READINESS-BASED SPARING

ROADMAP

VERSION 1

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Readiness-Based Sparing Roadmap

The Department of Defense has long been an advocate of using the most advanced and effective tools to provide high levels of weapon system readiness to the warfighter. With the Military Services' and Defense Logistics Agency's (DLA's) adoption of enterprise resource planning (ERP) systems, DoD has an opportunity to improve spare parts forecasting through many independent advanced planning and scheduling (APS) efforts.

To facilitate an expanded and common approach to APS software and business process applications within and across its Components, DoD established a joint initiative and consolidated funding authority for APS in the Office of the Secretary of Defense (OSD) for fiscal years 2006 through 2011. Facilitating this joint initiative, the Office of the Assistant Deputy Under Secretary of Defense for Supply Chain Integration (OADUSD[SCI], or SCI) established a senior executive steering committee that identified readiness-based sparing (RBS) as a valuable legacy capability that should be included in the proposed APS solutions. Given its significant potential to affect warfighter support, this committee identified RBS as the initial focus for APS implementation.

PURPOSE

This roadmap outlines the activities that will:

1. Research the applicability of commercial off-the-shelf (COTS) RBS tools within the DoD environment and, where appropriate, implement RBS functionality within the context of the ERP systems. These efforts must address individual Component requirements while they consider their effect on the DoD enterprise.

2. Establish a framework for communicating essential RBS information among the Components to facilitate coordinated requirements. The efficient and effective exchange of key data elements and information enables logistics planning from an enterprise perspective.

3. Facilitate interoperability among the Components' RBS models. An effective collaboration and governance structure will ensure the DoD Components understand RBS functionality across the enterprise and communicate commonly understood information.

This roadmap has been developed as a result of collaboration across the DoD Components and has been vetted with their representative members of the Supply Chain Capabilities Group (SCCG). The roadmap will continue to evolve and be updated as RBS efforts progress and new lessons are learned. Future updates will

be facilitated through the RBS Working Group, which has representation from the Services, DLA, and OSD.

RBS WITHIN THE DEPARTMENT OF DEFENSE

RBS is a requirements determination process that computes the levels of secondary item spares needed to support a weapon system readiness goal at the lowest possible cost. RBS algorithms determine, for each inventory location (supply and maintenance), the lowest cost spares mix that will provide the required operational readiness level for a weapon system.

The *DoD Supply Chain Materiel Management Regulation*, DoD 4140.1-R,[1] mandates that RBS models be used, whenever possible, to assess inventory investment required for fielding new programs (i.e., weapon system or subsystem) and to set sparing levels for secondary items that have support goals related to weapon system readiness. In addition to these primary objectives, RBS analytical capabilities can be used to negotiate performance-based supplier agreements; assess the effect of reliability, maintainability, and supportability improvements on weapon system readiness; plan and develop budgets; and conduct what-if exercises related to deployments.

The military uses RBS models in various levels of detail and complexity. Several excellent examples of legacy software tools were developed internally by the Services and are now used to support high levels of system readiness. As the Services modernize their logistics systems through ERP and APS implementation, COTS software can be employed to perform RBS functions and replace those legacy models.

Having no weapon systems of its own, DLA does not tie its inventory levels directly to a weapon system readiness target—the traditional definition of RBS; however, DLA is taking advantage of the mathematical approach inherent in RBS models to determine more efficient and effective inventory levels in a multiple-echelon environment. In this context, DLA must compute requirements to meet a different goal, such as customer wait time. Even though DLA's efforts are identified throughout this roadmap as RBS efforts, it is important to note this distinction.

PROMOTING COTS RBS CAPABILITIES

Across the DoD, each Military Service supports its RBS practices with its own RBS tools within its respective legacy logistics systems. Although this RBS functionality is a mature capability with proven algorithms and business rules that have evolved over time to address specialized requirements, OSD is committed to promoting commercial RBS as an alternative to the existing RBS tools to exploit the potential benefits of COTS solutions.

[1] DoD 4140.1-R, *DoD Supply Chain Materiel Management Regulation*, May 2003.

While each Service's RBS tools provide excellent support for individual functional needs, OSD is concerned about the ability of modernized COTS ERP solutions to effectively and efficiently integrate these RBS tools. OSD also hopes to improve Department-wide planning, especially primary inventory control activity (PICA) item support to the secondary inventory control activity (SICA) forecasting, which requires increased data exchange among Components. Accordingly, OSD believes it is important to consider RBS capabilities that are available or that closely complement the comprehensive COTS ERP solutions the Services and DLA are currently implementing.

The ability to interactively share data among the Services' legacy inventory systems is limited. Each service currently projects demand and unserviceable returns for items that the other Services support. DLA also provides the Services with expected delay times. To effectively and efficiently compute enterprise requirements using RBS principles, future RBS solutions will need to capture and exploit more detailed information. It is hoped that the COTS ERP solutions will facilitate enhanced communication of the information needed to enable RBS capabilities with an enterprise perspective.

With modern software applications, integration and data sharing are achieved through common data elements, metadata standards, and an underlying technology that facilitates application-to-application communication. The RBS applications in use today were developed for legacy logistics systems. Because these systems are based on outdated technology that pre-dates current standards, OSD believes building new interfaces between the legacy RBS tools and the modernized COTS software will be expensive both to develop and to maintain.

While there are some industry organizations that practice RBS and reap its benefits, it is not widely applied in the commercial sector. Thus, without a large install base of customers, COTS RBS tools do not enjoy the traditional benefits of COTS products. For example, the limited commercial use of these tools limits the incentive for vendors to continue research and development for ongoing enhancement. As a result, DoD may incur an additional cost to enhance and support the software to meet its specific requirements. Similarly, the knowledge base of implementation best practices is also limited, as are the demonstrated performance of the algorithms and scalability of the solutions.

Costs are incurred either to refine the RBS capabilities that are inherent in the COTS solutions and configure them to the DoD environment, or to maintain the legacy RBS tools. In the longer term, DoD will reap the benefits of modern technology with the use of COTS solutions. OSD is committed to supporting the advancement of RBS capabilities within the COTS solutions rather than developing custom coding to integrate the Services' existing RBS tools. By promoting COTS RBS tools, OSD intends to foster the evolution of those tools to reap the potential benefits and develop solutions that are integrated with the larger ERP platform.

VISION OF THE RBS END-STATE

The RBS Working Group, facilitated by SCI and consisting of RBS subject matter experts from the Services and DLA, considered various alternatives when determining the desired RBS end-state model. The following were the major alternatives considered:

1. *Unlinked RBS solutions.* This alternative would include independent implementations of an RBS software solution within each Component, with no interoperability or data sharing with the other Components' software.

2. *Single RBS solution.* This alternative would implement an RBS system that puts all data from all Components into a single software solution with a single data repository. The inventory levels would be set at each wholesale and retail DoD location for every national stock number (NSN) on every DoD weapon system.

3. *Interoperable RBS solutions*. An independent implementation of an RBS software solution within each DoD Component, with sharing of data across the Components to improve requirements and inventory levels.

After considering the different alternatives, the RBS Working Group agreed that the third alternative was the best to optimize both Component-level requirements and Department-level results. Considerations for each of these alternatives are described in detail below.

Consideration of Alternatives

UNLINKED RBS SOLUTIONS

While the first alternative may lead to optimization of some NSNs within a Component, the RBS Working Group determined that, to be efficient, the RBS end-state model must enable the sharing of data between Components for common items. A Component responsible for managing an item must have information about the support requirements of other users. Similarly, the users of an item managed by another Component must have information about the ability of the managing Component to supply that part. Inaccuracies and continued inefficiencies will result without the flow of information across Components.

SINGLE RBS SOLUTION

The second alternative, a single software solution across all Components, would be optimal for common items. With this RBS model, all information on all parts, on all weapon systems, for all Services would be managed within one system. All inventory levels, at all echelons, for all Components, for every stock location would be set in one system.

Although seemingly advantageous for common items, there are several reasons why this alternative is not desirable:

- A single data set containing this much information would be extremely large and unwieldy. The opportunity for data errors would be great, and an error on one NSN for one Component could affect multiple NSNs across many weapon systems and across all the Components.

- Such a data set would very likely create a "churn" in requirement computation as data would constantly change, not just from one Component but from all Components. There also may be timing issues; the Components may require model output or may be able to supply model input data at different times.

- Because of the way funding is budgeted and executed, it is difficult to satisfactorily trade off the distribution of assets across echelons and Components. Government funding practices do not allow money that would support fluctuating inventory levels to be moved easily between Components or, for some Components, between wholesale and retail accounts. It would be difficult to implement a single multiple-echelon and cross-Component solution that would adhere to these funding limitations. Planning for National Guard and reserve forces and performance-based logistics agreements only adds to these complexities.

- It would be difficult to implement a single RBS solution that can handle the wide variety of requirements and business rules needed to support the different missions, forces, maintenance philosophies, and weapon systems that exist across DoD.

- It is risky to rely on a single vendor with all of the Components using one COTS software product in a single RBS solution. The support requirements for all users within DoD, for both maintenance and potential product enhancements, might be more than a single vendor could sustain. Furthermore, removing competition among vendors might result in higher total costs.

- Reliance on a single solution for the DoD's RBS capability presents risks associated with a single point of failure. If an error is encountered in the software, or if it is not available for some reason, no computations can be executed for any Component.

INTEROPERABLE RBS SOLUTIONS

The RBS Working Group identified this alternative as the best to achieve both Component and Department-level goals. In this end-state model for RBS, each Component will run its own RBS software to determine wholesale inventory levels

and wholesale delay times (WDT). The WDT and related information are then shared with the other Components for the computation of retail inventory levels.

There are many reasons for using this modeling approach:

1. It allows flexibility for each Component to optimize its wholesale and retail inventory levels according to different budgets, operational requirements, and other constraints.

2. It allows DLA to use multiple-echelon techniques to optimize to a customer wait-time goal to determine the wholesale stock and WDT. At the same time, the Services will be able to use the WDT to set their retail levels.

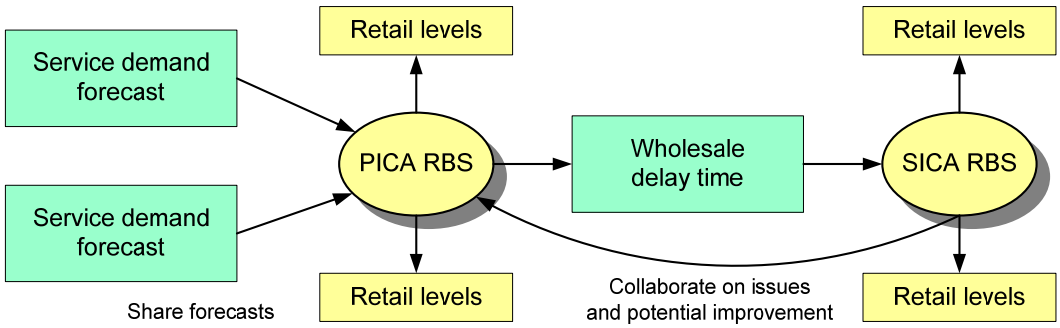
3. It has a greater chance of implementation success. Because the Services are at different milestone points in their various ERP deployments, this approach allows each Component to progress according to its own timeline and internal capabilities, while minimizing constraints from others. This simpler approach reduces data challenges and other risks that might otherwise lead to implementation failure. Components would be able to participate in this coordinated approach using their legacy RBS solutions while the COTS solutions are being developed, refined, and deployed.

The sharing of data would provide greater weapon system support at the same cost. The Air Force tested this concept and found that, when WDT was considered in the RBS model, the Air Force could increase support for its weapon systems at the same cost. In the case of the Navy (which uses historical WDT in its models for items managed by other Services), using planned performance times could increase model accuracy. For items managed by the Navy and DLA, the Navy already uses a mixture of analytic WDT forecasts based in the inventory levels and historical values.

End-State Solution

Figure 1 illustrates the flow of information among Components. This flow supports the proposed end-state solution.

Figure 1. WDT Information Flow



The Services provide their demand forecasts to the PICA Component that manages the item. The PICA includes this information in its RBS calculations for wholesale inventory levels necessary to support DoD. The resulting wholesale inventory levels dictate the expected WDT for that item. The SICA that uses the item uses this lead-time information when determining where and how much of the item it should stock. In some cases, the SICA may set wholesale inventory levels and send money to the PICA to make procurements. In these cases, the SICA would determine its own WDT for its customers. To reap the full benefit of WDT information sharing, collaboration between the PICA and SICA is needed to resolve issues that arise because of budget, storage, or operational requirements.

In addition to planning across Components, the end-state RBS solution will need to accommodate weapon system items that are supported through performance-based logistics agreements and initial provisioning calculations for new system fielding and early operational sustainment. Similar to common items across Components, these arrangements have associated data-sharing needs, which have yet to be defined or addressed.

This targeted end-state solution provides directional guidance for ongoing RBS efforts; however, the process and technical details necessary to implement this solution will continue to develop. This vision will also continue to be fine-tuned and adjusted as Component-level efforts progress and new lessons are learned.

ACHIEVING RBS END-STATE VISION

The DoD RBS vision will be achieved through various Component-led efforts and supported by inter-Component coordination. SCI will facilitate this coordination and provide research funding to evaluate the feasibility of COTS RBS solutions and, where appropriate, support their implementation. SCI will also provide oversight and management of OSD-funded activities as they relate to the broader APS program.

Component-Level RBS Efforts

As a first step toward achieving the DoD RBS vision, OSD funded several Service and DLA projects to explore RBS COTS capabilities and determine how these could be applied to the DoD environment. RBS projects within the Navy and DLA look to implement these RBS COTS capabilities. Implementation of RBS COTS capabilities within the Army and Air Force depend upon their RBS pilot activities and will be determined as these activities progress. In addition to addressing Component-level requirements, the Components will work to improve and support Department-level results and the end-state vision.

This section provides a “snapshot” of the Component RBS efforts. It is important to note that these activities are ongoing; therefore, stated objectives and timelines are not fixed. This information will be updated as RBS efforts continue to evolve.

ARMY

In response to OSD's desire to explore RBS COTS software solutions, the Army initiated an RBS pilot effort to evaluate MCA Solutions' Service Planning and Optimization (SPO™) functional calculations and compare the output (recommended stockage lists) to the legacy Army RBS model for a combat, aviation, and low-density engineer system.

The Army pilot has three phases:

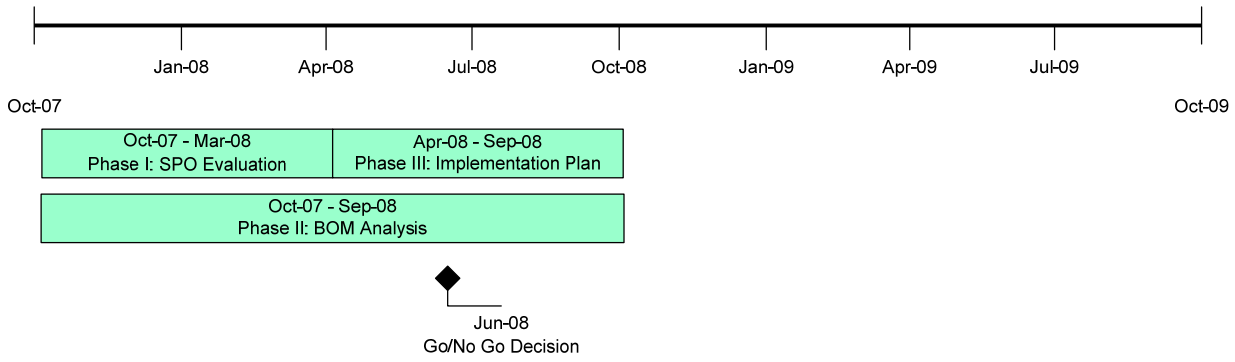
- Phase I: SPO evaluation
- Phase II: Bills of material (BOMs) analysis (separate but supporting functionality)
- Phase III: Draft implementation plan.

During Phase I, the Army will perform a thorough technical and functional evaluation of SPO, including the effectiveness and efficiency of the SPO recommended stock lists for the peacetime sustainment of selected high- and low-density Army weapon systems. This evaluation compares the results of the SPO RBS calculations to the results of the legacy software tool, Selected Essential Item Stock for Availability Method (SESAME). The Army will also look at the SPO's ability to support decision making and perform "what-if" analyses for the Army service supply chain.

During Phase II, the Army will investigate methods, policies, and best commercial business practices for establishing, storing, and maintaining actionable BOMs. These efforts are independent of any COTS RBS package selection, so they will be accomplished simultaneously with the Phase I efforts.

Phase III will begin when and if the Army decides to move forward with SPO. The goal of Phase III is to develop an implementation plan for the possible rollout of SPO to the Army's Logistics Modernization Package. Figure 2 outlines the timeline associated with these Army RBS pilot activities.

Figure 2. Army RBS Pilot Activities



NAVY

The Navy began looking at RBS COTS software in 2002–2003 when it conducted the "RBS Olympics," a study to evaluate several COTS solutions. The Navy selected MCA Solutions' SPO RBS package, in part, because it was already in use by several Navy original equipment manufacture's (OEMs), such as Boeing and Lockheed Martin. The Navy continued to validate SPO by comparing it to existing legacy models.

While the Navy's interest in maintaining legacy systems was diminishing, OSD began supporting efforts to evaluate RBS COTS software solutions. OSD funded a Navy pilot effort, allowing the Navy to proceed with an RBS implementation.

The objective is to develop an integrated solution to spares requirements determination by leveraging both MCA SPO capabilities and legacy tools that manage data and business processes and provide a range of simulation capabilities. The long-term goal is to eliminate support for aviation and maritime legacy retail-only RBS models as well as the Navy's legacy wholesale model, replacing them with the SPO model. An additional objective is to develop a collaborative multiple-indenture, multiple-echelon (MIME) RBS process between DLA and the Navy to identify the most cost effective allocation of assets to achieve readiness goals.

The Navy RBS effort has three phases:

- Phase I: Test SPO and develop collaborative techniques.
- Phase II: Integrate new tools and techniques into aviation process.
- Phase III: Expand to maritime models and systems.

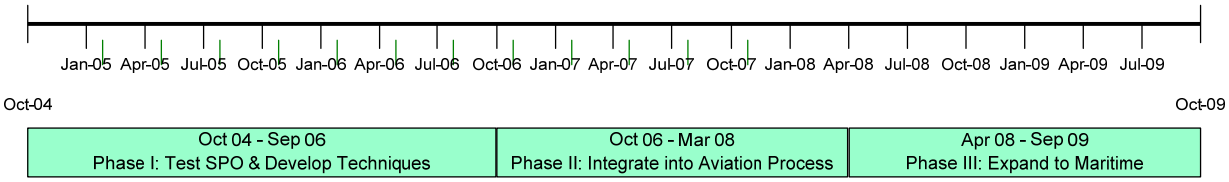
In Phases I and II, the Navy is developing an aviation MIME RBS process that utilizes SPO. This was originally prototyped with the F/A-18 and later expanded to all aviation items. When fully implemented, SPO will support organizational maintenance (O-level) and intermediate maintenance (I-level) retail aviation requirements determination for pre- and post-material support date (MSD) programs.

In addition, Phase I establishes a Navy-DLA collaboration process to develop support levels for DLA-managed items, which will form a baseline for similar arrangements between DLA and all the Services.

Phase III extends SPO capabilities to Navy maritime sparing models and support systems, supporting maritime weapon systems identified as RBS candidates. In addition, it will develop a wholesale requirements determination capability for all Navy-managed items (aviation and maritime).

Figure 3 outlines the timeline associated with Navy RBS efforts.

Figure 3. Navy RBS Efforts



AIR FORCE

The Air Force launched a modernization effort to implement an Oracle-based ERP solution, Expeditionary Combat Support System (ECSS). This solution has an RBS computational element, which is being provided by Click Commerce's Advanced Inventory Optimization (AIO™) solution. The Air Force initiated a pilot project to better understand the RBS capabilities being provided by ECSS and to determine how these capabilities could be applied. Findings from this pilot will contribute to ERP design activities.

This pilot allows the Air Force to become familiar with Click Commerce's AIO RBS engine, and to compare the AIO's MIME capabilities to the Air Force's existing RBS MIME capabilities (i.e., the Aircraft Availability Model, or AAM). The Air Force computes spares requirements using a representative range of reparable and consumable replenishment items that support the HH-60 fleet. It conducts an inventory analysis that is similar to what was previously performed, allowing the Air Force to compare AIO's performance to known RBS methods.

The Air Force pilot also analyzes the value of sharing WDT data across RBS tools in a multiple-service environment, which will identify potential benefits of joint inventory management. Since many of the piloted items are common to other weapon systems, especially Navy and Army versions of the H-60, this project addresses alternative methods for computing joint availability-based and CWT inventory requirements for multiple-service weapon systems. These methods, which are referred to as "meta-models," compute requirements appropriate to each service's wholesale and retail needs and enable DoD to coordinate cross-service inventory requirements for common weapon systems.

The Air Force's analysis has three main tasks:

- Task 1: Familiarize Headquarters Air Force Materiel Command (HQ AFMC)/A9A with AIO RBS capabilities.
- Task 2: Exercise the AIO RBS capabilities and performance for Air Force issues.
- Task 3: Develop DoD enterprise-wide RBS inventory management capabilities and evaluate performance and implementation feasibility in a joint (including DLA) environment through the meta-model.

The first task, to familiarize AFMC with AIO's capabilities and its specific configurations, was conducted from November 2006 to April 2007 and included these main activities:

- Study AIO RBS user documentation and complete training.
- Deploy AIO RBS to a server and remotely access it from the test team's work locations.
- Run AIO RBS successfully using sample HH-60G data provided by HQ AFMC/A9A to Click Commerce.
- Use the sample data to better understand AIO RBS's input and output variable definitions, requirements, and formats.

The objective of the second task is to apply an AIO RBS model to the full range of HH-60G Components. This task benchmarked AIO RBS performance against legacy Air Force RBS methodologies (e.g., AAM) and earlier AFMC/A9A HH-60G RBS study results. Task 2 started in January 2007 and will extend through September 2008. It includes the following activities:

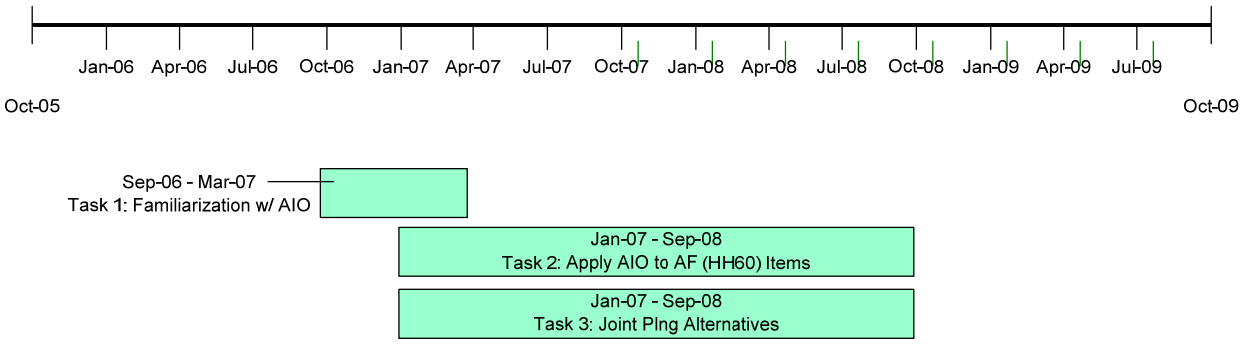
- Prepare the input data for the AIO RBS by adapting previous HH-60G RBS study inputs.
- Benchmark the AIO RBS performance against legacy tools: AFMC's Requirements Management System (RMS) and Customer-Oriented Leveling Technique (COLT), comparing the resulting outputs.

The objective of the Task 3 is to develop and evaluate alternative methods to compute joint availability-based and CWT-based inventory requirements for multiple-service weapons systems. This task will explore the use of meta-model methods to compute requirements appropriate to each service's wholesale and retail needs. This would enable DoD to coordinate cross-Service inventory requirements for common weapon systems. This task started in January 2007 and will extend through September 2008. It involves the following activities:

- Use LMI's Aircraft Sustainability Model® (ASM®) as the availability-based item meta-modeling test bed.
- Use SESAME to emulate the wholesale and depot echelons for CWT-based items and to generate WDT results for a range of CWT goals.

Figure 4 outlines the timeline associated with these Air Force RBS pilot activities.

Figure 4. Air Force RBS Pilot Activities



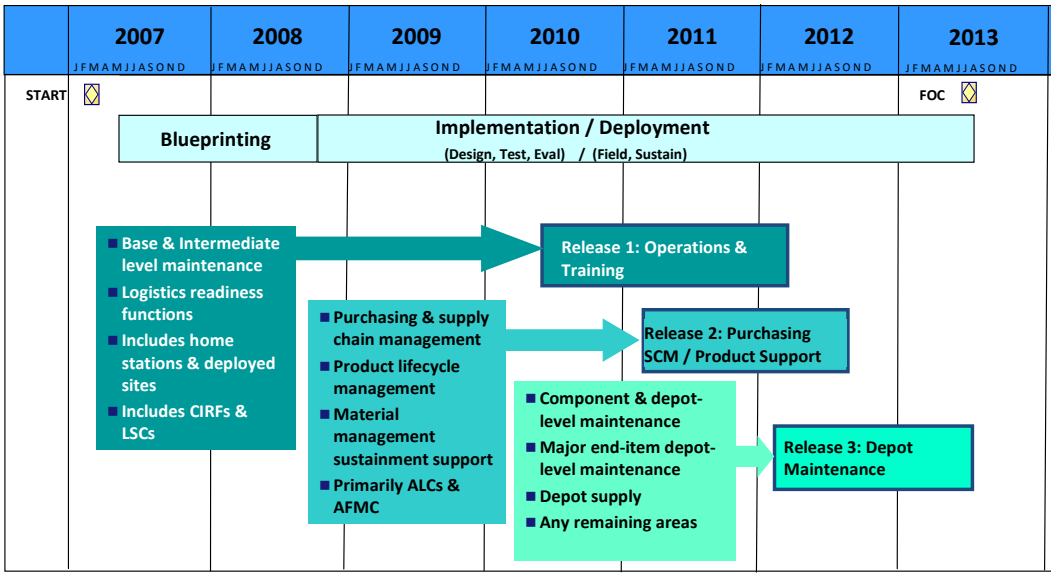
Notes: AF = Air Force; Plng = Planning.

The intent of the Air Force's pilot efforts is not to yield an operational implementation and rollout of AIO. The ECSS implementation team will manage that as an ECSS capability. The ECSS implementation will consist of a blue-printing period and be followed by implementation/deployment, when the software will be designed, tested, evaluated, and fielded. ECSS capabilities will be provided in three releases:

1. Operations and training
2. Purchasing and supply chain management and product support
3. Depot maintenance.

RBS capabilities are provided by the supply chain management solution and will be included within the second release. Figure 5 highlights the key milestones associated with the ECSS implementation.

Figure 5. Air Force ECSS Implementation



DLA

DLA is expanding its retail responsibilities through such initiatives as National Inventory Management Strategy, Joint Regional Inventory Material Management, and Base Realignment and Closure (BRAC). Addressing the need for optimizing inventory levels to support these retail initiatives, DLA launched an RBS effort that utilized JDA's Inventory Policy Optimization (IPO) solution. IPO was a logical choice for DLA because it shares a data model with the other JDA planning modules within DLA's Enterprise Business System (EBS) solution.

DLA's efforts are focused on developing a solution to replace legacy computation of statistical safety stock levels. DLA's current inventory optimization model calculates safety stock at the wholesale item level, which could not be used for planning retail levels. The new solution will allow DLA to generate multiple-echelon safety stock level recommendations for replenishment items using a readiness-based approach that can optimize using fill rates, backorder targets, or CWTs while minimizing inventory investment.

DLA's RBS effort has two major tasks:

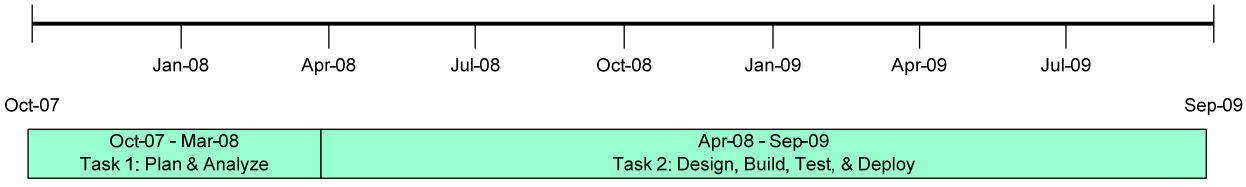
- Task 1: Plan and analyze
- Task 2: Design, build, test, and deploy.

Task 1, which was conducted from October 2007 to March 2008, defined the IPO model and developed the "as-is" and "to-be" processes for both DLA and the Services. During this task, DLA modeled a readiness-based sparing MIME network that simulated today's DLA network plus the additional BRAC items. This reflects the DLA to-be model and provides lessons learned for moving into the design and build phase.

Task 2 of the project will be conducted from April 2008 to September 2009. This task will focus on designing, building, testing, and deploying IPO as defined during Task 1. During Task 2, IPO will be rolled out to the DLA enterprise.

Figure 6 outlines the timeline associated with DLA RBS efforts.

Figure 6. DLA RBS Efforts



Department-Level Coordination

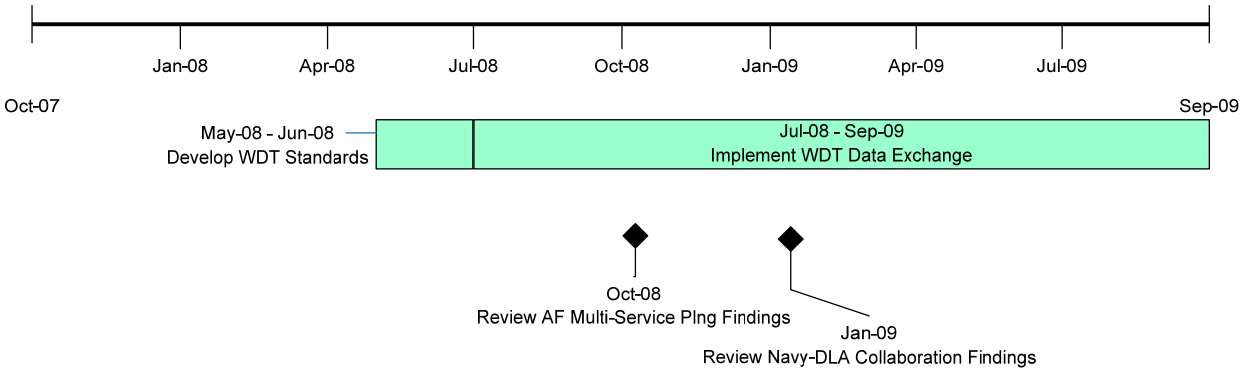
The RBS Working Group agrees that sharing WDT, as described by the end-state solution, is desirable. Analysis has shown that sharing this data can result in better RBS models that lead to greater weapon system support at the same cost. The working group has begun to coordinate its efforts on this and define the details needed to implement.

The timing for implementing WDT data exchange depends upon the extent to which each Component can provide data to other Components and their need to receive this data from other Components. The Army can provide planned WDT and will use this data, when applicable, in the RBS models. The Navy can provide WDT and could use data provided by other Components to replace the historical WDT currently used in models. The Air Force COLT model is a good operational example of the use of DLA-supplied WDTs in a legacy environment, but other Air Force legacy RBS models are now being modified to use and generate WDT. DLA currently shares WDT with the Navy and Air Force, but, because it has no weapon systems of it own, it has no need for WDT from the Services.

The RBS Working Group has identified a set of WDT data elements to be exchanged that will meet Component needs and that can be supported. These data elements are identified in Appendix A. Once implemented, the data will likely be provided in quarterly updates, but the method for data transfer is still being determined. The RBS Working Group will continue to work this issue through to completion.

In addition to initiating WDT data exchange, the Navy and the Air Force continue to examine processes that will further coordination between Components. Both the Navy and the Air Force are developing and testing collaborative processes with DLA to develop support levels for DLA-managed items. As these processes mature, they will require collaboration and standardization before expanding them across all Services. The Air Force is also continuing to analyze alternative methods for computing joint availability-based and CWT-based inventory requirements for multiple-service weapon systems. Findings from these efforts will be reviewed by the RBS Working Group and used to validate and further define the targeted end-state solution. Figure 7 highlights key activities associated with the coordinated Department-level efforts.

Figure 7. Department-Level RBS Efforts



Department-Level Oversight

The DoD RBS vision will be facilitated by SCI and achieved through coordinated efforts of the Components. This section describes the oversight of RBS activities, including roles and the project proposal process, which funds new and ongoing activities.

ROLES

RBS activities will be supported by the DoD Components and SCI at both the executive and project levels. The roles for supporting the RBS vision and achieving the implementation of modernized RBS solutions are described below.

Supply Chain Capabilities Group

The Supply Chain Capabilities Group (SCCG) is an executive body that meets bimonthly to review and address the supply and transportation challenges of DoD. The SCCG is co-chaired by the Assistant Deputy Under Secretary of Defense for Supply Chain Integration and the Assistant Deputy Under Secretary of Defense for Transportation Policy. It also has representation from the Military Services, DLA, and the U.S. Transportation Command.

The SCCG will act as the senior executive steering committee to

- provide enterprise-level guidance and help prioritize program efforts,
- consider proposals and make recommendations for new projects, while looking for joint benefit,
- review and approve common RBS metrics,
- provide necessary resources for working groups to participate in development of joint capabilities, and
- provide executive support to pilot projects within owning organizations.

OADUSD(SCI)

As the joint APS (including RBS) initiative lead, SCI will facilitate the achievement of DoD's RBS vision. In collaboration with the DoD Components and through the SCCG, SCI will engage in the following tasks:

- Develop and maintain the RBS Roadmap, which identifies the approach for implementing RBS across the Department and the coordination required to support interoperability and joint objectives.
- Facilitate the process by which Components propose RBS pilot projects, which SCI will evaluate against program objectives and goals, and administer funds for acceptable projects.
- Conduct periodic program reviews of funded Component efforts to assess progress, cost, schedule, functionality, scalability, and interoperability.
- Provide DoD policy and procedural guidance to the Components as needed.
- Identify potential roadblocks and enablers at the Department level.
- Facilitate the sharing of best RBS practices and information with regard to vendors, technology, and related areas.
- Establish metrics for success and evaluate all efforts against these metrics.

DoD Components

The DoD Components will play a key role in accomplishing Component-level RBS goals and supporting the Department-level vision:

- Propose and conduct projects that will work toward implementation of modernized RBS solutions.
- Implement modernized RBS solutions to support both Component-level goals and the DoD vision for RBS.
- Provide periodic in-process reviews and updates on RBS project activities.
- Provide resources for RBS Working Group and ad hoc subordinate teams.

RBS Working Group

The RBS Working Group was established by the SCCG to address cross-Component RBS concerns. This working group meets quarterly, is facilitated by SCI, and has representation from the military and DLA.

The RBS Working Group will

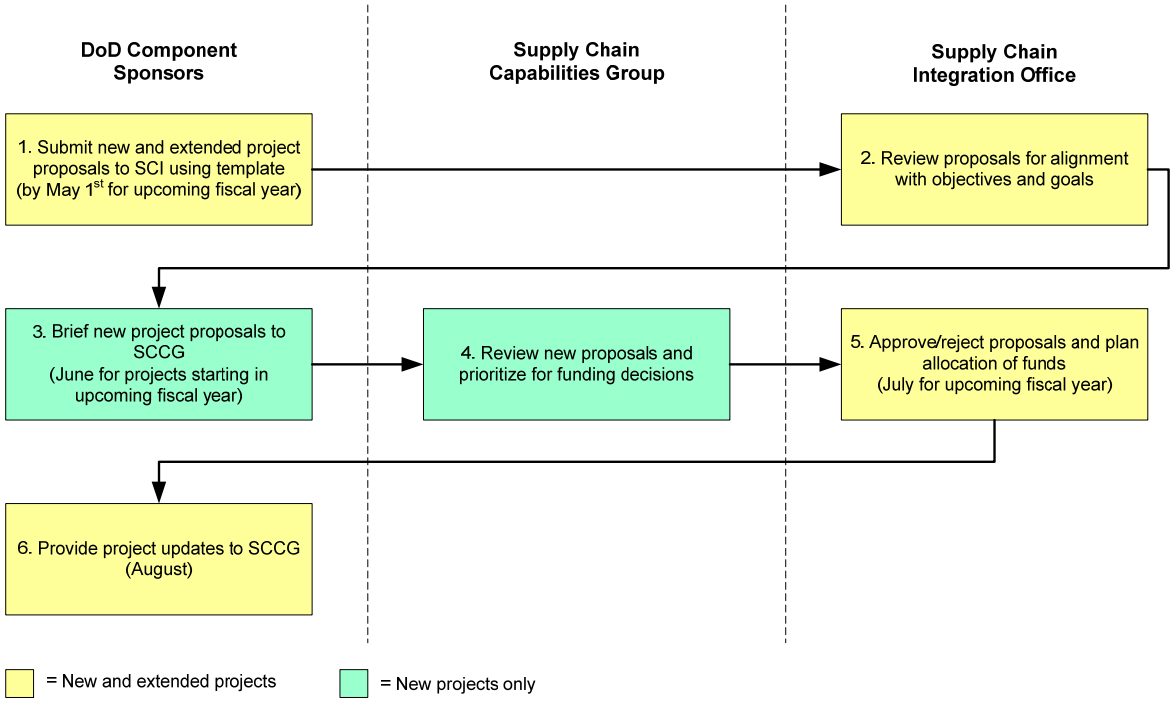
- share knowledge, experience, and research in the area of RBS;
- share progress, findings, and lessons learned from RBS efforts;
- define RBS interoperability requirements and Department-wide approach for managing and collaborating on common items;
- identify ad hoc sub-teams to address detailed technical RBS issues (e.g., data formats for information sharing, other system requirements); and
- assist SCI with development and maintenance of the RBS Roadmap.

PROJECT PROPOSAL PROCESS

To continue advancing RBS, SCI will provide research and development funding to the Components for RBS activities that align with program objectives or goals as identified by SCI. The Components will submit, on an annual basis, proposals for continued projects or new projects to SCI for consideration.

For new projects, the SCCG will consider joint benefits and make recommendations to SCI whether to fund these efforts. SCI will ultimately decide whether to approve these projects and determine allocation of program funds across efforts. The project teams will also provide annual update briefings to the SCCG, detailing the progress of their RBS activities. Figure 8 outlines this project proposal process.

Figure 8. Project Proposal Process



RBS METRICS

Monitored Metrics

Improvements in the management of spares inventory to meet goals for weapon system readiness are expected as a result of the implementation of COTS RBS software across DoD. The RBS Working Group identified a common set of performance metrics that will be influenced by RBS practice.

Many factors affect inventory and weapon system readiness, and it is difficult to directly correlate performance to a single initiative or practice. For this reason, metrics identified in this section will be monitored to ensure that, overall, performance is moving in the right direction and not being negatively affected by changes being implemented in the area of RBS.

CUSTOMER WAIT-TIME

CWT is the time from when the customer asks for an item until he receives the item. It will be measured at both the Component and DoD level. It is a metric used to show how well the customer is being supported. If the RBS implementations improve customer support, we would expect the value of this metric to decrease.

VALUE OF INVENTORY

This is a measure of the dollar value of total inventory, and a breakdown of that measure into two components—the value of weapon-system related inventory in the pipeline and the value of inventory which is not directly applicable.

QUANTITY OF INVENTORY

This is a measure of the quantity of items in inventory. It is expressed as total quantity, and also broken down into quantity of weapon-system related inventory in the pipeline and the quantity of inventory which is not directly applicable.

READINESS LEVELS

Readiness levels measure the operational capability of the weapon systems. It is measured at the Component level. A specific goal for the readiness level is the objective of the RBS model, and an improved inventory requirement system would be expected to achieve or exceed the objective. This metric will be used to measure whether the goal for readiness levels is being met.

BACKORDERS

The number of backorders is the number of orders, demands, or requisitions placed by a customer at a location that are still not filled. The number of backorders is an indication of whether or not the depth of stock at the wholesale and retail locations is adequate. The metric will be measured at all supply echelons.

Other Metrics

In addition to the monitored metrics above, the RBS Working Group identified metrics that will determine the progress of RBS implementation. Further specification of these metrics will be agreed to as measurements are put into practice.

PERCENTAGE OF ITEMS COMPUTED WITH COTS RBS SOLUTIONS

This metric would be measured at the Component and DoD level. It measures how many items are actually being managed by the COTS RBS software. This will be used to measure the progress of COTS RBS software implementation.

VALUE OF ANNUAL DEMAND

This metric measures the dollar value of demand that is being managed by the COTS RBS software. This will be measured at Component and DoD level to assess the progress of COTS RBS software implementation.

RBS ROADMAP EVOLUTION

The Military Services have long practiced readiness-based sparing to manage their spares inventory and achieve weapon system readiness goals at the lowest cost. The reliance on legacy tools to support their efforts has been a challenge to optimizing inventory across the various echelons and across the different Components. Moving forward in the development of greater capabilities and addressing cross-Component requirements may be facilitated by commercially available software.

The RBS Working Group provides a mechanism for information sharing and greater collaboration across the Components to evolve the practice of RBS across DoD. This roadmap captures a shared end-state vision and the current direction for achieving that end-state. The roadmap will evolve and the direction may change as each Component evaluates new RBS solutions, leverages newly available capabilities, and collaborates to share information in new ways. The RBS Working Group will continue to advance the practices of RBS across DoD. It will maintain this roadmap and apply the latest in best practices and lessons learned to make course corrections as appropriate.

APPENDIX A. WHOLESALE DELAY TIME DATA ELEMENTS

The RBS Working Group identified a set of data elements related to wholesale delay times that will be exchanged between the DoD Components. These data elements will support the RBS end-state solution described in this document and are identified in Table A-1.

Table A-1. WDT Data Elements for Exchange

Seq no.	Data element	Description	Field length	Char	Field options/notes
1	NIIN	National Item Identification Number—unique identifying item designator for the Sub-group Family Master (or Prime NIIN).	9	AN	
2	PICA Routing Identification Code	Identifies the PICA activity for this item.	3	AN	
3	IMPC/Management type	Inventory Management Processing Code or management type—identifies how item inventory is managed (e.g., variable safety levels, numeric stockage objective, nonstocked, direct delivery from vendor).	1	AN	REP = replenishment NSO = numeric stock objective NSK = non stock PBL = performance based logistics
4	Acquisition Lead Time	Total time including administrative and production lead time.	5	N	
5	Supply Availability	Projected supply performance based on current levels (safety level, lead time demand, buy quantity). Either requisition based or unit based.	9.6	N	
6	CONDEL	Conditional Delay Time—current average time on backorder for backordered requisitions. Analytic if possible, otherwise empirical.	15.4	N	
7	WDT	Wholesale delay time—current average supply response time, excluding transportation time.	15.4	N	
8	Inventory Position	Wholesale quantity on hand, plus due in, minus backorders.	10	N	
9	On-hand—Serviceable	Wholesale quantity serviceable on-hand.	10	N	
10	On-hand—Reparable	Carcasses awaiting repair.	10	N	
11	Annual Demand Quantity	Historical annual quantity demanded.	9	N	

Table A-1. WDT Data Elements for Exchange

Seq no.	Data element	Description	Field length	Char	Field options/notes
12	Annual Demand Frequency	Historical annual requisition frequency.	9	N	
13	Repair Survival Rate	Percent of time item comes out of repair and is not condemned (final recovery rate).	3	N	Repair Survival Rate, Repair Turnaround Time, and Leadtimes are used to determine delay time for nonstocked reparables.
14	Repair Turnaround Time	Retrograde Time + Depot Repair Time + Base Processing Time.	3	N	Repair Survival Rate, Repair Turnaround Time, and Leadtimes are used to determine delay time for nonstocked reparables.
15	Replacement (Acquisition) Price	Acquisition price.	15.3	N	
16	Repair Price	Cost to repair.	15.3	N	
17	Date	Date data was developed/pulled.	9	N	DDMMMYYYY

Notes: AN = alphanumeric, N = numeric, date.

APPENDIX B. ABBREVIATIONS

AAM	Aircraft Availability Model
AIO™	Advanced Inventory Optimization
APS	advanced planning and scheduling
ASM®	Aircraft Sustainability Model®
BOM	bill of material
BRAC	Base Realignment and Closure
COLT	Customer-Oriented Leveling Technique
COTS	commercial off-the-shelf
CWT	customer wait-time
DLA	Defense Logistics Agency
EBS	Enterprise Business System
ECSS	Expeditionary Combat Support System
ERP	enterprise resource planning
HQ AFMC	Headquarters Air Force Materiel Command
I-level	intermediate maintenance
IPO	Inventory Policy Optimization
MIME	multiple-indenture, multiple-echelon
MSD	material support date
NSN	national stock number
OADUSD(SCI)	Office of the Assistant Deputy Under Secretary of Defense for Supply Chain Integration
OEM	original equipment manufacturer
O-level	organizational maintenance
OSD	Office of the Secretary of Defense
PICA	primary inventory control activity
RBS	readiness-based sparing
RMS	Requirements Management System
SCCG	Supply Chain Capabilities Group
SESAME	Selected Essential Item Stock for Availability Method
SICA	secondary inventory control activity
SPO™	Service Planning and Optimization
WDT	wholesale delay times