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Supply Chain Council Awards for
Supply Chain Operational Excellence
U.S. Air Force Spares Campaign
2003 Submission
February 2003
Air Force
Supply Spares Campaign

FOREWORD

February 15, 2003

This document contains the United States Air Force, Deputy Chief of Staff/Installations & Logistics submission for the 2003 Supply Chain Council Awards for Operational Excellence. This submission describes the Spares Campaign supply chain integration efforts being spearheaded by the Supply Chain Integration & Logistics Transformation Office (AF/IL-I).

As the 1990's came to a close, the United States Air Force entered a new century, with a new set of rules, challenges, and expectations, and an entirely new security environment. During the Cold War, money and manpower were in abundance and spares were plentiful. Warehouses were well stocked with parts and support equipment. However, in the early 1990's, the U.S. Department of Defense (DoD) responded to the end of the Cold War, the cessation of hostilities in the Gulf War, and resulting change(s) in the national security environment with an extensive downsizing effort. The effort resulted in the reduction of money, manpower, services and spares inventories. Air Force Supply made pervasive policy and process changes to meet DoD-mandated inventory reductions and budget cuts. As a result of this effort, by the end of the decade, spare parts support has declined below required levels. Recognizing that the Air Force's ability to execute its mission is directly related to the availability of weapon system spare parts, the Chief of Staff for the Air Force endorsed a review of spares management processes, which became known as the "Spares Campaign."

The Spares Campaign is a major logistics initiative designed to fundamentally reshape the Air Force Supply chain management processes and systems. The fundamental objective of the Spares Campaign is to focus end-to-end supply chain activities toward meeting weapons systems mission capability requirements and supporting Expeditionary Air Force (EAF) operations. Through the collective implementation of a set of complementary spares process improvement initiatives, the Spares Campaign establishes a foundation for "transformation" of Air Force spares supply chain and significant process improvements. As such we are pleased to present this initiative to the Supply Chain Council as an example of emerging excellence in supply chain operations.

// Signed //
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Assistant DCS/Installations & Logistics

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EXECUTIVE SUMMARY

The Spares Campaign is fundamentally about Air Force supply chain transformation; it is the Air Force's commitment to make dramatic changes to the way we accomplish our logistics missions in order to address changes in our operating environment. The turn of the century marked the Air Force's shift to an Expeditionary Air Force (EAF). Based on a rapid response capability, this paradigm shift has meant that fewer deployments are able to take their full maintenance support with them. As a result, deployed forces are increasingly fighting wars in a "come as you are" fashion, highly dependent on organic spares kits and "Just In Time" re-supply. At the same time, the service has experienced chronic spares availability problems, as evidenced by decline in supply support indicators, brought about in large part by the inventory reductions that occurred at the end of the Cold War. While significant increases in spares funding have arrested this decline, the Air Force cannot afford to continue to rely on "more money" solutions.

Thus, the Spares Campaign, which is at its heart a concerted effort to apply best practices in supply chain management and supply chain integration, offers an alternative approach to addressing recent and emerging changes in the Air Force operating environment. Focused on developing an end-to-end supply chain network that truly integrates the activities of all supply chain participants, the Spares campaign aims to optimize collective performance, minimize cost, and decrease the time between order and delivery of a product.

This award package presents a summary of the development of the campaign and a description of the initiatives selected to return spares parts, along with parts management, to acceptable levels. At the same time, these initiatives will modernize Cold War based spares process, define accountability and authority for supply chain and budget performance, and exploit relevant commercial capabilities to meet EAF weapon systems availability needs.

SECTION 1: GENERAL INFORMATION AND PROJECT COMPLEXITY

1) Provide the name of the submitting organization (corporation, service, etc).

Headquarters United States Air Force, Deputy Chief of Staff/Installations & Logistics

2) Identify the organizational unit responding (site, function, etc.)

Headquarters United States Air Force Chief of Staff/Installations & Logistics (AF/IL-I), Logistics Supply Chain Integration & Logistics Transformation Office.

3) Provide a brief mission description of the overall business objectives, product lines, and mission of the organization.

The AF Spares Campaign's overarching goals are to increase weapon system availability/mission capable sorties, and transform spares support in the Expeditionary Air Force (EAF) operating environment. The Supply Chain Integration and Logistics Transformation Office's specific mission is to implement these recommendations of the Spares Campaign Plan in the areas of Supply Chain Command & Control (C2), Financial Management, Demand Repair and Workload Forecasting, and Supplier Relationships. To that end, a specific set of initiatives, or strategies, have been identified that address the recommendations. They fall into three broad categories: 1) command and control; 2) financial management; and 3) transformation. There is also an underlying technology or e-Business strategy component.

The IL-I office is responsible for the development of project plans and schedules to implement the initiatives and to manage the change process. This office is comprised of a fully integrated team of government and private sector personnel structured into initiative-specific sub-teams that capitalize on team members' diversified supply chain management strengths, knowledge, and experience. An IL-I team member leads each sub-team.

4) Indicate the award category of submission (Operations, Academic, Technology – winners in these categories will automatically advance to Global).

Supply Chain Operational Excellence Award

5) Provide a brief description of the supply chain and the processes the submission spans (e.g., Plan, Source, Make, Deliver, Return)

The Air Force supply chain encompasses all government and private sector organizations, processes, and systems that individually or collectively play a role in planning, acquiring, maintaining, or delivering material resources for Air Force operations.

The Spares Campaign initiatives touch on all five of the Supply Chain Operational Reference (SCOR) model processes as detailed in the following table:

INITIATIVE/ OBJECTIVES	DESCRIPTION	SCOR PROCESS AREA(S)
1. Change Depot Level Reparable Budget Submission and Cost/Price Structure	Enact changes to the DLR budgeting submission and cost structure designed to better align programming and budgeting responsibilities for spares to those MAJCOMs that most influence the requirement. Proposed changes focus on reducing the volatility in the rates MAJCOMs pay for spares, improving visibility and understanding of elements of the total cost of DLR ownership, and reducing the volatility in the working capital fund. The initiative also includes using Activity Based Costing/Management (ABC/M) to better identify and assign responsibility for cost drivers to manage costs. Collectively, the changes will support smarter repair decisions that ensure the best "bang for the buck" for the weapon system operator.	PLAN
2. Improve the Spares Budgeting Process	Improve the integration of spares planning and forecasting taking place within the Program Budget Review (PBR) process to ensure the entire spares requirement is fully understood and made visible to the Air Force corporate structure. The Spares Campaign endorses the full implementation of a Spares Requirements Review Board (SRRB), whose responsibility is to agree upon a single credible spares requirement and improve the linkage of the spares requirement to specific weapon systems goals. The SRRB process has been implemented. Budgeting and programming decisions are being made by consensus of the board based on the total spares requirement. This provides for more robust decisions on the funding of spares within the overall AF budget process.	PLAN
3. Improve Financial Management	Take steps to complement improvements in DLRs and the spares PBR process by developing a tool with the enhanced ability to track execution of Weapon System (WS) support against the approved plan and budget. This tool will improve the ability to manage the inevitable variations between forecasting and actual experience, track variations and provide alternatives for problem resolution in "real-time". This will assist decision-makers in identifying specific spares issues, assessing the alternatives and making adjustments where necessary.	SOURCE MAKE/MAINTAIN
4. Improve Demand and Repair Workload Forecasting	Change the way logisticians forecast and plan for weapon systems spares support. This initiative will implement several supply chain management "best practices" through AFMC's workload planning and the Air Force end-to-end Demand Planning processes. This initiative also includes demonstrating the effectiveness of an Advanced Planning & Scheduling (APS) tool that will compliment these planning processes. Demand Planning develops integrated supply, maintenance, distribution and financial plans to meet the known and forecasted spares demands. The eventual addition of APS technology gives the Air Force the capability to use vast amounts of historical & projected real-time data in developing the forecasts and plans that will meet customers' demands. As an integrated planning tool, the APS facilitates demand planning as well as provides constraints analysis to assist in decision-making concerning demand forecasting and planning, resource scheduling and repair workload planning.	PLAN
5. Establish Virtual Single Inventory Control Point	Provide consistent execution and enforcement of spares buy and repair decisions. The objective of the VICP is to centrally prioritize buy and repair activities to meet Air Force Weapon System operational priorities vs. local repair priorities. This initiative keeps the current organizational alignment but centralizes the prioritization process, currently done by decentralized ALCs, which is why this is a virtual ICP. By establishing a VICP, resources will be better balanced against weapon systems targets and improvements will be made in the responsiveness to changing EAF operations.	SOURCE MAKE/MAINTAIN
6. Align Supply Chain Management Focus	Establish policy and procedure changes that more clearly align the authority, responsibility and accountability of Supply Chain Managers (SCM) to orchestrate spares support. This initiative will strengthen the focus of SCMs on weapon systems. This will be done by giving the weapon system SCMs authority and responsibility to "quarterback" the entire supply chain, thereby creating the end-to-end spares visibility required to optimize mission capability targets. In conjunction with the VICP and Regional Supply Squadron initiatives, all members of the supply	PLAN SOURCE MAKE/MAINTAIN DELIVER RETURN

INITIATIVE/ OBJECTIVES	DESCRIPTION	SCOR PROCESS AREA(S)
	chain will have visibility and understanding of spares needs and priorities through a Common Operating Picture (COP) data system tool.	
7. Standardize the Use and Expand the Role of Regional Supply Squadron (RSS)	Currently, five MAJCOMs (ACC, AMC, USAFE, PACAF, AFSOC) have consolidated their common core supply processes (stock control, funds management, equipment management and MICAP Control) under the RSS. This organizational alignment has proven to be very effective and has yielded efficiencies and cost savings, so now is the time to standardize the common core supply processes across the Air Force. This initiative also includes expanding the role to the RSS to make spares distribution decisions, which is currently an ICP function.	PLAN DELIVER
8. Adopt Improved Purchasing and Supply Management	Incorporate relevant commercial practices that have had significant positive impact in the private sector. Improved Purchasing and Supply Management (PSM) practices more closely integrated demand planning; purchasing; and inventory supply chain, and supplier & supply base management to create continuous improvement in performance, quality, responsiveness, flexibility, and cost of purchased goods and services. In close collaboration between SAF/AQC and the Spares Campaign, this initiative also includes an e-Business prototype that facilitates the integration needed to achieve the full effect of improving our PSM practices.	PLAN SOURCE MAKE/MAINTAIN DELIVER RETURN
9. Improve Stock Levels Process	To improve stockage of consumable items to support depot maintenance throughput. The initiative will ensure that low demand items that are critical to aircraft mission capability are identified and their availability improved. The approach involves studying, analyzing, and quantifying low demand and no demand items for which a revised stockage strategy is required. In addition stockage policy for items awaiting inspection will be renegotiated. Finally, a multi-tiered inventory management strategy has been developed for all these items that prioritizes requirements.	PLAN SOURCE MAKE/MAINTAIN DELIVER RETURN
10. Improve AF Material Policies	To ensure AFMC material support policies clearly state process objectives and establish compliance standards. The initiative revolves around working with HQ AFMC/LG to clearly define and publish who is responsible for what areas of material support. Centers are encouraged to align functions the same way. Efforts will also be made to improve and issue better policy in specific areas such as Awaiting Parts (AWP) -- to include guidance on when to put items in AWP, when to stop, and when to consider cannibalization actions; clearly defining Reparability Forecast Model (RFM) policy and updating related Operating Instructions; and revising the Supply Support Request (SSR) process and policy for local purchase to make them part of the MSD unprogrammed requirements process. There will also be an immediate mandatory review of all Material Review Codes (MRCs) that will remove all restrictive MRCs unless they have Air Logistics Center (ALC)/LGM approval.	SOURCE DELIVER

Any of these initiatives taken individually would result in some incremental improvement. However, taken together, and managed as an end-to-end supply chain improvement effort, they begin to provide a significant contribution to improving weapons systems availability and cost management.

6) Provide the names of the supply chain partner organizations (external) involved in the project. Indicate the number of people involved from each partner organization and the functional category of each.

- BearingPoint (9)
- Dynamics Research Corporation (4)
- RAND (2-3)
- Altarum/MSXi (2)
- Logistics Management Institute (4)
- Lockheed Martin Aero (3-6)

- Manugistics (2-4)
- ABC Technologies (2)
- Defense Logistics Agency (2)

7) Provide the names of the functional organizations (internal) involved in the project and indicate the number of people involved from each functional organization and the functional category of each.

- HQ AF Installations & Logistics (12)
- USAF Deputy Assistant Secretary (Contracting) (4)
- Air Force Material Command, LG & PK (6)
- OC-ALC (5)
- WR-ALC (3)
- OO-ALC (1)
- AF Systems Support Group (2)
- AF Material Support Group (2)

8) Provide a point of contact for each supply chain partner (name, mailing address, commercial telephone number, DSN, and e-mail address).

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SECTION 2: PROCESS

1) Describe the reason that the supply chain initiative was undertaken and how it was selected.

The Air Forces Spares Campaign was born of the need to profoundly change the way the Air Force manages its spares and the parts used to repair them. For the support of fielded weapon systems and major end items, the Air Force relies on the repair of a large inventory of spares, sometimes called depot-level repairables. These spares are critical to keeping aircraft airborne. However, between 1992 and 2000, Air Force weapon system Mission Capable (MC) rates dropped 8.5%. In addition, Total Not Mission Capable-Supply (TNMCS) rates rose 5.7% and cannibalization rates spiked upwards 3.8%. A significant reason for these performance problems was spares management process breakdowns and funding decisions. The Spares Campaign was established to reshape spares and parts management in order to reverse the negative trend.

The spares and repair parts problems began in the early 1990's when the Air Force began to size inventories to match the force reductions that followed the Persian Gulf War deployment. It became apparent that the supply processes in-place at the time were not designed to accommodate quick reaction to changes in inventory size. There was no efficient way, given the massive size of inventory stocks and capability of information systems, to determine which items and what quantities should be disposed of, particularly in the time frames demanded. Important weapons systems items were likely disposed along with "excess" items. Thus, to cope with this pressure and risk, decisions were made to change the spares and repair parts computation formulas to lower the number of spares and repair parts computed as required by the supply inventory system. In this manner, inventory stock could be drawn down at a fairly rapid rate and not be replaced without unwittingly affecting important weapons systems items.

Virtually every supply inventory computation was changed and the desired outcome was achieved: inventories levels fell. Unfortunately, as with most complex systems, other variables changes simultaneously. The level of operations (OPSTEMPO) increased and weapons systems continued to age. Budget constraints in several years resulted in under-funding of the now truncated spares and repair parts inventory replacement requirements. The need to better understand the cost per flying hour (CPFH) process, impacts, and dynamics resulted in a new spares requirement based on annual projected consumption of spares and repair parts by individual weapons systems. Money that was once centrally controlled was budgeted by CPFH, and provided to the major commands employing the weapons systems to "buy" spares and repair parts from the central logistics system. The processes used by the central logistics system for determining spares and repair parts needed to maintain and replace inventory for response to orders to reduce weapon system down-time became disconnected from the programming and budgeting process. Similarly, the process for determining additive levels for Readiness Spares Packages (RSPs) used by deployed units until supply lines are established was misaligned and not able to respond to increased turn rates.

The collective impact of all these changes created a situation where too few spares and repair parts were available to support Air Force weapons systems at desired mission capability levels. This became clear in combat operations. The great achievements of the Air Force over the skies of Bosnia and later Kovoso were made on the backs of the maintainers through longer hours and a practice called "cannibalization" (taking working parts from a weapon system to repair another). By 1998, the Air Staff and Materiel Command recognized the under-funding of the spares and repair parts requirement and were able to gain increases. In 1999, a complete review of spares and repair parts processes was initiated.

By 2000, it was clear that the supply system was itself in need of repair. In February 2001, the Chief of Staff of the Air Force (CSAF) was briefed on launching a Spares Campaign to fix the process disconnects that occurred over the previous ten years. The CSAF gave his permission to conduct comprehensive planning to correct spares and repair parts deficiencies.

2) Indicate the duration of the project. Note if the project was a pilot that is being rolled out. Note if the project is ongoing/still in process.

The Supply Chain Integration and Logistics Transformation Office (IL-I) was originally chartered for one year (2001-2002). As of September 2002, initial implementation of all eight initiatives had begun and preparations are being made to transfer mature initiatives to implementation agencies such as Air Force Material Command and HQ Defense Logistics Agency. At the same time, IL-I is preparing to transition into the Air Force institution as the Directorate for Logistics Transformation and Innovation (ILI). This office will continue to help guide progress toward full implementation of the suite of initiatives, which is anticipated in FY04.

3) Describe, in detail, the process used to complete the initiative.

From 23 March to 18 June 2001, teams met to determine the best way(s) to improve the spares and repair parts posture of the USAF. Five teams were established based on processes needed to produce spares. They focused their attention on outcomes to improve mission capability and manage cost. The Programming and Financial Management Team was to analyze how spares budgets are determined, funding obtained, and cost managed. Requirements Determination Team reviewed the processes used to identify the spares requirement(s). The Requirements Allocation, Execution, and Distribution Team analyzed the processes and policies involved in getting spares and repair parts to the depot repair lines and field. A spares Command and Control Team studied the management control of the spares processes. Given that suppliers outside the Air Force's immediate control were playing an ever-increasing role, a Supplier Relationships Team explored the options available for improvement. The key roles suppliers have in the availability of spares and repair parts underscored the need for supply chain management and integration.

A planning management organization was put in place in early March 2001. The five teams had Air Force subject matter experts, representation from industry, the Defense Logistics Agency, and consultants. More than seventy people ultimately participated on the teams. A senior uniformed or civilian AF expert led each team. To ensure these Spares Campaign

teams received full support, the DCS/Installations and Logistics (HAF/IL), assigned the AF Director of Supply (HAF/ILG) full-time to manage the planning effort. An experienced logistician (GS-15) and uniformed officer were detailed to assist him form a small management team. With the assistance of RAND Corporation and BearingPoint, the Spares Campaign planning proceeded. A Review (Red) Team was also used to provide an independent look at the solutions and associated initiatives. The Review Team consisted of senior AF military and civilian logistics leaders and a retired AF general officer. The Deputy Director of Maintenance (HAF/ILM) led the Red Team.

A concept of operations (CONOPS) was developed to guide the five teams' work. Each team was to develop a high-level, strategic process map that depicted the way the team believed the area they were investigating should be managed to meet the objectives of improving the contribution to weapons system availability and cost management. In conjunction with these functional process maps, an overall spares management strategic process diagram was produced. Each team then identified "disconnects" or barriers to the process(es) functioning as desired. Once this was done, the next step was to develop solutions to correct the deficiencies. Twelve major deficiencies were noted and over 190 corrective actions identified. Through a reconciliation process among the teams (an Integration Team made-up of the team leads and the Management Team) and Red Team review, a set of 20 initiatives resulted as solutions to the disconnects/barriers.

In mid-June 2001, the Spares Campaign planning results were briefed to HAF/IL. On 13 July 2001, the major air command Directors of Logistics (MAJCOM/LGs) were briefed via video teleconference (VTC). At that VTC, the MAJCOM/LGs were asked to provide their comments, concurrence, and to prioritize the 20 initiatives in the order they believed would provide the most impact for improving spares management to contribute to improved weapons system availability and cost management. The LGs concurred with all the recommendations, with some minor clarification, and ranked the initiatives.

It was recognized that the implementation of the Spares Campaign Plan initiatives would take more than ad hoc study teams and a small management team. Thus, the HAF/IL sought permission from the CSAF to temporarily assign a general office to lead the implementation. The CSAF approved the request, and in late August 2001 the positions of Special Assistant, Supply Chain Integration and Logistics Transformation were temporarily established. The AF Logistics Transformation Office, which had been exploring transformational pathfinders, became the Spares Campaign Implementation Team under the direction of the former AF Director of Supply.

The need to raise mission capability and weapons systems availability, and get costs better understood was urgent. Near immediate impact from the Spares Campaign initiatives was required. Implementing all 20 initiatives would take time and many resources—something not readily available. To gain maximum advantage from the initiatives in the shortest time, a decision was made to focus implementation resources on a subset of the initiatives that would likely result in near term improvements. As the implementation team was organizing , the 20 initiatives were closely reviewed to select the first set for implementation. The criteria used to make this selection were: MAJCOM priorities; contribution of weapons systems

availability and cost management; time to implement or achieve an initial operational capability; consideration of initiatives currently underway; contribution to spares process improvement and transformation, and the greatest impact and return to the Air Force as a whole.

By late August the final set of 8 initiatives was identified. The MAJCOM/LGs were briefed of the selection of this smaller set of initiatives and concurrence given. These initiatives were then presented to the most senior leadership of the Air Force by HAF/IL in October 2001, at their Corona Fall meeting. They endorsed the entire set of initiatives for implementation.

The Spares Campaign implementation is a top-down directed activity. Each initiative has an Air Staff team leader. A project manager from the Spares Campaign implementation team supports each team leader. The project manager's role is to help the team leader keep the implementation project schedule up-to-date and the initiative on schedule to implementation. The team leader is responsible and accountable to bring together the subordinate activities to work the details of implementation. Many of the implementation actions are in the Air Force Materiel Command (AFMC). For this reason, the AFMC Directors of Logistics, Financial Management and Contracting are actively engaged in detailed implementation actions.

4) Identify significant challenges encountered, the process for resolution, and the solutions. Identify any best practices employed / developed.

There have been a number of significant "change management" challenges encountered with the Spares Campaign, most involving predictable resistance to process transformation at the individual and organizational level. Many of these change management challenges centered on the ability to coordinate implementation actions across a large organization, and coordinate these actions with a number of parallel performance improvement initiatives sponsored at the USAF Headquarters, major command, and field level. Concerns also focused on the Spares Campaign Team's ability to effectively manage the "pace of change"; that is, the ability to achieve rapid process change while not overwhelming the ability of the logistics community to continue its current support to the Warfighter. A related issue involved the resourcing of the various Spares Campaign implementation efforts in terms of manpower, funding and management attention.

Each of these challenges was addressed through a robust change management process that emphasized organizational communication at every phase of the Spares Campaign. Initial diagnostics efforts were conducted via cross-functional IPTs including representation from organizations across the AF logistics community, extended supply chain partners, and commercial supply chain management practitioners. This base ensured concerns were addressed early in the process, and also established a "grass roots" communication network for vetting ideas and keeping constituent organizations apprised of Spares Campaign status. A review team of senior leaders was used to assess the value of initiatives. This informal communications network was supplemented by regular communications between the Spares Campaign program office and Headquarters/MAJCOM organizations. Finally, this theme

was continued through the creation of integrated teams designed to implement the various Spares Campaign initiatives.

Of note, a number of best practices were identified and applied to the development of the Spares Campaign initiatives. Examples include the Demand Planning process and Advanced Planning and Scheduling system technology that are being brought together for improved parts supportability, and the Purchasing and Supply Chain Management initiative that establishes the framework for enhanced collaboration with/management of the internal and extended supply chain network. In these and other examples, the identification and use of public and private sector best practices was a fundamental component of efforts to improve overall supply chain performance in the areas of Plan, Supply, Make/Repair and Distribute.

5) Indicate the metrics used to measure (a) progress and (b) success.

Metrics are a critical component of the Spares Campaign. The measure implementation results, provide feedback for mid-course program adjustments, and help to maintain the program focus on the war fighter. The goal of metrics development within the Spares Campaign is to measure the effects of the initiatives, individually and collectively, on logistical and operational measures of importance to the Warfighter such as weapon system availability, parts supportability, and cost management/total ownership cost reduction.

Efforts to date have been structured around multiple requirements including consideration of multiple stakeholder perspectives and consistency with on-going metrics efforts including the AF Balanced Scorecard, Depot Maintenance Reengineering and Transformation, and Future Logistics Enterprise. Candidate metrics have been selected and are as follows:

Spares Campaign Metrics
Balanced Scorecard

Warfighter

Weapon System Availability ▲ Mission Capable Sorties

SPARES CAMPAIGN INITIATIVE	PROCESS	FINANCE	PEOPLE
Financial •DLR Pricing •Implement ABC •Improve Financial Management •Improve Spares Budgeting		Price Stability/Volitility Net Operating Result Forecast Accuracy Spares Ownership Costs	
Demand Planning & Repair Workload Forecasting •Demand Planning •APS Pathfinder	Constraint Delay Cnstraint List Acquistion Lead Time Time Utilization Cycle Time Inventory Cost Backorders/AWP/Canns Productivity Gains	Forecast Accuracy Spares Ownership Costs Sales Effectiveness	
C2 •Establish Virtual ICP •Align SCM Focus •Standardize/Expand Role of RSS •Create Common Operating Picture	Stockage Effectivenss Customer Satisfaction Customer Wait Time Inventory Costs Repair Induction Effectiveness RSP Fills Backorders/AWP/Canns Delivery Commitments Buy Effectiveness Supplier performance		
Adopt PSM	Supplier Performance ALT/PLT Customer Wait Time Perfect Order Fulfillment Customer Satisfaction Cycle Times Stockage Effectiveness	Spares Ownership Costs Supply Chain Costs	Cross-Functional Skilled Workforce
Improve AF Materiel Support Policies	Significant Problem Items		
Improve Stock Level Process	Significant Problem Items		

Better Cost Visibility – A measure of the "completeness" of the ABC models by comparing cost identified in the ABC models with cost identified in the general ledger accounts. ABC is a different way of allocating costs, however the total costs expressed in a general ledger account should match the total costs of an ABC model that considers the same areas.

- Improved Cost Management/Productivity – A measure of the utilization of the improvements and cost savings identified through the development of ABC models.

- Awaiting Parts (AWP) – A materiel condition indicating a lack of a part or component to repair a line replacement or shop replacement unit (LRU / SRU). Assets in AWP status are unserviceable and not available for use to satisfy mission requirements. AWP time starts when the component / part is ordered to repair the LRU / SRU. Time stops upon downgrade of the requirement or processing of the receipt for the component / part in the accountable supply system.

- Forecast Accuracy – Comparison of APS/DRWF generated end-item forecast against actual end-item requirements experienced during the same time frame. Results will be expressed in terms of % accuracy; desired trend is 100% accuracy plus or minus upper / lower control limits based on statistical variability.

- Inventory Cost – Total cost of parts utilized to support maintenance, repair and overhaul operations; specific definitions and valuation consistent with those utilized in the AF Supply System Inventory Report (SSIR) (e.g., DoD 4140.1R indicates the inclusion of materiel held for sale or issue, and materiel in the process of repair for future sale…valued using the latest acquisition cost method or alternate method prescribed by USD Comptroller).

- Logistics Response Time (LRT) – The time it takes to complete an order placed on the wholesale level of supply from the date a requisition is generated until the data the material is received by the retail supply activity.

- Not Mission Capable Supply (NMCS) – A materiel condition indicating that weapon systems (e.g., aircraft, missile, communication-electronics equipment, etc) have one or more "holes" (missing LRUs) and are therefore not capable of performing any of their assigned missions (MICAP criteria) because of maintenance work stoppage due to a supply shortage. Generally measured in terms of incidents and/or total hours; desired trend is reduction in both indicators.

- Shop Flow Time – Amount of time (mean days) elapsing between the induction of a shop order and the date that order was completed (and identified for sale or transfer). Desired trend is reduction in the indicator.

- Throughput Plan vs. Accomplishment – Variance between specific product quantities planned for production within a specific time frame (monthly) and the actual quantities produced (for sale or transfer) within that same period.

- Redistribution Effectiveness – A measure of excess items being held at any one specific location above the authorized amount that could be turned in for repair and used to satisfy global demand.

- Spares Price Index – A "market basket" comparison of spares prices computed during the budget process to actual prices charged during year of execution.

- Actual Repair Dollars (aRD) Spent/Planned Repair Dollars (pRD) Budgeted - Actual Repair Dollars is measured as what the SMAG pays the DMAG for repair actions during the period to be measured. Planned Repair Dollars Budgeted is measured from the SMAG WCF budget provided each year by Air Staff. Algorithm would be aRD/pRD.

- Actual TNMCS (aTNMCS)/Planned TNMCS (pTNMCS) – This ratio measures actual TMNCS achieved against planned TNMCS by weapons system. TNMCS is an existing rate metric describing a materiel condition indicating that systems/equipment are not

capable of performing their assigned missions (MICAP criteria) because of repair/maintenance work stoppage has occurred due to a supply shortage. Decreased TNMCS implies increased weapon system availability.

- Requirements Accuracy of SRRB – Comparison of spares requirement forecast generated during SRRB process against what actually occurs during the year of execution. This metric was developed/selected because it reflects the overall goal of the SRRB which is to develop a single, comprehensive spares requirement that should most accurately reflect what will occur in the year of budget execution.

- Administrative Lead Time (ALT)[1] - A measurement of the time elapsing between the initiation of a procurement action and the award of the order or contract.[2]

- Customer Wait Time (CWT) - A measurement of the total elapsed time between the issuance of a customer order and the satisfaction of that order.

- FSC/PSC Price Adjustment - A new metric that will take the price for each item in the commodity group purchased during a base year and compare it against the new purchase price of that same item in subsequent years. Differences will be multiplied by the quantity of each item purchased in the study year, and summed for a total price adjustment figure.

- Material Management Strategy Coverage - A measurement to indicate the extent of the application of the material management strategy methodology to Air Force supply chain operations. This metric will track the percentage of the Federal Supply Class (FSC)/Product Service Code (PSC)s for which a material management strategy has been developed.

- Production Lead Time – An existing metric that measures the time from contract award date until full delivery of each schedule.

- Perfect Order Fulfillment - A count of the number of orders that fail to meet any one of the following "perfect order fulfillment criteria": 1) delivery incomplete; 2) delivery late; 3) required documentation incomplete; or 4) condition/installation unacceptable.

- Cannibalizations (CANNs) – A CANN action is the removal of a serviceable part from an aircraft or engine to replace a like unserviceable part on another aircraft or engine, or removal of a serviceable part to put into a Readiness Spares Package (RSP) for deployment. (Source: AFLMA, p.43, Metrics Handbook for Maintenance Leaders, 2001)

- Total Not Mission Capable Supply (TNMCS) Rate – A materiel condition indicating that systems and equipment are not capable of performing any of their assigned missions

[1] Also known as contract lead time.
[2] HQ AFMC/PKL

(Mission Capable (MICAP) criteria) because a supply shortage is causing a maintenance work stoppage. The TNMCS rate is based on the number of airframes out for parts, instead of the number of parts that are MICAP. (Reference: AFLMA, p.39, Metrics Handbook for Maintenance Leaders, 2001)

- Buy Forecast Effectiveness - Measures the accuracy of the D200 buy forecast as well as the ability of supply chain managers to execute the buy list. Deviations from the list will be annotated with reasons why in order to improve the accuracy of the requirements computation. Currently, there is on going analysis to relate more NSNs to weapon system availability.

- Repair Induction Effectiveness - Measures the effectiveness of the depot repair shops to perform work in accordance with the prioritized repair list from EXPRESS. Currently EXPRESS skip-overs are not tracked and many skip-overs are impacting Weapon System Availability. The goal is to move towards 100 percent induction effectiveness.

- Weapon System Availability Effectiveness – This metric measures the achieved weapon system availability (WSA) of a particular weapon system fleet relative to an operational standard for the fleet. This will measure the performance of VICP funded buy and repair execution relative to operational expectations in terms of a rate. This is a new metric that will measure the impact of centralizing the prioritization of buy and repair lists and executing from the lists.

- Readiness Spares Package (RSP) Fill Rates - Metric is a calculated comparison of RSP kits requirements and assets. As the WSSCM and SC COP initiatives are implemented, better of asset needs and availability should lead to higher RSP fill rates. Ratio of RSPs filled to RSPs authorized, expressed in percentage terms, measured quarterly.

- Aircraft Availability Target / Weapon System Availability (AAT/WSA) – A metric tracked during a specified period of time compared to an operational standard, by WS. The deviation of actual AA/WSA (1-TNMCS) from operational standard, in percentage format, by WS by quarter.

Initial metrics deployment is tied to initiative implementation efforts. Follow-on work will include the incorporation of new metrics, working hand-in-glove with other logistics metrics efforts within AFMC, USAF, and DOD. The eventual presentation vehicle is a Spares Campaign Metrics Dashboard. This dashboard will identify metrics by initiative, and be built utilizing data from the USAF Enterprise Data Warehouse (EDW). The impact of the Spares Campaign can then be viewed, and managerial actions taken within the Campaign (or its future institutionalized home) can be made to more directly facilitate long-term improvements.

6) Document and quantify cost and performance benefits, which should include Return on Investment of the Project and changes in the value of one or more of the SCOR Level I Metrics (not all metrics are required to be captured / reported).

Precise quantification of cost and performance benefits of individual/collective initiatives within the Spares Campaign is not possible at this time. Efforts to date have focused on the identification of long-term performance improvement opportunities, the creation of an integrated performance improvement framework, and the development of initial implementation plans appropriate for roll-out to the Air Force maintenance and repair environment. Within this overarching framework, specific determination of cost and performance benefit will be a function of the degree to which the collective initiatives are institutionalized in each area of the Air Force (e.g., depot, base, maintenance, supply, transportation, etc.).

On a broader level, however, it is possible to tie expectations and individual metrics to the SCOR Level 1 performance areas. We anticipate that our reengineering of processes for out-year forecasting of spare parts, pricing of those parts, and closed-loop budgeting will translate to improved results in the areas of Fill Rate, Perfect Order Fulfillment, Supply Chain Response Time, and other areas impacted by having a clearer understanding of demand requirements and associated financial steams. Similarly, we expect the combination of our Demand Planning and APS efforts will have a significant positive impact on Supply Chain Response Time, Production Flexibility, Value-Added Flexibility, Asset Turns, and Inventory Days of Supply. Indeed, benchmark data identified during our examination of these areas suggest a conservative improvement of 25% or more in the areas of Inventory Reduction, Orders Fulfillment Cycle Time, Forecasting Accuracy and Total Supply Chain Management Cost. Finally, we note commercial benchmarks indicating reductions in Total Supply Chain Management Cost of 3-20% in areas where Purchasing and Supply Management is implemented.

With annual expenditures for AF logistics support exceeding $25B, including over $9B on spare parts and consumable items, improvement in these areas will generate a significant financial return for the Air Force. More importantly, we see the most significant return on investment to be in areas that do not map directly to SCOR measures, but that are critical in the Air Force environment:

- Increased availability of mission-capable weapons systems to the Warfighter to meet operational targets and fiscal realities
- Logistics enablement of expeditionary Air Force operations anywhere in the world within 24 to 72 hours
- Robust, collaborative relationships with our extended supply chain to provide agile and flexible sustainment
- Provide credible estimate of AF spare requirements.
- Provide C2 to integrate and synchronize AF Supply Chains to be flexible and adaptable
- Increased cost visibility and stable spares prices
- Improved funding of inventory pipelines and Readiness Spares Packages
- Reduced Working Capital Fund losses
- Improved delivery performance
- Reduced cycle time
- Improved fill rates

7) Outline how the success of this effort supports the organizational objectives described in Section 1, item 3.

The Supply Chain Integration and Logistics Transformation Office's (AF/IL-I) mission is to implement the recommendations of the Spares Campaign Plan and enable supply chain and supply management transformation. The Spares Campaign is a major logistics initiative designed to fundamentally reshape the Air Force Supply spares management processes and systems. Its fundamental objective is to focus all supply chain activities toward meeting weapons systems mission capability (MC) requirements and supporting the Expeditionary Air Force (EAF) style of operations. This mission of the this directorate is in support of the USAF/IL mission to develop policy and provide resources to deliver effective agile combat support across the full spectrum of expeditionary aerospace force operations.

SECTION 3: TRANSFERENCE

1) Describe the efforts to share lessons from this effort with other organizations.

Senior Leader/Management support: Upon determining changes were necessary in the way the Air Force managed its spare parts, approval from senior leadership was a must to garner the resources and organizational support necessary to identify and implement changes. The Air Force Deputy Chief of Staff for Installations and Logistics (AF/IL), aware of the fundamental problems impacting spares management in the Air Force, was briefed on a proposed game plan to identify the problems, analyze systemic process disconnects, propose recommended solutions and develop a program for implementing change. AF/IL approved the game plan to begin the study and briefed CSAF, who approved moving forward. Armed with this approval, the Major Command senior logisticians were advised of the pending effort and tasked to provide manpower to participate in the study and solution development. Accordingly, briefing senior leadership and management carried the net effect of communicating the initial word to all corners of the Air Force. The senior level support and agreement to provide resources now ensured the word would pass to the lower levels in the myriad organizations requested to provide manpower for this effort. All impacted organizations became very interested in the efforts of this initiative because of senior leadership support. Furthermore, senior leadership was regularly updated on the initiative at staff meetings, through video teleconferences (VTCs) and other regularly scheduled meetings. When the effort moved from the study phase to the "present recommendations" phase, a briefing was prepared for the Air Force CORONA (a gathering of all Air Force Senior Leadership, four star generals). Armed with their support and approval for continuation of the effort, implementation of recommended solutions would be easier. Senior level interest was key!

Organizational Participation: Through the support of senior leadership, personnel from across affected organizations were provided to assist in development of the ultimate spares improvement recommendations. War fighter support and participation was key in getting the word out to other affected personnel. In addition, active participation provided credibility to the results of the effort. If a contracted study group had privately studied the issues with

only a passing head nod from senior leadership, the information impact across the Air Force would not have been as great. Instead, representative elements of the organization were involved and through the power of participation, name recognition, and "word of mouth" advertisement, the word continued to migrate. People were excited about the direction in which the Spares Campaign initiative was reshaping the Air Force.

Dedicated Communications: Several forums were chosen to further get the word out about AF supply chain integration including Senior Leaders Forums (e.g., CORONA), Logistics Officers Association (LOA), appropriate MAJCOM conferences (e.g., Engine Summit), and MAJCOM IL/LG Conference. Besides target audience-directed VTCs and conferences dedicated to discussing supply chain integration, other communication media were used. Media releases through the Air Force News Service ensured the story was available to all base newspapers and other literature that picked up information from these sources. The World Wide Web was used through information submissions for both the Air Force Web Page as well as the creation of our own web site. Other forums included briefings by initiative participants and leaders at general logistics education courses and participating in scheduled conferences not necessarily dedicated to this effort. A Supply Chain workforce education course was also developed for a large audience in the Air Force's Materiel Command (AFMC) and is serving as a forum to share the results of this initiative. Overall, it was determined necessary to utilize a multitude of media sources including websites, newsletters, journal publications (e.g., Air Force Journal of Logistics), and official Air Force forums to get the word out to the total impacted population.

2) Indicate how this initiative can be transferred to other organizations, and specify the likely candidates for transference.

Across the Air Force

This supply chain integration initiative impacts organizations across the Air Force. Not only will logistics organizations be impacted by this effort, but other organizations as well. The Financial Management (FM) and Contracting communities will better understand their place in the supply chain relative to logistics and one another, and the symbiotic relationship that already exists will be further strengthened. Members of these communities have been briefed and are regularly asked to coordinate on activities as well as participate in briefings, discussions, and meetings. In fact, the contracting community has provided a dedicated action officer to the PSCM effort and the AFMC/FM (a two star general) has personally taken up some of the initiatives such as DLR pricing and the ABC work and run with them.

Across the Department of Defense

Supply chain integration also impacts other agencies and Services within the DoD, not only customers of Air Force supply and repair activities, but providers of supply and repair to Air Force customers. It is important that the benefits are transferred across the DoD. The Defense Logistics Agency (DLA) is undergoing a major business system modernization effort as well as revisiting procedures relative to Air Force accounts. With the identification of best supply chain practices, DLA and the Air Force can strengthen their bonds.

Discussions between Air Force and DLA leadership are regularly held on these issues and DLA has provided a liaison officer to further ensure integration of activity. The AF and DLA have entered into a teaming relationship in the Purchasing and Supply Chain Management initiative. Both DLA and naval Supply Command are engaged in the Demand Forecasting and Advanced Planning and Scheduling initiative.

Logistics Community at Large

Supply Chain integration includes commercial suppliers from the private sector. The Air Force logistics community has gone to great lengths to ensure inclusion of major players in the private sector. The creation of a "Supplier's Council" has been discussed with Pratt and Whitney, General Electric and Lockheed-Martin. In this council, senior personnel from the Air Force logistics community and participating companies would discuss issues of benefit to all parties. Additionally, pilot programs are being initiated with individual private sector organizations to include Pratt and Whitney and Lockheed-Martin to further ingrain some of the supply chain integration practices being developed. Results of these initiatives will provide lessons learned for future endeavors.