Supply Chain Council Award for Supply Chain Operational Excellence

U.S. Naval Air Systems Command,

Industrial Operations Group (NAVAIR 6.0)

NAVAIR Depot Maintenance System

2003 Submission

15 February 2003

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SECTION 1: GENERAL INFORMATION AND PROJECT COMPLEXITY

A. NAME OF THE SUBMITTING ORGANIZATION

- U.S. Navy, Naval Air Systems Command (NAVAIR)

B. NAME OF THE RESPONDING ORGANIZATIONAL UNIT (SITE, FUNCTIONS, ETC.)

- NAVAIR Industrial Operations Group (AIR 6.0), Patuxent River, MD
- Naval Aviation Depot, Cherry Point, S.C. (NADEP CHPT)
- Naval Aviation Depot, Jacksonville, FL. (NADEP JAX)
- Naval Aviation Depot, North Island, CA. (NADEP NI)

C. MISSION DESCRIPTION OF THE ORGANIZATION

1) Mission Statement

"The Mission of the Maintenance Team is to maximize the material readiness of Naval air forces through management of in-service maintenance, engineering, logistics support and the performance of depot maintenance. This enables the Naval battle forces to train, deploy, fight and win with the lowest expenditure of resources."

2) Business Objectives

The Naval Aviation Depot Maintenance Team, as an integral and inseparable element of the Naval Aviation Systems Team, is dedicated to the comprehensive life cycle support of Naval Aviation Weapons Systems. The Team is focused on material readiness and reduced life-cycle cost for all systems within Naval Aviation Maintenance. The Team supports its mission by meeting the following objectives:

- Employ proven business practices and modern concept of operations to improve effectiveness and reduce costs.
- Reduce aviation repair requirements through the application of Reliability Centered Maintenance principles to improve maintenance policies, processes and technologies with the ultimate objective of minimizing the burden of maintenance requirements and maximizing aircraft availability.
- Form a direct alliance with the fleet to eliminate barriers and redundancies within all levels of maintenance. Ensure that maintenance is performed by the activities that provide the optimal reduction of out-of-service time and maintenance costs.
- Foster partnerships within DoD and private industry to maximize effectiveness within acquisition, maintenance and environmental excellence. Our operations reflect commitment to Total Quality Leadership and continuous process improvement.

- Execute infrastructure reductions mandated by law while assuring uninterrupted support to the Warfighters and the fulfillment of our obligations to our employees.

3) Product Lines

Each of the three Naval Aviation Depots (NADEP) is assigned in-service support cognizance and depot maintenance responsibilities for specific airframes, engines and cell technologies thereby facilitating single point of contact coordination for in-service support. This focus permits the Naval Aviation Depot Maintenance Team to respond to program manager and fleet operation needs.

FIGURE 1: PRODUCTS AND SERVICES BY LOCATION

	NADEP Cherry Point Rotary Wing / VSTOL	**NADEP Jacksonville** Fixed Wing East Coast	**NADEP North Island** Fixed Wing West Coast
Aircraft Rework	AV-8B, H-53, H-46	P-3, F-14, EA-6B	E-2, F/A-18, C-2, S-3
Engine Rework	F402, T58, T76, T64, T400, J79	J52, TF34, F404	LM2500
Component Repair	Dynamic Repair Rotor Blades Propellers Blades / Vanes APU / GTC Pneumatics Non-Avionics SPT Equip	Electro-Optics ASW Systems Racks / Launchers Air Refueling Stores Electronic Warfare Regional Cal Lab	CATE Instruments COMM / IFF NAV / ELEC Radar CSD / Rotating Elec. Regional Cal Lab
Technology	Vertical Flight FCIM UAV / RPV Composite Repair	EO / EW Environmental	Composite Repair Bearings Calibration Hydraulics Common ATE

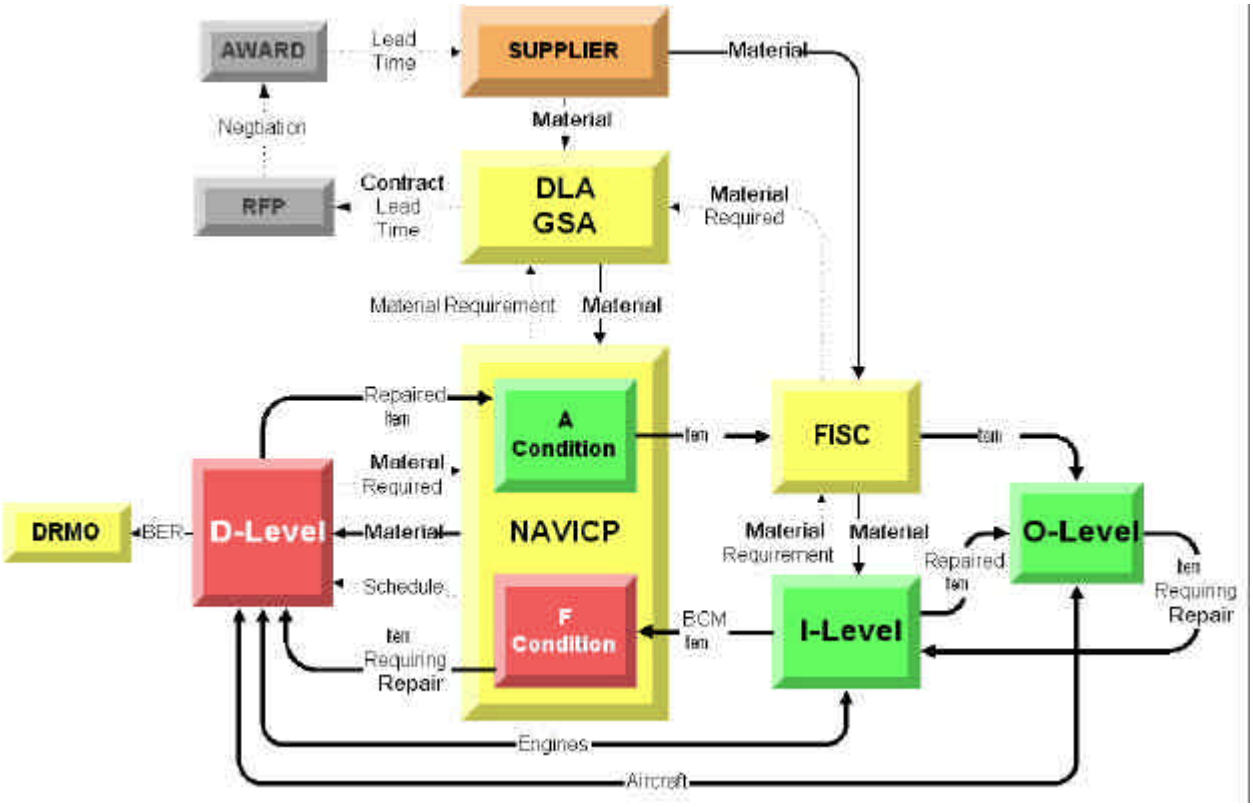
D. SUBMISSION AWARD CATEGORY

The NAVAIR Industrial Operations Group is applying for the Award for Supply Chain Operational Excellence, U.S. Department of Defense.

E. BRIEF DESCRIPTION OF THE SUPPLY CHAIN AND THE PROCESSES THE SUBMISSION SPANS.

The NAVAIR Industrial Operations Group submission is based upon their work to develop, implement and sustain the NAVAIR Depot Maintenance System (NDMS) across the three NADEPs at Jacksonville, FL, Cherry Point, NC, and North Island, CA. The NDMS Program delivers new remanufacturing philosophies, processes and tools that address major end item management, commodities repair, facilities management, advanced planning and scheduling, workload execution and support and specialized operations support (tool management, hazardous material management, laboratory management and inter-service workload tracking).

FIGURE 2: THE AVIATION REPAIR PROCESS

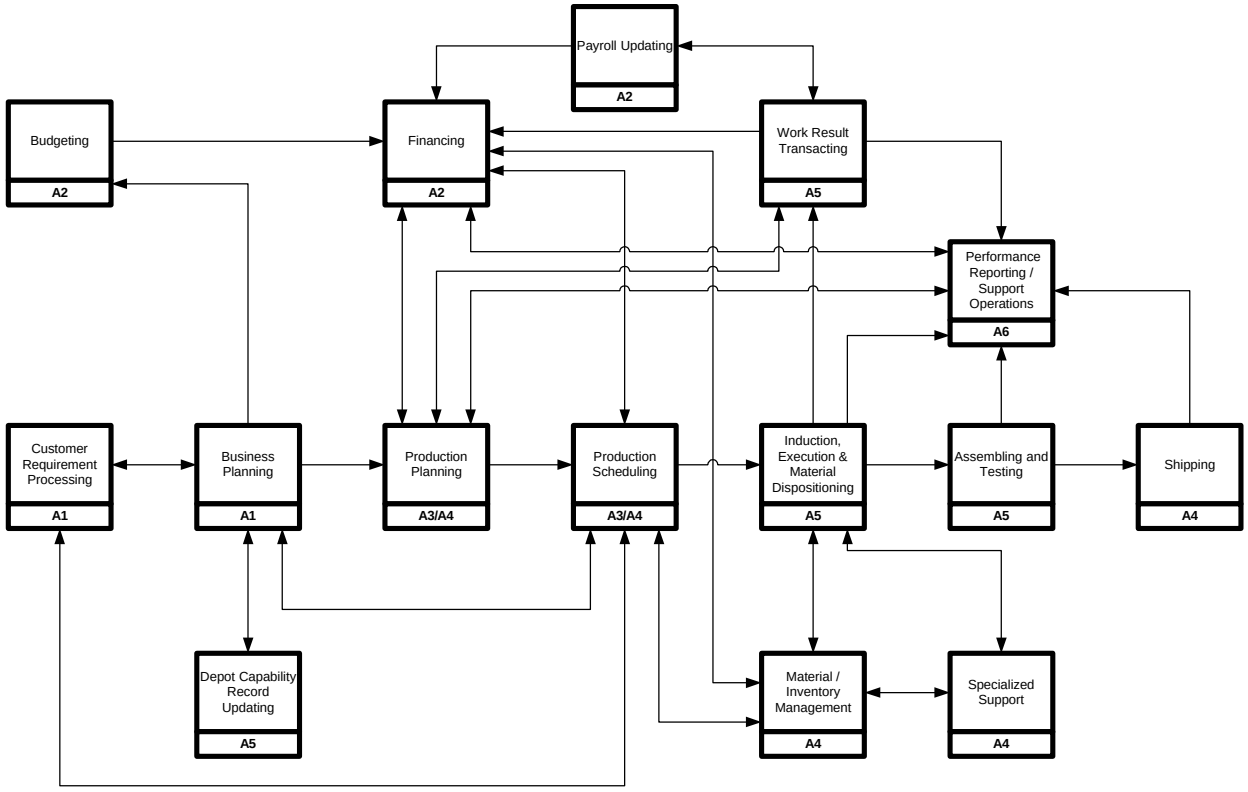


Because of the separation of Commands and missions across the Navy supply chain, a series of initiatives have been established to provide a truly integrated and transparent supply chain management solution – each under the control of its respective Command. As identified by NAVAIR, the implementation of the NDMS suite of processes and solutions across the NADEPs provides the foundation – the crucial step – for integrating the greater Navy supply chain partners.

From the initial identification of fleet asset repair requirements, throughout the detailed and complex repair and overhaul operations, and to the shipping of the assets back to the DoD Supply system, the NDMS Program modernizes NADEP processes and system infrastructure in preparation for greater supply chain integration. A key element of the NDMS Program, a commercial-off-the-shelf Manufacturing Resource Planning (MRP II) / Maintenance Repair and Overhaul (MRO) application, gives NAVAIR a highly functional platform. NDMS reduces the cycle time and cost of asset repair while delivering a stable, simple solution that will tie into NAVAIR's SIGMA Enterprise Resource Planning (ERP) and SMART ERP. The ERP encompasses the management of programs, finances, asset configurations, acquisition and human resources, while the SMART ERP encompasses the maintenance planning and management supply material initiatives.

The following figure, from the NDMS Level Zero Concept of Operations (CONOPS) identifies the functions that the NDMS Program provides to the NADEPs. Each of the functional activities listed below ties back to the business requirements document that bounds the NDMS Program and is performed by detailed and documented user processes.

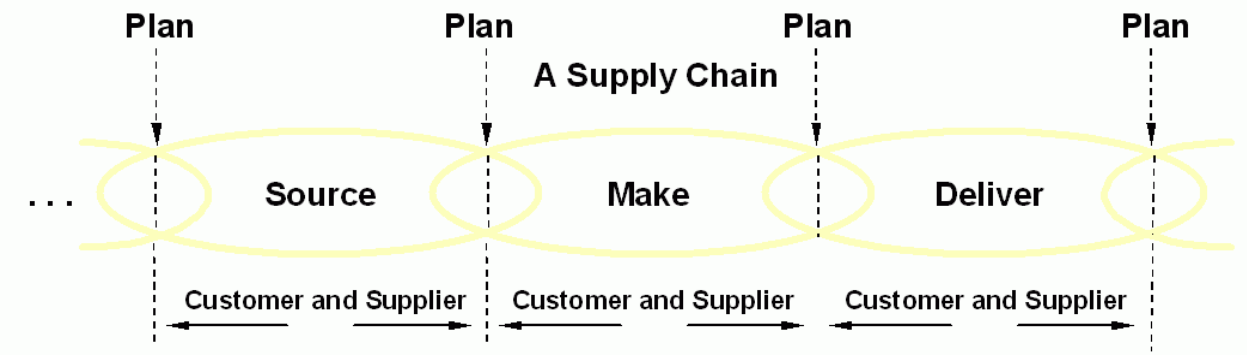
FIGURE 3: FUNCTIONAL BUSINESS PROCESSES ENCOMPASSED BY THE NDMS PROGRAM



Customer (NAVICP)

Plan: NDMS users electronically receive an extensive and highly variable repair forecast from the customer. The NDMS users then validate the repair capacity and capability, and electronically submit back to the Customer the supportable forecast. This communication allows NAVICP to source the repair requirement to the proper NADEP and external Original Equipment Manufacturers (OEM).

FIGURE 4: NDMS PROCESSES AND SOLUTIONS MIMIC THE SCOR MODEL



NADEPs

Plan: The NDMS plans all phases of the induction, repair, and shipment of assets through the NADEP. Planning includes updating the customer on the progress of repair.

Source: The NDMS provides management the information required to determine the timing and content of outsourcing and subcontracting requirements.

Supplier (NAVICP)

Source: The NDMS accesses the Supplier system and verifies that components requiring repair are available in the Supplier's inventory.

Deliver: The NDMS electronically submits an "induction schedule" to NAVICP that identifies when the NAVICP must deliver the components to the NADEP to begin repair.

NADEPs

Make: The NDMS is the information management system for all NADEP repair, manufacturing, inventory and costing activities.

Deliver: The NDMS manages the packaging and shipment of repaired assets to the Customer.

Return: The NDMS electronically submits several different types of "return" messages to the Supply system. These "return" messages notify the Supply system that 1) an end item sent for repair is unrepairable, 2) an end item submitted for repair is missing important subcomponents (which requires Supply action) and/or 3) a part purchased through Supply is being returned to vendor.

Customer (NAVICP)

Plan: Upon induction at the NADEP, the NDMS electronically submits the anticipated delivery date to the Customer's system. Interim progress reporting is performed to manage delivery expectation.

Deliver: The NDMS delivery process includes electronically notifying the Customer's system that a repaired part is being transferred back to NAVICP inventory.

The NDMS Program is used daily by over 6,500 government and contractor personnel across the three NADEPs.

F. PROVIDE THE NAMES OF THE SUPPLY CHAIN PARTNER ORGANIZATIONS (EXTERNAL) INVOLVED IN THE PROJECT.

(Indicate the numbers of people involved from each partner's organization and the functional category of each.)

- Naval Inventory Control Point, Mechanicsburg, PA

- Naval Inventory Control Point, Philadelphia, PA
- Fleet Industrial Supply Center (FISC), North Island, CA

Approximately 50 participants from the following contracting firms support AIR 6.0's NDMS Program efforts. A lead point of contact has been identified for each major contractor listed below:

- BearingPoint, Lexington Park, MD: John Dulle (15 people)
- Western Data Systems, Calabasas, CA: Mike Rappaport (15 people)
- LMTI, Jacksonville, FL: Rob Handshuh (5 people)
- Mitre, McLean, VA: Roger Woolford (5 people)
- Logtech, Dayton, OH: Cathy Cook (5 people)
- Veridian, Arlington, VA: Dean Smith (2 people)

G. PROVIDE THE NAMES OF THE FUNCTIONAL ORGANIZATIONS (INTERNAL) INVOLVED IN THE PROJECT.

(Indicate the numbers of people involved from each partner's organization and the functional category of each.)

More than 200 people, across seven NAVAIR agencies directly support the development, implementation and sustainment of the NDMS Program. A lead point of contact has been identified for each agency.

FIGURE 5: AGENCY LEADS

Agency	Lead	Number of People
NAVAIR 6.3.5, NDMS Program Management Office, Patuxent River, MD	CDR Jack Mills	7
NAVAIR PMA 203, Patuxent River, MD	CAPT Tom Cahill	5
NADEP Cherry Point (CHPT), Cherry Point, NC	Col. Eugene Conti	50
NADEP Jacksonville (JAX), Jacksonville, FL	CAPT Karl Yeakel	50
NADEP North Island (NI), San Diego, CA	CAPT Pete Laszcz	50
Project Support Office (PSO), Cherry Point, NC	Ken Collins	20
Central Maintenance Activity (CMA), Jacksonville, FL	Roger Andrews	20

H. POINTS OF CONTACT FOR EACH SUPPLY CHAIN PARTNERS.

The NDMS Program is governed by a Functional Guidance Team (FGT), which is staffed by the Program's supply chain partners. The primary points of contact for the FGT are as follows:

FIGURE 6: FGT POINTS OF CONTACT[1]

Organization	Lead	Telephone
NAVAIR 6.3.5, NDMS Program Management Office	CDR Jack Mills	301-757-3040
NADEP CHPT	Meg Gillikin	252-464-5233
NADEP JAX	Dave Dollar	904-542-2690
NADEP NI	Ron Snipes	619-545-3391

[1] Post addresses and email addresses will be furnished upon request.

SECTION 2: IMPLEMENTATION

A. WHY THE SUPPLY CHAIN INITIATIVE WAS UNDERTAKEN AND ITS SELECTION

1) Circumstances that challenged the team

The current DoD maintenance logistics environment consists of over 120 independent and component-unique legacy systems/applications supporting the DoD depot maintenance business processes. These systems were developed independently by the Components to satisfy their own unique needs and contain limited capability to be interfaced with other systems outside their respective environments. The following characteristics have been attributed to the current legacy environment:

- Contains redundant storage, redundant data processing, data inconsistency, and a lack of process automation.
- Uses older technologies that no longer effectively or efficiently support today's depot needs.
- Does not support the evolving roles of warfighting and is inflexible.
- Impairs DoD's ability to take advantage of economies of scale that exist by jointly developing systems and sharing in their operational costs.

Several factors have necessitated the push to streamline logistics processes, increase efficiency and reduce the enormous size of the DoD logistics legacy environment. These factors range from a basic change in DoD's readiness profile, to economic factors, to improvements in technology. In response, the Services have initiated several process reengineering initiatives. The four major initiatives are Lean Logistics (Air Force), Velocity Management (Army), Regional Centered Maintenance (Navy), and Precision Logistics (Marine Corps).

As part of the DoD logistics environment, the DoD Material community has an immediate need to deploy modern Automated Information Systems (AIS) to support component business process reengineering efforts with focuses on interoperability, flexibility and asset visibility. The need for an improved depot maintenance AIS is documented in the following reports and studies:

- DoD Depot Maintenance Business Vision and Strategies
- Defense Management Review Decision (DMRD) 908 and DMRD 925
- DoD Logistics Strategic Plan, 1996/1997 Edition
- Government Accounting Office (GAO) Reports

In 1995, the DoD initiated a modernization effort to make the NADEPs more competitive with commercial organizations and to set the framework for tying the NAVAIR supply chain solutions

into an integrated solution. The first phase of the modernization effort centered on providing the depots with an increased capability to support repair, re-manufacturing, manufacturing, and overhaul of depot workloads, and specifically to:

- increase control over operations,
- improve productivity and throughput,
- optimize inventory levels,
- reduce operating costs,
- optimize work-in-process levels,
- increase cost visibility and control,
- improve capacity analysis and workload prioritization and
- improve depot production and scheduling responsiveness.

The team conducting the modernization effort focused on the business philosophies, policies, procedures and supporting information technologies that the NADEPs utilized to repair and maintain NAVAIR assets. After conducting an internal and external assessment, the Joint Service Feasibility Working Group submitted the *MRP II Solution Feasibility Analysis Final Report* (3 August 1995) which concluded that a Commercial-Off-The-Shelf (COTS) MRP II / MRO solution would pave the way for the operational improvements required by the modernization program. On 21 July 1995, the Deputy Under Secretary of Defense (Logistics) (DUSD(L)) approved MRP II / MRO as the overhaul/repair management migration system for the Navy.

A MRP II / MRO COTS software package was selected through a full and open competition to provide a complete, standardized and automated overhaul/repair management system. In 1996, NAVAIR purchased a MRP II / MRO COTS developed by Western Data System (WDS) named *Compass*CONTRACT®. The solution integrates all of the production variables into one system vice the traditional stovepipe stand-alone systems. *Compass*CONTRACT® forms the core solution of the NDMS Program solution suite.

The NDMS Program enhances the business processes of the depot maintenance environment in several ways:

- Allows NAVAIR depots to conduct workload planning by negotiating workload with customers, establishing structure for workload budgeting and by maintaining forecasts of workloads against business plans.
- Improves production management by planning and authorizing work, developing project and production schedules and by assigning work to specific resources.
- Improves production execution and feedback by managing resources utilization and material usage, comparison with budgets, plans and historical information.

- Supports operations by managing quality, compliance and performance.

2) Suggestion/contribution made by the team

In the early 1990's, the DoD initiated a review of Depot Maintenance practices to see if there were potential savings to be gained by streamlining its business processes and supporting IT systems throughout the department.

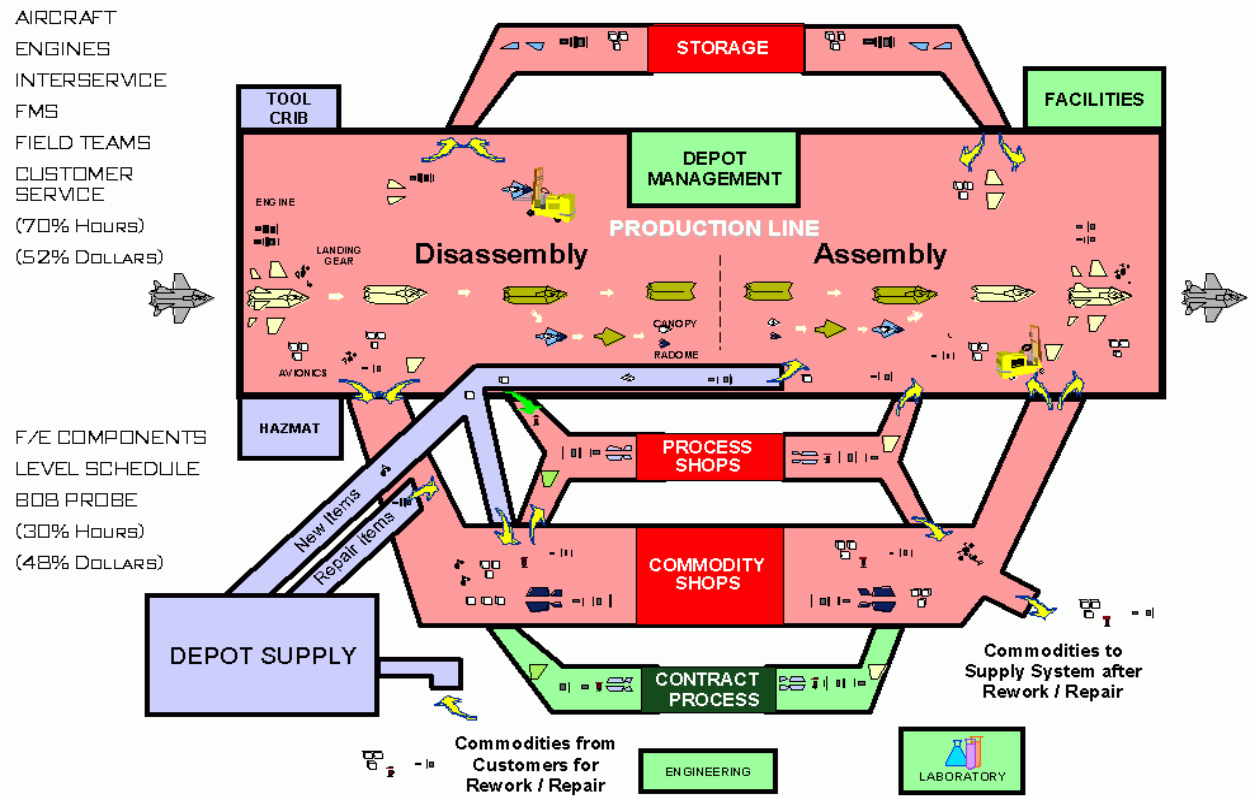
A thorough review of processes and supporting software was conducted. This effort resulted in the creation of the NDMS, which was envisioned to be a suite of existing and COTS software to support Depot processes.

The core of the system was to be a COTS MRP II package working in conjunction with a Project Management package for shop floor control of industrial areas involved in the repair of the major end items (ships, planes, tanks, trucks, etc.) and sub-elements of the major end item (landing gear for an F-14, as an example.) These core systems would then be interfaced with existing special purpose software that supported DOD unique requirements. These core systems are known as MRO and are the basis for the Depot's Enterprise Resource Planning (ERP).

3) The NAVY Supply system is the key to NADEP success.

The flow of material is the lifeblood of the depots. Whenever the flow of parts is constrained, the ability of the NADEP to perform work on time and on cost is jeopardized. The following diagram illustrates parts flow in the NADEPs.

FIGURE 7: NAVAL AVIATION DEPOT MAINTENANCE MODEL

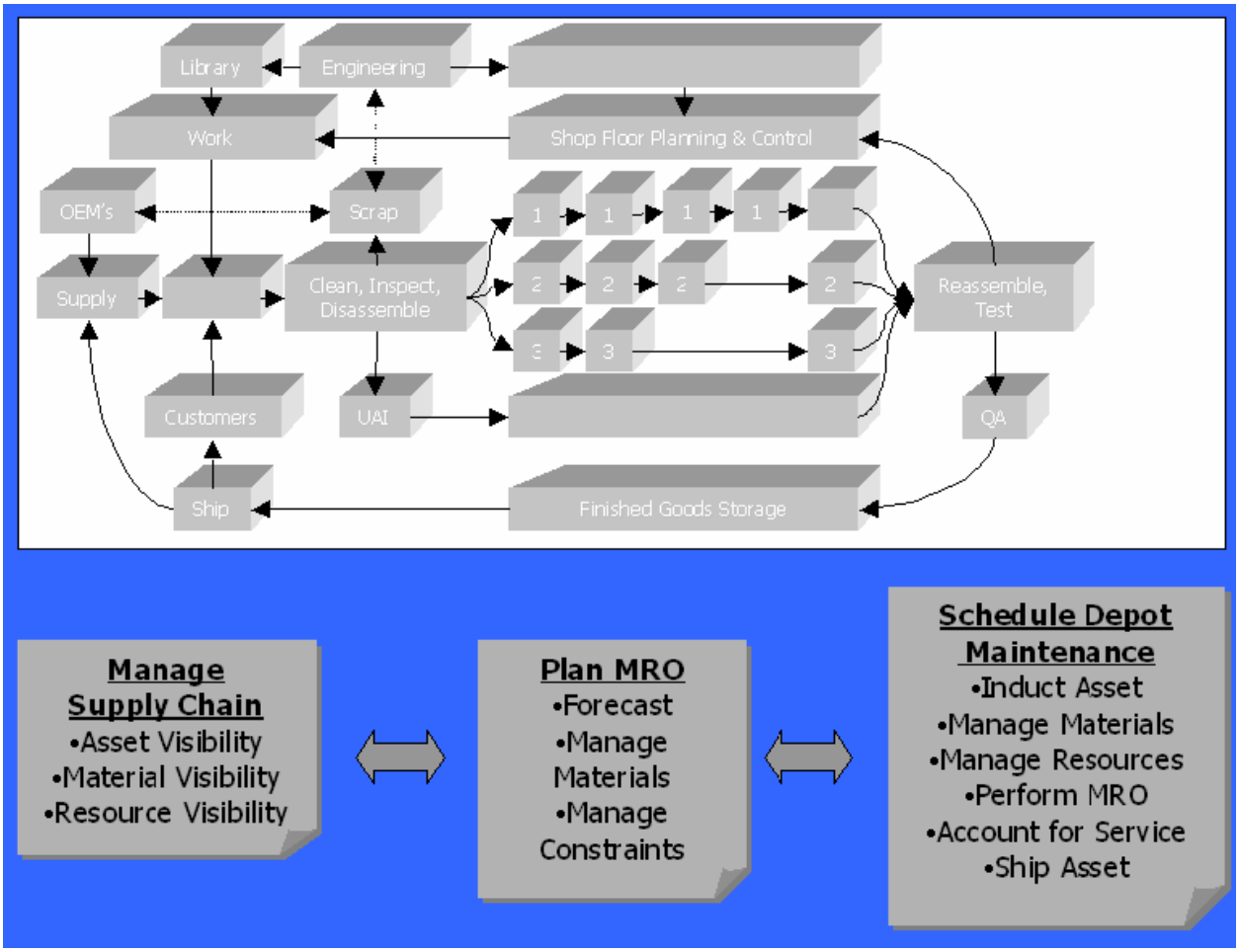


Assets requiring repair are "inducted" into the NADEP and disassembled. The disassembled sub-assemblies are sent to "back shops" for repair. The repaired sub-assemblies are aggregated and sent back for assembly. Key and critical to this process is the flow of the right material in the right quantity at the right time from Depot Supply to the "back shops". Any issue in material supply often ripples to the assembly line and the ability of the NADEP to return an airplane, engine or component back to Navy Supply and the warfighter.

4) Transformation from managing "dependant demand" to managing "independent demand"

Previously, the NADEP community operated by planning for "dependent" material and capacity requirements based on historical usage data. Since each NADEP constantly deals with changing aircraft, engine and component usage patterns and configurations, this practice led to excess inventory for many parts along with shortages of many others, capacity constraints in some areas and excess in others, unpredictable lead times and higher than necessary costs.

FIGURE 8: D-LEVEL MAINTENANCE



In the new MRP II / MRO environment, the focus has been on determining and managing Independent Demand. By accurately determining the Independent Demand (customer aircraft, engine and commodity repair requirements), the "Depot Maintenance World" can quickly identify the parts (Dependent Demand) needed from supply to complete the repair of the end-items at "lead

time away". This capability allows all supply procurement actions to be tied directly to the initiating repair requirement and identified with plenty of time to procure the needed parts. By embracing this new capability and managing the Independent Demand, a vast majority of material issues are identified well in advance and managed proactively.

The MRP II / MRO philosophy is embedded in the automated information solutions in use at the NADEP to plan workload, predict net material requirements and manage production. To reduce confusion of terminology, NDMS is implementing an application based upon MRP II / MRO philosophy. The MRP II / MRO application is called *Compass*CONTRACT®. These terms may be used interchangeably.

One of the key outputs of the MRP II / MRO calculation is a list/report of "what items that I need – and when – in order to meet my customer due dates". To perform these calculations, MRP II / MRO requires the following four primary inputs:

- **Forecast / Master Schedule of Independent Demand**: The number, type, and desired customer delivery date for independent end items. Independent Demand is entered as Sales Orders into the MRP II / MRO system.

- **Item Masters and Bills of Material**: The "ingredient list", or dependent demand, for each end item. Using the repair and replacement factors, MRP II / MRO determines the quantities and due dates for material and work order requirements that are needed to support the Master Schedule.

- **Inventory Records**: MRP II / MRO first reduces the total piece part requirements by the quantity of each item expected to be salvageable off of a incoming end-unit. Then, the items, which are available in stock or on order, are subtracted from the total material requirements.

- **Routes**: MRP II / MRO determines the workload on each of the work centers based upon the Master Schedule and the "recipe" of each end item. Allows users to plan capacity at discrete times and levels.

The MRP II / MRO calculations allow the NADEP to "backward schedule" from customer due dates to determine when procurement actions must take place. This gives the NADEP the capability to order the right quantity and kind of parts lead-time away from their actual need date on the shop floor.

NADEP use MRP II / MRO to identify all dependant demand items. This includes component, engine and aircraft material requirements. The dependant demand items for engines are identified via MRP II / MRO and aggregated by Supply to create a full picture (O, I & D-Level Maintenance) in the Parts Forecasting Model (PFM).

To identify long lead time dependent demand for Special Program Requirements (SPR) submission to DLA, prior to actual requisitioning, NADEP use PFM to forecast SPR to DLA twelve (12) quarters in advance of requirement due date. PFM gross requirement output for O, I and D levels is run through Material Availability Forecasting (MAF) to determine and submit

SPRs. For other than engine workload, MRP II / MRO replacement factor and Bill of Material (BOM) data is used to generate SPRs to DLA / NAVICP eight (8) quarters in advance. As with PFM, MPR II / MRO data generates the gross requirements and MAF determines and submits SPR quantities.

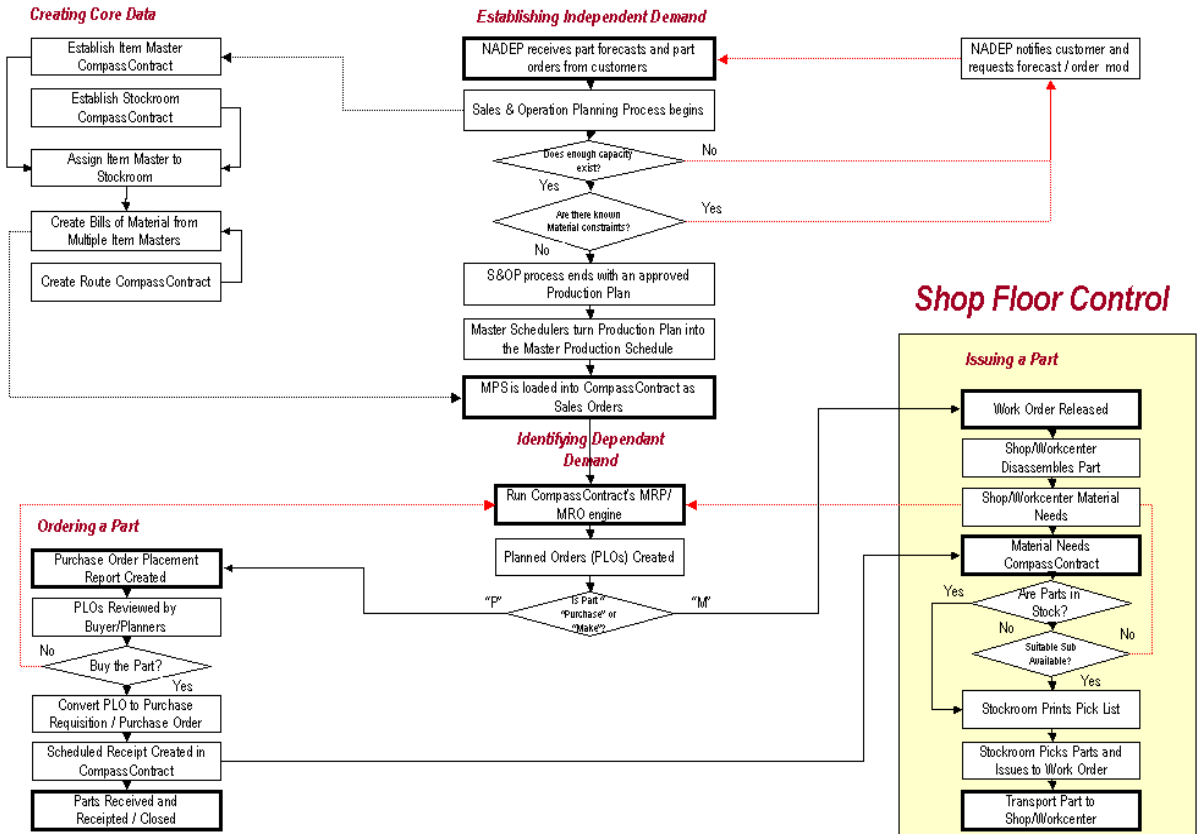
For actual funded engine submission vice SPRs, MRP II / MRO generates time-phased material requirements based upon sales orders loaded into the MRP II / MRO application. Currently, Fleet Equipment (FE) component schedules are loaded six (6) weeks prior to the beginning of the induction quarter. Aircraft sales orders are loaded one year in advance. Engines are loaded approximately six (6) weeks prior to induction.

5) Inventory / Material Management Processes In MRP II / MRO

From a NADEP perspective, Inventory / Material Management processes can be broken down into four main areas as illustrated in Figure 9:

- Creating "Core Data" in MRP II / MRO
- Establishing Independent Demand
- Identifying Dependant Demand and Ordering a Part
- Issuing a Part from Inventory (Shop Floor Control)

FIGURE 9: INVENTORY / MATERIAL MANAGEMENT PROCESSES IN MRP II / MRO



The four processes are described in detail below for a better understanding of the scope and level of integration involved.

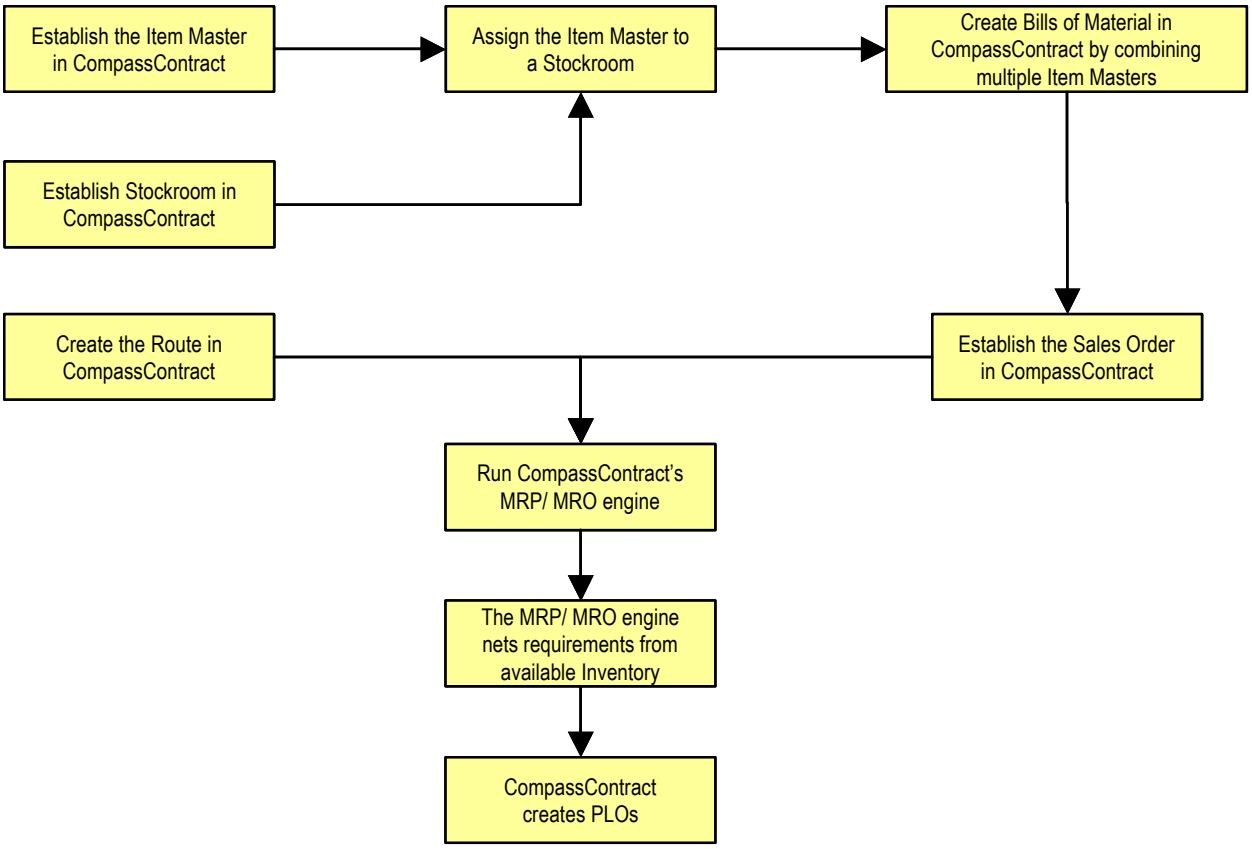
6) Creating "Core Data" in MRP II / MRO

Like any other modern automated information system, Manugistics *Compass*CONTRACT® MRP II / MRO application requires a significant amount of static data be created to initialize the application. Much of the initializing data revolves around database setup, security rules and one-time population of static data sets.

However, *CompassCONTRACT*Ò also contains a smaller set of "core data" that requires initialization and on-going, focused maintenance. These data elements are integral to the material requirements and workload planning functionality of the software. For the purpose of the FISC/NADEP Partnership, the key data elements of concern are Item Masters, Bills of Material, Stock Rooms, and routes.

The Team reviewed the process steps identified in Figure 10 for the creation and maintenance of core data in MRP II / MRO and identified which process steps would be performed by the NADEP, FISC or both teams under the potential partnership.

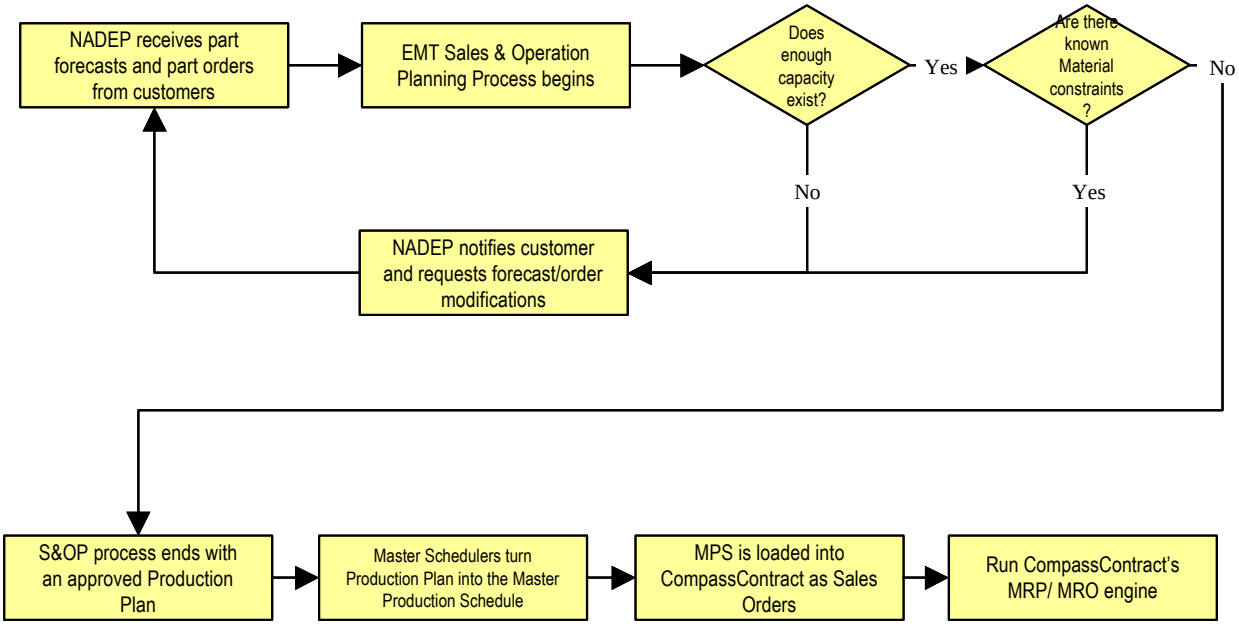
FIGURE 10: CREATING "CORE DATA" IN MRP II / MRO



7) Establishing Independent Demand

The NADEP receives different forecasts for engine, component and aircraft workload (Independent Demand) from various customers and, through a Sales and Operations (S&OP) process, aggregates the forecasts, performs rough-cut capacity planning, and high-level material supportability reviews before loading the Independent Demand into *Compass*CONTRACT®. The S&OP process provides the NADEP an entity (the Enterprise Management Team) that has higher authority than the Program/Product Lines and focuses on optimizing the NADEP enterprise rather than a single Program or Product Line.

FIGURE 11: ESTABLISHING INDEPENDENT DEMAND



8) Identifying Dependant Demand and Ordering a Part

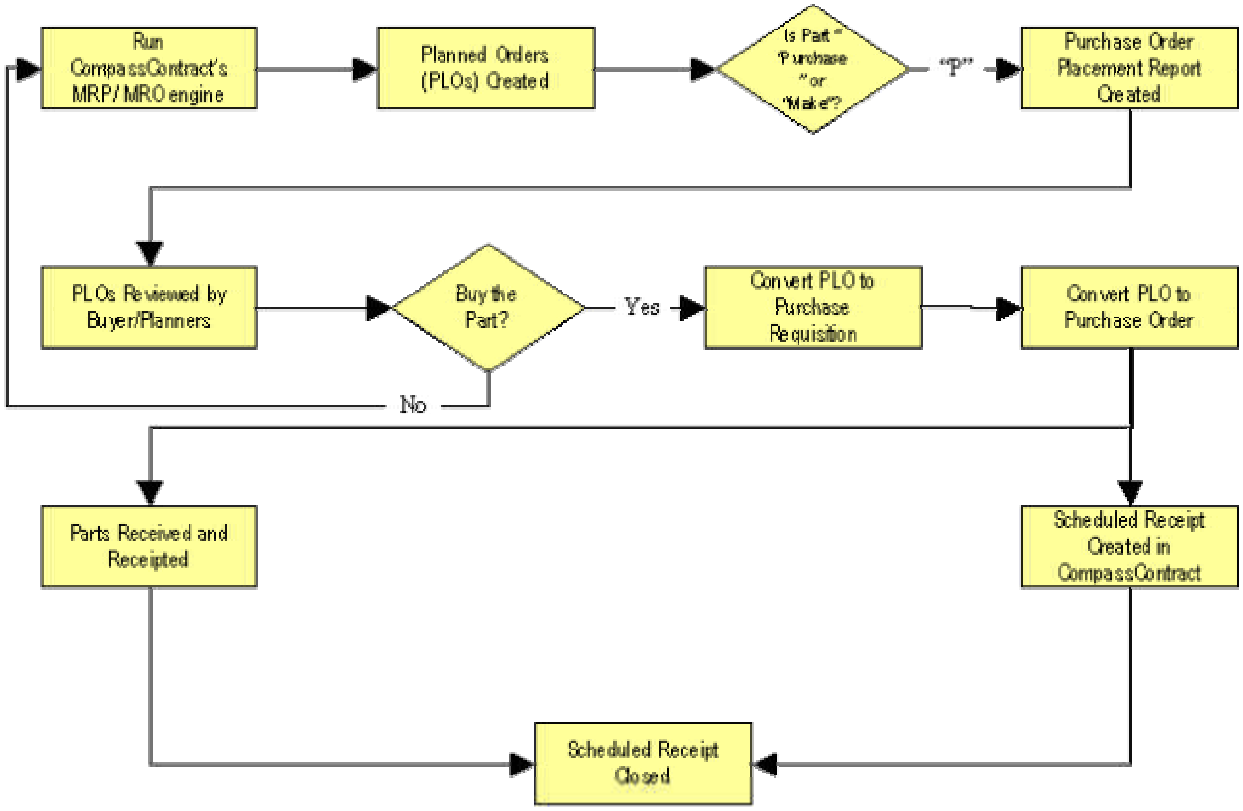
Once Independent Demand has been established in *Compass*CONTRACT® and the MRP engine is run, the MRP II / MRO application calculates and reports the material requirements (dependent demand) needed to perform the repair workload. The process illustrated in Figure 14 identifies the individual steps the NADEP perform to identify what parts need to be procured and how they order needed parts.

The FISC/NADEP Partnership will have to obligate a considerable amount of funds to procure all dependant demand identified on the POPR. While there remain issues on the amount of financial risk that Supply is willing to accept, current paradigms grudgingly accept a high cost of inventory but constrain the amount of funds committed to open purchase requisitions / obligations.

The new paradigm would change to having a high value of open purchase requisitions / obligations for dependant demand items and little in on-hand inventory. Because MRP II / MRO determines what parts are needed and when, purchases made at lead-time should arrive just in time to be used by the NADEP. This philosophy supports lower inventory levels but often only after

the organization has committed to ensuring that incoming supply is certain and known (meaning, that all known material requirements not in stock are on purchase orders).

FIGURE 12: IDENTIFYING DEPENDENT DEMAND AND ORDERING A PART



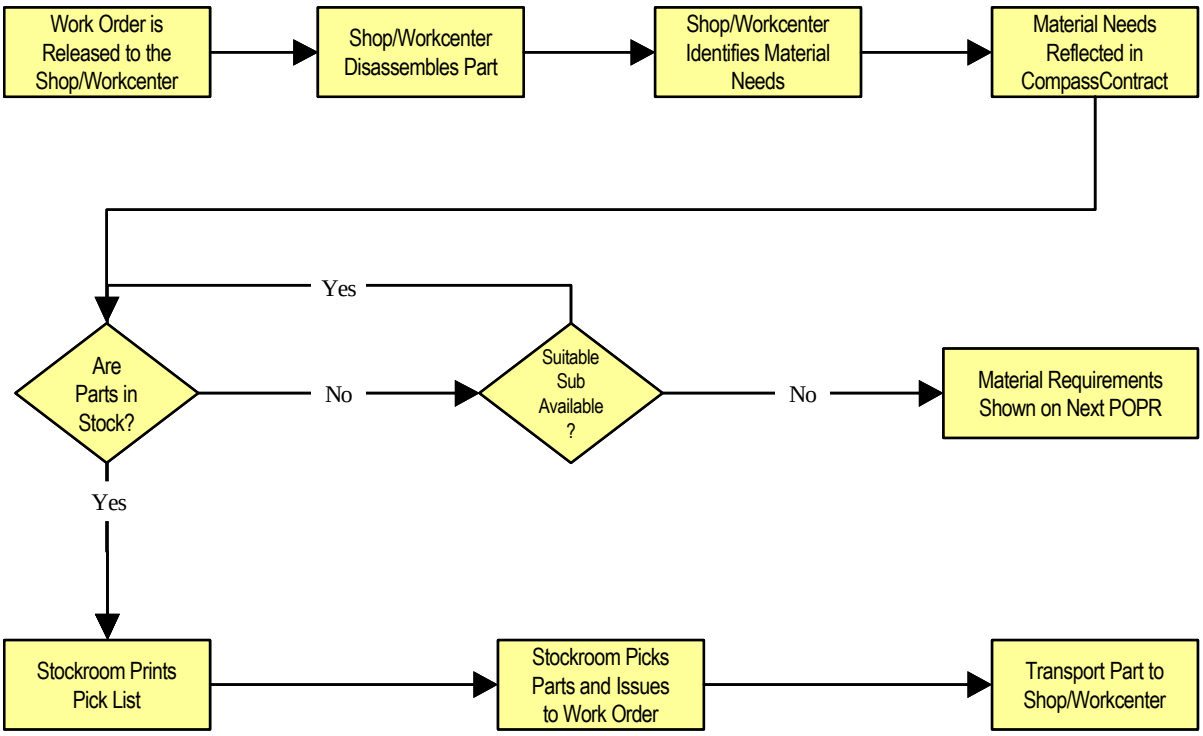
9) Issuing a Part from Inventory (Shop Floor Control)

Once a part has been ordered and confirmed to stock, the final step is to move it from stock, issue it to a work order and move the part to the shop floor to support production. Up until this time, planning parameters established in the BOM, workscope codes and repair & replacement factors have driven the requirement for a part. However, the actual issuing of a part from stock occurs only after a repairable item has been torn down and dispositioned and the actual material requirements have been identified by a NADEP employee.

At NADEP, the process calls for employees to use a "Type 4" work order during the teardown and disposition (T&D) process. During T&D, depot personnel review the Type 4 work order and identify which parts need to be added to the work order to complete the repair.

Recalling that up until issue a material the planning parameters (namely repair & replacement factors) heavily contribute to material requirements that are identified on the POPR, the NADEP are attempting to develop an automated process to quickly update repair & replacement factors based upon historic and/or trend data. Figure 13 depicts the high-level "to be" process for issuing a part from inventory.

FIGURE 13: ISSUING A PART FROM INVENTORY (SHOP FLOOR CONTROL)



B. INDICATE THE DURATION OF THE PROJECT.

(Note if the project was a pilot that is being rolled out. Note if the project is ongoing or still in development.)

The NDMS Program's roots go back to 1995 when the DoD established the Joint Logistics System Center (JLSC) at WPAFB, Dayton OH to modernize the DoD repair agencies through business process reengineering and "best of breed" COTS implementations. While the NADEPs were involved with the Program during the first few years, system implementations didn't commence until 1998.

NDMS implementation activities continue at NADEPs Cherry Point and North Island and have completed at NADEP JAX. Approval was granted to proceed with implementation of the NDMS to NADEPs CHPT and NI based on a successful prototype of the system at the NADEP Jacksonville Initial Operating Site (IOS). Figure 14 identifies the beginning and end date for the NADEP implementation activities.

FIGURE 14: SITE IMPLEMENTATION DURATION

NADEP	Begin	Actual End Date	Projected End Date
Cherry Point	Jul-98	Jan-03	N/A
Jacksonville	Mar-98	Sep-01	N/A
North Island	Nov-98	Sep-03	N/A

Once a NADEP achieves the exit criteria established for Final Operational Capability, the NDMS Program moves into the sustainment phase at that NADEP.

C. DESCRIBE IN DETAIL THE PROCESS USED TO COMPLETE THE INITIATIVE.

FIGURE 15: NADEP SCOR CARD

A SCOR Model Contains:	NADEPs
Standard descriptions of management processes	✓
A framework of relationships among the standard processes	✓
Standard metrics to measure process performance	✓
Management practices that produce best-in-class performance	✓
Standard alignment to software features and functionality	✓

As the concept of the Depot Maintenance System was developed, NADEP JAX recognized the need to develop a Concept of Operations (CONOPS) or a set of high-level business processes that would serve as the basis for the rules to be automated through the COTS system. Gaining clarity and consensus regarding the CONOPS was both essential to success and difficult, with four armed services involved and a host of separate corporate cultures within each service. Nonetheless, the developed CONOPS has served a very useful purpose as a guidebook for the effort. The CONOPS began as a graphical depiction of the notional repair process, and then conceptualized into a flow diagram, and then the functionality was allocated to various systems, which is our CONOPS today. It provides the roadmap for functionality and connectivity links to the NAVAIR ERP system.

Procurement of the COTS software package was awarded to Western Data Systems in early 1996 as an ACAT-1AC program. NAVAIR selected the NADEP JAX as the IOS and proved out the concepts of NDMS. By re-engineering existing business processes and developing the necessary interfaces between systems NADEP JAX attained Initial Operating Capability in December of 1998. By April of 1999, the Avionics Strategic Business Team (SBT) was operating exclusively under the MRP II / MRO system, with interfaces maintaining parallel continuity within the legacy environment. Since then, the entire facility, representing 100% of the Depot's workload, has switched over to MRP II / MRO and has shut down the legacy Workload Control System (WCS) as planned by 1 Oct 01.

A key component of this innovative approach primarily consists of adapting MRP II to a repair environment. Repair is similar to manufacturing except that the incoming carcasses are raw material for finished product and carcass conditions are unknown. Each carcass has variable material and repair requirements.

Specifically, the new approach is being used to modernize business processes and tools in order to improve depot production throughout while reducing material and operating costs. With the fundamental forward-planning capabilities of MRP II, enhanced with the important new MRO specific planning and management capabilities, NADEP JAX can now more effectively forecast future material and capacity requirements based on actual projected workloads from the Fleet.

Material planning must account for the percent of time that parts are evaluated as Serviceable, Scrapped and Purchased, Routed and Repaired, Missing on Induction (MOI), or designated as

Material Review Board (MRB). Capacity planning must account for the variable occurrence of some process steps and the percent of time that a repair process occurs.

Work Scope Codes enable the user to define specific requirements unique to the re-manufacture of an assembly, dependent on the type or level of work to be performed on the item. Different customers have different needs. Repair and Replacement Factor Planning provides the ability to calculate the percentage of time the item is restored to serviceable condition (repaired), and the percentage of time an item is replaced. The Anticipated Supply Process (ASP) predicts the quantity of material from tear-down that can be re-used in the re-build process, and works in conjunction with MRP to ensure an accurate material plan using Occurrence Factors on the routers, based on work scope code, to plan capacity.

Repair ID Cross-Reference provides the ability to link the specific work orders to the respective sales order line item delivery schedule via the repair identification number that is important for the Anticipated Supply Process. The Teardown & Evaluation Bench allows the user to determine which parts on an assembly are serviceable, scrap, missing or require repair. This allows the user to take appropriate action: develop a purchase requisition, place an item into inventory, create a work order, or zero-out requirements relative to the specific components.

A much more accurate projection of needed parts can be ordered in advance, with on-hand and ordered inventory being monitored on a daily basis to closely balance the supply of discrete parts to actual requirements as they become known at induction. At the same time, shop floor priorities can be closely aligned to deliveries, with capacity bottlenecks being identified and resolved before they cause major delays.

The on hand material inventory is managed in 32 separate satellite storerooms. The work is tracked through the client server network consisting of over 1600 PC based transaction devices and support PCs that handle planning, scheduling, and material. We have instituted MRP II methodology for forecasting demand efforts to reduce inventory-carrying cost. The FISC performs a MAF program for worldwide availability inquiry of our MRP runs. The percentages of material that we purchase from various sources is: DLA: 74.2%; ICPs 16.9%; GSA: 5.6%; other: 3.3%.

1) Challenges Of The Repair Environment

The sheer scope of the effort and the legacy environment cause the smooth rollout of a new system to be a daunting challenge. Having completed the implementation and now entering the sustainment phase, NADEP JAX has well over 300,000 individual part numbers in the Item Master data base, and over 50,000 routers with 400,000 labor lines to maintain. The construction of BOMs for the components flowing through the Depot is complicated by the large number (over 10,000 to 12,000 separate end items per quarter) and by the wide schedule variability. Our highest volume repairs are focused on only 1,000 or so part numbers of the 31,000 in our database for which we maintain capability. This represents a large amount of data regarding BOMs, routers and inventory, which must be maintained accurately for the system to be effective.

The repair processes and related work centers of the repair site were structured as ‘flow’ shops, which dictates a large number of moves and changes of setups across common processes and equipment. This also made segregation of product lines during cut-over from legacy systems to

MRP II / MRO more difficult. As a mitigation of this structure, an interface that allowed the collection of data in both systems simultaneously was developed, and the 'slice' phase-in plan sought to cut-over the most self-contained areas first.

The need to operate in parallel with the rest of the Navy and DOD as implementation progressed was another requirement. Since all other NADEP and DOD repair sites were (and still are) operating with legacy principles and systems, finding ways to exploit new business rules and adopt new business processes with our suppliers (the Defense Logistics Agency) and our own service stakeholders (the Navy supply system, which receives the repaired components and the fleet headquarters that receive our completed aircraft and engines,) was difficult. In essence, the attitude could be expressed as 'Why should I have to change?'

Our suppliers are beginning to see the logic behind buying in to our forecasts, and our customers are seeing improved performance since the early stages of our implementation.

Maintaining consensus and agreement regarding the business processes during an extended implementation by three geographically separated organizations adds another challenge to implementation. Close coordination, frequent meetings, and extraordinary amounts of email have mitigated the tendency to let the focus on the effort diffuse. Close management attention from the very top down through the separate implementation teams themselves has made the difference in this continuing struggle.

D. IDENTIFY SIGNIFICANT CHALLENGES ENCOUNTERED, THE PROCESS FOR RESOLUTION, AND THE SOLUTIONS.

(Identify any best practices employed or developed)

The NDMS Program followed DoD-mandated project management techniques and processes to control the cost, schedule and performance of the acquisition, development and deployment effort. The efforts can be broken up into planning, execution and control functions.

1) Planning

When the NDMS Program was established by the DoD, it was categorized as a ACAT 1AM program (later re-designated as ACAT III). This categorization required the NDMS Program to build a series of inter-related planning documents that defined in growing detail the requirements, scope, content, project management and deployment plan for the Program. Each of these plans would be staffed through the Program Executive Officer and a Milestone Decision Authority before the Program could proceed to the next milestone. The following table contains a list of the major planning documents developed by AIR 6.3.5's NDMS Program Management Office (PMO) to guide the NDMS effort. This list is not comprehensive.

FIGURE 16: NDMS PLANNING DOCUMENTATION

DoD-Mandated Planning Documents	Non-Mandated Planning Documents
NEED STATEMENT Operational Requirements Acquisition Program Baseline (APB) Project Plan Resource-Loaded Project Schedule	Change Management Plan Configuration Management Plan Site-Specific Training Plans Data Migration Plan Sunset Transition Plan Concept of Operations (CONOPS) Success Management Plan Communication Plan Information Technology Management Plan Lifecycle Management Plan

Additional planning documents were generated as needed by the site implementation teams to further guide the program activities.

2) Execution

While Program Management is performed centrally by AIR 6.3.5, deploying the NDMS Program rests mostly with three, site-level implementation teams. These teams consist of functional and technical Subject Matter Experts from the site supported by the site's management team. The site implementation teams are responsible for following the planning guidance of the NDMS PMO as they perform detailed process reengineering and system implementation activities.

Each of the NADEPs followed the same implementation path:

a) **Conference Room Pilot**: During the CRPs, the site implementation teams learned the "vanilla" NDMS solution set and then built the detailed, role-based processes that they would utilize to execute their MRO tasks via the NDMS Program.

b) **Slice Implementations**: Rather than perform a one-time, "big bang" deployment of the NDMS applications and processes across the NADEP, each implementation team followed a "slice" approach. Under a "slice" approach, segments of the NADEP's business are transitioned to the NDMS Program at different times over the life of the implementation program. This approach allows the implementation team to focus their efforts, reduce the risk of failure, achieve implementation successes earlier than a "big bang" approach and perform implementation with fewer overall resources.

3) Control

The NDMS Program is subject to many reporting requirements from DoN and DoD agencies. No less than every quarter, the NDMS Program must submit specific and detailed progress reports as part of the ACAT acquisition reporting cycle. Additional "ad hoc" reporting data calls are placed on the NDMS Program on a continual basis so that DoN and DoD agencies can control the overall information management portfolio.

Internally, the NDMS PMO and NADEPs established several controlling functions and processes to manage scope, cost and performance. While there is daily communication between the

implementation site teams and the PMO, the following are three very specific, planned events that are used to control the NDMS Program:

a) The NDMS Functional Guidance Team (FGT) consisting of supply chain partners/stakeholders meets on a bi-monthly basis to review and solve program issues that have been elevated to the leadership team for conclusion.

b) The NDMS Program reviews a monthly progress report generated from input across the Program that identifies schedule progress, issues/risks and miscellaneous program activities.

c) The NDMS Program holds a bi-weekly Video Tele-Conference that is attended by the major agencies involved in the site implementations. During these VTC's, specific site issues are discussed, lessons learned are identified and shared and interim progress reports are provided.

4) Overcoming a Competitive Past

While each of the NADEPs support the overall NAVAIR mission, their corporate pasts placed them in direct competition with each other for work and resources. While this created some minor teaming difficulties for the NDMS Program, it had a significant impact on the Program's ability to export process improvements identified and created by one site to the other two sites. The level of distrust and/or belief in another depot's technical/functional ability initially made it difficult to build upon lessons learned, bring the depots to consensus on major issues and deal collectively with the other members of the Navy supply chain.

To tackle this issue, the NDMS Program brought each of the NADEP implementation teams together for a five-week Gap-Fit Assessment beginning in August 2001. During the Gap-Fit Assessment, the NADEPs were required to present to each other the detailed procedures that they had developed during their CRPs. During this review, the NADEP teams discovered that over 90% of their established – highly detailed – processes were the same. They also identified first hand "best business practices" being performed at their sister NADEPs that they desired to adopt. Since this event, the NADEPs have gained a new respect for each other's capabilities and have worked actively to support "corporate" initiatives that will benefit all NADEPs.

5) Data Accuracy and Timeliness

To achieve high levels of process automation, functional efficiencies and asset visibility, the NDMS Program's solution set consists of interfaced, real-time commercial-off-the-shelf systems. While the NDMS Program has based part of its business case analysis on the benefits of its interfaced architecture, the same architecture poses challenges to realizing these benefits. Soon after implementing the NDMS Program, the NADEPs and supply chain partners discovered the disruptive effects of poor data and data that was not entered on time.

NDMS Program experienced significant confusion (and cleanup costs) when data entries made incorrectly in one application were promulgated through its other applications. Cleaning up the bad data required scouring multiple system databases and reversing multiple transactions.

The NDMS Program has also discovered that in real-time systems, data that is not entered on time can be as costly as incorrect data. Several times, transactions have "accumulated" at positions in the supply chain while work and material have physically moved through these positions (leaving

the paperwork behind). The transaction backlog confuses the messages users receive from the system, delays downstream activities, "locks out" other activities from occurring and misrepresents the actual status of material.

To overcome this challenge, the NDMS Program has undertaken two activities. First, system users have been given rudimentary education on real-time, relational databases. A basic understanding of how data is shared and passed across the data architecture has caused users to be more careful and consistent in their data transactions. Second, data validation checks have been built into user-defined fields. By using data validation at the point and time of entry, incorrect data is automatically caught and corrected before it is committed into the applications.

6) Managing Simultaneous Implementation and Production Activities

The NADEP mission, planned and unplanned NAVAIR/DoD workload and Title 10 (10 U.S.C. 2462) limitations on non-Federal Government personnel workload for depot-level maintenance and repair requires the NADEPs to continually maintain production activities. Additionally, few commercial counterparts possess the tools, skills, capacity and/or expertise to accomplish DoD repair and overhaul work. Any halt to production, no matter how temporary, detrimentally affects Naval Aviation and interservice customers and reduces their operational mission capability. Given this backdrop, the NDMS Program had to define and execute an approach that incrementally replaced the processes and systems within the NADEPs and supply chain partners to plan, execute, manage and report repair workload without negatively impacting production levels.

Maintaining production while implementing the NDMS Program necessitated operating the legacy Workload Control System (WCS) and performing "dual data entries" over a four year span. It also required detailed data migration, sunset, communications and information technology planning to ensure NADEP leadership and supply chain partners that all of their production concerns were identified and mitigated. While the incremental "slice" implementation reduced overall risk, it placed an extra burden on the system users and database administrators. Despite these hardships, the NDMS Program has been able to implement its processes and systems without negatively impacting production levels during the deployment phase.

E. INDICATE THE METRICS USED TO MEASURE PROGRESS AND SUCCESS.

The NDMS Program focuses on the following metrics to determine progress, operational performance and degree of success.

- Turn Around Time (TAT)
- Required Delivery Date (RDD)
- Part Numbers (IM Records in MRP II)
- Controlled Inventory Turns
- Controlled Inventory Accuracy
- Controlled Inventory effectiveness

- MRP II BOMs (PSF Records)

F. DOCUMENT AND QUANTIFY COST AND PERFORMANCE BENEFITS.

1) Return on investment

The NDMS PMO developed the metrics in conjunction with the NADEPs and supply chain partners to measure the progress and success of the initiative's implementation across the NDMS community.

FIGURE 17: THE MEASURE OF SUCCESS

SCOR Level One Metrics		
Performance Attribute	**Level 1 Metric**	**Wins**
Supply Chain Delivery Reliability	Delivery Performance Fill Rates Perfect Order Fulfillment	✓ ✓
Supply Chain Responsiveness	Order Fulfillment Lead Times	
Supply Chain Flexibility	Supply Chain Response Time Production Flexibility	✓ ✓
Supply Chain Costs	Cost of Goods Sold Total Supply Chain Management Costs Value-Added Productivity Warranty/Returns Processing Costs	 ✓
Supply Chain Asset Management Efficiency	Cash-to-Cash Cycle Time Inventory Days of Supply Asset Turns	 ✓

a) Progress Metrics

In addition to schedule and cost variance, the NDMS Program identified, tracks and reports metrics specifically developed to monitor the progress of the implementation activities. By monitoring the metrics identified below (Figure 18) on a monthly basis, the NDMS PMO and supply chain partners receive a detailed and objective snapshot of implementation progress. The NDMS Program expects growth in all of the progress metrics each month.

FIGURE 18: NDMS PROGRESS METRICS REPORTED JANUARY 2003

Metric	NADEP JAX	NADEP CHPT	NADEP NI
Part Numbers in NDMS	292,026	228,890	414,554
Inventory Records in NDMS	325,171	359,196	233,119
BOMs in NDMS	192,010	185,117	236,979
Routes in NDMS	58,225	87,992	83,328
Inventory Accuracy	Unavailable	78%	95.7%
Inventory Effectiveness	96.4%	87%	83.4%

To ensure objectivity in the progress metrics, data points are drawn directly from the NDMS application "production" (live) databases by site database administrators.

b) Success Metrics

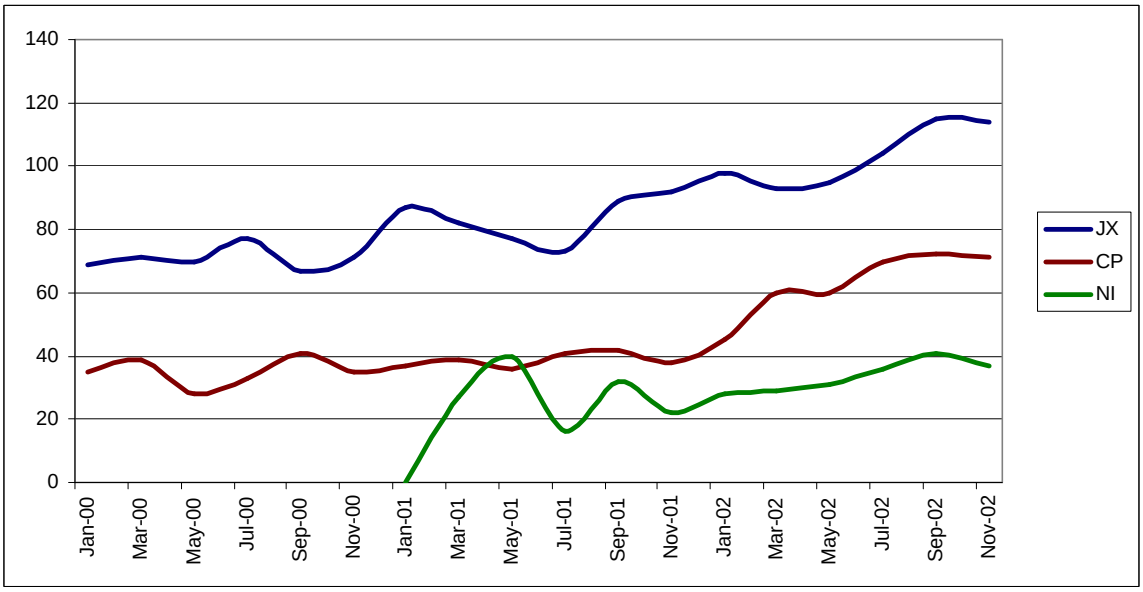
While it is important to monitor the progress of NDMS implementation activities, the above metrics do not guarantee overall program success. The NDMS Program Economic Analysis[2] objectively defines the anticipated payback and benefits of the program. To measure the success of the NDMS Program and verify if it achieves its anticipated ROI, the NDMS Program and supply chain partners defined and track a series of operational metrics. Of these operational metrics, the following metrics best reflect the impact that the NDMS Program has on the supply chain.

- Turn-Around-Time: Turn-around-time, in days, from inducting an end item for repair to shipping the end item to the customer.
- Deliver to Promise Date: Percent of time an end item is delivered on or ahead of its promise date.
- Inventory On-Hand: Dollar value of inventory on-hand.
- Total Production : Total number of products repaired.

Each one of the following success metrics is discussed below.

i. Turn-Around-Time

FIGURE 19: NDMS PROGRAM TURN-AROUND-TIME (IN DAYS)



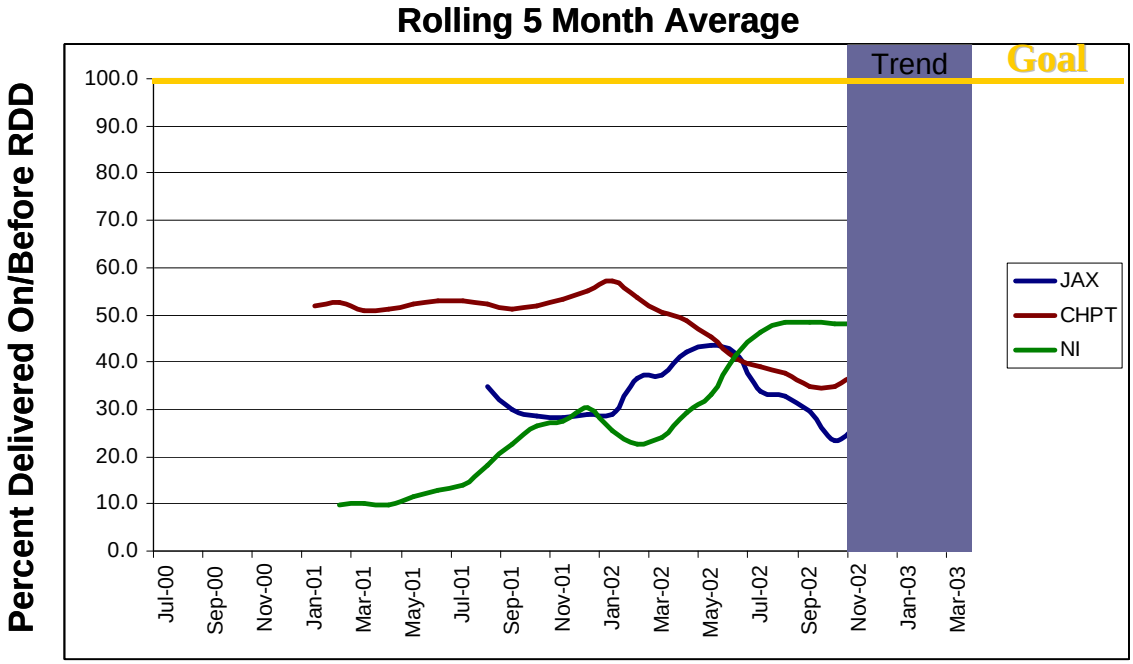
[2] NAVAIR Depot Maintenance System Economic Analysis, 13 October 2000

Turn-around-times reported by the NADEPs reflect the "sliced" implementation paths taken by each agency. The trend line for each NADEP rises each time a new "slice" of the depot is taken live on the NDMS Program and then falls as the processes take hold. Turn-around-times have oscillated since their last "slice" implementation and especially since "9/11" when NAVAIR levied "surge" repair requirements on the NADEPs to support the fight on terrorism. TATs are beginning to moderate and the NADEPs expect to see TAT fall precipitously over next few months.

ii. Deliver to Promise Date

The NADEPs are reporting a steady increase in their ability to deliver repaired end-items to customers on or before their originally promised due dates. Ability to deliver products on or before customer due dates is a hallmark of MRP II / MRO. The NADEPs are better able to properly identify lead times for repair and overhaul and communicate those dates to customers.

FIGURE 20: NDMS PROGRAM DELIVER TO PROMISE DATE



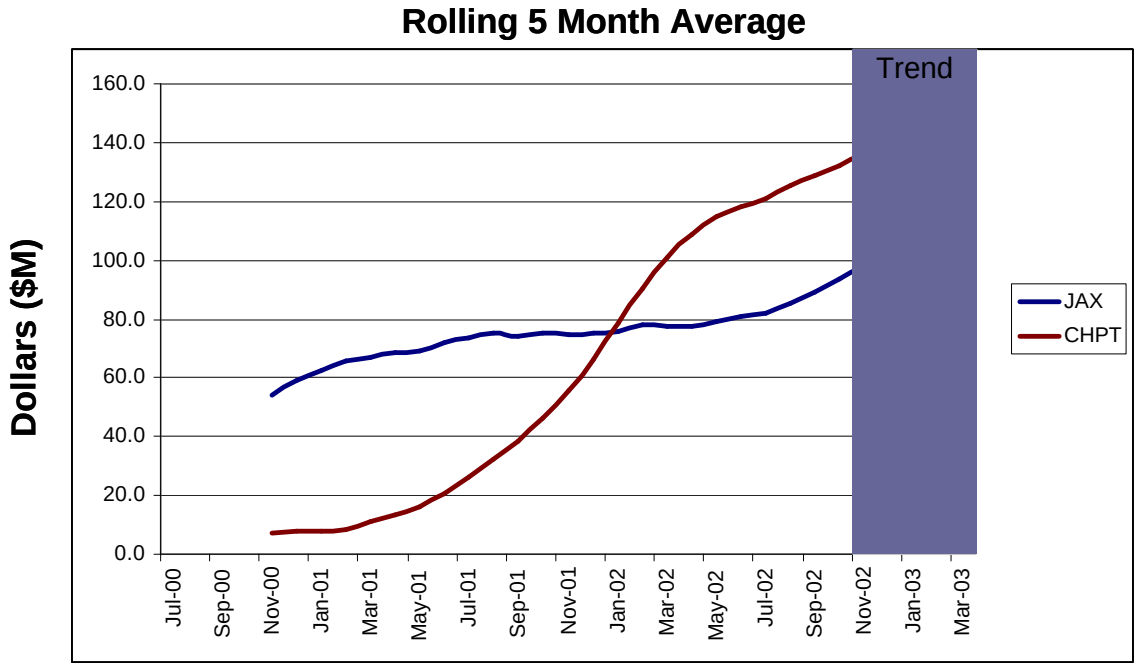
iii. Inventory On-Hand

The inventory on-hand metric that the NADEPs report has acted to shed a spotlight on poor supply chain practices. While NADEP and supply chain partners cringe at the story this metric shows, understanding the extent and impact of a problem is the first step to addressing it. Figure 21 indicates a steady rise in inventory dollar value at NADEPs CHPT and JAX.

After investigation, NADEPs and supply chain partners documented that the NDMS Program was properly reflecting three different types of inventory that had previously gone unrecorded: Artisan-held bench stock, inventory in active stockrooms, and millions of dollars of inventory gained through the Base Realignment and Closure (BRAC) process. As part of the "slice"

implementations, stock rooms were inventoried, informal inventory systems were discontinued and all unrecorded items were uncovered and migrated into the NDMS applications. Much of this unrecorded inventory is obsolete and the NADEPs are in the process of removing from their accounts.

FIGURE 21: NDMS PROGRAM INVENTORY ON-HAND VALUE

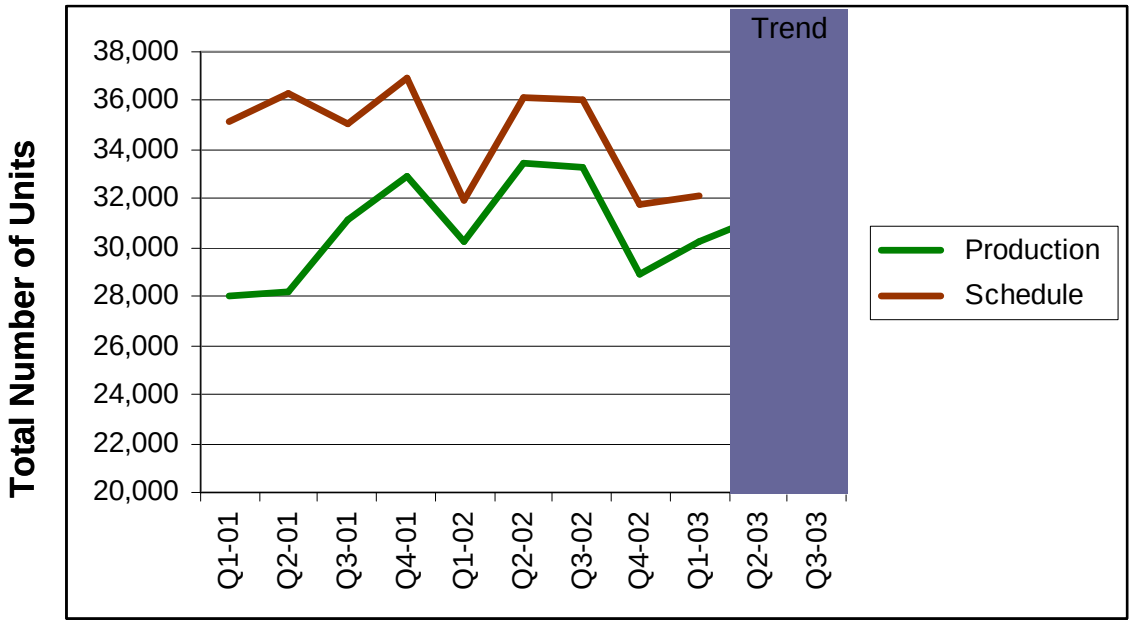


iv. Total Production

NAVICP, the primary customer for the three NADEPs, aggregates the total productive output from the NADEPs and reports these numbers in their leadership meetings. The following exhibit, Figure 22, identifies the forecasted production "schedule" and the actual "production" quantities for the past 9 quarters. Over this period of time, each of the three NADEPs have been using the applications and processes that constitute the NDMS Program to plan, execute, monitor and manage depot repair and overhaul activities.

According to the NADEP's customer, FY 2002 was a record year for total number of units repaired by the NADEPs – up 7% from the previous year to 125,850 units. Over that time, the NADEPs repaired 93% of "scheduled" units versus three year average of 86% - a significant improvement. Additionally, FY 2003 is continuing the trend set in FY2002. Total production in quarter one is up 8% from last year's first quarter to 30,291 units and 94% of the "schedule" is being met. The trend for total productive ability is positive – which is key to meeting warfighter requirements in the post 9/11 environment.

FIGURE 22: NADEP TOTAL PRODUCTION



G. HOW THE SUCCESS OF THIS EFFORT SUPPORTS THE ORGANIZATIONAL OBJECTIVES.

(Where or how teams contribution can be used, what will it accomplish and how it will benefit the Navy/Federal Government (in terms of tangible and/or intangible benefits)).

The NDMS Program delivers philosophies, processes and tools that enable the Naval Aviation Depot Maintenance Team to deliver comprehensive life cycle support of Naval aviation weapon systems. By increasing NADEP capabilities, capacity and supply chain connectivity, the NDMS Program supplies increased responsiveness to customer needs, reduced life-cycle costs and maximized aircraft availability. The NDMS Program increases the velocity, manageability and cost effectiveness of NAVAIR's repair operations and supports Supply and the warfighter by making repaired assets available for training, deployment, fighting and winning.

The implementation of MRP II / MRO within NADEP JAX was a challenging task. The establishment of MRP II business processes in a DoD repair facility utilizing COTS software, depot wide, and the subsequent shut down of legacy systems has not been accomplished in any other DoD facility.

For the first time, we will have disciplined processes, improved planning and scheduling and more accurate MRO information. The discipline of these processes provides the basis of our ISO 9000 certification.

We can draw on the improvements developed by the software vendor to support other commercial users of this product, such as Boeing, BAE Systems, and Sikorsky to improve our business operations as version upgrades to the product occur. As the initial operating site for the NADEP community our processes are the basis of implementation of MRP II at both NADEP Cherry Point and North Island as well as the future implementations at all three Air Force Air Logistics Centers.

The system also provides a common connection point across all three depots enabling establishment of NAVAIR's ERP system. The fundamental goal is to provide more responsive service to the customer at reduced cost. Our principal customers are the U.S. Navy Fleet, comprised of the Navy operational and reserve squadrons, and other aircraft operators (e.g., NASA, Customs Service, U.S. Air Force, foreign governments, etc.) who use the aircraft, engines and components that we maintain and aircraft and engine program managers and other program sponsors, who provide funding and levy requirements for products and services consumed by the Fleet operators.

Achieving this goal has strategic implications to the U.S. defense, and ultimately has a positive impact on the U.S. defense budget. The Navy can plan Fleet operations with more confidence in the projected availability of equipment. This, in turn, improves readiness while at the same time making the nations defense more cost effective. However, we realize that this represents just a beginning, the foundation for continuous improvement and change, so that we can be more successful in serving the finest armed forces in the world.

1) EA-6B: Zero Bare Firewalls In Four Months!

The EA-6B "Prowler" is the only tactical jammer aircraft in service today. It flies in support of the Navy, Marine Corps, and Air Force and is a critical element of the strike package in virtually every combat scenario. No one anticipated a simple; one pound bearing could halt the Prowler's 22,400 pounds of thrust. Failed J52 engine bearings resulted in 48 Fleet bare firewalls, or empty aircraft engine bays, in a matter of a few weeks in January 2002. The bearing failure causes heat build up on the low-pressure turbine shaft, creating a potential for shaft failure.

With the bearing problem looming, Depot leader-ship developed plans, requirements, and process improvements to meet the anticipated production surge in July 2002. A battlefield "war room" concept was adopted, bringing the most critical experts onsite to immediately respond to potential production problems. The J52 team worked 12 hours a day, seven days a week for several months to meet the need. In August, at the height of production, the team produced 17 engines. This is a significant increase in production over the three engines per month production rate prior to the accelerated schedule.

On Nov. 19, 2002, Whidbey Island supply issued a J52 engine to VAQ-129, bringing the Fleet bare firewall count down to ZERO. This response to unexpected demand resulted in an average 500 percent increase in J52 engine production.

SECTION 3: KNOWLEDGE TRANSFER

A. DESCRIBE THE EFFORTS TO SHARE LESSONS LEARNED FROM THIS EFFORT WITH OTHER INTERNAL ORGANIZATIONS.

The NDMS Program is committed to communicating and sharing programmatic information across the NADEPs, NAVAIR Command and the supply chain partners. The NDMS Corporate Solution Program Management Plan[3] identifies the community of internal organizations that must – at a minimum – be continually updated on NDMS progress, issues and experiences.

1) Functional Guidance Team

The FGT is an Enterprise Team, which operates under the authority of the Naval Aviation Industrial Executive Board (NAIEB). The mission of the FGT is to implement the Command-wide strategy within the Industrial Operations Competency and the NADEPs. The FGT meets periodically to address program-level issues and determine program direction.

2) Technical Control Group

The Technical Control Group (TCG) is called upon to identify and present technical requirements for sustained applications, establish a common set of infrastructure standards for the Industrial Community, develop technical alternatives, suggest solutions to business problems and maintain configuration control of the technical baseline. The TCG works as a cohesive team with the FGT to address technical issues and helps the FGT articulate technical matters to the Industrial Business Process Leadership Team (IBP-LT) for decisions as required.

3) Monthly Status Report

Each month the NDMS PMO rolls up individual NADEP progress and status reports into a combined report. This combined report is then distributed to appropriate NDMS Program personnel at the NADEPs, PMO, PSO and CMA. Additionally, information from this report is transposed into other DoD and DoN required reports. The focus of the report is site status, implementation metrics and risks/issues to NMDS implementation.

4) Biweekly VTC

The NDMS Program conducts biweekly VTCs for the benefit of engaged personnel. This VTC is a forum for relaying information from NAVAIR Headquarters, project progress reporting and project management reviews. Minutes from this meeting are distributed to NADEP, PMO, PSO and CMA representatives.

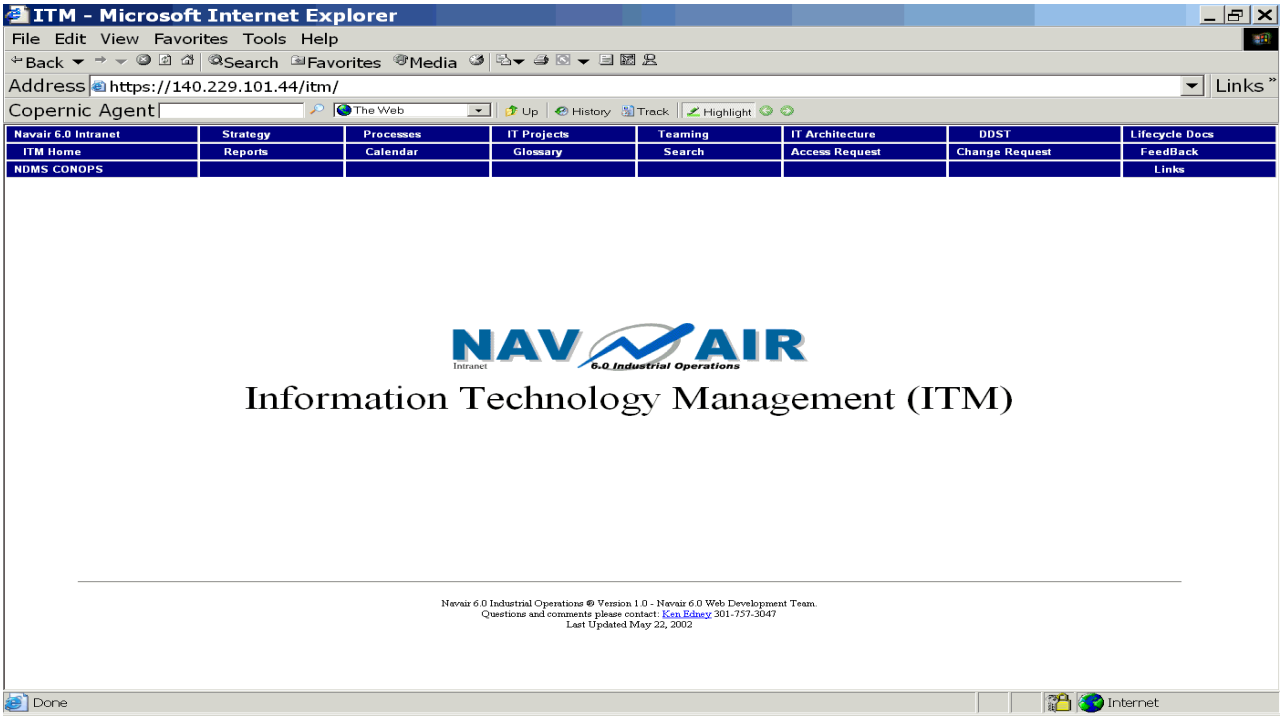
5) Corporate Information Technology Management Website

The NDMS PMO established a Corporate Information Technology Management (ITM) Website available on the NAVAIR intranet. Through the website, NDMS Program personnel can access

[3] NDMS Corporate Solution Program Management Plan, 17 November 2000

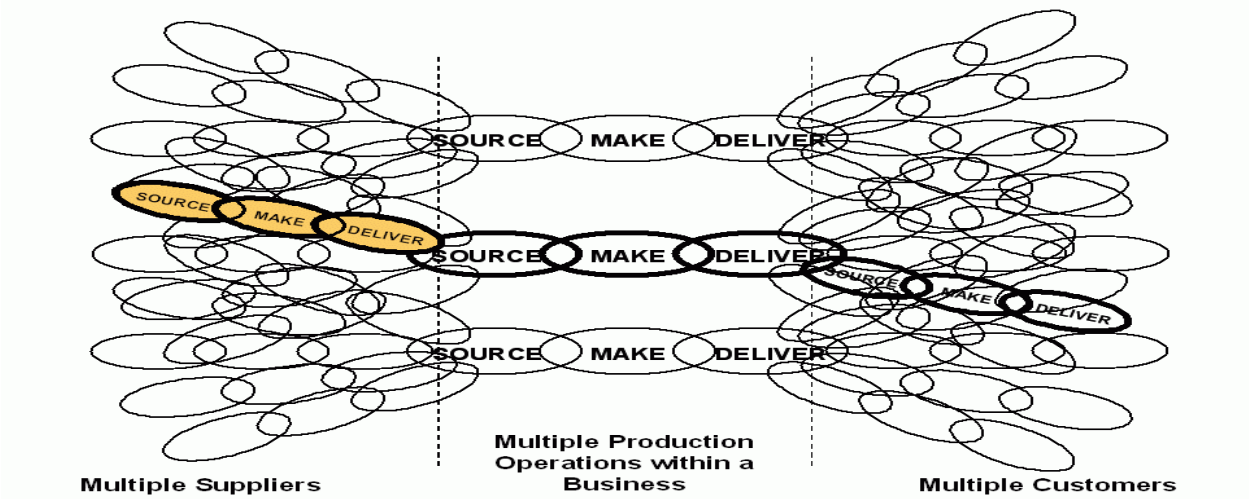
the CONOPS document, project deployment information, technical architecture documentation, teaming information and other important programmatic details. The NDMS PMO provides the most current information via the Corporate ITM Website.

FIGURE 23: NAVAIR 6.0 ITM WEBSITE



B. EXPLAIN HOW THIS INITIATIVE CAN BE TRANSFERRED TO OTHER ORGANIZATIONS AND THE LIKELY CANDIDATES FOR TRANSFERENCE.

FIGURE 24: SUPPLY CHAINS CONSIST OF MANY THREADS



1) Across DoD

The NADEPs make up only three of 19 DoD depots. Macroscopic depot functionality remains the same across the Army, Air Force, Navy and Marine Corps. Additionally, joint initiatives in financial, logistics and information technology systems acquisition and deployment imply the only differences in business processes will be in local depot manufacturing management applications. The MRP II / MRO solution of NDMS can help modernize and standardize DoD depot-level maintenance practices from an information systems perspective. Through the use of NDMS's MRP II / MRO solution, depots can more easily interface with DoD's Enterprise Resource Planning (ERP) initiatives.

In August 2001, the U.S. Air Force commenced a study to compare their current business requirements and processes to the NDMS Program's functionality and processes. This study is reaching its conclusion and preliminary indications from the U.S. Air Force are that the NDMS Program's MRP II / MRO solution will be installed across the Air Logistic Centers (ALC). The U.S. Air Force has engaged NAVAIR at multiple levels to investigate the exportation of the NDMS philosophies, processes and tools to the ALCs.

For weapons systems that retain three levels of maintenance, many NDMS component applications may be of use at the intermediate-level. Again, intermediate-level applications can be interfaced directly into a service ERP initiative or depot MRP II system, creating a more collaborative supply chain.

2) Commercial Depot-level Facilities

Surprisingly few commercial depot-level facilities possess an MRP II / MRO solution. Although many commercial companies use an MRP II or ERP system in manufacturing new products for DoD, MRO implementations are relatively new to the commercial world. Deployment of NDMS components or an NDMS-like solution facilitates the growth of true supply chain management in DoD, increases total asset visibility and enables logistics transformation on a global scale.

3) Foreign Military Depots

As Foreign Military Sales (FMS) progress and DoD looks for cost sharing solutions, foreign customers are committing to some depot-level repair capability. These depots do not provide the comprehensive capability of a NADEP per se. Nonetheless, MRO activities and repair standards on weapons systems components remain ubiquitous. The addition of a foreign military depot into the supply chain through NDMS components or NDMS-like applications fosters greater collaboration in allied defense readiness.

4) Foreign Commercial Manufacturing Activities

Weapons systems development programs such as the Joint Strike Fighter require more than allied cooperation. Synergistic collaboration in the weapons system life cycle will be not only desired, but required to ensure the system is fully mission-capable and the customers' desired level of operational readiness maintained. Deployment of NDMS Program elements to these facilities and activities provides an unprecedented asset life cycle visibility, increases manufacturing collaboration and enhances the cooperation necessary to field the desired weapons systems.