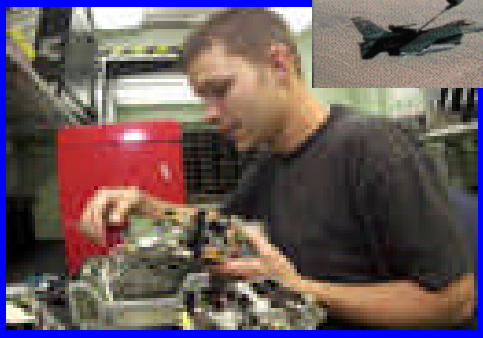
# Supply Chain Council Awards for Excellence In Supply Chain Operations and Management 2002 Submission



## United States Air Force
## Integrated Logistics Capability

AF/IL: The Force Behind Air & Space Power

# Supply Chain Council Awards for Supply Chain Operational Excellence

## U.S. Air Force
## Supply Chain Integration

2002 Submission

February 2002

# Foreword

February 15, 2002

This document contains the United States Air Force, Deputy Chief of Staff/Installations & Logistics submission for the 2002 *Supply Chain Council Awards for Operational Excellence*. This submission describes the Spares Campaign Plan and resulting 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, basic supply support indicators had shown a steady, continual drop. Between 1992 and 2000 Mission Capable (MC) rates had dropped, Total Not Mission Capable-Supply (TNMCS) rates had risen and cannibalization rates spiked upwards. These negative trends are not solely supply related, but supply of spares is without a doubt a major component. Coupled with the move to an Expeditionary Air Force operating style, fundamental change is warranted.

To begin this change an in depth study was conducted and recommended changes were briefed and accepted by to Senior Air Force Leaders. The Supply Chain Integration Office was formed to implement eight high impact initiatives. On an individual basis, each of these initiatives promise important improvement to the availability of parts necessary for weapon system operations. However, the collective implementation of these complementary initiatives establishes a foundation for "transformation" of Air Force spares management and significant process improvements.

MICHAEL E. ZETTLER
Lieutenant General, USAF
DCS/Installations & Logistics

# Contents

**Section 3 Knowledge Transfer**

# Executive Summary

The end of the Cold War, coupled with turbulence and change in Air Force logistics processes and infrastructure, led to chronic spares availability problems and a decline in supply support indicators from 1992-2000. While significant increases in spares funding has arrested the decline, the Air Force can't afford only a "more money" solution. Fundamental transformation was required. Recognizing that the Air Force's ability to execute its mission is directly related to the availability of weapon system spare parts, on 9 Feb '01 the CSAF endorsed a review of spares management processes. A four-month effort ensued and became known as the "Spares Campaign." Team members from Headquarters Air Force, Major Commands, Air Logistics Centers and industry experts and consultants analyzed strategic spares management processes to identify disconnects, deficiencies and areas for fundamental improvement.

After disconnects were identified, mapped, and solutions narrowed, Air Force Deputy Chief of Staff for Installations and Logistics selected eight initiatives for immediate implementation action. These initiatives were then briefed to the Senior Air Force Leadership within the Air Force and approval was given to proceed.

Headquarters USAF, DCS/Installations and Logistics (AF/IL) is responsible for the implementation of the Spares Campaign initiatives. The execution of program management functions are accomplished by a full-time implementation team (AF/IL-I), consisting of uniformed and civilian Air Force personnel and KPMG Consulting.

This award package will define the mission of the Supply Chain Integration & Logistics Transformation Office (AF/IL-I) and the implementation of the Spares Campaign's complementary set of eight initiatives. 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 the weapon systems availability needs of the Expeditionary Air Force.

# Section 1
# General Information and Project Complexity

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

2) Headquarters United States Air Force, Deputy Chief of Staff/Installations & Logistics, Logistics Supply Chain Integration & Logistics Transformation Office.

3) The Supply Chain Integration and Logistics Transformation Office's (AF/IL-I) mission is to implement the 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. The IL-I office is comprised of government and private sector personnel fully integrated to capitalize on their diversified supply chain management strengths, knowledge and experience. Each of the eight initiatives are led by an IL-I team member and each team consists of members from a variety of Air Force and private industry functional areas. The IL-I's initial focus is on implementing, within 12 months, eight AF approved Spares Campaign initiatives. These were selected to improve supply support processes to increase combat support capabilities for the 21st Century Expeditionary Air Force Warfighter. The IL-I office is responsible for the development of project plans and schedules to implement the eight initiatives and to manage the change process.

4) Supply Chain Operational Excellence Award.

5) The focus of the eight initiatives is on increasing weapon system availability/mission capable sorties, and transforming spares support in the Expeditionary Air Force (EAF) operating environment. This focus has led us to look at the entire Supply Chain from end to end. The first three initiatives--Change Depot Level Reparable (DLR) Pricing Structure, Improve the Spares Budgeting Process, and Improve Financial Management--are designed to improve the Air Force's ability to determine the number of needed spares, effectively budget for them, and track the execution of weapon system support. Recognizing the importance of the Spares Requirements Review Board, Air Force officials have taken steps to institutionalize the group so the various spares managers can collectively arrive at a credible, the best-estimated spares requirement forecast. The fourth initiative, Improving Demand and Repair Workload Forecasting, calls for improved methods of calculating the type and timeframe of spares repair needs. This initiative utilizes relevant commercial technologies like advanced planning and scheduling systems (APS) in order to better align known forecasts with changes in spares repair demand. Establishing a Virtual Single Inventory Control point is the fifth initiative and will centralize through software the way in which the Air Force distributes its repair priorities to the air logistics centers and, ultimately, to commercial contract repair facilities. All repair activity within a supply chain for a weapon system will be focused on the platform's availability to perform missions at desired levels. The final three

initiatives--Aligning Supply Chain Management Focus, Standardizing the Use and Expanding the Role of Regional Supply Squadrons and Adopting Improved Purchasing and Supply Chain Management--involve creating better internal and external relationships.

6) External Supply Chain partner organizations involved with the Spares Campaign are:

RAND
Manugistics
ABC Technologies
Logistics Management Institute
Defense Logistics Agency; and
Office of the Secretary of Defense/AITL

7) Internal Supply Chain partner organizations involved with the Spares Campaign are:

KPMG Consulting
Dynamics Research Corporation

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

**RAND**
Mr. Bob Roll
1200 South Hayes Street
Arlington VA 22202-5050
703-413-1100
broll@rand.org

**Manugistics**
Jeff Holmes
2115 East Jefferson St
Rockville, MD 20852-4999
301-998-7460
jholmes@manu.com

**ABC Technologies**
Mr Kent Menser
1111 Jefferson Davis Highway, Suite 702
Arlington, VA 22202
703-412-5202
KentM@abctech.com

**Logistics Management Institute**
Mr. Randy King
2000 Corporate Ridge
McLean, VA 22102-7805
703 917-9800
RKING@lmi.org

**KPMG Consulting**
Mr. Marc Miller
1676 International Drive
McLean, VA 22102
703-747-4118
mjmiller@kpmg.com

**Dynamics Research Corporation**
Mr. Rick Benson
1755 Jefferson Davis Highway
Arlington, VA 22202
(703) 412-2812
rbenson@drc.com

# Section 2
# Implementation

**1)** ***Explain why the supply chain initiative was undertaken and how it was selected.***

In the early 1990's the U.S. Department of Defense responded to the end of the Cold War, cessation of hostilities in the Gulf War, and resulting change(s) in the national security environment with an extensive downsizing effort. As a result, Air Force Supply made pervasive policy and process changes to meet DoD-mandated inventory reductions and budget cuts. These Air Force supply changes were made over a period of several years, and in many instances without full consideration of the integrated nature of Supply with other functional processes. Concurrent with these supply system/process changes, other substantial changes were made with the primary purpose of reducing the total cost of the Air Force.

While these efforts were successful in reducing Cold War inventories and suppressing materiel budgets in order not to rebuild them, no systemic re-look was taken to ensure that Air Force supply and financial changes previously made adequately supported the new vision of an Expeditionary Air Force. The complexity of the Supply system and its interconnectivity with other logistics and financial systems seemingly precluded an all-encompassing assessment. However, as the 1990's came to a close, basic supply support indicators had shown a steady, continual drop. Between 1992 and 2000 Mission Capable (MC) rates had dropped 8.5%, Total Not Mission Capable-Supply (TNMCS) rates had risen 5.7% and cannibalization rates spiked upwards 3.8%. These negative trends are not solely supply related, but supply of spares is without a doubt a major component.

Beginning in 1998 the Air Force Director of Supply has led an effort entitled "Supply Foundation Program". The primary focus of the program is to investigate, identify, and assess various spares policies and procedures thought to be inhibiting warfighter support. The result of the review has been a series of new spares management initiatives to transform Supply back to its more productive and reliable past, but with a focus on the future. All of the initiatives are valuable as individual efforts, but it is the positive cumulative effect on improving Mission Capable rates is the most important. Through this Program, it also became very clear that there is an urgent need to reshape Air Force Supply to meet the demands of an expeditionary operating environment, and this reshaping needed to happen now.

On 9 February 2001, the Air Force Director of Supply presented a briefing to the Chief of Staff of the Air Force (CSAF) highlighting the need for a "Spares Campaign Plan". The Plan focused on five primary areas: (1) Financial Management and Planning, (2) Requirements Determination, (3) Requirements Allocation, Execution and Distribution, (4) Command and Control, and (5) Supplier Relationships. This Plan was to outline how to reshape Air Force Supply to provide a better fit with the Expeditionary Air Force with an ultimate end state of maximizing mission capability and weapons systems

availability across the Air Force well into the 21st century. A four-month effort ensued and became known as the "Spares Campaign." Team members from the Major Commands, Headquarters Air Staff, Air Logistics Centers and industry technical experts/consultants analyzed the strategic processes to identify disconnects, deficiencies and areas for improvement:

- 47 process disconnects were identified which were then organized into 12 major categories

- 190 implementation options were developed and considered to "fix" these disconnects, and ultimately 86 were deemed viable options and considered for implementation.

- These 86 recommended implementation options were aggregated into 20 initiatives. A "red team" made up of eight senior AF logisticians reviewed the five teams' work.

- These 20 Initiatives were then presented to the MAJCOM Directors of Logistics. They provided comments, ranked the initiatives, and AF/IL selected eight high impact initiatives for immediate implementation action.

These eight initiatives were briefed to the Senior Air Force Leadership at the four star level by Lieutenant General Michael E. Zettler, the Air Force Deputy Chief of Staff for Installations and Logistics on 31 October 2001). The CORONA Fall endorsement of the initiatives signaled a start for implementation. The eight initiatives are:

**#1. Change Depot Level Reparable (DLR) Pricing Structure.** The objective of the Depot Level Reparable (DLR) Structure initiative is to set more stable prices, provide cost visibility, reduce working capital fund loses, improve inventory levels, and encourage smarter repair decisions. Past spares working capital fund pricing focused on total cost recovery through complex methods of sales forecasting (variable costs) and business operations (fixed costs) allocations. This has resulted in turbulence in customer funding, revenue shortfalls, and incentives that sub-optimized the supply chain which contributes to missing weapons system mission capability targets.

The implementation of Defense Management Review Decision (DMRD) 904 - Stock Funding of Depot Level Reparable - in 1993 by the AF largely focused on total cost recovery through prices levied on the customer for each spare issued. The inclusion of surcharges added to the repair or acquisition cost to recover fixed costs (costs not directly related to the repair) has motivated activities and behaviors that work against original objectives of the DMRD. The DMRD objective was to increase base level repair (thought to be most cost effective) by forcing base level payment for spares issued. It attempted to encourage the return of spares to the depots by awarding financial credit to field activities. Additionally, an objective of the directive was to increase the awareness and visibility of total costs. It was believed that spares funding would be improved by

placing the total spares cost requirement in the hands of the operational commands as part of the flying hour requirement.

The past ten years of experience has shown that motivating local repair has not always been cost effective. The economies of scale realized by centralized computation of total spares requirements (pipelines, safety levels, readiness spares packages, ect) are not entirely captured in base level repair as related to flying hours at individual locations. Forecasting the entire spares requirement and then forecasting base level repair segment and sales from the "wholesale" depot system to recover all supply chain costs is difficult at best. When more local repair occurs than was anticipated or budgeted for in the price surcharge, the revenue necessary to recover all the fixed costs are not realized. Additionally, serviceable spares that are readily available at the central AF inventory are not requisitioned because the base can save money by repairing items locally. Awarding financial credit for serviceable assets has also resulted in bases holding reparable spares in awaiting parts status while simultaneously ordering serviceable spares in the hope of getting future credits. This ties up a large number of spares in unserviceable condition at the bases in anticipation of serviceable return credits. Another consequence of attempting to recover fixed costs in a pricing surcharge is that the true repair costs are masked rather than made more visible. The current logistics support structure and pricing mechanism do not focus users and providers on the common goals of reducing total AF ownership costs while optimizing spares availability to meet mission capability/weapon system availability. Changing the pricing methodology for DLRs and cost recovery strategy is a key financial management reform initiative proposed by the Spares Campaign. This initiative will enable the Air Force to separate fixed and variable costs, and ultimately result in customers paying only the latest repair cost ( LRC) or latest acquisition cost (LAC), the variable cost.

The fixed costs required to keep spares in the pipeline to meet response times, guard against uncertainty in demand and re-supply (safety levels and adjusted stock levels), to support contingency or wartime operations (readiness spares packages), or replace condemnations would be programmed and budgeted centrally by Air Force Materiel Command (AFMC).

Changing the DLR pricing and cost recovery approach will result in a number of benefits. It will eliminate much of the pricing turmoil and fluctuations the major commands and wings have had to live with in the past. In addition, it will ensure fixed costs are understood by all and programmed and budgeted for by the responsible parties. Finally, better repair decisions can be made when the financial incentive to retain assets with the hope of future credits is removed; reducing spares held in reparable condition, as well as investments in repair parts and equipment.

Included in the DLR initiative is a proposal to use Activity Based Costing/Management (ABC/M) approaches to identify cost drivers and provide better visibility and management of costs associated with providing spares. Current AF cost accounts primarily and properly support polices focused on funds accountability. They are increasingly used to aid in making management decisions and for process analysis—

something they were not designed to do. ABC/M is explicitly designed to present costs to support specific management decisions to help reduce process costs. ABC identifies cost drivers that can be associated with traditionally "fixed" or indirect costs and allocates these costs in a more meaningful way to customers, services or products. Contract award for a one-year pilot should be awarded in Mar 02 with final analysis completed NLT Mar 03.

**#2. Improve the Spares Budgeting Process.** The objective of this initiative is to institutionalize a single, consolidated, and credible requirement computation process for spares, consumable and equipment items linked to specific readiness goals. In the past, the total Air Force spares requirements were not adequately identified and budgeted. The Air Force Cost Analysis Improvement Group (AFCAIG) and the Air Force Working Capital Fund (AFWCF) requirements computations were not well synchronized. These events often resulted in unplanned year of execution bills to the Air Force. This Spares Campaign initiative implements the Spares Requirements Review Board to create programming and budget decisions based on a single agreed requirement. Expanded use of the Aircraft Availability Model (AAM) logic in computing safety levels for items in repair status is also being addressed. This initiative should be complete by Dec 02.

**#3. Improve Financial Management.** The objective of this initiative is to provide the Air Force programming and budgeting planners with a closed loop decision support tool to improve their ability to track execution of weapon system support against the plan approved in the budget. Currently, logistics planners lack the ability to evaluate how close to their budget plans they are during execution and are unable to make trade-off, repair and buy decisions when operational requirements or budget allocations change.

The Closed Loop Decision Support Tool (DST) architecture is intended to assist in planning and support during the execution year. Multiple processes need to be connected through assessment and feedback mechanisms to keep the overall budget system for weapon system support on track and meet the Air Force's goals. The first stage is to allocate the execution year's funds to weapon systems through a process involving HAF, MAJCOMs, and weapon system czars, where participants are provided the information needed to evaluate tradeoffs. This includes the requirement for mission capable sorties to support training, operations associated with boiling peace, and readiness to deliver sorties in a MTW. The DST will asses the ability to deliver the desired mission capable sorties, along with overall dollar cost for each weapon system given an account of assets, capabilities, and constraints of the logistics system. The result of this allocation process will be to support a budget for each weapon system for an NSN planning process. The intent is to be able to evaluate plans with a more realistic and detailed understanding and be able to indicate where constraints and conflicts are likely to interfere with the execution of the plan. The tool will use a set of metrics to monitor performance against sortie and MC goals and provide diagnostics. It will assess whether or not goals will be achieved and indicate the causes for falling short. If plans are not being fulfilled, corrections can be made within the particular weapon system's allocation of funds by modifying the plan or adjusting controls in the execution process. The

architecture for the system has been developed and the building of the prototype is next; f Sep 02 is the target date for an implementation decision.

**#4. Improve Demand & Repair Workload Forecasting.** The objective of this Spares Campaign initiative is to improve Air Force (AF) customers' parts forecasts and enhance supply & workload planning through implementation of a robust Demand Planning process. Demand Planning is a structured process for forecasting customer requirements (quantity & schedule) and using this information to create integrated functional plans (supply, maintenance, finance, etc.) that best meet these demands given logistics constraints. The Demand Planning process was tested at OC-ALC using the low-pressure turbine (LPT) rotor of the F-101 engine; significant improvements in logistics support were realized, including: avoidance of depot-level repair delays due to lack of supply-provided components; shortened actual LPT rotor shop flow time (over 20%) due to pre-execution actions taken; increased production throughput (over 50%) due to pre-execution actions; and reduced Non-mission capable supply (NMCS) (over 80%) without jeopardizing support to other rotors.

The Pathfinder test concluded with the identification of 30 recommendations that should be implemented to fully deploy the Demand Planning process defined by the pathfinder results. Initial Operational Capability (IOC) with a subset of the thirty recommendations is to be implemented in one shop at each Air Logistics Center (ALC) by May 02, with expanded IOC throughout Air Force Materiel Command ALCs in Oct 02. However, to fully implement the Demand Planning process the Air Force will have to invest in enabling technology; accordingly, a pilot of an Advance Planning & Scheduling System (APS) is beginning in Feb 01. The objective of this pilot is to evaluate the functional benefit and technical fit of commercial APS software in an AF maintenance and repair environment and to determine its ability to support the new Demand Planning process. The pilot should be complete and evaluated for implementation by Dec 02. Implementation, given favorable results is in FY04.

**#5. Establish Virtual Single Inventory Control Point (ICP).** The objective of this initiative is to centralize processes for consistent execution and enforcement of spares repair and buy to best achieve weapon system availability (WSA)/mission capable (MC) goals. The objective function of the AF requirements computation and repair prioritization algorithm is to achieve an aircraft/weapon system availability goal at least cost. However, because the current process of making spares buy and repair decisions is fragmented among the different ALCs, results are sub-optimal because they focus on individual stock numbers versus focusing on overall WS availability and capability. Although current funding is computed by weapon system and allocated to centers by weapon system, it is not executed by weapon system nor managed by weapon system. The VICP will provide the mechanism for AFMC to implement a weapon system focus by centralizing the processes of generating the buy and repair lists by weapon system across centers vs. within centers. To ensure that execution is driving towards WSA the position of the WSSCM is being created. The WSSCMs will be responsible for ensuring depot repair operations are synchronized for achieving the funded WSA target, for

recommending resource reallocation to support the weapon system, and to prioritize constraints and develop mitigation plans for those constraints impacting WSA the most.

The core activities of the VICP span a range of activities from preparing budget submissions to executing the budget. The central objective is to manage financial resources across the various repair and buy activities in order to maximize weapon system availability. Key to the successful operation of the VICP is access to accurate data, WSA goals to support operational requirements, and a weapon system priority matrix to guide the application of funds when full funding is not available. The capability to monitor execution against the plan is key to adjusting demand planning techniques for future budget projections. Additionally, operational monitoring tools that will assess repair execution against the budget allocation and WSA goals will be a necessity for Weapon System Supply Chain Managers (WSSCM) to manage their weapon system supply chains effectively. WSSCMs will be responsible for mitigating constraints at all repair activities if that constraint has an adverse impact on achieving the WSA target. Finally, the VICP application programs must have real time access to world wide asset positions to ensure fielded spares are properly utilized to support operational units prior to inducting reparable items for repair that may not contribute to the overall WSA goal.

When faced with constraints that cannot be overcome by the WSSCM, the Fleet RSS will become the single point to the WSSCM to manage the distribution of critical fielded spares. Maximum use of automated decision support tools such as the Spare Parts Release Sequence (SPRS) will be used, however the Fleet RSS can direct distribution outside of SPRS when operational conditions dictate. Full operational capability to centralize repair should be accomplished by Jan 2003.

**#6. Align Supply Chain Management Focus.** The objective of this initiative is to provide a weapon systems' spares "quarterback" with the resources, authority and accountability for focusing spares management on meeting mission capability targets. The current spares management process is not integrated and not focused on weapon systems. Spares are predominately managed by NSN, commodity group, or technology repair centers. Current success is measured through efficiency and yield in the repair shops and execution of current year dollars for spares acquisition, without a way of tying directly back to improved weapon system availability. Actions are currently underway to better define SCM roles, responsibilities, polices and procedures to better manage the supply chain for specific weapon system availability. Proactive identification/mitigation of constraints is the corner stone to improving supplier relationships and achieving higher mission capable sortie rates. This re-engineered process will move away from the current "bullwhip effect" by fostering trust throughout the supply chain, and will leverage current IT solutions to allow proactive analysis techniques. Also, this initiative will continue to incorporate best commercial practices. Full alignment of SCMs to Weapon System is to be achieved by Oct 02.

**#7. Standardize Use and Expand Role of Regional Supply Squadron (RSS).** This initiative has two objectives. The first objective standardizes common supply processes across the United States Air Force by consolidating existing base supply processes into

Regional Supply Squadrons. Currently four MAJCOM's have consolidated their common supply processes. This consolidation has proven to be effective in cost and performance: results include the reduction of 579 manpower spaces and savings of $25M. These early RSS' efforts also helped to achieve the tenets of Agile Combat Support by extending reachback, cutting the logistics deployed footprint. Finally, in terms of direct operational impact, the Air Combat Command (ACC) RSS was able to cut Total Not Mission Capable Supply on several weapon systems by 50 percent, Awaiting Parts incidents over 45 days by 57%, and customer wait time by 2/3 in one year. The Pacific Air Forces (PACAF) reduced the number of open MICAP's in the first 30 days from 994 to 420 a significant improvement in support to the warfighter.

The second objective is to move portions of the distribution decision authority for intensively managed spares from the item manager to a Fleet RSS. This transition is important because the RSS' are much closer to the warfighter daily operations and have greater visibility of individual needs and current operations than do supply chain managers at the Air Logistics Center inventory control points. It also expands the RSS role to include prioritization of I-level maintenance actions for intensively managed items to meet the most pressing spares needs. This aspect of the initiative brings in significantly more management over the overall Air Force spares supply chain than has previously existed. This effort, combined with the Virtual Inventory Control Point and Align Supply Chain Management Focus initiatives, will significantly improve AF spares command & control. Initial operational capability for this initiative is Jun 02.

**#8. Adopt Improved Purchasing & Supply Chain Management.** The objective of this Spares Campaign initiative is to reduce purchase costs, improve product quality and delivery by implementing improved PSM practices.

PSM is attractive to the AF for a number of reasons. In addition to the over $20 billion it spent on weapons in FY00, the Air Force purchased over $30 billion worth of goods and services from a broad range of suppliers to include other government organizations. As the amount of its non-personnel spend[1] has grown due to new weapon support policies and ongoing competitive sourcings, so has the strategic importance to the Air Force of its supply base, supplier selection, negotiation, and management practices as well as the integration and management of its supply chains to effectively and efficiently support the war-fighter.

Against this backdrop, leading firms report significant rewards from improved Purchasing and Supply Chain Management (PSM) practices. They claim initial savings of from 3% to 20% or more in specific categories with ongoing new total spend savings of 3% to 5% per year. They also report performance improvements such as quality improvements of 10% to 13% per year, delivery responsiveness improvements of 7% to 10% per year, and faster product development (almost 3% per year). Further, purchased goods and services offer a large and growing target area for the AF in which to seek improved performance and cost savings. Adopting improved PSM practices offers the AF a means of achieving significantly improved performance and reduced costs.

[1] 67 percent of the Air Force's FY00 budget

Based on the above, AF/CV proposed improved PSM as an alternative to competitive sourcing to achieve significant savings. SECAF and CSAF endorsed PSM in Jul 01. The Spares Campaign PSM implementation is not intended as a reduction in personnel. Of note, the overall objective is different from A-76; its purpose is to improve, indeed transform, purchasing and material management processes and practices. Any savings are to be redistributed to other needs. Additionally, PSM replaces, not adds to, current workload. The first implementation of improved PSM practices is underway at OC-ALC in the F-100 engine product area. The SCOR model is being used to map the supply chain, identify relevant metrics and the Gensym e-SCOR software is being used to model different strategies to improve engine support. At the same time, e-commerce is being tested to support the C-130. A partnership between Lockheed Martin and the AF has resulted in the development of e procurement to purchase spares in support of the C-130. Lockheed Martin and the AF are building on this initial phase to develop an electronic supply chain for the C-130 to include collaborative planning, technical management, engineering management, training and publications management.

**2) *Indicate the duration of the project.***

The Supply Chain Integration Office has been chartered for one year. By Sep 02 initial implementation of all eight initiatives will be achieved, with full implementation anticipated in FY04.

**3) *Detail the process used to complete the initiative.***

For each of the eight initiatives, detailed implementation plans have been built utilizing Microsoft project. Project inputs are developed in partnership with the stakeholders. All activities to include policy, procedures, milestone events, or identified constraints are worked jointly to ensure success and implementation of the initiatives. The actual implementation is being accomplished by those organizations that functionally own the process. We have found that by all stakeholders understanding the initiative, gaining support and cooperation is much easier. These project plans allows the team to monitor, manage, and teak activities to ensure all actions have been completed in support of initiative implementation.

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

There were 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 were 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 (b) success.***

Because the Spares Campaign has so many broad objectives of which we hope to achieve it became necessary to identify distinct activities required to be accomplished toward achieving our end objective. Each one of these activities is clearly defined and assigned an OPR (office of primary responsibility) and OCR (office of coordinating responsibility) and given a timeframe for completion. The program manager tracks execution of each activity utilizing a Microsoft Project 2000 enterprise schedule. The enterprise project has inter/intra dependencies built into it and as activities are completed the primary initiative moves toward IOC and FOC.

***(a)*** Our primary means of measuring progress is whether or not we meet our timelines for accomplishing each activity in the enterprise schedule. Both IOC and FOC for each initiative have been defined and quantified based on which performance measures we hope to effect. We are trying to improve our overall supply chain processes related to providing spares. The Air Force has a very robust set of fully developed

performance measures and each one of our initiatives will be measured against these to validate improvement. These metrics have been used for some time and a baseline has been established. There are two primary metrics and several minor ones that we are using.

***(b)*** As mentioned in the preceding paragraph, the Air Force has a robust set of fully developed military-specific performance measures that have focused on logistics system output (e.g., Mission Capable rate) and functional performance (e.g., Cannibalization rate and Not Mission Capable Due to Supply). These metrics have established baselines and historical data that supports trend analysis and a variety of other performance improvement uses.

We intend to supplement these existing metrics with new and emerging performance measures designed to focus on overall supply chain performance. These metrics are consistent with the SCOR Tier 1 metrics, and include:

- **Weapon System Availability (WSA):** WSA can be defined as how many of my on-hand quantity of weapon systems are available to perform their primary function. An example of this would be if I had 10 Aircraft in my organization and 2 could not be flown because of scheduled maintenance that had to be performed they were down for repairs and waiting on parts. Weapon System Availability is the primary performance measure that is driving the Spares Campaign Initiatives.

- **Mission Capable Sorties (MCS):** MCS are an output of high Weapon System Availability and the true measure of combat effectiveness. Many of the tactical and strategic missions given to the Air Force require multiple aircraft and multiple types of aircraft to perform them. MCS can be defined as the ability to execute sorties with the proper aircraft. An example of this would be a bombing mission may require 5 bombers to fly in a formation to successfully execute the sortie. If there are only 4 bombers available at the time of that sortie (WSA of 80%) they can still not perform the sortie (No MCS).

  There are many performance measures subordinate to WSA/MCS. All of the following metrics contribute to high WSA/MCS and are being used to measure progress and success as we move toward IOC and FOC of our primary initiatives.

- **Stockage Effectiveness:** Stockage Effectiveness is a rate indicating the percentage of time base supply is able to satisfy a base maintenance requisition with stock off of the shelf, for items with an authorized base stock level.

- **Issue Effectiveness:** Issue Effectiveness is how often the base supply is able to issue an item to a customer when it is requested. It is very closely tied to stockage effectiveness.

- **Unfilled stock levels:** Outstanding backorders at all priorities are the measure of unfilled stock levels. They can be the result of vanishing vendors, long pipelines, acquisition lead times, lack of repair capacity or unavailability of spare parts or skilled work force.

- **Logistics Response Time:** The time required to fill a customer requirement (base supply requisition to base receipt of asset).

- **Losses to the Working Capital Fund (WCF):** Losses to the Working Capital Fund are evident when overhead costs are not fully collected and there is an unpaid bill that results at the end of the fiscal year.

- **Price Volatility:** Price Volatility can be measured by how much the price of the same item changes over a given period of time. Current price volatility is currently a result of how the Air Force assigns and collects its overhead costs.

**6) *Document and quantify cost and performance benefits, including the projects return on investment and changes in the value of one or more of the SCOR Level 1 metrics.***

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 don't map directly to SCOR measures, but that are critical in their own right. The Spares Campaign promises a transformation of the AF logistics system that provides:

- Increased availability of mission-capable weapons systems to the Warfighter to meet operational targets

- Logistics enablement of expeditionary Air Force operations anywhere in the world within 24 to 72 hours: and,

- Robust, collaborative relationships with our extended supply chain to provide agile and flexible sustainment.

**7) *Outline how the success of this effort supports the organizational objectives.***

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 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
# Knowledge Transfer

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 gameplan to identify the problems, analyze systemic process disconnects, propose recommended solutions and develop a program for implementing change. AF/IL approved the gameplan to begin the study and a briefing given to CSAF, who approved moving forward. Armed with this approval, the Major Command senior logisticians were advised of the pending effort and tasked to provide support in terms of freeing up the necessary manpower to participate in the study and solution development. Accordingly, briefing senior leadership and management carried the net effect of getting the initial word out 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 they knew that senior leadership supported the effort. Further, as senior leadership was regularly updated on the initiative at staff meetings, through video teleconferences (VTCs) and other regularly scheduled meetings, the "word" was getting out. 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 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. Participation by the "guys in the trenches" was key in getting the word out to other affected co-workers. Also, their participation provided credibility to the results of the effort. Had a contracted think tank or study group gone off and 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 wanted to know what was going on and the participants carried the message. Active participation by members of the organization was key.

**Dedicated Communications:** Several forums were chosen to further get the word out about AF supply chain integration. 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 and official Air Force forums to get the word out to the total impacted population.

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

## Across the AF

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. In fact, the contracting community has provided a dedicated action officer to the effort and the AFMC/FM (a two star general) has personally taken up some of the initiatives and run with them.

## Across the DoD

Supply chain integration also impacts other agencies and Services within the DoD. As 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 of this effort will be 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 in general and this effort in particular has gone to

great lengths to ensure inclusion of major players in the private sector in this effort. 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 participate in a forum to discuss issues of benefit to all parties. Additionally, pilot programs are being initiated with certain 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.