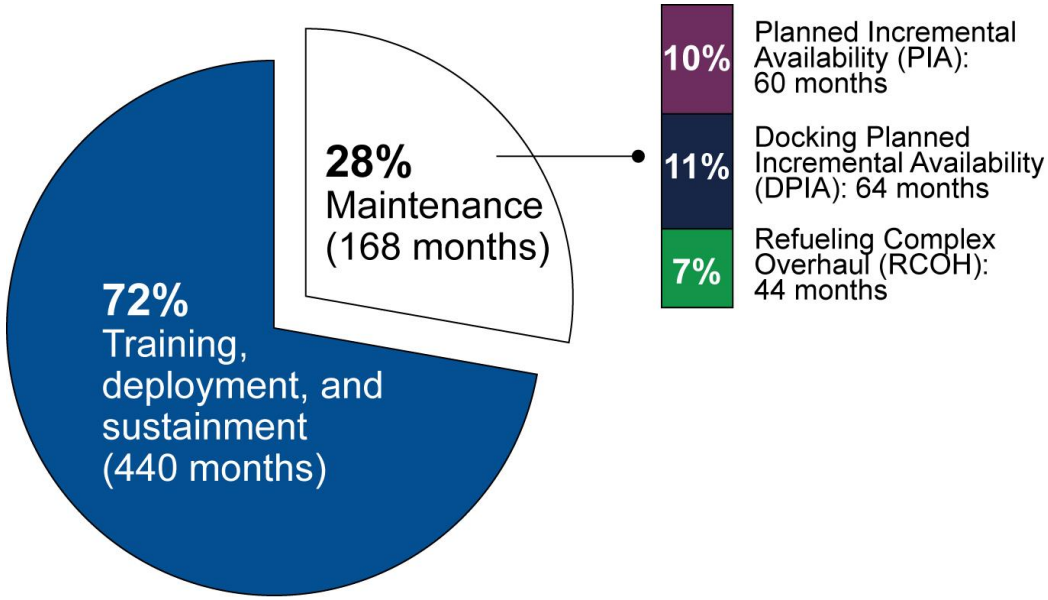
- The OFRP seeks to maximize employability while preserving maintenance and training with continuity in ship leadership and carrier strike group assignments, and restoring operational and personnel tempos to acceptable levels.
- According to Navy officials, this new schedule is designed to achieve a number of benefits, including increasing readiness and maximizing employability to combatant commanders.
- The Navy also anticipates that better scheduling will result in increased predictability for sailors and the public shipyards and private ship repair companies that maintain the fleet.
- The Navy plans to develop optimized schedules for all of its assets, including carrier strike groups, amphibious-ready groups, submarines, expeditionary units,[4] Military Sealift Command ships, and its maritime patrol and reconnaissance force.

[4]Navy expeditionary units provide a variety of combat service support and force protection capabilities and include coastal riverine, civil affairs, construction, and explosive ordnance disposal units.

Background: Maintenance Availabilities

- Navy ships routinely undergo depot-level maintenance, which includes major repair, overhaul, or complete rebuilding of weapon systems needed for ships to reach their expected service life.
- These scheduled periods of ship maintenance and modernization are referred to as maintenance availabilities.

Figure 1: Percentage of Time the Navy Plans for an Aircraft Carrier to Be in a Major Maintenance Availability over Its 50-Year Service Life under the Optimized Fleet Response Plan



Source: GAO analysis of Navy data. | GAO-16-466R
Note: Under the Optimized Fleet Response Plan, a PIA is a 6-month availability in which ship maintenance and modernization are performed. A DPIA is a 16-month dry-docking availability in which ship maintenance and modernization are performed. An RCOH is a 44-month availability in which the ship's two nuclear reactors are refueled and a significant amount of maintenance and modernization is performed.

Background: Shipyard Responsibilities for Conducting Maintenance Availabilities

- Maintenance availabilities for the nuclear elements of the fleet (i.e., aircraft carriers and submarines) are performed at the four Naval shipyards, with support from private shipyards.
- Maintenance availabilities for the conventional elements of the fleet (e.g., cruisers, destroyers, amphibious assault ships, and Military Sealift Command ships) are performed at private shipyards.
- For each maintenance availability, the Navy identifies the technical and engineering requirements that are provided to the shipyard for execution.
- The maintenance timeframes established under the OFRP are adequate and based on technical and engineering requirements, according to Navy officials responsible for ship maintenance and engineering planning.

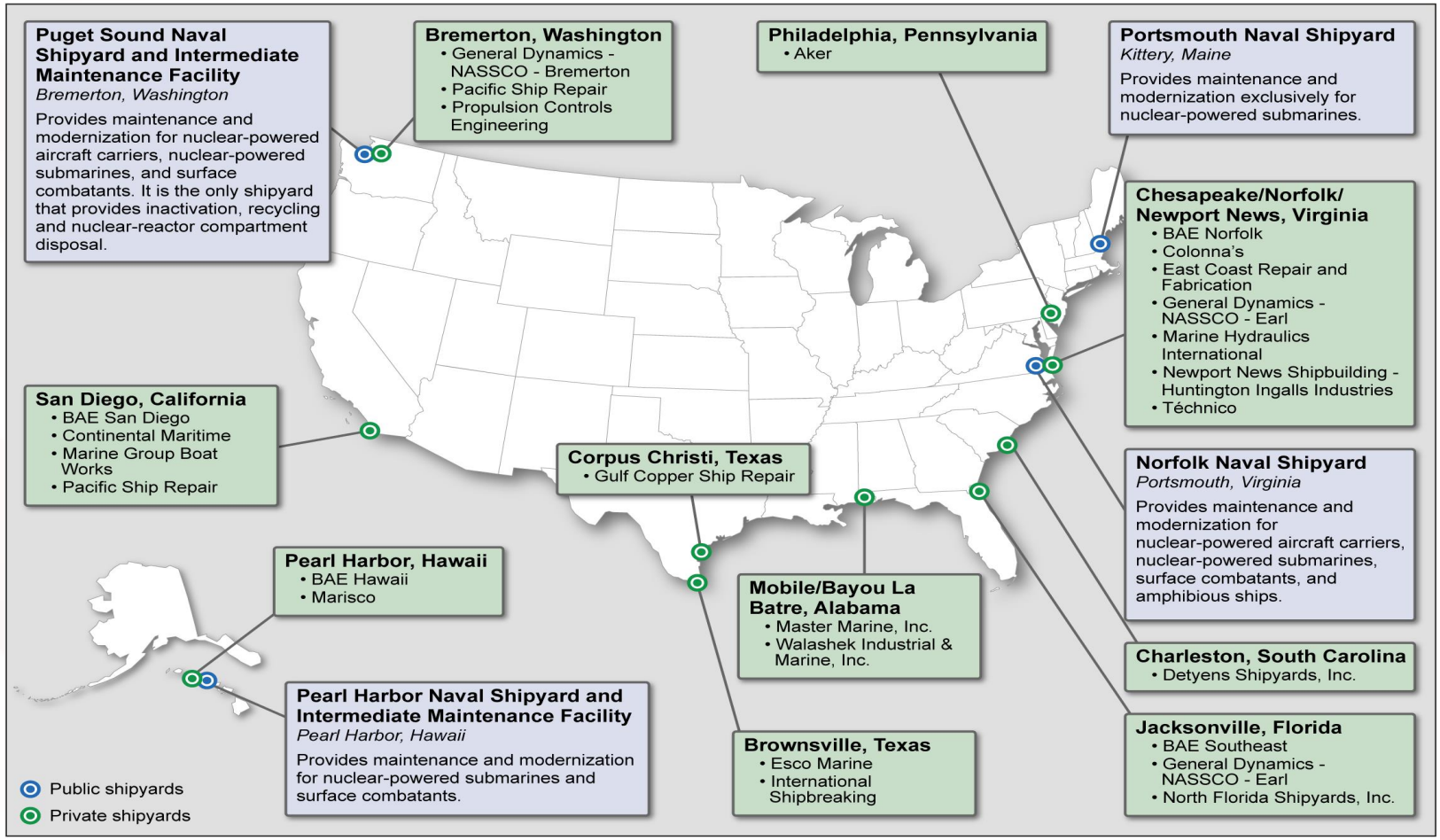
Table 1: Shipyard Responsibilities for Maintaining Elements of the Fleet

Element of the fleet	Maintained by public shipyards	Maintained by private shipyards
Carrier Strike Group	Yes ✓	Yes ✓
Amphibious Readiness Group	No	Yes ✓
Submarines	Yes ✓	Yes ✓
Navy Expeditionary Combat Command Force Packages	No	Yes ✓
Military Sealift Command	No	yes ✓

Source: GAO analysis of Navy data. | GAO-16-466R
Note: Maritime patrol and reconnaissance aircraft are maintained by both fleet readiness centers (public) and private companies, according to Navy officials.

Background: Public and Private Shipyards

Figure 2: Map of Public and Private Shipyards That Perform Ship Repair, Maintenance, and Modernization

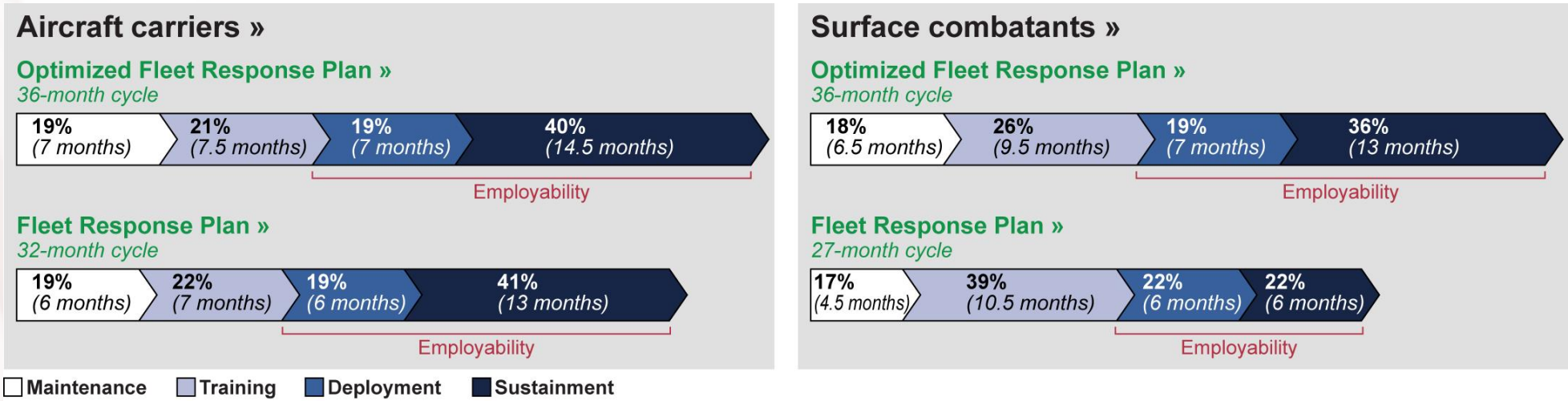


Source: GAO analysis of Navy data. | GAO-16-466R

Background: OFRP Phases

- The Navy designed the OFRP to prioritize maintenance by developing a predictable schedule that allows sufficient time to accomplish needed maintenance tasks and ensure that platforms reach their expected service lives.
- A typical OFRP cycle has four phases, which are planned to comprise a total of 18-36 months, depending on the force element. Carrier Strike Groups, the Navy's major force element, use a 36-month OFRP cycle.
- Fleet Forces Command officials stated that the Navy was not adhering to the previous schedule, referred to as the Fleet Response Plan, due to the high demand for Navy forces.

Figure 3: Comparison of the Optimized Fleet Response Plan and Fleet Response Plan Cycles for Aircraft Carriers and Surface Combatants



Source: GAO analysis of Navy data. | GAO-16-466R

Note: The total amount of time a ship spends in maintenance over its lifecycle will be greater, since the above schedule does not include significant maintenance events such as docking planned incremental availabilities and refueling complex overhauls.

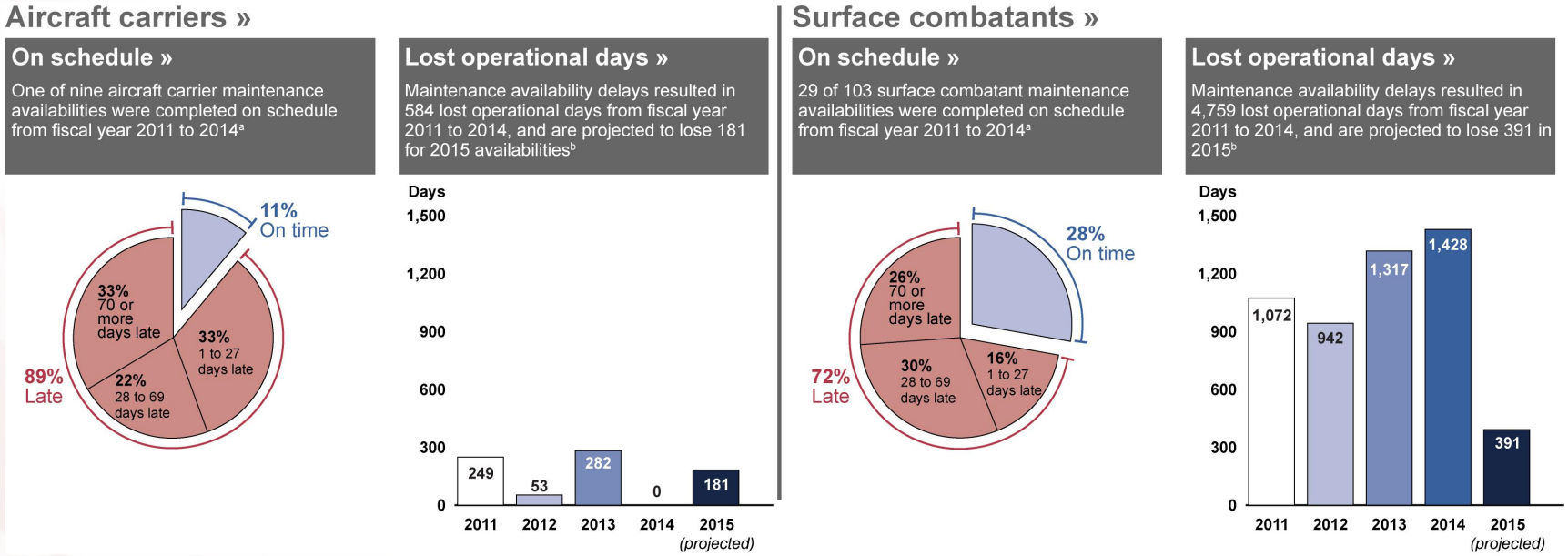
Summary

- GAO's analysis of Navy maintenance data found that before the implementation of OFRP in fiscal year 2015, 8 of 9 (89 percent) aircraft carrier and 74 of 103 (72 percent) surface combatant maintenance availabilities conducted from fiscal years 2011 to 2014 experienced schedule overruns that reduced ships' availability for training and operations (employability).
- In November 2014 the Navy began a multi-year process of implementing the OFRP, with the goal of maximizing employability, ensuring adequate time for maintenance and training, and restoring operational tempo and personnel tempo rates to acceptable levels. Thus far, only a small portion of the fleet has entered an optimized cycle, and as a result it is too early to assess the OFRP's overall effectiveness. However, the first 3 aircraft carriers have not completed maintenance tasks on time, a step that is crucial to successful implementation of the OFRP. Further, of the 83 cruisers and destroyers, only 15 have completed a Chief of Naval Operations maintenance availability under the OFRP.
- The shipyards face several challenges in completing maintenance on time, such as unanticipated requirements, workforce inexperience, and workload fluctuations. GAO's analysis of Navy data shows that the Navy has been struggling to accurately define maintenance requirements—a key step to completing maintenance on time. Furthermore, private shipyard officials say they may also face challenges as the Navy implements a new contracting strategy.
- Navy officials are aware of the risks associated with OFRP implementation and the challenges faced by both the public and the private shipyards in completing maintenance on time. Navy officials stated that they continually examine and refine the OFRP schedules and have taken steps to address the risks, to include studying options for mitigating workload fluctuations at the ports, hiring additional shipyard workers, and improving their maintenance planning process. Navy officials stated, however, that it will take time for these changes to bring about a positive effect.

Objective 1: Extent of Maintenance Overruns

- GAO's analysis of Navy maintenance data from fiscal years 2011 – 2014 (pre-OFRP) shows that the majority of maintenance availabilities completed by both the public and the private shipyards have taken more time than scheduled, thereby decreasing the number of days during which ships are available for training and operations (employability). The Navy continues to experience delays on availabilities begun under the OFRP.

Figure 4: Timeliness of Aircraft Carrier and Surface Combatant Maintenance Availabilities and Resulting Lost Operational Days



Source: GAO analysis of Navy data. | GAO-16-466R

[a]This excludes forward deployed naval force aircraft carrier and surface combatant maintenance availabilities.

[b]The Navy tracks maintenance availabilities by the fiscal year in which they begin. Figure data showing fiscal year 2015 lost operational days for aircraft carriers are as of February 2016, and for surface combatants they are as of December 2015, and reflect approved schedule changes and completed maintenance availabilities. Total lost operational days will not be known until all aircraft carriers and surface combatants have completed their maintenance availabilities.

Objective 1: Impact of Extended Maintenance Availabilities and Overruns on the Navy

- The Navy has several options for mitigating extended maintenance availabilities and overruns, including the following:
  - Condense training period (most common, according to Navy officials)
  - Reduce sustainment period
  - Reduce sustainment and training periods
  - Deploy another ship ("swap out")
  - Delay the deployment (rarely if ever used, according to Navy officials)
- Extended maintenance availabilities and schedule overruns compress the time available for training, deployment, and sustainment, thereby jeopardizing the Navy's ability to meet its goals in these areas.
- For example, the 2015 planned maintenance availability for the USS *George H. W. Bush* (CVN 77) exceeded its 6-month availability by more than 2 months. To accommodate the increase, the Navy reduced the ship's employability to operational commanders by 3 weeks and compressed its scheduled training by 5 weeks.

Objective 1: Impact of Extended Maintenance Availabilities and Overruns on the Navy *(continued)*

- The USS *Dwight D. Eisenhower's* (CVN 69) maintenance availability, begun in 2013, was extended from a planned 14 months to more than 23 months to accommodate 2 ½ times more growth and new work than the Navy had planned for, as well as shipyard performance issues.
- The extension required the USS *Harry S Truman* (CVN 75), which the Navy had intended to be the first aircraft carrier to transition to the OFRP, to complete back-to-back deployments to meet operational demands. This prevented the *Truman* from entering her OFRP maintenance phase at Norfolk Naval Shipyard as scheduled in fiscal year 2015.
- The *Eisenhower* maintenance delay had ripple effects that impacted the entire optimized carrier schedule.

Figure 5: USS *Dwight D. Eisenhower* (CVN 69) Undergoing a Maintenance Availability at Norfolk Naval Shipyard

Source: United States Navy. | GAO-16-466R

Objective 2: OFRP Goals

- **Overall goal:** *Maximize employability while preserving necessary maintenance and modernization, work-up entitlements, maintaining a clean chain of command, and ensuring acceptable/predictable operational tempo and personnel tempo.*[5]
- **Key sub-goals:**
  - Complete the maintenance and modernization availability work package on schedule.
  - Train units to one high-end, near-peer competitor standard, and complete required qualifications within allotted timeframe.
  - Return deployments to sustainable operational tempo and personnel tempo levels. The Chief of Naval Operations service goal for deployment lengths is 7 months.
  - Maintain readiness after deployment for surge capacity (referred to as sustainment).
  - Achieve a minimum of 92 percent fit and 95 percent fill for all billets in the carrier strike group prior to basic training phase, and maintain throughout OFRP cycle.
  - Maintain continuity in ship leadership and assignments to the carrier strike group throughout OFRP cycle.

[5]Commander U.S. Fleet Forces Command / Commander U.S. Pacific Fleet Instruction 3000.15A, *Optimized Fleet Response Plan* (Dec. 8, 2014).

Objective 2: Progress in Implementing the OFRP

- The Navy has established OFRP schedules for five of the six elements of the fleet.
- The Navy tracks employability using a 9-year schedule (three OFRP cycles for carrier strike groups).
- Optimized schedules allow the Navy to better schedule maintenance and modernization, training, deployments, and sustainment activities, and to better understand the potential impacts of any schedule changes.
- As of January 2016, no aircraft carrier and only 15 of 83 cruisers and destroyers had completed a Chief of Naval Operations maintenance availability under the OFRP.

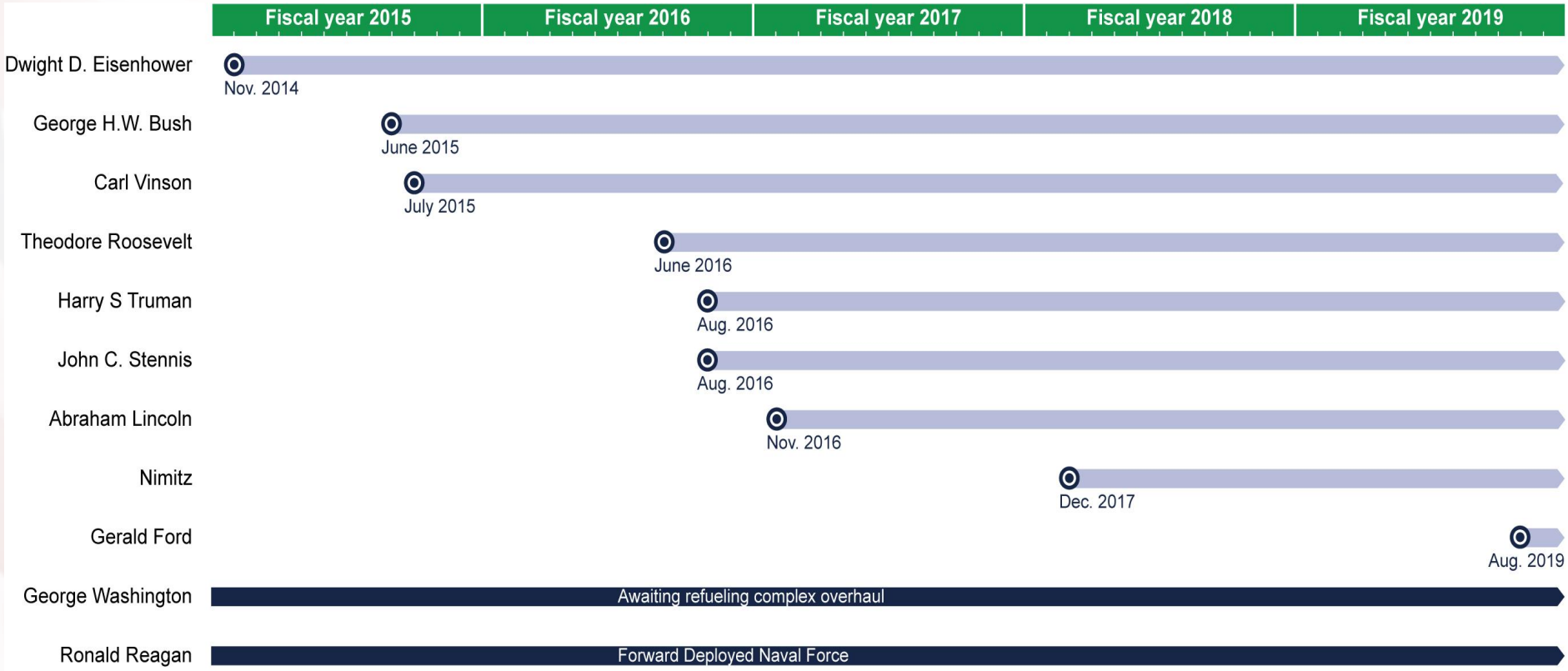
Table 2: Navy's Progress in Developing Optimized Schedules for Elements of the Fleet

Elements of the fleet	Optimized schedule
Carrier strike groups	Approved
Submarines	Approved
Maritime patrol and reconnaissance aircraft	Approved
Military Sealift Command	Approved
Navy Expeditionary Combat Command force packages	Approved
Amphibious readiness groups	Under development; expected May 2016

Source: Fleet Forces Command | GAO-16-466R
Note: Optimized schedules were developed by Fleet Forces Command and according to officials were approved by the Fleet Commanders Readiness Council. Optimized schedules were developed for forward deployed naval forces within the elements as appropriate. Information as of April 2016.

Objective 2: Progress in Implementing the OFRP (*continued*)

Figure 6: Planned Implementation of the Navy's Optimized Fleet Response Plan (OFRP) for Carrier Strike Groups



Source: GAO analysis of Navy data. | GAO-16-466R

Note: Forward deployed naval forces are ships that are homeported overseas whose crews and their families reside in the host country. These aircraft carriers have different optimized schedules from those based in the United States. An OFRP cycle starts with the maintenance phase; however, the USS *Dwight D. Eisenhower* (CVN 69) began its OFRP cycle with the training phase, because her maintenance availability was not planned under the OFRP.

Objective 2: Progress in Implementing the OFRP (*continued*)

- As of February 2016, the carrier strike groups that have entered the optimized cycle have met their minimum manning goals, but these ships continue to experience maintenance delays which, thus far, the Navy projects will result in 76 aircraft carrier lost operational days.
  - 3 of 10 carrier strike groups have entered an optimized cycle, and none have completed a full 36-month cycle.
  - No carrier strike group has completed a maintenance and training phase, and none have deployed or entered the sustainment phase under the OFRP.
- The 3 carrier strike groups that have entered the optimized cycle have been aligned: that is, the ships in each strike group are expected to go through the entire cycle together (i.e., maintenance, training, deployment, and sustainment).

Objective 2: Key OFRP Assumptions and Risks

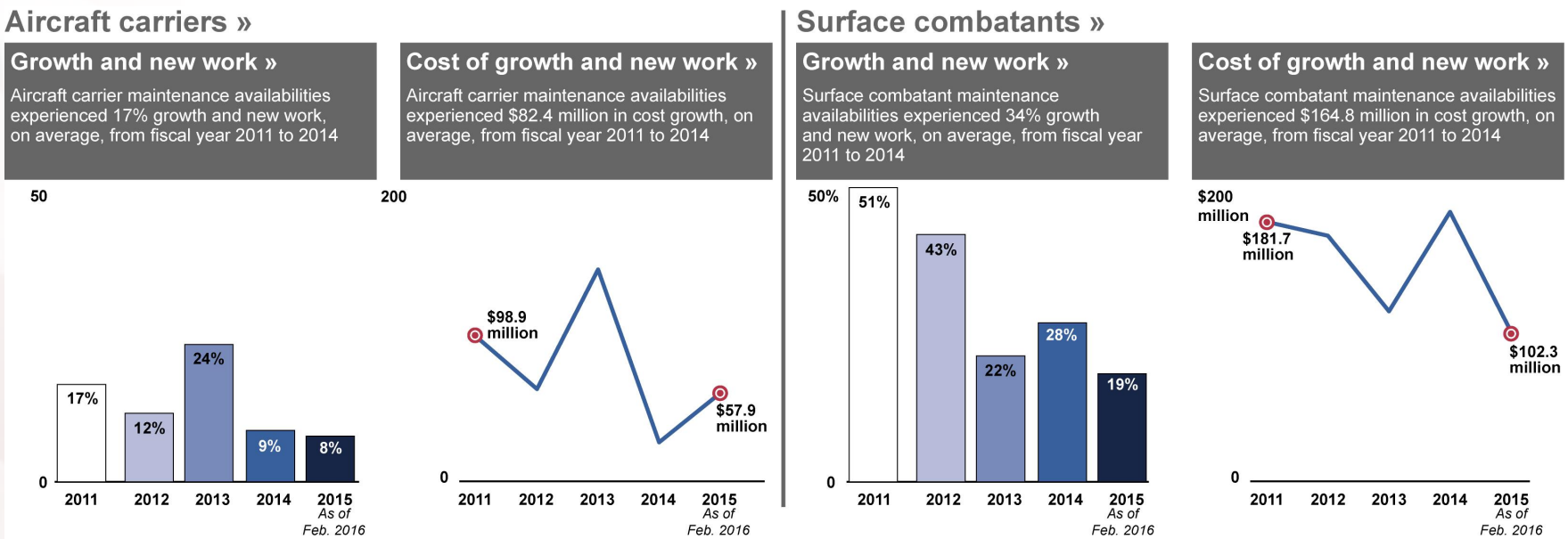
- Key assumptions made by the Navy when developing the OFRP include the following:
  - The Navy will be funded at planned fiscal year 2016 levels.
  - The Navy will have the force structure contained in the 30-year shipbuilding plan, which includes 11 aircraft carriers.[6]
  - Presence demands will not increase above 2016 levels.
  - Shipyards will complete maintenance on time.
- If any of these assumptions are not realized, then the Navy is at risk of not achieving its OFRP employability and sustainability goals.

[6]The Navy's 30-year shipbuilding plan attempts to balance the competing objectives of maximizing the mission capabilities of each ship and reducing crew size, while at the same time providing a sufficient quantity of ships to achieve the necessary level of global presence and to provide a stable workload for shipyards.

Objective 3: Public and Private Shipyards Continue to Experience Growth and New Work

- From fiscal years 2011 to 2014, aircraft carriers and surface combatants required 17 and 34 percent more work, respectively, than estimated by the Navy in each ship's availability work package, which has resulted in increased costs.
- Officials attribute the unanticipated growth and new work to: difficulties in estimating required work, high operational tempo and deferred maintenance experienced over the past decade, and changes in the Navy's maintenance approach.

Figure 7: Growth and New Work and Associated Costs for Aircraft Carrier and Surface Combatant Maintenance Availabilities, Fiscal Years 2011 – 2015



Source: GAO analysis of Navy data. | GAO-16-466R

Note: The Navy tracks maintenance availabilities by the year in which they begin. Data for ongoing availabilities are as of February 2016, and include 3 aircraft carriers and 10 surface combatants. Total growth and new work and costs will not be known until all aircraft carriers and surface combatants have completed their maintenance availabilities. Some modernization costs outside of the maintenance contract are not captured in cost figures.

Objective 3: Key Challenges Common to Both Public and Private Shipyards

Key Challenge	GAO's Analysis
Shipyard performance	Shipyards must perform at their expected levels of productivity. From fiscal years 2011 to 2014, public and private shipyards struggled to complete maintenance availabilities on time, with 89 percent of carrier and 72 percent of surface combatant availabilities experiencing schedule overruns. These schedule overruns resulted in an average of 65 and 46 lost operational days per availability for aircraft carriers and surface combatants, respectively.
Adequacy and timing of funding	The Navy identifies adequate funding for maintenance as being important to the success of the OFRP. Navy and shipyard officials we interviewed during this review stated that budget reductions, such as sequestration, and delays in appropriations negatively impact the shipyards' ability to maintain the fleet and warfighting readiness.
Requirements definition	The Navy must accurately define the requirements for ship maintenance availabilities. From fiscal year 2011 to 2014, carriers and surface combatants experienced unanticipated growth in maintenance requirements on an average of 17 percent and 34 percent, respectively. This "growth and new work" also led to annual average cost growths of $82.4 million and $164.8 million for aircraft carrier and surface combatants, respectively.

Objective 3: Specific Challenges: Public Shipyards

Public Shipyard Challenges	GAO's Analysis
Workforce inexperience	Public shipyard workforce data show that 32 percent of all employees have fewer than 5 years of experience. According to Navy officials, this workforce inexperience negatively affects shipyard productivity. The Navy has increased personnel at the shipyards and reduced training time; however, it will take several years to obtain full productivity, according to Navy officials.
Aging infrastructure	The age, deterioration, and design of infrastructure at the shipyards negatively affect shipyard efficiency. For example, the average ages of facilities and drydocks are 62 and 81 years old, respectively. From fiscal years 2010 to 2013, 96 ships in maintenance were affected by infrastructure-related issues.
Competing priorities	The Navy prioritizes the maintenance of some submarines more highly than that of aircraft carriers; shipyard officials stated that this practice can divert limited maintenance workers and resources away from aircraft carrier maintenance.

Objective 3: Specific Challenges: Private Shipyards

Private Shipyard Challenges	GAO's Analysis
Port loading	Navy documents show that aligning ships' command and control under the OFRP contributes to wide swings in port workload, which in turn can have a negative effect on the private-sector industrial base. According to industry officials, these cycles result in unsustainable lows followed by potentially unmanageable highs in workload that they expect will eventually erode the ship-repair industrial base's skilled workforce. Additionally, Navy officials stated that wide fluctuations in port loading adversely affect private industry's ability to support public shipyard maintenance work. Navy officials stated that they have begun to take steps to ensure that ships being aligned under a carrier strike group have staggered maintenance start and stop timelines, and that they are studying the effects of OFRP ship alignment on the ship repair industrial base.
Navy's transition to a new contracting strategy	The Navy's new contracting strategy will involve, among other things, the use of a separate contractor to identify and plan the work (a "third party planner"); the award of multiple indefinite-delivery, indefinite-quantity contracts with competed task orders for individual availabilities; and transition from a cost-reimbursement to a firm fixed-price contract type. It is too early to determine the impact of the transition on the private shipyards' ability to complete maintenance under the OFRP. Navy officials stated that they expect the new strategy to improve requirements definition, decrease costs through competition, and increase schedule and quality performance. We have separate work underway to assess the new contracting strategy in terms of (1) its potential benefits and risks, (2) the extent to which Navy infrastructure and processes have facilitated implementation of the strategy, and (3) how industrial base considerations have shaped the strategy. We will seek industry views as part of this work.

Objective 3: Specific Challenges: Private Shipyards *(continued)*

Private Shipyard Challenges	GAO's Analysis
Delays in finalizing work packages	GAO's analysis of Navy data shows that the Navy did not finalize work to be performed within the timeframes presented in Navy guidance for 53 percent of all private-sector aircraft carrier maintenance contracts and 70 percent of cruiser and destroyer contracts from fiscal years 2011 to 2015.[7] According to industry officials, delays in finalizing work packages can contribute to delays in starting maintenance.
Discovery and negotiation of growth and new work	GAO's analysis of Navy data shows that the Navy continues to encounter unanticipated growth and new work. Industry officials stated that incorporating growth and new work into maintenance contracts is slow and can lead to delays. The Navy reports that from May to October 2015 the median time to process and complete negotiations for new work for surface combatants was 18 days, exceeding the Navy's standard of 5 days. The Navy expects that using a third party planner will reduce growth and new work overall; however, data on the impact of this change are limited as of February 2016.

[7]According to a Navy official and documentation, the on-time award metric tracks exercise of an option, award of an order, or other agreement related to the work to be performed.

Navy Installation and Personnel Security Protocols, Procedures, and Policies

- Over the past decade, the Navy has implemented personnel security protocols, procedures, and policies affecting contract personnel performing ship maintenance, according to Navy and industry officials.
- Navy and industry officials generally agree that installation and personnel security protocols, procedures, and policies do not impact the private shipyards' ability to complete their work on time.
- Officials from Norfolk and Puget Sound Naval Shipyards, seven private shipyards, and the Puget Sound and Virginia Ship Repair Associations stated that there have been instances when private shipyard employees experienced delays in accessing the shipyard; however, most of these Navy and private shipyard officials agree that the situation has improved and is no longer a major issue.