US AIR FORCE
LOGISTICS ENTERPRISE ARCHITECTURE
CONCEPT OF OPERATIONS

U.S. AIR FORCE

Developed By:

Deputy Chief of Staff for Installations and Logistics
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1.0 EXECUTIVE SUMMARY

Air Force Logistics processes support one of the largest supply chains in the world. These processes have many characteristics that are different from typical production based supply chains. The most differentiating characteristic is the objective. The AF objective is to provide weapon system capability to the warfighter to achieve a desired effect at minimum cost. Highly variable demand patterns create uncertainty in the AF logistics chain, which can drive cost if not properly managed. Additionally, a major portion of the AF logistics chain is the repair and overhaul of weapon systems and their key components. Managing the flow of reparable assets, to include physical return, disposition, maintenance, condemnation, and procurement of replacement (or increased) assets with an enterprise view of repair and overhaul capacity across a multitude of suppliers is a challenge not many industries face today. Finally, critical operating locations change based on national objectives and the logistics enterprise must have the agility to adjust and respond with seamless support to the warfighter.

Air Force Logistics has met its challenge throughout history, and continues to do so today. Throughout its evolution, the Logistics community has developed unique capabilities to support the mission need. However, the AF Logistics enterprise does not provide the capability to rapidly re-plan requirements when operational goals change, nor can it swiftly allocate resources to support changing operational scenarios. Consequently, tomorrow's environment demands a more improved Logistics chain. One that is not only effective, but also efficient and agile. To support AEF taskings, it must become rapid in its response, dynamically re-configurable in its structure, integrated across all its processes, and common in its application across the Air Force. In order to meet the ever-changing needs of the warfighter, the logistics enterprise must completely re-think the way it does business. This will require a logistics enterprise transformation. A key element that will guide this transformation will be the *Logistics Enterprise Architecture (LogEA).* This document, the LogEA *Concept of Operations (CONOPS),* presents the collection of high-level requirements for Air Force Logistics to develop and employ an enterprise-wide logistics architecture that encompasses both operations and systems.

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2.0 TRANSFORMATION ROAD MAP

To realize these objectives, the Logistics Enterprise Architecture (LogEA) is being developed as a roadmap to the future. It will be comprised of three main components:

2.1 OPERATIONAL ARCHITECTURE (OA)

The OA identifies the future state processes and attributes that collectively define the future state operating picture for the Air Force Logistics Enterprise.

2.2 SYSTEMS ARCHITECTURE (SA)

The SA provides the future state definition of the information technology systems that will be used to enable the operational architecture.

2.3 TRANSITION PLAN (TP) AND GOVERNANCE STRUCTURE

This step-by-step roadmap will guide the transition from current state to the defined future state through process and systems implementation.

The goal of the LogEA process is to establish a single authoritative source that clearly defines Air Force Logistics processes and systems models. This CONOPS document will demonstrate the processes and activities associated with the planning, management, and fulfillment of the future state logistics requirements. The LogEA will act as a catalyst for developing doctrine, policies, and organizational structure to enable the Air Force to provide efficient and effective logistics support.

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3.0 INTRODUCTION

The Logistics mission is straightforward: 1) Get the force to the fight; 2) Keep the force in the fight; and, 3) Prepare the force for the next fight. Air Force Logisticians have met this challenge throughout history, and they continue to do so today. However, tomorrow's Expeditionary Air Force (EAF) environment demands a more improved Logistics chain. One that is not only effective, but also efficient. It must satisfy operational requirements such as Air Expeditionary Force (AEF) rotations, and the Global Strike CONOPS. Air Force logistics must become rapid in its response, dynamically re-configurable in its structure, integrated across all its processes, and common in its application. To meet the ever-changing needs of the warfighter, Air Force logistics processes must significantly change. The Air Force can no longer view logistics processes in terms of functional areas but as a single integrated logistics enterprise. In addition to more traditional logistics functions, the Logistics Enterprise Architecture (LogEA) will bring together other major disciplines such as Accounting and Finance, Acquisition, Human Resources, Installations and Environment, Strategic Planning and Budgeting, and Technical Architecture. The LogEA is tied closely with the Department of Defense (DoD) Business Enterprise Architecture – Logistics (BEA-LOG) that provides higher-level guidance for developing enterprise architectures. The integration provided by the LogEA will allow the Air Force to manage logistics from an enterprise-wide perspective focused on meeting warfighter requirements effectively and in a cost effective manner.

The future Air Force logistics vision is focused on delivering capability to the warfighter. To accomplish this, logistics goals will be derived directly from weapon system operational requirements. This will ensure that all logistics enterprise goals are directly aligned with support requirements for both peacetime and wartime. The result is providing the right stuff, to the right place, on time – every time. The future state enterprise will be well-led by motivated and skilled people equipped with the tools they need to execute their mission. The LogEA must be scalable, responsive and able to support the EAF concept at home and deployed. It will deliver reliable, time-certain and effective support. It will have network-centric operations leveraging centralized planning and decentralized execution with real-time Command, Control, Communications and Interoperability (C^3I). It will be predictive and pro-active while being responsive. It will maintain an enterprise-wide perspective that drives behavior at all levels. Summarily, it delivers mission capability while maintaining affordability.

In the future, to most effectively support the warfighter and deliver best in class support, the Air Force will transform key areas of its Logistics operations by adopting an, *end-to-end focus on customer support*. The Logistics Enterprise will support the EAF concept by adopting transformational management and execution practices that are not bound by existing processes, legacy systems, geography, or organization.

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4.0 KEYS TO SUCCESSFUL TRANSFORMATION

The success of any transformation lies in its foundation. Success requires innovation, partnering with industry, leadership commitment, targeted investment, and massive change management, which is an integral part of governing the transition. Key elements of the transformation foundation are:

- **Innovation** – Innovation is not new to the AF. The Aircraft Availability Model, for example, is one of many innovative approaches adopted to improve and measure logistics support. By applying home grown improvements and leveraging innovations from industry, the AF can incorporate best practices into its logistics operations through process and systems improvements. Change is rarely easy and establishing the Logistics Enterprise Architecture is no exception. Innovation will require fundamental changes to the way the AF does business and these changes are necessary to continue providing logistics support to the warfighter. It is through innovation that improved AF logistics processes will be recognized for adoption. By capturing innovation within the AF community (such as the Aircraft Availability Model), and leveraging innovation occurring in the marketplace (such as Advanced Planning & Scheduling), the AF can drive best practices into logistics chain operations through process and systems improvement. The AF must fundamentally re-think the way it does business. Break the mold…don't polish it.
- **Leadership Commitment** – AF leaders within and beyond the Logistics community must drive the change to completion. It is through strong, consistent leadership that the necessary change occurs. A commitment to the transformation path will be embedded in daily business priorities and championed by the Air Force corporate structure.
- **Targeted Investment** – Transformation is a journey of steps and each step must be executed in accordance with a plan. It is through timely execution of these steps that transformation occurs. By focusing Air Force resources on these steps, the Air Force will travel a single path to transformation, through the LogEA CONOPs.
- **Successful Change Management** – Transformation by definition is the dramatic change from one state to another. The Logistics Transformation will dramatically change the way the Air Force does business, and will necessarily change the way in which its people will conduct business. This change must be embraced by those involved, to ensure successful implementation. Change does not happen to people, it happens because of them.
- **Partnering with Industry** – The Air Force will integrate its business processes with industry partners. By integrating with these partners, AF goals will become their goals, and their success will ensure AF success. Further, the competencies of partner organizations will be leveraged wherever possible, enabling the Air Force to focus on its core competencies.

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5.0 PURPOSE

The overall purpose of the LogEA itself is to stand as the single authoritative source that clearly defines both the operating and systems models for Air Force logistics. This CONOPS document will demonstrate the processes and activities associated with the planning, management, and fulfillment of the future state logistics requirements. Further, the CONOPS will not only provide a catalyst for developing doctrine, policies, and organizational structure to align the Air Force for efficient and effective logistics support for the foreseeable future, but will also be the basis for the development of the overall EA which includes; OA, SA, and Transition Plan (TP).

The purpose of the CONOPS is to serve as *the* high-level roadmap for transformation of Air Force logistics operations supporting the warfighter. The objective is to establish the framework, standards, and guidelines to define the environment in which the "to be" systems can be identified, acquired, or built. The LogEA is not meant to provide all the detail necessary to procure and build discreet logistics functional systems but rather enable the future SA to be developed in support of the OA.

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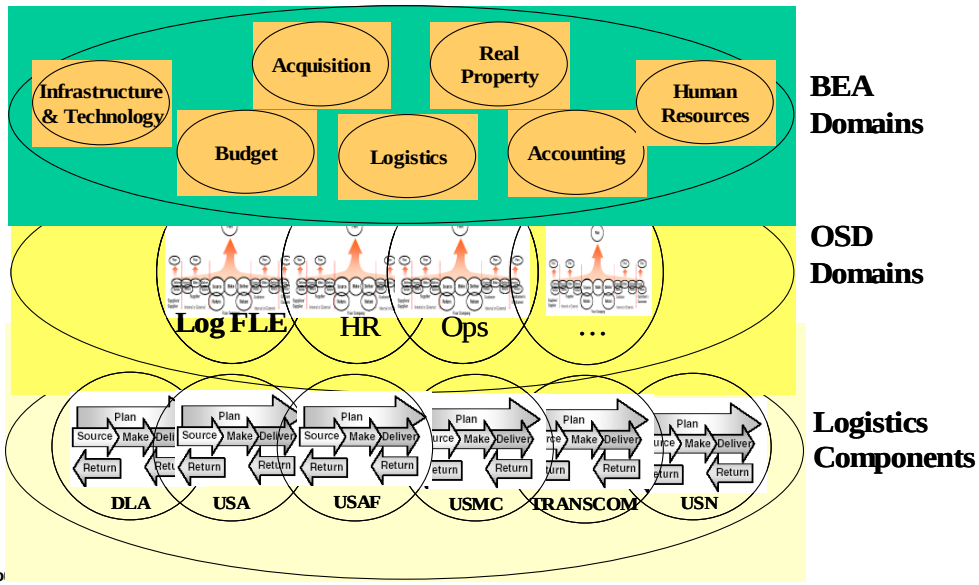
6.0 SCOPE

The Air Force Logistics Enterprise is defined as the collection of processes, technology, and resources that deliver Logistics support to the Warfighter. This Enterprise includes Delivery, Transportation, Maintenance, Procurement and Purchasing, Inventory Management, and Product Lifecycle Management and operates across all product lines. Partners of the Air Force Logistics Enterprise to include suppliers in concert with organic Air Force functions, create the Air Force Logistics *Extraprise.* The Air Force Logistics *extraprise* is a subset of the larger DoD Logistics extraprise both of which include internal and external suppliers of goods and services. Although specifically excluded in the scope of LogEA, the remaining Architecture domains are recognized as a major part of the AF Supply Chain and Air Force Enterprise. Links from the LogEA to the other domains are identified throughout the Operational Architecture, and will continue to be developed the other domain Architectures are developed in the Air Force, as shown in the Figure below. The LogEA CONOPS document provides a detailed explanation of the specific business needs that the LogEA will address. The document captures the high-level needs and expectations of the stakeholders and users across the Air Force logistics communities, and details the high-level features required meeting those needs and expectations. This document does not cover the detailed technical requirements needed for development and transition to the future logistics state. The detailed technical requirements shall be documented in the Systems Architecture and Transition Plan, which are part of the EA itself. Similarly, this document does not detail the functional nor the technical "as is" logistics environments.

This CONOPS document stands as the Architecture Overview and Summary Information Document (AV-1). Included in this document, Sections 14.0 and 15.0 are an "operational view" and a "systems view". These are not meant to replace the later documentation associated with the OA (operational views (OVs)) or the SA (system views (SVs). Rather, they are meant to provide an overview of the later documentation, which will be completed and submitted separately. The scope and extent of the architectural products that define the LogEA, including this CONOPS have been tailored in accordance with the Command, Control, Communication, Computers Information, Surveillance and Reconnaissance (C4ISR)/ Department of Defense Architecture Framework (DoDAF).



7.0 ON-GOING INITIATIVE INTEGRATION

The LogEA will consider the on-going transformation initiatives as part of its execution plan. Key initiatives such as those listed below (not inclusive) and other initiatives both within other AF domains and across the DoD will be considered in the execution of the transition plan. These initiatives each address key transformational areas and are moving toward the force-centric logistics enterprise. Close coordination and integration are essential to ensuring that these architectures are able to communicate and share data across and within domains and components. The LogEA is one of these architectures and it will ensure that there is an integrated path within the Air Force Logistics domain. This architecture will also allow for integration with other OSD and BEA domains.

- Purchasing and Supply Chain Management (PSCM)
- Weapon System Supply Chain Manager (WS-SCM)
- Integrated Maintenance Data System (IMDS)
- Enterprise Resource Planning (ERP) Reviews
- Enhanced Technical Information Management System (ETIMS)
- Enterprise Solution - Supply (ES-S)
- Centralized Intermediate Repair Facility (CIRF)
- Strategic Distribution Projects
- On-Line Vehicle Management System (OLVIMS) replacement
- Global Combat Support System - Air Force (GCSS-AF)
- Linkage between Operational C2 and Logistics Chain (C2) (Rand Project Air Force)
- Advanced Planning & Scheduling (APS)
- Maintenance Repair & Overhaul (MRO)
- Virtual Inventory Control Point (VICP)
- Bills of Material IPT
- Commercial Asset Visibility II (CAV II)
- EXPRESS Planning Module (EPM)
- Combat Ammunition System (CAS) replacement
- Reengineered Supply Support (RSS) Program
- Stock Control System (SCS) Modernization
- Serial Number Tracking
- Point of Maintenance (POMX)
- Enhanced Maintenance Operations Center (EMOC)
- Automated Identification Technology (AIT)

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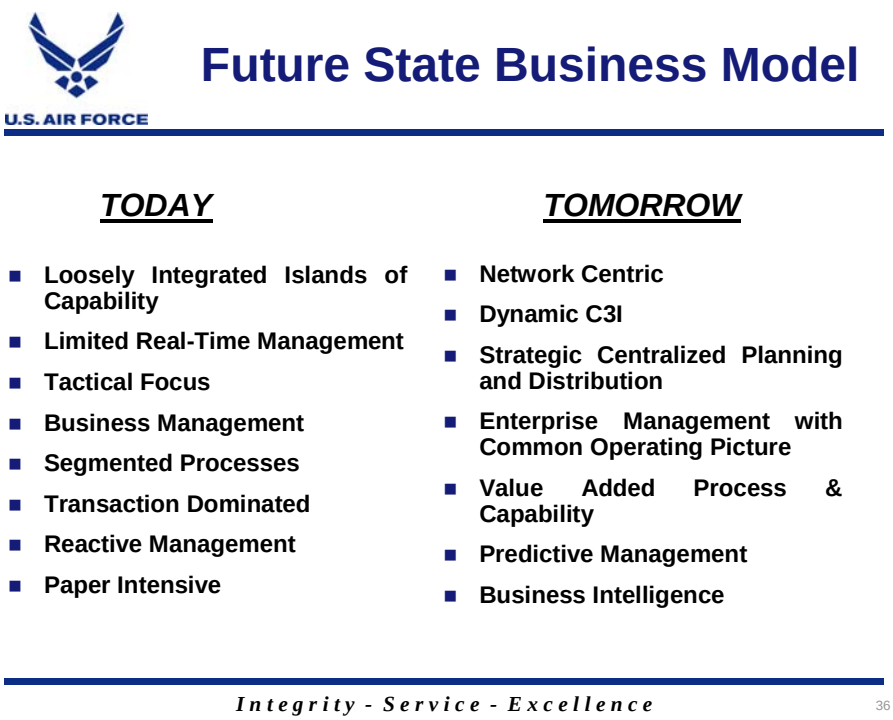
8.0 ELOG21 STRATEGY, OBJECTIVES, AND GOALS

eLog21 is the Logistics Transformation campaign that captures both the future vision and the transformation path for Air Force logistics to better met the needs of future air operations in a more cost effective method. LogEA is the operational and systems architecture that will support the execution of the eLog21 campaign. In order to lay the groundwork and frame the CONOPS, this section will review the mission, strategies, goals and objectives of eLog21 in relation to the logistics enterprise. It was with these goals and mission in mind that the Architecture Groups began their work and set the foundation for the "Best Logistics Practices", operational view and system view discussed later in this document.

8.1 MISSION OF THE LOGISTICS ENTERPRISE

The Logistics mission is straightforward: 1) Get the force to the fight; 2) Keep the force in the fight; and, 3) Prepare the force for the next fight. The result is providing the right stuff, at the right time and place, on time – every time. The Logistics vision for the future has an integrated enterprise-wide, end-to-end focus on delivering capability to the warfighter. *Figure 1. Future Logistics Vision* depicts this vision.

Figure 1. Future Logistics Vision



The future state Logistics enterprise has well-led, motivated, and skilled people with the right tool sets to execute their mission. It is scalable, responsive, with deployed-and-in-place capability. It delivers reliable, time-certain and effective support. It has network-centric operations leveraging centralized planning and decentralized execution with real-time Command, Control, Communications and Intelligence (C^3I). It has a resource process that is simple, makes sense, and reduces transactions. It is predictive and pro-active as well as responsive. It maintains an enterprise management perspective that drives behavior at all levels. Summarily, it delivers mission capability while maintaining affordability.

The Directorate of Innovation and Transformation (AF/ILI) is moving forward with their intentions of shifting the Air Force Logistics Enterprise from a platform based to an effects-based Air Expeditionary Force (AEF) to better align with the Chief of Staff's vision of the future Air Force. Continued success requires innovation, partnering with industry, targeted investment, and massive change management that is an integral part of governing the transition. **Strong, consistent leadership support is a key factor**.

8.2 ELOG21 – LOGISTICS ENTERPRISE TRANSFORMATION

In order to meet the Air Force Logistics mission described above, AF/ILI has grouped Logistics transformation initiatives under the heading "eLog21". To measure how the eLog21 initiatives impact the AF Logistics mission, AF/ILI established a straightforward high-level goal to improve operational capability while minimizing the costs of delivering that capability.

More specifically, that goal is segmented into two measures that are used to drive and measure Logistics transformation:

- Increase Weapon System availability by 20% within the next three years.
- Incur 0% real Operating and Support (O&S) cost growth over the current Future Years Defense Program (FYDP).

All other logistics goals will tie directly to these two primary goals, ensuring that the enterprise goals drive logistics performance at all levels. To achieve these goals, the Air Force Logistics community will be responsible for examining its processes to ensure that they support overall AF goals. Incentives and rewards will be tied to goal achievement. The principal underpinning is to keep metrics, goals, and incentives simple and direct.

Weapon System Availability is a measure of readiness and is calculated using Total Not Mission Capable-Supply (TNMCS), Not Mission Capable-Maintenance (NMCM), Mission Capability rates (MC) and Possessed Hours. The enterprise wide supply and maintenance, planning and replanning capabilities required and provided for within the LogEA will significantly improve these rates by leveraging efforts across the AF to meet customer demands. Additionally, successful execution of this initiative, in conjunction with other AF transformational initiatives, will improve readiness by analyzing repair, usage and historical data to predict failures in advance and planning for the required parts to conduct the repair. This analysis will improve readiness rates by reducing demand for component parts.

Weapon System availability must be balanced with affordability. The overarching logistics affordability goal for FY 04-09 is zero % real growth in Operations and Sustainment (O&S), which is an 8.9% reduction over the current spend forecast. This goal allows for a 1.42% inflation rate. The fiscal spend allowances are based upon the FY03 budget; the total spend for AF/IL is $27.5 million.

The O&S cost element structure is divided into six major categories:

- **Unit Personnel** – Cost of operators, maintainers and other support personnel assigned to operating units. This category includes military, civilian and contractor personnel.
- **Unit Operations** – Cost of unit operating material, support services and travel material. All maintenance and repair materials are excluded from this category.
- **Maintenance** – Cost of all maintenance other than maintenance personnel assigned to operating units. Contractor maintenance costs are included in this category.
- **Sustaining Support** – Cost of support activities other than maintenance that can be attributed to a system and are provided by organizations other than operating units.
- **Continuing System Improvements** – Cost of hardware and software modifications to keep systems operating and operationally current.

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- **Indirect Support** – Cost of support activities that provide general services that cannot be directly attributed to a system. This category is generally provided by centrally managed activities that support a wide range of activities.

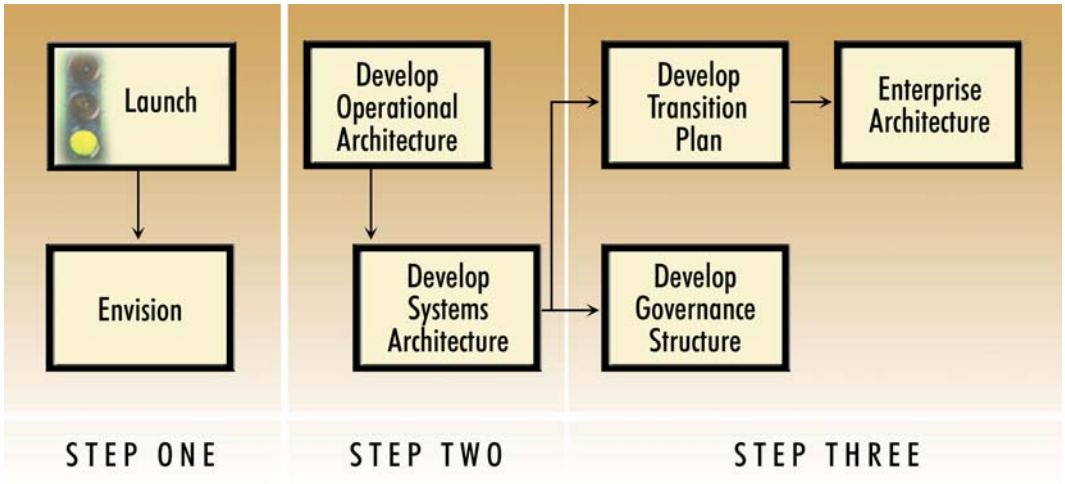
Establishment of a LogEA will result in an integrated set of enterprise wide priorities which will be clearly communicated to the maintenance community which will reduce costs by improving the planning and execution of maintenance activities. Additionally, requirements will be routed to the production facility best suited to conduct the repair. This will lead to the creation of efficiencies and economies of scale resulting in reduced repair material costs. Implementation of a Total Lifecycle System Management approach (TLCSM) will focus specifically on O&S costs. TLCSM will reduce these costs by managing weapon systems in their entirety and proactively. Finally, establishment of the LogEA and fielding of an APS will result in an integrated set of enterprise wide plans and priorities which will be clearly communicated to the throughout the logistics community. This will lead to the creation of efficiencies and economies of scale resulting in reduced O&S costs.

9.0 APPROACH

The LogEA stands as a tool for managing logistics information technology. To accomplish this, the LogEA will link System Architecture to the OA it supports, and will integrate all Air Force logistics functions into an architecture that supports business process re-engineering and information technology (IT) management decisions.

To realize this objective, the LogEA shall be developed in three main steps, which entails five basic phases: launch, envision, develop OA, develop SA, and develop TP and governance structure. *Figure 2. LogEA Approach* depicts this process. Operational, procedural and technical requirements for the future state architecture will be captured throughout these phases.

Figure 2. LogEA Approach



9.1 LAUNCH

This phase defines the scope and objectives of the overall architecture. It establishes the project management process. Defining and communicating a common set of expectations and shared understanding of key business issues driving the development of both the business and systems architecture is *key* to the success of the effort. This phase also addresses standard project management objectives such as roles and responsibilities, staffing, project planning, tracking and control processes, and quality management.

9.2 ENVISION

This phase establishes the high-level vision of the way in which information and technology will enable and support the subject functions. This vision serves as the basis for the more detailed analysis and design activities. It also establishes the goals and objectives for logistics at an enterprise level, and defines vision by making enterprise decisions that drive strategy, i.e., decisions pertaining to centralized inventory planning, centralized maintenance workload planning, process owners, and contractor logistics support.

9.3 DEVELOP OPERATIONAL ARCHITECTURE

This phase develops a more detailed understanding of the overall business process requirements the architecture will meet. It establishes metrics that support the enterprise goals and objectives, and focus on meeting capabilities based targets (i.e., aircraft readiness at time of need). It also establishes constructs to

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support enterprise decisions, such as eliminating functional alignments, or managing by responsibility, authority, and accountability vice oversight.

9.4 DEVELOP SYSTEMS ARCHITECTURE

This phase establishes the blueprint that outlines the enabling technologies that support the OA. It defines the systems structure, toolset guidance, and implementation strategies by making enterprise decisions, i.e., commercial-off-the-shelf (COTS) based approach versus defending non-COTS implementations, federated or centralized integration framework, trading partner integration framework. The framework also identifies technology standards that will be used to implement the architecture

9.5 DEVELOP TRANSITION PLAN AND GOVERNANCE STRUCTURE

This phase develops a strategy and plan for effectively managing the transition from the current environment to the enterprise architecture. The TP defines the sequence of activities that must be completed in order to implement the end-state architecture. The Governance Structure supports the TP and establishes the “chain of command” relative to implementation decisions. The Governing bodies will provide guidance on the interpretation of the architecture, manage the feedback loop, and ensure consistent application and use of the EA.

The Governance structure will also ensure the LogEA will be revisited, refined and extended through subsequent phases, in order to ensure the architecture reflects the current strategy and requirements of the organization.

10.0 LOGEA GROUPS AND RESPONSIBILITIES

The LogEA will be prepared using a collaborative strategic planning process led by AF/ILI. There are four groups that have been stood up to develop the pieces of the LogEA. *Figure 3. LogEA Organizational Structure* details the four groups, the level of effort required for this effort, the deliverables and the timeline for accomplishing the necessary milestones.

Figure 3. LogEA Organizational Structure

	Who	When	LOE
WBS Validation	Architecture Executive Group Architecture Steering Group	16 April 2003	Low
Charter Validation	Architecture Executive Group Architecture Steering Group	27 April 2003	Low
Strategy Development	Architecture Steering Group	29 – 30 April 2003	High
Attributes Validation	Architecture Executive Group Architecture Steering Group	Early to Mid May	Low
Operational view	Architecture Team Systems Team	June	High
Systems View	Architecture Team Systems Team	June	High
Views Vetting	Architecture Steering Group	Late June	Medium
CONOPS Validation	Architecture Executive Group Architecture Steering Group	July	Low
Draft LogEA Validation	Architecture Executive Group Architecture Steering Group	Late October	High
Draft Transition Plan	Architecture Executive Group Architecture Steering Group	Late November	High

10.1 ARCHITECTURE EXECUTIVE GROUP

The Architecture Executive Group organizationally consists of Secretary Air Force Installation, Environment & Logistics (SAF/IE), AF/IL, Air Force Material Command (AFMC), Air Combat Command (ACC), Air Mobility Command) AMC, Secretary Air Force Acquisition (SAF/AQ), (Air Force Chief Information Office (AF CIO) Advisor). Specifically, this group consists of AFMC Commander (CC), ACC Vice Commander (CV), AMC/CV and senior government officials or Senior Executive Services (SESs) from the noted organizations. Although this group has no specific deliverables assigned to it, this body is responsible for validating and approving all deliverables generated by the other groups. They also are to provide guidance and general oversight for the development of the LogEA.

10.2 ARCHITECTURE STEERING GROUP

The Architecture Steering Group organizationally consists of AF/ILI, Installation & Logistics Maintenance (ILM), Installation & Logistics Readiness (ILG), and Installation & Logistics Resources (ILP), SAF/AQC, AFMC Deputy Chiefs of Staff Logistics (LG), ACC/LG, AFSPC/LC, AMC/LG (Air Force Program Executive Office (AF/PEO) Advisor). Specifically, this group consists of IL Directors and major command (MAJCOM) LGs from the noted organizations. To ensure adherence to other architecture initiatives both within the DoD as well as the Air Force, Architecture Steering Group will include

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integration personnel. This group's deliverables are the Vision / Strategy, which shall be approved by the Executive Group. This group is also responsible for validating the output of both the Architecture and Systems Teams.

10.3 ARCHITECTURE TEAM

The Architecture Team organizationally consists of AF/ILI leader plus dedicated subject matter experts (SMEs). Specifically, this group consists SMEs from each noted organization in the Steering Group; the level of persons should be Grade Scale (GS)-14, GS-15, LtCol, or whoever can speak for the organization. This group's deliverables are the OA, and the TP, which includes Governance, all of which shall be approved by both the Steering Group and the Executive Group.

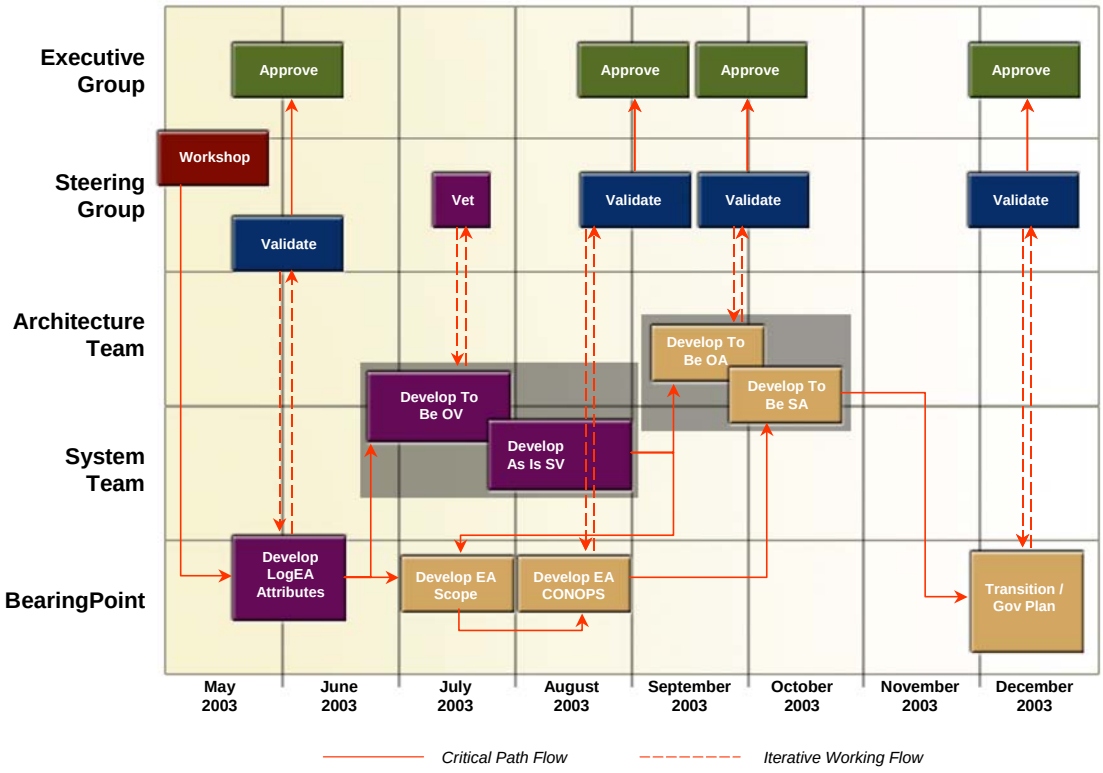
10.4 SYSTEM TEAM

The System Team organizationally consists of personnel from AF/ILI, SAF/AQC, ILM/ILG/ILC, AFMC/LGN, AMC/LG, ACC/LG, SSG/IL, and AFSPC/LC. Specifically, this group consists of SMEs from each organization; the level of persons is the resident expert. This group's deliverables are the "as is" SA, and in conjunction with the Architecture Team the development of "to be" SA and TP, both of which shall be approved by both the Steering and Executive Groups.

11.0 LOGEA GROUP ORGANIZATIONAL FLOW

Figure 4. Organizational Flow depicts the organizational process flow of documents development and approval throughout the course of the LogEA effort.

Figure 4. Organizational Flow



12.0 ARCHITECTURE MODELING FRAMEWORK

12.1 SUPPLY CHAIN OPERATIONS REFERENCE MODEL (SCOR)

The LogEA will employ the SCOR as its core framework. This model was selected by OSD for the development of the BEA-LOG (formerly, Future Logistics Enterprise (FLE)). The SCOR model was developed by the Supply-Chain Council (SCC) to describe business activities associated with all phases of satisfying customer demand. The model contains several sections and is organized around the five primary management processes of Plan, Source, Make, Deliver, and Return. By describing supply chains using these process building blocks, the model can be used to describe supply chains that are very simple or very complex using a common set of definitions. The model has been able to successfully describe and provide a basis for supply chain improvement for global projects as well as site-specific projects. Further explanation of the SCOR model and its application in LogEA is included in Appendix A.

12.2 DEPARTMENT OF DEFENSE ARCHITECTURE FRAMEWORK (DODAF)

The DoDAF was formally known as the Command, Control, Communication, Computers Information, Surveillance and Reconnaissance (C4ISR) Architecture Framework. Application and adherence to the DoD's *Architecture Framework* requires the development of three products described below. This framework is intended to ensure that the architectures developed by the DoD's unified commands, military services, and other defense agencies are:

- Integrated and interoperable across Joint and multi-national organizational boundaries; and,
- Comparable across the Department's business operations, systems, and technical architecture environments.

These products are three architecture views – operational, systems, and technical – have implications on which architecture characteristics are to be considered and/or displayed, though there is necessary redundancy in displaying certain characteristics from one view to another.

- **Operational View** - view describes the tasks and activities, operational elements, and information flows required to accomplish or support an operation (business or military). It specifies the nature of the information exchanges in sufficient detail to determine the required interoperability requirements.
- **Systems View** - identifies which required systems support the operational view requirements. It translates the required degree of interoperability into a set of needed system capabilities and compares current/postulated implementations with needed capabilities. It is a description, including graphics, of systems and interconnections providing for, or supporting, operational functions.
- **Technical View** - articulates criteria that govern the implementation of each required system capability. To be consistent and integrated, an architecture description must provide explicit linkages among its various views. This view is the minimal set of rules governing the arrangement, interaction, and interdependence of system parts or elements, whose purpose is to ensure that a conformant system satisfies a specified set of requirements. This CONOPS, as an overview operational document, provides no technical views.

The framework also calls for essential and supporting working products, which can be broken down by each of the three architecture views, along with a general, "all views" (AV) reference.

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12.3 GUIDELINES

The Air Force Joint Technical Architecture (JTA-AF) will serve as the IT reference model; the Info-structure Technology Reference Model (I-TRM) will serve as the technical reference model when it replaces the JTA-AF. Similarly, the C4ISR/DoDAF will also serve as a guide. The Architecture and the Systems Group will use these reference models to communicate compliance with the Air Force IT technical standard.

13.0 REFERENCED DOCUMENTS

This section provides a list of all documents referenced throughout this CONOPS document.

SCOR: http://www.supply-chain.org

C4ISR / DoDAF: http://www.dod.mil/comptroller/bmmp/pages/arch_arch_home.html

JTA-AF: http://www-jta.itsi.disa.mil/

I-TRM: http://www.e-publishing.af.mil/pubfiles/af/33/afman33-223/afman33-223.pdf

Future Logistics Enterprise (FLE): http://www.acq.osd.mil/log/logisticsmateriel_readiness/organizations/lmr/html/fle.html.

Department of Defense, Business Management Modernization Program, *Business management Enterprise Architecture Overview and Summary Information (AV-1)*, http://defenselink.mil/comptroller/bmmp/Apr-25/html_framework/products/av1.htm

14.0 OPERATIONAL VIEW

The Air Force Logistics community has effectively supported Air Force missions throughout its history. However, changing national security priorities, and global realities have forced a change in the way the Air Force is approaching its mission. This transformation in Air Force warfighting has exponential impacts to the logistics community. The Expeditionary Air Force model demands that the logistics community support a "constant" deployment, with frequently changing mission objectives, across an increased number of physical locations, with smaller deployment footprints, and using fewer resources. Although historically effective, the current logistics processes and systems will not efficiently support the demands of the future-state operating environment.

To most efficiently support the warfighter, the Air Force will transform key areas of its Logistics operations by adopting an enterprise-wide, end-to-end focus on customer support to deliver best in class performance. This unified logistics enterprise is the underlying premise behind the eLog21 campaign. This enterprise will be flexible, responsive, scalable, modular, and always expeditionary - tailored to meet the full range of mission need. The Logistics Enterprise will support the Air Expeditionary Force modules by adopting transformational management and execution practices that are not bound by geography, organization, or legacy processes.

14.1 LOGISTICS ENTERPRISE KEY DESIGN ELEMENTS

- **Customer Focused** - The Air Force logistics enterprise will be managed as a single enterprise to meet the enterprise-wide goal of meeting warfighter requirements. Process integration will eliminate the vertical organizational stovepipes of the past by re-aligning organizations, where necessary. Logistics chain planning will be based on the operational requirements of theater commanders and will consider enterprise wide requirements and resources in a shared data environment for more responsive and accurate decision-making.
- **Goal Driven -** A single end-to-end focus on customer support will be codified using performance driven execution across the logistics enterprise and tied directly to Air Force mission goals. Management by responsibility, accountability, and authority rather than through oversight will be adopted. Fully integrated processes, organizations and systems will enable best practice solutions.
- **Network Centric -** The Air Force logistics structure will be redefined to become network centric with dynamic C^3I and instant feedback permitting rapid supply chain reconfiguration - in other words, modular logistics network for maintainers, suppliers (including USAF, DOD, and commercial supply sources), inventory managers, etc., that can be dynamically re-configured to support geographically diverse mission needs.
- **Mission Focused -** As previously stated, those processes which prepare, transport, sustain and reconstitute forces are at the core of the Air Force logistics mission. To allow the Air Force to focus on what it does best, those functions, organizations, or processes that do not support the Air Force logistics mission will be eliminated or outsourced. The strengths of other organizations – public or private – will be fully integrated into Air Force logistics processes creating strategic partnerships wherever possible. By taking these steps, the Air Force will be better able to support EAF of the future.

Ultimately the eLog21 campaign aligns logistics systems, processes, procedures, organization, and infrastructure to create a responsive, reflexive and robust logistics chain. Implementation of the future logistic CONOPS focuses on two key elements:

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14.2 ESTABLISHING A CUSTOMER-FOCUSED ENTERPRISE-WIDE PERSPECTIVE

A Customer-Focused Enterprise-wide perspective will be the foundation that guides Air Force logistics performance. In the future state, warfighters and logisticians will collaboratively define the goals for the logistics community. Once established, these goals will provide the basis for logistics planning priorities. These priorities will drive the plans that support delivery of logistics capabilities to include what items to repair/ buy, how much to repair/buy, where to deliver the items, and how to assign/acquire the necessary resources to execute those functions. These goals will be dynamic and responsive to expeditionary deployment, and will be linked in a cascading structure throughout the logistics organization. The goals will be embedded into the day-to-day business processes where Air Force resources will have a clear understanding of these goals, their role within the Enterprise and how that role contributes to meeting the enterprise goals. Organizations and functions will be aligned, such as acquisition and sustainment.

14.3 DEVELOPING AN INTEGRATED LOGISTICS ENTERPRISE

To meet the enterprise goals, the Air Force must transform to an Integrated Logistics Enterprise. The new enterprise will establish full visibility of all internal and external resources and requirements and share that information with all participants, customers, and stakeholders. It will assure that resources and assets are directed to the greatest enterprise-wide need and enable coordination and synchronization across both internal and external resources. A centralized planning process will drive these enterprise goals into execution via a dynamic planning process. Processes will be managed in real-time across organizations and systems, with a focus on proactive / anticipatory management. Strategic partners will be part of the extended enterprise so that the combined strength of all partners can be directed to achieve the enterprise goals.

14.4 ENTERPRISE LOGISTICS BUSINESS PRACTICES

The AF Logistics Chain is different from those of commercial companies. The primary objective of the Air Force is National Defense, not profit. Therefore, the Air Force cannot sacrifice effectiveness for efficiencies. The Air Force is required to operate in unfriendly environments that companies do not. The Air Force is dynamic in its logistics structure, often creating bases from scratch to support the mission need, whereas companies often take months to plan a new location. The Air Force has many challenges that are unique to the military environment. However, commercial industry has developed capabilities that can be exploited by the Air Force to improve its logistics chain. Private sector best practices such as Strategic Sourcing and Advanced Planning and Scheduling are applicable to the Air Force environment, and imbue dramatic improvement. It is the strategic application of these best practices that will deliver dramatic logistics chain improvements while still meeting Air Force Mission requirements.

This section outlines **best supply chain practices**, and how they will be adopted by the future Air Force logistics enterprise. They tie together the strategic work done by the Architecture Steering Group and the process work done by the Architecture Working Group. It is these best practices that lay the foundation for further process and systems implementation.

In defining the future operational view the two threads discussed previously, establishing a **Customer-Focused Enterprise Wide Perspective** and **Integrating the Logistics Enterprise**, must be considered together. Establishing an Enterprise Perspective on the customer will be accomplished through establishing a cascading enterprise goals structure that translates mission goals into Logistics Enterprise goals. The mechanism for managing and communicating these goals will be ***plans***. The future state Air Force Logistics Planning capability will optimize based on these goals. Dynamic re-planning cycles will be exploited to support frequently changing goals.

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To deliver on these plans, the logistics enterprise must be integrated across processes, systems and organizations. This integration will create end-to-end processes that function in real-time, are directly linked to the plan (both forward and backward), and provide enterprise wide visibility to all elements within the process. This visibility will enable key future state principles such as; Total Asset Visibility (TAV), real-time inventory management, automated Chief Financial Officer (CFO) reporting and strategic sourcing. In addition to CFO reporting the enterprise must automate the collection and reporting of regulatory compliance data (e.g. 50/50 data) and include it into the decision process on meeting enterprise goals. Further, it will support the planning process by providing a responsive, closed loop execution process that delivers the product/service to the warfighter.

For purpose of organization, these future state practices will be discussed in two primary areas: 1) Logistics planning; and, 2) Execution.

14.4.1 Logistics Planning Business Practices

In the future state, planning will drive the execution of the Supply Chain. To ensure an enterprise perspective, customer-focused goals will be established at the highest level by defining Logistics Goals that are directly and dynamically integrated with the warfighter. By using a multi-level planning process, the Air Force will develop plans to guide strategic elements such as defining the mission and goals, defining the physical Supply Chain Network, establishing strategic partnerships (e.g., TSPR, TSSR, and performance based relationships), and managing Weapon Systems across their Lifecycles, etc., as well as using operational and tactical plans to centrally define the production/repair schedule, centrally establish and track inventory levels, centrally procure materials and services and centrally plan delivery routes, schedules, and structures. These plans will be used to codify the enterprise goals, becoming more granular with increasingly detailed plans, but always linking directly back to the enterprise goals. These plans will drive the execution processes to enable Air Force Logistics to affordably deliver effective support to the warfighter. *Figure 5. Logistics Planning Business Practices* below highlights the transformation from current state business practices to future state business practices with logistics planning.

Figure 5. Logistics Planning Business Practices

Logistics Planning Business Practices	
Current State	**Future State**
Decentralized Planning – Production, Inventory, Procurement, Transportation, Distribution	Centralized Enterprise Planning across all functions with decentralized execution – including collaboration with partners
Deployed and Home Station Planning	EAF centric Planning
Reactive Planning with limited re-planning	Predictive Planning with dynamic and frequent re-planning
De-coupled planning and execution with long planning horizons	Continuous planning drives Execution for near term (days) and long term (years) horizons
Fragmented, uncoordinated systems	Integrated Enterprise systems
Limited Feedback, Visibility	Dynamic C3I
Limited Enterprise Planning Skills	Better motivated and more skilled people
Fragmented financing	Enterprise focused finance

To achieve these best business practices the Air Force will:

- Adopt Centralized Planning across all Functions (Transportation, Maintenance & Supply).

- The future planning processes will be conducted centrally across planning levels, and across all states of operation, deployed and non-deployed.

Strategic planning elements will be managed centrally with centralized lines of authority and accountability. These elements include:

- **Logistics network planning** – Defining the physical network to include facilities, routes, distribution and transportation nodes and equipment.
- **Trading partner network planning** – Suppliers, contract repair, outsource providers.
- **Capital Asset planning** – includes acquiring and maintaining facilities and equipment.
- **System lifecycle planning** – is focused on managing weapon systems and supporting systems throughout their lifecycle.

Operational planning elements will also be managed centrally to meet the goals established by the strategic planning processes. Elements such as:

- **Inventory and sourcing planning** – Enterprise inventory levels will be managed centrally with visibility across all locations. Strategies will be used to manage items based on their inventory behavior.
- **Maintenance and production planning** – Enterprise visibility into Maintenance capabilities across all levels of maintenance will enable central planning functions to optimize repair throughput across the enterprise.
- **Delivery and fulfillment planning** – Enterprise visibility into inventory levels and delivery capabilities will allow for streamlined delivery networks and time definite delivery. Delivery Plans will optimize the use of fulfillment resources while meeting customer demands.

This cascading of plans will ensure that the focus on achieving Enterprise goals is maintained at all levels. Further, these plans will be developed collaboratively across all logistics constituents, to include organic, DoD, and non-organic. This collaboration ensures that plans are achievable across the logistics chain.

To achieve centralized planning, planning and execution processes and systems must be integrated in a real-time, dynamic structure. Organizations must be re-aligned to support horizontal process management and resources must be trained/re-trained to operate in this new business model.

14.4.2 Adopt a Predictive Planning Perspective

To most effectively meet the plan, the future logistics enterprise will commit to a produce-to-plan model. By producing to plan, the enterprise will maintain responsiveness while moving away from a reactive posture. This philosophy will harmonize the production and delivery cycles and reduce the short-term variability against these functions. To support this, the planning processes must be able to dynamically re-plan to adjust for execution variance and changing requirements. Further, these plans must be tied to execution processes to capture data such as failure rates and causal factors which will be fed back into the plan. Elements that will be required to support this construct include:

- Integrated, Robust, and Enterprise-focused planning and supporting systems.
- Real-time planning/re-planning capability.
- Simulation and modeling planning capabilities.
- Integrated real-time execution systems to maintain constant feedback loop.

14.4.3 Logistics Execution Business Practices

In the future state, execution will be governed by the Logistics Chain plans. Execution will be modular, scalable, and flexible. Execution processes will maintain an Enterprise perspective both by adopting a

common process and by executing the plans. *Figure 6. Logistics Execution Business Practices* below highlights the transformation from current state business practices to future state business practices within logistics execution.

Figure 6. Logistics Execution Business Practices

Logistics Planning Business Practices	
Current State	**Future State**
Fragmented sourcing	Enterprise wide Strategic Sourced acquisition of goods and services
Vertically integrated	Virtually integrated
Functional stovepipe execution	Enterprise process integration
Deployed and Home Station functions	Common processes for logistics execution
Fragmented uncoordinated systems	Protected, Assured, and fully Integrated Enterprise systems
Cold War Era skills	Better motivated and more skilled people

The Air Force Logistics Enterprise will meet the needs of the warfighting customer by ensuring that the right part is delivered to the right place, at the right time. This will require managing the procurement of goods and services, the manufacture/repair of parts, and the delivery of goods and services to meet customer demand as defined by the plan.

To support these processes, best practices will be employed to ensure effective execution against planned goals, but also efficient execution against cost constraints. Key practices that will be employed include:

14.4.4 Integrating Business Processes

In the future Air Force Enterprise, business processes will execute without regard to functions or organizations. Processes will be integrated across the enterprise and across systems, so that planning decisions can trigger purchasing transactions, which will in-turn trigger inventory transactions, which will trigger financial transactions, seamlessly and instantly. Execution processes will be common across the enterprise and will not be distinguished by deployed and home status. These common processes will enable a modular logistics chain that can support reconfiguration of the network, optimization across capacity, and dynamic re-planning. This will result in an integrated enterprise driven by integrated processes.

14.4.5 Integrating Trading Partner Core Competencies

By integrating business processes with key partners, and leveraging their strengths, the Air Force can best manage the extraprise to optimize the efficiency of business processes while maintaining effectiveness. This will include integrating processes and systems to ensure an end-to-end management of the logistics chain and to ensure that trading partner capabilities are included in Air Force planning processes.

This will be accomplished via multiple avenues to include:

- **Business process integration** – Integrating business processes with trading partners to improve partner effectiveness, efficiency and process visibility, based on AF goals (Collaborative planning, Electronic Transactions). This is applicable to all trading partners.
- **Sub-process outsourcing** – Leveraging trading partner competencies to improve efficiencies associated with process elements. This involves extending the process across partners. (Vendor managed inventory (VMI) and just in time (JIT)). This is applicable to proven trading partners.

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- **Full process outsourcing** – Exploiting trading partner competencies to improve efficiency and effectiveness of major business functions (repair and maintenance functions, transportation). These trading partners are strategic and are part of the logistics extraprise. These partners are included in strategic and operational plans and are managed to AF goals. Visibility is maintained at the strategic and execution levels.
- **Full management and process outsourcing** – Optimizing across trading partners. Outsourcing both the business process and the management of those processes is undertaken with select strategic suppliers that have demonstrated value to the Air Force. These organizations are extensions of the AF enterprise and are critical to success. These organizations offer improved efficiency while meeting AF goals. These organizations are included in the strategic planning process and are directly integrated with the operational planning and execution processes.

14.4.6 Adopting Value Added Lean Processes Throughout the Execution Functions

The Air Force will focus on improving its own processes, as well. This will be accomplished by maintaining a focus on continuous improvement. The Air Force will ensure efficiency in its processes, but will always ensure that its processes are value added and oriented toward the business goals. By establishing continuous improvement and quality programs that are integrated with an Enterprise Balanced Scorecard approach, the organization will be able to quickly identify opportunity areas and respond.

14.4.7 Leveraging Business Intelligence to Improve Execution Management

The Air Force will use sophisticated management reporting processes and tools, collectively known as "business intelligence", to improve business process performance. These tools provide advanced reporting capabilities that support leadership decisions based on enterprise data, such as Enterprise Balanced Scorecard. These tools provide capabilities such as 'executive dashboards' that provide a single point of information for executives and managers. The use of these tools will enable a more proactive business management approach while simultaneously driving continuous improvement.

14.4.8 Establishing and Leveraging a Single Integrated, Robust, & Enterprise-focused Set of Systems

The future state logistics systems will deliver real-time visibility across the enterprise and across trading partners. This visibility will optimize the enterprise response to meet customer demands by managing internal and external resources to meet the priorities of the warfighting customer. Systems will provide the process enablement that will ensure real time asset visibility, automated business process workflow, a single data source, and a common operating picture. These systems will enable the plan and execution linkages. The future state systems will be COTS based and will support continuously evolving system architecture.

In the future state, execution processes will focus on driving an integrated logistics enterprise that satisfies the needs of the end-customer by executing the logistics plans effectively and efficiently.

14.5 ROLES AND RESPONSIBILITIES

To capture a complete picture of the future state, it is necessary to discuss the roles and responsibilities within the force-centric logistics enterprise. Roles are not necessarily specific to an organization, or to an individual. Roles are hats that can be worn by different individuals at different times throughout the logistics chain. Some key roles based on the attributes identified above (not exhaustive) include:

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14.5.1 Product Lifecycle Manager (equivalent to PM or NAM BEA-Log role)

Product lifecycle management is focused on managing the health of a system (Weapon System, Equipment, Vehicles, etc.) from womb to tomb. The product lifecycle manager is involved in the acquisition of a system, the sustainment of the system, and the disposition of a system. The product lifecycle manager is the final authority for a system. Priorities within the system are set and managed by the lifecycle manager and funding authority is executed through the lifecycle manager. The product lifecycle manager is concerned with elements such as:

- Acquisition of the weapon system and sustainment of the System throughout its lifecycle
- Composition of the fleet (configurations, quantities)
- Health of the fleet – Managing programmed maintenance, eliminating bad actors
- Health of supporting infrastructure to include suppliers, parts, equipment

14.5.2 Logistics Chain Manager (same name in BEA-Log defined role)

The logistics chain manager is focused on the execution of the logistics chain to support enterprise goals. The logistics chain manager is concerned with delivering weapon system availability by balancing resources such as inventory, maintenance and repair, and delivery against requirements such as parts orders, and periodic depot maintenance (PDM). The Logistics Chain Manager is focused on managing the execution of the overall logistics chain and is responsible for managing trade-offs across the chain to ensure that enterprise goals are most effectively met.

14.5.3 Planner/Buyer (equivalent to Fulfillment Agent in BEA-Log defined role)

The Planner/Buyer is focused on maintaining an inventory flow to meet customer requirements. The planner/buyer is responsible for planning inventory requirements across the logistics chain for specific commodities or product groups and then filling those requirements by sourcing inventory from organic sources of supply or repair or from external trading partners. These resources adopt a strategic view of logistics chain inventory and manage that inventory at an enterprise level. The planner/buyer uses the goals provided by the logistics chain manager to govern decisions.

14.5.4 Execution Agent (equivalent to Fulfillment Agent in BEA-Log defined role)

The execution agent is focused on executing a plan. This includes maintainers at all levels of repair, order managers, and delivery agents. Execution agents are the largest group of stakeholders within the logistics chain. Execution agents execute the plan and provide the core transactional data that will be fed back into the supply chain.

14.5.5 Consumer Role (same name in BEA-Log defined role)

The Consumer is the person that consumes products, thus is the source of demand. They are responsible for the use and consumption of weapons systems, material, or services.

14.5.6 Customer Role (same name in BEA-Log defined role)

The Customer is the decision-maker for buying products. The person is accountable for and manages the requirements associated to funding required to obtain material, services, or information (e.g. negotiates level of service) for a consumer or that manages the requirements and advocates the funding for a weapons systems.

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15.0 HIGH LEVEL SYSTEMS VIEW

In order to meet the dual operational goals of providing an enterprise perspective while providing the full logistics visibility discussed in Section 3.1, Air Force logistics must implement enterprise-class enabling technologies. The future logistics enterprise requires a complete integrated suite of tools that are built on a unified architecture and data model. All the applications in the suite should work off the same complete set of business data and integrate seamlessly with the next functional application. It should also provide a complete and accurate view of the logistics enterprise. This section provides a high-level systems view of the underlying technologies supporting the future logistics enterprise.

15.1 ARCHITECTURE DESIGN PRINCIPLES -

As discussed above in order to support the best in class business process described in Section 5.0 the Air Force Logistics Enterprise needs a robust, integrated, and flexible applications suite. The Systems Architecture is designed using a number of broad principles:

- **Functional Integration** – The architecture must provide support for cross-functional process integration. Operational integrity is maintained throughout a particular transactional thread even if that transaction crosses functional boundaries. (Example: Parts procurement transactions crosses Procurement – Financial – Inventory – Maintenance.)
- **Single Data Model** – The architecture must provide for logically centralized and integrated logistics data. While the data may be physically distributed, to the applications layer it is recognized as a single normalized data model.
- **Data Integrity and Quality** – In order to ensure integrity of the data, the architecture enforces that every data element has only single point of entry. Additionally, all edits for a data element, and for all data in the transaction, are performed at time of entry. With solid data integrity the users of data (man or machine) is confident that all data is accurate.
- **Flexibility** – The architecture must provide a flexible set of composite applications that can be configured to support varying business models and management philosophies. In the event the enterprise solution cannot be configured to enable current state processes, those processes will be changed to fit the solution. The architecture also has to allow for integration of external (partner applications) and legacy applications. Also the architecture must allow the Air Force to deploy on a number of platforms on databases.
- **Scalable** – The architecture must support not just volume (transactional) scalability but also geographical scalability, while still supporting the design principles above. The architecture supports models that accommodate physical distribution of components and transactional growth. It also supports a wide-range of hardware solutions for additional scalability.
- **Commercial** – When possible the architecture calls for the use of commercial off-the-shelf software (COTS). Most of the future business practices discussed above is inherent to most current COTS Supply Chain Management (SCM) applications. By using commercial applications the Air Force can more quickly roll out these practices. Additionally, the Air Force can share the application development cost with all other customers of the SCM applications.

The next section will provide an overview of the high-level systems architecture.

15.2 HIGH-LEVEL SYSTEMS ARCHITECTURE

The architecture is based on the concept of an **integrated application suite** at its core with **"bolt-on" applications** to "extend" functionality. It provides an **enterprise application integration** infrastructure to allow for legacy and "bolt-on" integration (as required). As discussed above the key feature is a shared

single data model and an **Enterprise Data Warehouse** that allows for data sharing, and provides secure and assured data to all applications. The remainder of this section provides a high-level overview of the composite application suite and its components, while the Systems Architecture (separate document) will provide greater detail including functional mapping.

15.2.1 Application Suite Description

This section provides a high-level functional overview of representative application modules, as well as some functions that each provides in order to support the operational architecture. This is not intended to provide a comprehensive discussion, but rather to provide a common frame of understanding.

15.2.1.1 Advance Planning and Scheduling

Functional Description: This module supports advanced demand and supply planning. It provides complete support for the Air Force's tactical and operational planning needs. By using collaborative demand planning, the Air Force and OEMs can leverage historic demand to drive forecasting, surge planning, and inventory planning. With collaborative supply and distribution planning, the Air Force can concurrently plan procurement, maintenance, and distribution. This module provides the Air Force the ability to do holistic planning.

General Functions:

- Demand Planning
- Supply Planning
- Collaborative Planning
- Procurement Planning
- Inventory Optimization
- Work Scheduling
- Maintenance Capacity Planning
- Maintenance/Production Planning

15.2.1.2 Product Lifecycle Management

Functional Description: A combination of key modules, Product Data Management, Asset Management, Shop Floor Control, and Operations Management, this module supports the processes associated with tracking and managing logistics assets, to include aircraft, reparables, equipment, AGE, and vehicles throughout their lifecycle. The focus of product lifecycle management is to manage the total ownership cost throughout the service life of the asset. This includes tracking configuration changes to the asset, costs associated with the asset over its lifecycle, and performance of the asset over its service life.

General Functions:

- Asset Tracking
- Engineering Configuration Mgmt
- Tech Data
- Asset performance statistics
- Serial Number Tracking
- Diminishing Manufacturing

15.2.1.3 Maintenance Management

Functional Description: This module supports the processes associated with maintenance, repair, and overhaul of all equipment, vehicles, weapon system reparables, or other major end items such as communication and navigational assets. This module optimizes whether maintenance processes are triggered out of depot maintenance or out of line maintenance. It also supports an open loop scenario where unserviceable components (which have been removed during depot or line maintenance) will be overhauled/repaired by the components shops based on the current serviceable component stock and available shop capacity across the enterprise.

General Functions:

- Maintenance/Production Scheduling
- Configuration Management
- Work Status and Control
- Quality Control & Assurance

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- Work Planning
- Work Execution
- Work Completion

15.2.1.4 Material Management

Functional Description: This module supports the execution of inventory management across the enterprise. It supports the processes of procurement, inventory tracking, and order fulfillment. It provides enterprise inventory visibility across the enterprise.

General Functions:

- Inventory Management
- Procurement
- Hazard Material Management
- Disposition
- Material Planning (Supply)
- Distribution and Transportation

15.2.1.5 Financial Management

Functional Description: This module supports the financial requirements of the future logistics enterprise by integrating financial transactions along with logistics transactions. It supports the process from programming and budgeting through execution and closeout.

General Functions:

- Programming/Budgeting
- Funds Management
- Managerial Accounting
- General Ledger
- Financial Accounting
- Supply Chain Costing
- Accounts Payable/Receivable

15.2.1.6 Personnel Management

Functional Description: This module is concerned with managing human resources across the enterprise. It supports the future logistics processes by managing training, certifications, assignments and human resource capabilities. The capabilities/competency data is critical in planning and scheduling.

Module Functions:

- Training coordination
- Certification Tracking
- Competency Management
- Availability/Capability

15.3 ENTERPRISE DATA MODEL/LOGISTICS DATA WAREHOUSE

As mentioned in the design principles above, the key to providing a true enterprise perspective and logistics visibility is a common unified data model. Each application in the suite has access to a complete and accurate data set. This enterprise data model ensures that each data element has only one point of entry into the model and that all edits are performed before entry.

The Logistics Data Warehouse provides detailed business analysis data and supports key enterprise-planning processes such as weapon system management, and supply chain network planning. While transactional analysis and reporting can and should be supported by the Enterprise Data Model, for more complex analysis and reporting a data warehouse proves more effective.

15.4 ENTERPRISE APPLICATION INTEGRATION

This module is concerned with integrating applications across the enterprise to include legacy applications. This toolset provides for greater enterprise data visibility by integrating applications that do not share a common data model. The logistic enterprise's EAI capability is able to model complex

processes, manage transaction workflows and integrate with a large number of legacy applications. It provides the ability to create an enterprise view across uncommon systems and various processes.

16.0 SUMMARY

Changing national security priorities and global realities have forced a change in the way the Air Force is approaching its mission. This transformation in Air Force warfighting demands that the logistics community support a "constant" deployment, with frequently changing mission objectives, across an increased number of physical locations, with smaller deployment footprints, and using fewer resources. To most effectively support the warfighter, the Air Force will transform key areas of its Logistics operations by adopting an enterprise-wide, end-to-end focus on customer support to deliver best in class performance. This transformation will require a fundamental change in the way in which we do business. By focusing on the four key design elements listed below, the Air Force will institutionalize an Enterprise Perspective and an Integrated Supply Chain.

- Customer Focused Enterprise.
- Dynamically Goal Driven.
- Network Centric.
- Competency Focused.

17.0 KEY TRANSFORMATIONAL CHANGES

Key Transformational changes will include:

- Centralized Planning across all functions and levels.
- Common processes for deployed and home stations.
- Integrated and Leveraged Extraprise.
- Skilled and well-trained workforce equipped with the necessary tools.
- Integrated systems that enable real-time, integrated business processes.
- Organizations and roles aligned to Logistics Chain Processes.

In summary, the Logistics enterprise will transform its business processes, its enabling technology, its organizational structure, and its training and human resource growth practices.

The challenge to the future is known. The solution is being crafted. This is a first step in the journey to deliver that solution.

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18.0 APPENDIX A: FUTURE STATE OPERATIONS

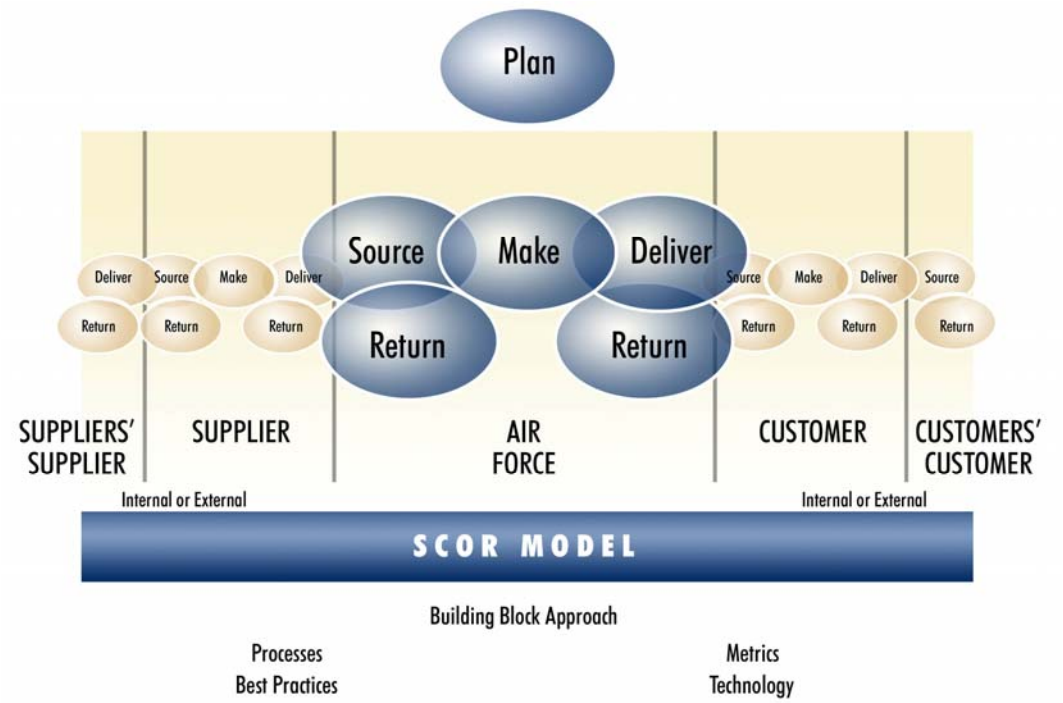
18.1 LOGEA STRUCTURE

To achieve the future vision for Air Force Logistics, changes must be made to all areas of the Logistics spectrum. The focus areas for this transformation are organized by the major Logistics processes, Planning and Execution, and then by major activities within each of these two major processes. Those activities are identified as Source, Make, Deliver, and Return and directly align with the SCOR model.

18.2 SUPPLY CHAIN OPERATIONS REFERENCE MODEL (SCOR)

The LogEA will employ the SCOR as its core framework. The SCOR-Model was developed by the Supply-Chain Council (SCC) to describe business activities associated with all phases of satisfying customer demand. The Model contains several sections and is organized around the five primary management processes of Plan, Source, Make, Deliver, and Return (shown in *Figure 7. SCOR Management Processes*). By describing supply chains using these process building blocks, the Model can be used to describe supply chains that are very simple or very complex using a common set of definitions. As a result, disparate industries can be linked to describe the depth and breadth of virtually any supply chain. The Model has been able to successfully describe and provide a basis for supply chain improvement for global projects as well as site-specific projects.

Figure 7. SCOR Management Processes



The Model spans: all customer interactions (order entry through paid invoice), all physical material transactions (supplier's supplier to customer's customer, including equipment, supplies, spare parts, bulk product, software, etc.) and all market interactions (from the understanding of aggregate demand to the fulfillment of each order). It does not describe every business process or activity. Specifically, the Model

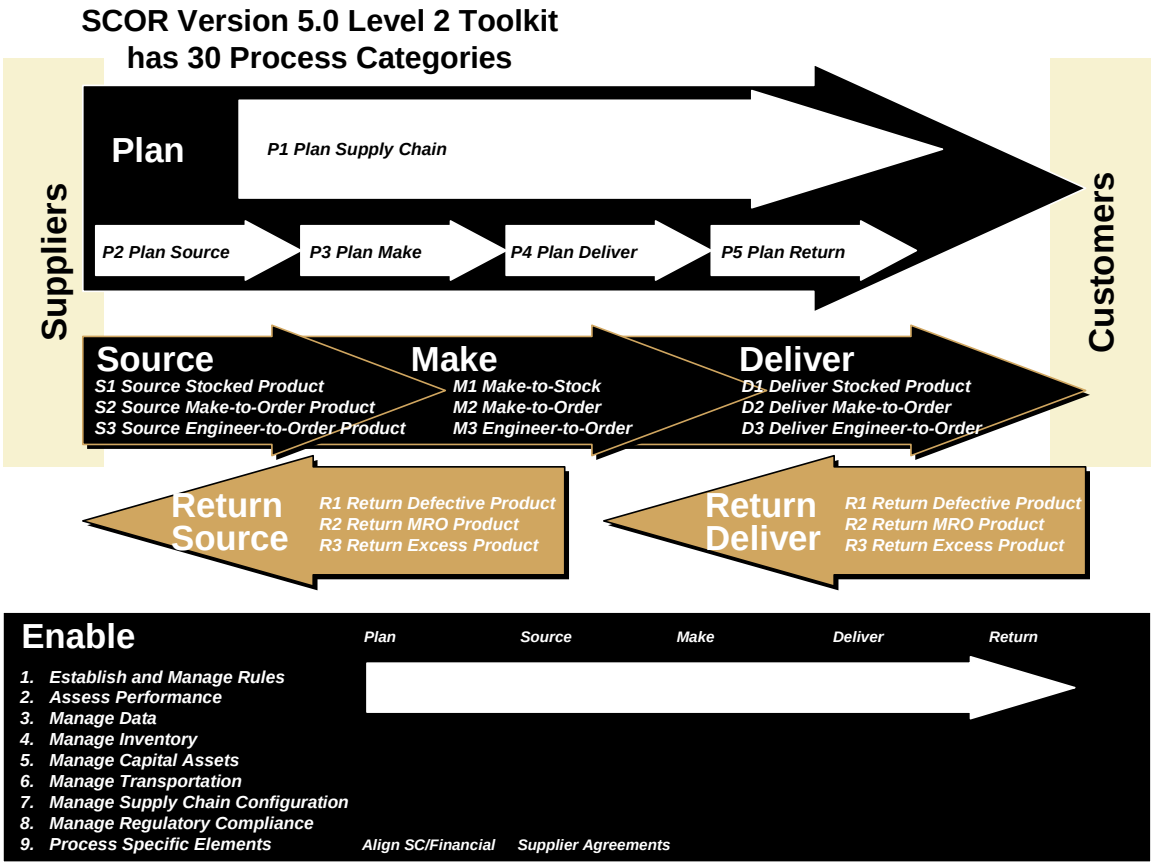
does not address: sales and marketing (demand generation), product development, research and development, and some elements of post-delivery customer support.

18.2.1 SCOR Overview

Plan, Source, Make, Deliver, and Return as processes are organized with a standard structure. In the Model, there are graphics that provide a visual representation of process elements, their relationships to each other, and inputs and outputs germane to each process element; see *Figure 8. SCOR Hierarchical Model*. Following the graphics are text tables that identify: 1) the standard name for the process element; 2) the notation for the process element; 3) SCC's "standard" definition for the process element; 4) performance attributes that are associated with the process element; 5) metrics that are associated with the performance attributes; and, 6) best practices that are associated with the process, and features that contribute to heightened performance of the process.

The Model is designed and maintained to support supply chains of various complexities across multiple industries. It consists of three process levels and does not attempt to prescribe how organizations should conduct business or tailor systems / information flow. The Model is silent in the areas of human resources, training, and quality assurance among others. Currently, these horizontal activities are implicit in the Model.

Figure 8. SCOR Hierarchical Model



The SCOR-model is a business process reference model; that is, it links process elements, metrics, best practice and the features associated with the execution of a supply chain in a unique format. The

uniqueness and power of the Model and its successful implementation is chiefly derived from using these four elements together.

It is important to note that this Model describes processes not functions. In other words, the Model focuses on the activity involved not the person or organizational element that performs the activity.

Besides the five basic management processes (Plan, Source, Make, Deliver, and Return) that provide the organizational structure of the SCOR-model, it is useful to distinguish between the three process types in the Model: planning, execution, and enable. A planning element is a process that aligns expected resources to meet expected demand requirements. Planning processes balance aggregated demand across a consistent planning horizon. Planning processes generally occur at regular intervals and can contribute to supply chain response time. Execution processes are triggered by planned or actual demand that changes the state of products. They include scheduling and sequencing, transforming materials and services, and moving product. The enable processes prepare, maintain, and manage information or relationships upon which planning and execution processes rely.

18.3 CRITICAL SUCCESS FACTORS FOR FUTURE LOGISTICS OPERATIONS

- To provide required support in an expeditionary environment, the future AF logistics processes and systems must be **deployable, secure, reliable and robust.**
- To manage the supply chain effectively and efficiently, future AF logistics processes must have an **enterprise wide view.**
- AF logistics **processes must be integrated** and tie together all functional areas responsible for providing support to the warfighter.
- To ensure all supply chain stakeholders understand and support enterprise wide goals and objectives, **collaboration** is essential.
- The future AF logistics processes and systems require well-trained **people** who understand their role in the **process,** are **skilled** and **equipped** with the necessary **tools.**
- Logistics processes must enable risk management. Manage risk without sacrificing required flexibility for efficiency.
- Measure using well-defined, enterprise balanced metrics.

18.4 FUTURE STATE OPERATIONS FOR AIR FORCE LOGISTICS

Throughout the following sections, these two themes: establishing an Enterprise Perspective and Integrating the Logistics Chain will recur in the context of the SCOR model, and will detail the future state operational concept that will deliver on the future state attributes.

Detailed in the following sections are the discussions for each of these processes and activities. Each section outlines:

- Current challenges and future state concerns if the current processes were to prevail.
- Commercial Processes and Best Practices for consideration for adoption within the LogEA.
- Future Air Force attributes based on LogEA Strategy and Working Group designs.

18.5 FUTURE STATE PLANNING

The total supply chain planning process is completely focused on the identification of requirements and resources for the Logistics Enterprise. This process results in a plan that is comprised of a balanced, time-phased projection of resources required to meet the requirements. For Air Force Logistics, the requirements will be derived from Air Force Operations and Training Plans. These requirements are met by assuring weapon systems availability. The resources to meet the requirements include all of the

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facilities, infrastructure, materials, manpower, and funds entrusted to Air Force Logistics and its partners and suppliers.

All supply chain-planning actions fall in one of five sub-processes, each of which addresses a set of requirements and resources. Plan Supply Chain is concerned with the expectations and capabilities of the Supply Chain in its entirety; Plan Source is concerned with determining a time-phased plan of identifying resources (currently available and to-be acquired) to meet usage requirements; Plan Make is concerned with production related requirements and resources; Plan Deliver is focused on order fulfillment; and Plan Return addresses the planning of materials returned for all reasons. These Plan processes are interdependent, each providing to the others:

- Forecasts of requirements.
- Assessments of capabilities.
- Identification of situations where requirements may be misaligned with capabilities.

The Plan Supply Chain sub-process assesses total requirements for supply chain resources and plans the appropriation of those supply chain resources. Plan Supply Chain considers a very broad range of resources to include the physical network (locations, facilities, routes); the virtual network (technology infrastructure such as communications, systems and computers); the partner network (suppliers and vendors and the associated working relationships); physical assets such as tools, equipment, and labor for production and distribution; and also financial resources.

The Plan Source sub-processes are focused on requirements and supply chain resources available, or planned, to meet these requirements. Plan Source projects the future state requirements against the use of resources both existing (e.g. inventory, production or maintenance and repair), and planned (e.g. internal and external sources of inventory, repair, etc). In Plan Source, the focus is on identifying what resources are available, what resources must be acquired, and what potential capacity and capability shortfalls may exist. Execution against the sourcing plan ensures that the necessary resources to perform Make, Deliver, and Return are available. The Sourcing Plan is directly linked to the other plans.

Plan Make is concerned with requirements for production (making, maintaining, and repairing) and the resources necessary to deliver that production. The resources considered include component parts inventory, equipment, labor, tools and instructions, and financial resources. The output from this sub-process is a Production Plan that projects the time-phased assignment of these resources. It also provides communications to identify any disconnects between requirements and capability. The Make Plan will communicate requirements and capabilities to the other Plans. In the event of a shortfall, the Plan Source function will respond to identify and acquire the necessary resources.

Plan Deliver focuses on a different set of requirements and resources. It is concerned with timely delivery of material to internal and external customers and considers resources such as inventory, shipment preparation capacity, transportation availability, and customs clearance resources. The resulting Delivery Plan details the time-phased projected assignment of these delivery resources and communicates any disconnects between requirements and capability. The Deliver Plan manages finished goods inventories and communicates those requirements to Plan Make and Plan Source to ensure that they are met. Plan Deliver is focused on ensuring that the end customer requirement is finally met.

Finally, Plan Return is concerned with materials that may be returned for any reason. This may result from defect, damage, failures, planned maintenance, or inventory excess. Plan Return addresses all resources required to affect the projected level of returns and creates a time-phased Return Plan. Plan Return seeks to create a coordinated Return Plan that supports the other Plans and ensures the timely flow of returned resources through the logistics chain.

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18.6 A1. PLAN SUPPLY CHAIN (P1)

18.6.1 A1.1 Current Supply Chain Planning Challenges

Plan Supply Chain is the process for linking the enterprise goals to the logistics infrastructure, logistics capability and capacity, and internal and external logistics relationships. The Program Objective Memorandum (POM) process is the existing means for linking Operational Requirements, articulated in Operational Plans (O Plans) and Training Requirements to the planning of Logistics resources. O Plans describe the forces and capabilities that combatant commanders require to protect our national interests within their areas of operational responsibility. Training plans describe the amount of flying hours or equipment hours required for training new pilots and operators.

18.6.1.1 A1.1.1 Enterprise View

The POM process is narrowly focused on financial considerations and does not directly link Operational Requirements with supply chain goals and actions. Additionally, execution diverges from the plan due to a lack of process discipline and lack of feedback.

There is a gap between directly linking the operational planners planning the military action, and the supply chain planner planning the logistics support for those actions. This results in missed opportunities to make the best use of logistics capability to overcome perceived obstacles. Most notably, however, this gap inhibits and slows the re-planning of logistics support to evolving and changing Operations Plans

Material and System acquisition plans developed within the Acquisition community may not mesh with the logistics sustainment plans supporting the warfighter. New weapon systems are fielded with their independent logistics capabilities and requirements that have not been interfaced with the existing systems resulting in disconnected and sub optimized support for the warfighter. Similar issues arise relative to installations of modifications, strategies for aging aircraft and changes in vendors. These events are initiated within the Acquisition community, but are not fully coordinated with Air Force Logistics, which is called on to drive the sustainment of the weapon systems.

When the Air Force transitions from peacetime to wartime operations, supply chain business rules and prioritization responsibilities shift from Logisticians who provide daily support to the Combatant Commander. Theater rules are very much part of the enterprise requirement and must be communicated to supply chain planning activities. Currently, these requirements are not well communicated beyond the Theater and consequently they are not well-supported and balanced with enterprise-wide resources.

Combat readiness is delivered by a capabilities based force package. The AF does not have a ready means to identify the resources required to provide this capability, nor to assess the impact constraints will have on combat effectiveness. Multiple, non-integrated supply chains (e.g. depot level reparables, munitions, fuels, vehicles, equipment) make it difficult to link enterprise supply chain requirements to operational capabilities. Where some linkage is found, too much time is spent validating and cleansing data rather than on delivering capability.

Information is hard to collect and aggregate. It is contained in multiple disconnected systems. This is particularly true where a contractor provides total systems support. Since total system outsourcing is an expanding strategy, this is an increasing concern. The lack of visibility to total requirements and assets is a major detriment to credibility.

Financial planning is not supportive of supply chain planning. Operational and financial metrics drive competing responses. Currently, metrics are inconsistent across the supply chain. Some are internally focused driving towards internal efficiencies at the expense of operational support, while others are not

clearly communicated. Consequently, the supply chain is slow when responding to changing customer requirements or customer priorities.

For supply chain planning to be effective, personnel executing supply chain operations must be aware of their impact on the total enterprise and have a clear understanding of expectations of them. This does not exist in the current environment and many actions are driven by parochial conditions.

There is an absence of tools and information to assist the supply chain planners to correlate mission success to Logistics capital assets. This capability gap prohibits the creation of a convincing operations-based plan for funding. Lack of enterprise wide capital asset data also hampers the ability to create a meaningful mitigation strategy in the absence of full funding.

For a plan to be credible it must be accurate and up-to-date. Changes to operational requirements are a way-of-life and the pace of change is constantly increasing. However, there is no meaningful rapid re-planning capability to remain current with enterprise requirements. Consequently, the plans do not have the credibility and impact that is required to drive the enterprise.

18.6.1.2 A1.1.2 Process Integration

Rapid response to changing requirements requires a highly integrated enterprise. Integration needs to exist in terms of information, communications, process, and purpose.

The current lack of integration makes it difficult for the supply chain to respond to expeditionary planning. Supply chain problems occur because of the inability to understand and interpret deployed requirements and capability and the inability to employ supply chain-wide resources to satisfy those requirements. Logistics and transportation systems may not recognize new locations. Material and facility requirements at these new locations are not well communicated. Forecasting airlift availability and the marrying of assets to be moved is not agile enough to swiftly re-plan based on changing requirements. Access to various databases make manual re-planning a prolonged and unresponsive process. Consequently, force closure dates do not support the requirements of Combatant Commanders.

Because of multiple, segmented supply chains aggregated information is hard to assemble and assess. While this is a severe deficiency for organic logistics, it is especially true when a contractor is responsible for providing partial or total systems support, a growing strategy for material and systems maintenance. Because contractor supported weapon systems are not tightly connected to the Air Force supply chain, contractor processes and information have difficulty interfacing with the supply chain. Capability and capacity to support and supplement these third party systems within the internal process is therefore very limited.

Lack of total asset visibility is the result of lack of integration. Lack of asset visibility frustrates the planner's attempts to assess requirements and plan resources. For example, airlift may be available but the required support equipment has not been planned and is not in place to off load the planes. This impacts customer wait-time and consumes additional resources for product delivery.

18.6.2 A1.2 Commercial Supply Chain Planning Process and Best Practice

18.6.2.1 A1.2.1 Enterprise View

Best practice requires that all plans and actions of the organization are derived from clearly articulated enterprise goals and strategies. These cascade through the organization in a unified planning process and operations execute according to this plan.

In a commercial setting enterprise goals are commonly stated in terms of revenue, earnings, competitive advantage and product strategy. The enterprise goals belong to the enterprise leadership. They are

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aggressive and achievable. Supply chain requirements are derived from these goals and are stated in such terms as customer satisfaction and retention, geographic participation, investment in capital assets, and operating expense. In the future state Air Force, Operations leadership defines requirements in terms of weapons systems delivery and training requirements. These operational requirements define both deployment and steady-state expectations in terms of speed and place of delivery, repair and maintenance capability, and weapon systems availability.

The Supply Chain Plan is the planned appropriation of supply chain resources to meet those enterprise requirements. The Supply Chain Plan considers as resources the physical network, facilities, and routes; infrastructure elements such as systems, communications, and computers; suppliers and vendors and their associated working relationships; and production and distribution assets such as tools, equipment, and labor.

All goals and plans within the supply chain are derived from the enterprise goals and the corresponding supply chain. This linkage is clear and traceable. All additions, modifications, relocations of these resources tie directly to the enterprise based plan. The supply chain plan is the foundation for funding of assets, for incrementing and decrementing labor, for applying new technology, and establishing strategic partnerships. All making, delivering, and repairing actions tie directly to the plans derived from the enterprise goals. There are feedback mechanisms for understanding the performance of the supply chain for retuning and reconfiguring purposes.

Product Life Cycle Managers assist in defining the enterprise supply chain requirements and capability by focusing on specific materials or systems. The Managers perform a critical role by acquiring materials and systems with consideration given to supply chain capability and by assuring that acquired systems and materials are serviceable and maintainable within the enterprise expectation for the supply chain. The Product Life Cycle Manager is responsible for defining and supporting the supply chain resources required to meet product goals. Continual monitoring, assessment and replanning of the life cycle plan are required to assure that the product requirements and supply chain capability remain aligned.

Analytical tools exist to assess alternative courses of action to meet potential enterprise expectations. These tools can respond to capability requirements within bounds of time and resources. They can help in the evaluation of location, facilities and equipment, materials, labor and in performance attributes of cycle time and cost. Tools are engaged for their speed and their optimization capability.

The Supply Chain Plan is kept current and responsive. Continuous updating assures that actual circumstances and latest enterprise objectives are accommodated. Simulation and analytical tools provide optimization capability and support rapid response to changing requirements and circumstances.

18.6.2.2 A1.2.2 Process Integration

Integration of processes with common practices is a critical supply chain strategy. It is employed extensively with customers to ensure that requirements and plans are clearly communicated. It is used with business partners (suppliers, third party subject matter experts, and systems' managers) to assure that goals, plans, and actions are aligned.

Customers are integrated in the Supply Chain Planning Process through implementation of customer-focused strategies. This includes customer support methods that assure the customer is fully informed of supply chain status, plans, and performance. Customers are partners in defining supply chain expectations and alternatives, and participate in performance management for the supply chain. The supply chain is demand driven with actual and anticipated customer requirements establishing the rate and pace of execution.

Integration and collaboration is employed as a strategy with key internal and external partners. Integrated and real-time sharing of data is used to reduce uncertainty and response time. Collaborative Planning, Forecasting, and Replenishment (CPFR) and VMI are employed to streamline processes and reduce redundant inventories and work. Joint Service Agreements are developed to share and balance workload and to mitigate the impact of change in activity levels.

Information is a valued asset for supply chain planning. Requirements and resource information is fully visible and immediately available for Supply Chain Planning. It is accessible at operational and enterprise levels, it drives the planning and it drives the work. It is available to customers, partners, and internally. Information visibility is a key to developing excellent supply chain plans, for communicating the plans and progress toward achieving them, and for providing feedback as to resulting performance.

18.6.3 A1.3 Future Air Force Plan Supply Chain Process

18.6.3.1 A1.3.1 Enterprise View

Enterprise goals will be established and communicated by means of Air Force Operations Plans, training requirements, theater and expeditionary plans. Air Force Supply Chain planning to support those goals will be collaborative and include operations, acquisition, supply, maintenance, and transportation communities. It will integrate both internal and external partnerships. This planning process will be centralized for all classes of supply as well as for all maintenance and delivery functions. The output of the Plan Supply Chain process will be a single supply chain plan that will enable planning to support peacetime and wartime operations seamlessly. Integrated, shared, accurate and timely data will allow the Air Force to quickly replan as required to meet real world changes. Establishing support for deployed units is of paramount importance and the Plan Supply Chain process must be able to quickly re-plan to meet those requirements. This plan will take logistics requirements and create a high-level enterprise wide view of what, where and when support is to be delivered with sufficient detail for execution.

To effectively deliver weapon system capability, the future logistics enterprise will adopt a total lifecycle systems management philosophy, consistent with that of the Air Force Business Enterprise Architecture (BEA) and the FLE. This philosophy will adopt a “Womb to tomb” management of weapon systems to include endowing upon the Lifecycle Manager the necessary authority, to include financial “control”, over weapon system life cycle management. The lifecycle manager will be responsible for the overall health of their weapon system to include overall supply chain management for the weapon system from the customer interface through to suppliers. To ensure weapon system health, a key focus includes the optimization of system and sub-system maintenance throughout the product lifecycle.

To effectively achieve product lifecycle management, we will:

- Adopt serialized part tracking, including consumables, as appropriate.
- Capture near real-time mortality information, to include tracking causal factors.
- Establish real time engineering change management.
- Integrate financial and resource tracking and control.
- Establish collaborative agreements with suppliers / Original Equipment Manufacturers (OEMs), including organic.
- Use collaborative engineering toolsets and configuration management toolsets (linked to execution systems).

In the future Air Force Plan Supply Chain process, Weapon System Supply Chain Managers (WS SCM) will focus, by weapon system, on specific end items and major component parts in helping to define requirements. These WS SCMs will play an important part in maintaining supply chain capability by ensuring that key component parts, capital equipment and other critical means of repair and overhaul are

available to enable supply chain execution. The WS SCM will play a critical role in overseeing, reviewing and re-planning as appropriate to ensure that weapon system requirements and supply chain capability remain aligned.

The future state Air Force enterprise process will include consistent goals that cascade down through the logistics community. When an asset is repaired there will be a direct effect in terms of weapon system availability and this effect will be communicated from the shop floor up through and across the supply chain. Joint Service Agreements and Memorandums of Agreement will correspond to enterprise goals to ensure that all internal and external suppliers are working in the same direction.

The Plan Supply Chain process will develop mitigation strategies to address issues associated with the supply chain's ability to balance resources and meet requirements. Decisions regarding substantial adjustments to resource allocations and development of larger scale mitigation strategies will take place in the Plan Supply Chain Process. These reallocations and mitigation strategies may require additional resources, the purchase of capital equipment, building facilities, or the relocation of resources. They may require changing relationships and agreements with either internal or external suppliers or both. These strategies may require changing expectations, which must then be communicated to customers enabling them to identify their mitigation strategies.

The single supply chain plan will be dynamic. As the supply chain plan is executed, constraints will arise that require re-planning. Constraints identified in execution may be managed within the respective execution process. For example, if during the Make process a minor capacity constraint may be identified, the mitigation strategy may be as simple as adding an additional shift for a short time to increase capacity and satisfy the specific production requirement. This mitigation strategy would be handled within the Make process and communicated to other affected parties within the supply chain. If, however, the constraint required the purchase of additional capital equipment, a re-planning signal would be sent up to the Plan Supply Chain process for action. In either case, information regarding the constraint and the response would be shared with the affected internal and external suppliers and customers. Unanticipated constraints will arise and requirements will change at any frequently, therefore the process will be continuous, iterative and proactive.

18.6.3.2 A1.3.2 Process Integration

The Plan Supply Chain process will focus on significant changes impacting overall supply chain performance. Significant changes to the supply chain include the establishment of new locations, as in situations where units deploy and establish bare base operations. The requirements, resources and capabilities needed to support these new supply chain nodes will be identified quickly. To ensure that the supply pipeline is filled quickly site-specific information Department of Defense Activity Address Codes DODAAC and Routing Identifier Codes (RIC) will be made available as units deploy and possibly before they deploy. Additional support requirements may include special handling equipment, technical support, bandwidth, system deployment, security issues, and communications needs.

The Plan Supply Chain process will address internal and external relationships across the enterprise. Potential suppliers will be identified and qualified in this process and strategic relationships will be established to integrate the suppliers as key components of the supply chain. Joint Service Agreements and Memorandums of Agreement will be established with internal and external suppliers. This will ensure that the Supply Chain Plan is integrated and able to respond to requirements from units at home station as well as deployed units. These agreements will take into consideration demand and inventory management approaches such as VMI and collaborative demand planning. Strategic partners will operate as full participants in the extended enterprise with shared information, and integrated processes through enterprise application integration, electronic data exchange (EDI) and other technology enablers. Program

managers will manage material and systems lifecycles and will be partners in the supply chain management process. They will integrate acquisition and sustainment requirements and will assure continuing supportability with replace/retire strategies.

18.7 A2 PLAN SOURCE (P2)

18.7.1 A2.1 Current Source Planning Challenges

Currently, requirements are aggregated and forecasted enterprise-wide annually as part of the POM process. Forecasts are reviewed and updated for the enterprise quarterly through the Requirements Computation (COMP) process. On a routine and continuous basis, requirements are accumulated and aggregated only at the retail level. Wholesale aggregation and analysis of enterprise data occurs only during the Requirements Computation process.

Sourcing decisions are not dynamic because of the long interval between updates. Although the buy-list and repair-list are created centrally, local metrics and decision rules cause deviations that are misaligned with operational goals.

18.7.1.1 A2.1.1 Enterprise View

Currently, the annual demand plan is created without regard to capacity constraints either within the organic repair resources or at third party facilities. Consequently constraints mitigation begins in local execution instead of being part of the enterprise planning process.

When the sourcing plan is developed and disconnects are discovered between the requirement, capacity, and the financial resources available, there is no feedback to the budgeters or the warfighting customer. Constraints are not correlated to operational impact and mitigation strategies may not always be elevated to the supply chain enterprise level. Consequently, resources required to mitigate shortfalls may not be received and customer expectations may not be realized.

Many times execution behavior is focused on internal efficiencies at the expense of providing enterprise derived operational capability. Because there is no timely feedback and assessment capability to ensure the sourcing plan is meeting operational requirements, course corrections are not executed in a timely manner and weapon system availability suffers.

Internal budget issues tend to constrain decisions and to restrict mitigation strategies resulting in sub-optimal sourcing decisions. Resource reallocation may provide better solutions but there is no easy way to assess and execute that alternative within the current financial model.

Suppliers are not responsive to Air Force requirements because the Air Force maintains an arms length relationship with its suppliers instead of fostering long-term collaborative relationships. Consequently, administrative lead times and procurement/production lead times are not responsive to operational requirements.

18.7.1.2 A2.1.2 Process Integration

The ability to capture, accumulate, and forecast requirements is limited by the lack of integration and the diversity of customers and their systems. The customer demand base includes independent demands at bases, depots and commercial partners. It includes all US DoD and foreign military sales requirements. In addition to the independent demands, there are dependent demands for component parts, supplies, and for other dependents such as transportation. Each of these has unique systems and unique processes, both of which contributed to inaccurate, untimely, and indecipherable data.

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Dealing with dependent demand requires accurate Bills-of Material (BOMs), routings, and Bills-of-Distribution. The lack of connectivity of supply chain management with engineering and production results in data that is not useable for this purpose. Serial number information for components and end items are not tracked through the material life cycle, thereby limiting failure predictability.

Given the diversity of processes and the challenge of collecting even the most basic data, it is unreasonable to consider meaningful analysis and forecasting to uncover causal factors and to assess trends, which would significantly improve the quality and utility of forecasts.

Lack of consistency of process and diversity of systems prohibits dynamic sourcing of requirements based on best utilization of enterprise resources. Customers would need to be able to interface effectively with multiple internal and external supplier systems. Demand creation, inventory availability, order status, and shipping and tracking capability differ throughout the supply chain and the current hierarchical sourcing is designed to protect the customer from this confusion. However, this sourcing strategy severely limits the capability to apply resources optimally to meet enterprise goals.

18.7.2 A2.2 Commercial Source Planning Process and Best Practice

18.7.2.1 A2.2.1 Enterprise View

Plan Source sets the velocity of Logistics based on an assessment of the total requirement for product and material and, based on planned and current resources, assigns that requirement to specific sources for fulfillment. Plan Source is tightly connected with Plan Supply Chain. This linkage assures that the sourcing plan is driven from the enterprise goals. Plan Supply Chain defines the practices for assessing requirements, establishes the resources and alternatives for assigning sources to requirements, and establishes and approves business practices that influence supply chain performance. Within the Air Force, Plan Source will derive requirements from Air Force Operations Plans

Plan Source assures that correct and projected requirements are derived from and consistent with enterprise goal. This connection is essential to assure that operational pace and velocity is driven by enterprise needs. Plan source manages the assignment of these demands to alternative sources, internal and external. This assignment may be detailed and specific (quantity, source, due-date) or may be in terms of business rules (percentage splits between internal and external sources). This assures linkage between the supply chain plan and execution at the sources.

Plan Source is responsible for adherence to supplier business rules established in Plan Supply Chain. These rules may establish preferred suppliers, internal and external mix. Plan Source assesses supplier performance and is the focus for Supplier Management.

Plan Source accounts for actual and planned resources and balances demands and resources. Plan Source is a collaborative and transparent process that assures that all supply chain participants and customers are involved in assessing anticipated performance and mitigating actions.

18.7.2.2 A2.2.2 Process Integration

Plan Source forecasts and accumulates all sources of demand for material and services and balances those demands with the resources available. The material requirements may be independent (customer) demands or dependent demands derived from Make or Deliver Plans. Resources include internal and external suppliers, 3rd Party providers, and inventories. Where it is not possible to provide an acceptable balance between requirements and resources, communication is provided to customers and other affected parties. This out of balance situation also is an alert for Plan Supply Chain, for possible action within the scope of that process.

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The Plan Source process is conducted for all materials classes (e.g. parts, fuels, end items, munitions). It is also conducted for other requirements (transportation, machines, tools, manpower) important to the success of Air Force Logistics. This inclusiveness assures that plans for all materials and all requirements are coordinated and aimed at the same objectives. Some of these requirements, such as transportation and component parts, may be determined within the Source, Make, Deliver, and Return process as dependent demands of forecasted items. Integration of the planning processes assures that Plan Source is aware of these requirements and includes them in total demand managed by this process.

Forecasting of independent demand occurs within the Plan Source process. Forecasting methods applied within Plan Source include statistical modeling, causal forecasting, and collaborative forecasting. VMI and other variations of Efficient Customer Response may be employed to improve integration of the customer and supplier demand management

Actual customer demand is also included in the scope of demands accumulated and planned within Plan Source. Near real-time linkage with customers through direct order entry and EDI assure that requirements are up-to-date and reflect the current situation. Information describing point-of-consumption data, customer inventories, and customer-planned usage is collected and analyzed. Requirements for end-use item and for all intermediate component parts are collected, as are replenishment requirements. Demand-pull mechanisms drive requirements. Actual consumption determines supply chain velocity and inventories are used only to offset lead times. Cycle times are reduced to match customer delivery requirements thereby further coupling actual demand with resource assignment. Only end-use requirements are forecasted. All other requirements are derived from end use via BOM and Routing and Bill-of-Distribution assessment.

Materials and resource requirements for engineering, testing and other purposes are included in the plan.

All qualified sources of supply are considered to fulfill requirements. There is an active strategic supplier management program, which positions these suppliers to be included in the enterprise processes. The network operates in a single echelon mode and both internal and external sources are evaluated. Resource and capacity data is up-to-date and accurate for internal and external sources.

Customers and suppliers understand the requirements in detail as well as implications of short-term limits to supply. They confirm plan requirements and resources and accept courses of action. Mitigation responsibility is understood and shared. Plans are current and visible to all stakeholders. Performance is actively tracked and actioned.

18.7.3 A2.3 Future Air Force Plan Source Processes

18.7.3.1 A2.3.1. Enterprise View

Plan Source will assure that projected demands and planned resources are aligned with the enterprise plan articulated through the operations plan and training requirements. The Plan Source process will accumulate and assess all enterprise wide projected demand (independent and dependent) for all classes of supply in determining total requirements. Inputs from the Plan Make, Plan Deliver and Plan Return processes will identify additional requirements for transportation, support equipment and personnel. Resources available from internal and external suppliers, on hand and due-in inventories and 3rd party logistics providers will be identified in the Plan Source process. The Plan Source process will balance these requirements with available and projected resources. Where requirements and resources cannot be balanced, this process will provide feedback via EDI or other e-business practices to customers and suppliers allowing them to develop mitigation strategies or trigger re-planning. To enable these principles, the Air Force will employ Strategic Sourcing methodologies and practices. This will entail establishing sourcing rules based on commodity type and spend, supplier relationship, supplier spend, and inventory

model and readiness requirement. Further, aggressive contract / supplier management to manage supplier performance in meeting performance standards will be instituted. This will require enhanced flexibility in contracts.

The output of this process will be a single sourcing plan that is fed to the Plan Supply Chain, Plan Make, Plan Deliver and Plan Return processes. Projections and forecasts developed in this plan will also be shared with external suppliers to assist in their planning processes.

18.7.3.2 A2.3.2 Process Integration

The future logistics enterprise will manage inventory at an Enterprise level to include eliminating the stovepipes that exist today between wholesale and retail supply. The future Air Force Plan Source process will assess enterprise requirements for end items and supporting materiel and balance those requirements against specific on hand and inbound resources for execution. The Plan Source and Plan Supply Chain processes are closely related and highly collaborative. Plan Source will take operational requirements from Plan Supply Chain to determine requirements for balancing against available resources. Plan Source will develop its requirements from the same Air Force operations plans and training requirements used in the Plan Supply Chain process to develop the single sourcing plan for buy and repair.

Independent demand will be forecasted in the Plan Source process applying business rules selected in the Plan Supply Chain process. To accurately forecast demand, modeling and simulation, analysis of causal factors and collaborative planning will be used. Comprehensive, accurate and timely visibility of demand will be critical in this process. Where appropriate, inventory management alternatives such as VMI will be implemented to optimize support to the customer. To enable these processes, automated information technology will be leveraged to minimize handling time and maximize data accuracy. A single enterprise supply view / solution set and advanced planning capability will be adopted to create effects-based forecasts and inventory plans. Supplier Integration will be improved to divest appropriate item / inventory management. Execution processes and Product Lifecycle Management will be integrated to plan causal factors, inventory requirements due to configuration changes, and establish a feedback loop between process and tools / technology. Joint Service Agreements and Memorandums of Agreement established in the Plan Supply Chain process will be leveraged in the Plan Source process ensuring that the sourcing plan remains integrated among internal and external suppliers.

18.8 A3 PLAN MAKE (P3)

18.8.1 A3.1 Current Plan Make Challenges

In order to effectively plan the production (make) processes, an accurate production plan must be generated from the sourcing plan. The production plan should be balanced with the production resources that must be available to support the repair and overhaul requirements. The production plan identifies where the repair process will take place using available facilities, capacity, skilled labor, and cost authority; however, current production planning does not consider intermediate level maintenance resources or contractor resources. Currently, the Air Force production plans, where they exist, are local in nature, there is no production plan that balances all available production resources with the requirements. Additionally, when the production plan is constrained, the effect on operational goals is not readily apparent. Consequently, mitigation plans are poorly prioritized in relation to their marginal return to achieve operational goals.

18.8.1.1 A3.1.1 Lack of an Enterprise View

Many locations are capable of performing repair. This includes bases and depots, third party operators, and strategic partners. Capacity, capability, and load information, with few exceptions, is known only

locally and in many cases is not validated. Consequently, load balancing between these resources is not part of the current production process

Enterprise materiel priorities are established for repair. However, these priorities may conflict with shop metrics and constraints and do not uniformly drive shop operations. Production metrics focus on internal efficiencies, not customer requirements. A shop may be 100 percent utilized, but producing the wrong mix of items because the constraint impacting the priority item is not being mitigated.

18.8.1.2 A3.1.2 Lack of Process Integration

Material Requirements Planning is not tied to the production schedule, and there is no viable inventory management process for components. Consequently, material managers are only influenced by stock out conditions and not by production need dates. This leads to awaiting parts conditions that prolong production lead-times and adversely affects operational capability.

Because the production schedule is not time fenced, it is constantly changed with unplanned requirements. This churn impacts capacity utilization and material availability and has a negative effect on throughput.

18.8.2 A3.2 Commercial Plan Make Process and Best Practice

18.8.2.1 A3.2.1 Enterprise View

Plan Make is the process that assesses the total requirement for making, maintaining, and repairing (producing) material and plans the appropriation of resources to that requirement. Goals for this planning process are aligned with the enterprise goals and requirements and resources correspond to the cascaded Supply Chain Plan and the Sourcing Plan. Actual demands are driven from equipment failures, defects, upgrades, and predictive maintenance (PDM). Plan Make considers all time-phased requirements for producing materials at each source and all resources (component inventories, tools, machinery, labor, funding) planned to be available according to the Supply Chain and Sourcing Plans. Capacities, such as number of approved shifts, are examined for short-term demand and risk mitigation. Plan Make also manages production specific requirements and resources such as component inventories, quality packages, tools, and maintenance specifications.

Production resources are considered an enterprise asset and all assets, internal and external, are applied to fill the enterprise requirements. Capability is well understood and plans are built based on demonstrated performance.

Plan Make balances requirements with production resources, applying appropriate enterprise based business rules. These rules address guidelines for short-term capacity additions and reductions, alternative routings and resources, priority dependent responses.

18.8.2.2 A3.2.2 Process Integration

Plan Make includes the Production Planning of strategic external suppliers, where they are important alternative or designated sources for production. Key suppliers of component materials are also included in the scope of Plan Make.

Plan Make anticipates and plans non-production activities that impact production levels. This includes scheduled shop maintenance, training and education, planned shutdowns or scale downs. These events are included within the production plan.

Key data is accurate, up-to-date, and readily available. Bills-of-Material, Routing Instructions, and Operator Instructions are high quality. Inventory data is accurate. All inventories are identified by quality

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and usability specification. Component parts and production consumables are managed. Inventory targets for them are reviewed and adjusted frequently. Incoming supply is managed and is reliable.

Plan Make includes the management of enterprise wide component inventories. This includes the establishment and review of inventory targets, as well as the review and disposition of obsolete or damaged materials.

Production reliability and cycle time is managed and improved. Producers are tightly integrated with their suppliers. Sharing of planning information assures clear understanding of requirements and capabilities. VMI, Consignment Inventories, and on-site supplier operations are employed to link production with its suppliers

Plan Make provides to Plan Source a forecast of requirements for component materials and other resources needed to support the Production Plan.

Unplanned orders are accepted and scheduled only when there is no detrimental effect on the production plan Changes to plans and unforeseen risks are communicated to all stakeholders.

18.8.3 A3.3 Future Air Force Plan Make Processes

18.8.3.1 A3.3.1 Enterprise View

Air Force production planning for the future state will plan capacity allocation centrally and apply resources for all repair activities, base, depot, and contract. Dynamic load planning will assure all capacity is considered for execution of the production plan. Constraints will be assessed in terms of their impact on operations. The maintenance function will move to a predictive, repair-to-forecast model that will minimize cycle times and improve production throughput. Repair will be based on predictive analysis replacing components as they approach the end of their service life.

Maintenance, Repair and Overhaul will become integrated across the enterprise and across Supply. The focus in the new Air Force logistics community will be managing inventory flow to meet customer demand, and will necessarily eliminate the current boundaries between Maintenance and Supply, as well as, those between wholesale and retail. To deliver this enterprise capability, Air Force Logistics will optimize homogeneous repair processes across levels of repair. Key planning functions across all sources of repair will be centrally managed to determine optimum source of repair at an enterprise level, with an eye on deployment needs.

18.8.3.2 A3.3.2 Process Integration

To enable this maintenance philosophy, common processes for maintenance will be established, at all levels of repair. Common systems will be adopted to manage capacity and shop floor planning. Lean manufacturing/load center based maintenance lines will continue to be adopted. Further, we will optimize maintenance outsourcing at the enterprise level balanced with deployment needs and capabilities, with an eye toward minimizing the deployment footprint. To enable central production planning, the capacity and capability of all shops must be known, including surge capacity. Bills-of-materials must be accurate and accessible by all sources of repair. Decision support tools must be available to support rapid re-planning to achieve balanced loads. Simulation capability will identify additional capacity required.

18.9 A4 PLAN DELIVER (P4)

18.9.1 A4.1 Current Delivery Planning Challenges

Plan Deliver is the process by which requirements for timely delivery of material to internal and external customers is balanced against resources and capability. It is the process that details requirements for

additional or relocated resources. Delivery resources include internal transportation, external transportation, handling equipment, and the storage facilities that will deliver material to satisfy customer orders.

Currently, there is no enterprise-wide, continuous Delivery Plan created to respond to enterprise goals, or Supply Chain, Souring, or Making Plans. There is a detailed Time Phased Deployment List (TPFDL), which is employed for large scale moves of supplies, equipment, and people. This is a preplanned activity that associates the requirements to be moved with the resources to do the moving. However, it is not very dynamic in its re-planning capabilities and is not integrated with real time execution.

18.9.1.1 A4.1.1 Lack of an Enterprise View

Except for the annual TPPDL reviews of movement and delivery, requirements are assessed and balanced against resources only on an ad hoc basis during exercises. There is not an enterprise-wide regularly updated Delivery Plan that addresses on-going needs and is prepared to respond to unplanned requirements. The absence of a real time planning process is especially evident when rapidly shifting the supply chain to support AEF contingencies. As identified during recent operations, specialized equipment was not available to offload certain aircraft that required the use of special equipment. This caused maximum aircraft on ground limitations to be exceeded that impacted planned airlift delivery throughput. Once an Airport of Debarkation was established, route optimization to deliver cargo to outlying locations was not planned. This resulted in all deliveries being coded as a priority requirement competing for theater airlift resources instead of using dedicated truck and time definite delivery. The ability to warehouse items requiring special handling was not available. This should have been identified during the resource and requirements planning process. The warehousing constraint should have been mitigated prior to the delivery operation

18.9.1.2 A4.1.2 Lack of Process Integration

The delivery process supports a wide range of materials (e.g., spares, equipment, fuel, munitions) from a variety of sources (bases, depots, internal and 3rd party maintenance, contractors, new manufactures, etc). Each of these segments has its own processes and systems, but shares key resources such as warehousing and transportation). Integration of these requirements into an integrated, dynamic, and balanced Delivery Plan is unachievable. This results in inefficiency and poor quality within the Delivery process. As a critical example, management of the total inbound freight network is not effective, forward, integrated transport requirements are not visible across the supply chains and resource requirements are not preplanned. As a recent case in point, shipments from contractor maintained weapon systems are not managed within the defense transportation system and subsequently they become frustrated in customs at overseas locations because of lack of visibility to the total resource requirement.

18.9.2 A4.2 Commercial Delivering Planning Process and Best Practice

18.9.2.1 A4.2.1 Enterprise View

Plan Deliver is the process that assesses the total requirement for delivering materials and services and plans the appropriation of resources to that requirement. Goals for this planning process are aligned with the enterprise goals and requirements and resources correspond to the cascaded Supply Chain Plan and the Sourcing Plan. Actual customer material requirements, production, acquisition, replenishment, returns, and material repositioning drive these requirements. Plan Deliver considers, for each delivery point, all resources (inventories, warehousing and shipping, transportation, equipment, labor, funding) planned to be available according to the Supply Chain and Sourcing Plans. Capacities, such as number of approved shipments, are examined. Plan Deliver also manages delivery specific inventories, special handling requirements, environmental factors, and customs considerations.

Plan Deliver balances requirements with delivery resources, applying appropriate enterprise based business rules. These rules address guidelines for short-term capacity additions and reductions, alternative shipping and handling methods, and priority dependent responses.

Plan Deliver includes the management of inventories. This includes the establishment and review of inventory targets, as well as the review and disposition of obsolete or damaged materials.

Plan Deliver anticipates and plans activities that impact throughput. This includes scheduled warehouse maintenance, training and education, planned shutdowns or scale downs. These events are included within the Delivery Plan.

Delivery reliability is managed and improved. Demand is managed to plan levels. Unplanned orders are accepted and filled only where there is no detrimental effect on the delivery plan. Alternative resources and suppliers are identified and employed to expedite response to change

Changes to plans and unforeseen risks are communicated to all stakeholders

18.9.2.2 A4.2.2 Process Integration

Plan Deliver includes the Delivery Planning for strategic external 3PL suppliers. Key suppliers of services such as transportation, customs, and storage are also included in the scope of Plan Deliver. Internal and external physical logistics suppliers are integrated in the planning process. Requirements are explicitly communicated and capabilities and capacities are shared. Third party suppliers commit to the Plan and openly share performance data. Where third party suppliers are utilized, the enterprise maintains responsibility for overall performance and for developing mitigation actions where the third parties are unable to perform as planned.

Supply Chain inventories are managed and controlled. Best solutions include VMI and consignment inventories to ensure tight linkage between supplier and the delivery process. Inventory targets are reviewed regularly. Inventory is employed only to the extent necessary to accommodate lead times.

Deliver is extremely dependent upon accurate and up-to-date distribution data. This includes the customer identification and location, routings, special storage and handling requirements, and inventory accuracy. Plan Deliver assures that there is appropriate priority and attention to quality activities necessary for proper maintenance of this data. Continuous improvement and other process upgrades are reflected within the Delivery Plan.

Plan Deliver provides to Plan Source a forecast of requirements for materials and other resources needed to support the Delivery Plan.

18.9.3 A4.3 Future Air Force Delivery Planning Processes

18.9.3.1 A4.3.1 Enterprise View

The future Air Force Delivery Plan will ensure an enterprise view of inventory is available to make the delivery process responsive to customer requirements. Customers will be serviced from the enterprise using business rules that support the operational goals and requirements. Total asset visibility will enable rapid re-planning of cargo moves, placement of material handling equipment and more efficient distribution operations.

To improve transportation and distribution processes, these processes will be integrated across the entire logistics chain. VMI programs will be used where the sourcing entity manages customer inventory and executes replenishment and distribution. We will optimize and dynamically re-plan our inventory/distribution network to include rationalizing network nodes. We will revise our priorities to assure delivery meets customer requirements. Distribution requirements planning and scheduling

processes will be institutionalized across the logistics chain. In-transit visibility will be established and tactical transportation management tools will be used to optimize delivery and transportation assets.

Further, as a strategic goal, a partnership with TRANSCOM will be sought to empower TRANSCOM with all AF Logistics Chain Transportation and delivery responsibilities that are not part of the base level delivery processes.

18.9.3.2 A4.3.2 Process Integration

The effectiveness of this process is dependent upon accurate distribution data including geographic location, routings, materiel storage and handling requirements, and inventories. The Plan Deliver process will assure the accuracy of this data. The Plan Deliver process will include the development and implementation of various quality initiatives such as continuous process improvement (CPI) in terms of inventory management and fulfillment of demands.

18.10 A5 PLAN RETURN (P5)

18.10.1 A5.1 Current Returns Planning Challenges

The Air Force is heavily dependent upon the repair and overhaul of high dollar value repairable items as a resource to fill forecasted demand requirements. Plan Return is the process by which requirements for timely return of material to internal and external repair sources is communicated and balanced against resources and capability. It is the process that details requirements for additional or relocated resources. Returns resources include transportation, handling equipment, and the storage facilities that will return material to the appropriate location. In the Air Force, returns represent the inventory available to fulfill the sourcing plan and become the raw materiel for the make plan; therefore, planning for returns is very important towards satisfying future demand.

Currently, returns are planned but due to data problems and process sub-optimization caused by financial considerations, returns are not directly linked to the maintenance process during execution and the return plan does not minimize the use of handling or transportation resources. The return process is highly reactive and is dependent upon excess capacities and excess assets in order to be successful.

18.10.1.1 A5.1.1 Enterprise View

Business rules that determine return locations and priorities are not dynamic and are not connected to current enterprise driven Plans. They do not consider the inventory position of the asset i.e. in long or short supply. Consequently, everything is shipped fast and at premium cost. Retrograde planning during contingencies is not effectively managed, as a source of spares, consequently there is no attempt to balance return requirements with production planning.

18.10.1.2 A5.1.2 Process Integration

The returns process supports a wide range of materials (e.g., spares, equipment, fuel, munitions) from a variety of causes (operational failure, material repair and maintenance operations, inventory overages). These may occur at bases, depots, contractors, third parties, etc). Each of these segments has its own processes and systems, however, lack of integration between processes, and especially returns for contract repair leads to sub-optimal return plans.

18.10.2 A5.2 Commercial Returns Planning Process and Best Practice

18.10.2.1 A5.2.1 Enterprise View

Plan Returns is the process, which assesses the total requirement for returning materials, and projects the appropriation of resources to that requirement. Goals for this planning process are aligned with the

enterprise goals and requirements and resources correspond to the cascaded Supply Chain Plan and the Sourcing Plan. Equipment failures, defects, upgrades, PDM, material repositioning, excess materials, and obsolete materials drive actual requirements. Returns require sourcing, delivery and production activity. Plan Returns considers, for each of these activities, all resources (warehousing and shipping, transportation, equipment, labor, funding) planned to be available according to the Supply Chain and Sourcing Plans. Capacities, such as transportation load and number of approved shifts, are examined. Plan Returns also manages special handling requirements, environmental factors, and customs considerations.

Plan Returns balances requirements with return resources, applying appropriate enterprise based business rules. These rules address guidelines for short-term capacity additions and reductions, alternative shipping methods, secondary repair sources, and priority dependent responses.

Plan Return includes the Return Planning for strategic external 3PL and Reverse Logistics suppliers. Key suppliers of services such as transportation, customs, and storage, and scrappage and destruction are also included in the scope of Plan Return.

18.10.2.2 A5.2.2 Process Integration

Plan Return includes the management of system wide returned inventories. This includes the establishment and review of inventory targets, as well as the review and disposition of obsolete or non-reparable materials, and the timely approval of returns.

Plan Return anticipates and plans activities, which impact throughput. This includes scheduled maintenance, training and education, planned shutdowns or scale downs. These events are included within the Return Plan.

Return is extremely dependent upon accurate, up-to-date, readily available data. This includes the customer and destination identification and location, routings, special storage and handling requirements, and inventory accuracy. Plan Return assures that there is appropriate priority and attention to quality activities necessary for proper maintenance of this data. Continuous improvement and other process upgrades are reflected within the Delivery Plan.

Plan Return provides to Plan Source a forecast of resources needed to support the Return Plan.

18.10.3 A5.3 Future Air Force Plan Return Processes

18.10.3.1 A5.3.1 Enterprise View

The Air Force Plan Return Process will take requirements from the Plan Make, Plan Source, and Plan Delivery processes and balance all resources available and projected to develop a return plan. Return capacities in terms of airlift, number of shifts, customs considerations and handling capabilities will also be considered in the assessment of resources. The Plan Return process also takes into account guidance developed in the Plan Supply Chain process to add or reduce interim capacity, 3rd party logistics providers and alternate transportation modes. Outputs from the Plan Deliver process will include plans for scheduled maintenance, training, planned shutdowns and these will be accounted for in the Return Plan. This process will balance requirements with return resources in accordance with guidance developed in the Plan Supply Chain process. The output of the Plan Return process is a balanced return plan, which will be communicated to the Plan Make, Plan Source, and Plan Deliver processes. Where return resources are insufficient to meet return requirements a signal will be sent back to Plan Supply Chain for mitigation.

18.10.4 A6 Future State Execution Processes for AF logistics

Effective supply chain execution is based on a supply chain plan that supports the operational plans of the Air Force. The overarching goals and objectives are found in these operational plans. These goals and

objectives generate the requirements for the supply chain to satisfy, and the supply chain obtains the resources to provide perfect order fulfillment to the customer. If customer requirements change beyond the planning horizon, new plans are developed to obtain the resources to meet the requirement. If customer requirements change within the planning horizon as identified by increased customer orders, changed op tempo, changed delivery locations, changed configurations, or changed maintenance requirements, execution data will update the planning requirements, which will result in rebalancing the available resources. When rebalancing resources with requirements results in unmitigated constraints, the customer will be immediately appraised so the operational strategy can be balanced with expected supply chain output.

Definition: The purpose of the collective execution activity is to buy, make (produce/ maintain/ repair) and deliver (pick, transport, receive) materials to customer requirements as directed by the plan. Execution includes the physical activities of generating purchase orders, repairing, shipping, etc. It includes the communications activities such as customer order entry, order routing, customs documentation, launching production orders to the shop floor. Operational scheduling activities such as job sequencing, and load planning, and inventory reservation are execution activities. And so too are the shop and distribution center focused quality management activities such as cycle time reductions, improvement in product quality, and inventory accuracy and control.

For Air Force Logistics, the customers' requirements are derived from sourcing plans based on Air Force Operations and Training Plans and are manifested in the assurance of weapon systems availability. Actual customer orders, linked to the sourcing plan, drive all pull activities. Resources employed by the execution processes consist of all the facilities, infrastructure, materials, manpower, and funds planned and available as determined in the planning sub-processes.

All supply chain execution actions fall in one of four sub-processes, each of which addresses a set of requirements and resources. Source is concerned with management of all demands – both customer initiated and internal (e.g. replenishment) and ties those demands to appropriate sources as either a buy, repair, or overhaul requirement. Make is concerned with production (repair and overhaul) related demands and resources; Deliver is focused on material fulfillment; and Return addresses materials returned for all reasons but of main concern are those returns for maintenance, repair, or overhaul (MRO). These execution processes are interdependent, each providing to the others demands and materials for action. Additionally, they are each dependent on the respective planning processes for the projected appropriation of resources to meet planned requirements.

Source receives all requirements, whether customer initiated (independent random failures), or dependent requirements that support the projected repair plan for repair and overhaul of end items. Based on sourcing plans it assigns those forecasted demands to sources for procuring, making, delivering or returning. It establishes due dates for the execution processes and required delivery dates for the procurement process. It also includes those activities involved with material receipt and transfer so resources can be made available to support the projected requirement.

Make includes all those operational activities required to manufacture, maintain, and repair materials. It is driven by the production plan and orders. It includes the creation of production schedules for shop sequencing and routing. It creates and issues inventory reservations, move instructions, and work instructions. It includes both physical making, maintaining, and repairing activities as well as all testing required ensuring release of quality materials. It concludes with packaging, staging, and releasing for delivery.

Deliver includes all those activities required to move materials from one place to another. Deliver is driven by routed customer orders, replenishment signals, and produced materials. Deliver includes the

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operational planning for material picking, warehouse routing, load building, and route planning. It includes the reservation of specific inventories (serial numbers, lots, stock locations) for specific orders and the creation of instructions for the physical activities. Those physical activities include picking, packing, loading shipping, and transporting. When it is relevant (as it may be with capital equipment), it includes the receiving at customer site, testing, and installation.

Return initiates with the identification of material for return from operational failure, damage, defect, predictive maintenance, recall, or excess. It includes the request, approval, and determination of disposition. And it includes the scheduling of activities to effect and verify the return.

The following sections describe each of these sub-processes in greater detail. While each of these sub-processes differs somewhat for make-to-stock, make-to-order, and engineer-to-order, we will not deal with those distinctions here.

18.11 A6 SOURCE – COMMERCIAL PROCESS AND BEST PRACTICE

18.11.1 A6.1 Enterprise View

Source provides the mechanism for the receipt and validation of customer orders. It includes the mechanism for customer awareness and involvement in fulfillment plans and status. It also includes the creation of demand signals for replenishment and component materials based on plans and actual activities. It has critical linkage to the enterprise goals and related plans. It is through the Source process that executable requirements are directed to sources for action. The discipline employed in Sourcing is key to ensure the sourcing plan aligns with operational goals. Source establishes priorities and due dates for specific demands. It assigns those demands to specific sources for procuring, making, delivering, and returning based on the enterprise goals and established plans. Source also redirects requirements to alternate sources when necessary to meet due dates, if that can be accomplished within the existing plans and business rules.

18.11.2 A6.2 Process Integration

Source includes the processes for customer order creation to capture demand. Solutions, which integrate order creation with the customers' business process, are best practices. This includes Point-of-Sale tracking, VMI, and point-and-click ordering all of which simplify the ordering process

Material availability, expected delivery dates, and shipment tracking are all customer critical information. Those customer activities involved with verifying receipts and mapping receipts to requirements are included in Source, as are final material disposition and financial conclusion to the ordering process. All these requirements are addressed aggressively using a variety of technological capabilities. EDI, web-based e-business solutions, scanner and GPS tracking are all commercial solutions, which are feasible with enterprise-wide integrated data.

Source also includes interactions with both internal and external suppliers and partners for requirements placement, status and schedule tracking, and performance information. EDI and e-Procurement are among the exploited technologies.

18.11.3 A6.3 Current Process Problems

Order entry is cumbersome and not timely. It is currently a sequential process that queries various inventory locations, which prolongs the delivery cycle time. Delivery status is not immediate. Not all customer orders are received by supplier.

18.11.4 A6.4 Future LogEA Attributes/Enablers

To address current execution challenges, the Air Force will establish the capability to accomplish accurate order entry as close to the point of need as possible using enabling technology that might include online catalogues, graphical, and click-able images from digitized tech data, bar coding, etc. Once an order has been entered into the system the customer will receive instant feedback to include a reliable estimated delivery date. Feedback may also include instructions to, where appropriate, take other actions in situations where a replacement part will not be available in time to meet specific requirements for that particular aircraft, vehicle or piece of equipment. Other feedback could include instructions to not repair a particular end item. The Air Force may be in a worldwide excess position for the end item and repairing additional end items would be considered an inefficient use of resources. This order entry process will also provide a process for capturing usage data, causal factors, and environmental considerations.

Information collected in the aforementioned discussion will be shared across and up through the supply chain with program managers, item managers, engineers as well as internal and external suppliers. This information is essential to overall supply chain planning and predictive maintenance.

18.12 A7 MAKE – COMMERCIAL PROCESS AND BEST PRACTICE

18.12.1 A7.1 Enterprise View

Make includes all those activities directly involved with, or supportive of production, maintenance and repair of materials. It includes preparation for the work, execution of the work and conclusion of the work. Make is initiated by and is linked to enterprise goals through sourced requirements and production plans. It includes new production, maintenance, and repair. Make-to-stock, make-to-order, and engineer-to-order are all strategies within the Make process.

Shop scheduling and sequencing determines and provides shop routing, tools, manuals, recipes, and operator directions and other items required for doing the work. The process determines shop floor sequencing based on shop capability, shop load, and due-dates and creates work instructions. These are driven directly from the Make (Production) Plan.

18.12.2 A7.2 Process Integration

The Make process is highly dependent on information interchange with its suppliers of components, supplies, tools and other requirements. EDI and web-based e-business provides this linkage.

Make includes determination of material requirements for the work based on bills of material. Commitment of engineering and others to the quality and availability of BOMs is critical. Make includes the issuing of specific inventories (serial number, lot number, bin location) to specific orders. It identifies and communicates inventory shortages. Best practice enables the enterprise-wide identification and assignment of these materials

In-line testing and other practices encouraged through six-sigma methods are used to ensure quality of execution. Process quality is explicitly shared among stakeholders to drive integrated improvements.

All materials, tools and other items used in the production activity are accounted for in the Make process. Replenishment requirements are signaled to Source. It may also signal a return if the Make process identifies the need to disposition damaged or excess materials, machines, or components.

Make includes all activities associated with managing and improving shop quality. This includes equipment maintenance (predictive and non-predictive), data quality management including inventories, routings, and bills-of-material. It includes quality improvement activities such as operator training,

process time reductions, lean manufacturing programs. It includes process management and process improvement with key suppliers.

18.12.3 A7.3 Current Process Problems

- Production scheduling/prioritization does not include Consolidated Intermediate Repair Facilities (CIRFs), base intermediate repair facilities, or contract repair activities.
- Shop capacities (tooling, facilities, people) are not well documented resulting in bottlenecks, long lead times, and missed schedules.
- Piece parts to support the production schedule are not available when required.
- Production schedules are not shared with suppliers resulting in excessive expediting and missed production schedules.
- Fencing production schedules is not a common practice; consequently, capacity planning and material requirements planning cannot react in time to meet variable due dates.
- Production scheduling for non-organic repair sources is not based on operational requirements and priorities.

18.12.4 A 7.4 Future LogEA Attributes/Enablers

Visibility of enterprise wide capacity will be available in a single system. This will aid in upfront planning and short-term mitigation strategies. This data will be made available to the central production planning process to mitigate variability in mid and long-term demand patterns. This will allow for centralized load balancing between all sources of repair with repair resources.

The future Air Force production process will use established production time fences to provide stability on the shop floor, improve capacity utilization, and increase throughput. By establishing these time fences plans can be acted upon and the process will move away from reactionary maintenance and production towards predictive planned weapon system support. This production planning will take into account and act in accordance with business rules established in the Plan Make process. The Make execution process will integrate all sources of repair to include depot, base, CIRF, and non-organic sources.

18.13 A8 DELIVER –COMMERCIAL PROCESS AND BEST PRACTICE

18.13.1 A8.1 Enterprise View

Deliver includes all those activities directly involved with or supportive of the movement of materials from one place to another. It includes those activities required prior to the movement, the actual movement, and activities that follow or complete the movement. Deliver is initiated by, and is linked to enterprise goals through, source requirements and delivery plans. It includes delivery of inventoried materials and produced (new or repaired) materials.

Delivery scheduling and shipment planning determine and provide shop routing, tools, manuals, recipes, and operator directions and other items required for doing the work. The process determines shop floor sequencing based on shop capability, shop load, and due-dates and creates work instructions. These are driven directly from the Delivery Plan

18.13.2 A8.2 Process Integration

Deliver includes determination of material requirements for the work based on bills of distribution. It includes the issuing of specific inventories (serial number, lot number, bin location) to specific orders. It identifies and communicates inventory shortages. It determines and provides shipping materials, special handling, shipping and customs documentation. The process determines distribution floor sequencing based on warehouse and material configuration, it plans shipment modes, loads, and routes based on

activity levels and due dates. It creates work instructions. These all require visibility to customers, suppliers, and enterprise information and plans

Deliver tracks material and order movements throughout the delivery chain and readjusts as required. Deliver provides status and schedules and communicates risk information. EDI, advanced ship notice, shipment tracking are key examples of exploited capability.

All materials and services used in the production activity are accounted for in the Deliver process. Replenishment requirements are signaled to Source. It may also signal a return if the Deliver process identifies the need to disposition damaged or excess materials, equipment, or supplies.

Deliver includes all activities associated with managing and improving delivery quality. This includes equipment maintenance (predictive and non-predictive), data quality management including inventories, routings, special handling instructions, and customer data. It includes quality improvement activities such as operator training and process time reductions. Deliver includes process management and process improvement with key third party suppliers.

18.13.3 A8.3 Current Process Problems

In-transit visibility of assets in the delivery process is not consistently available.

Identifying special handling resources required at receiving locations inhibits deliveries to forward deployed AEF units.

Customer order entry is currently sequential going from one supplier to another in a linear fashion until the order can be fulfilled. These impacts customers wait time and delays timely status back to the customer.

The cycle time to establish new delivery locations for deploying units is too long causing deliveries to wrong locations causing multiple customer orders to be made.

Current financial billing process creates adverse delays in promptly paying transportation service providers.

18.13.4 A8.4 Future LogEA Attributes/Enablers

In-transit data as well as special handling requirements will be made available to all players involved in the process. Likewise, visibility of available support equipment will be made available to shippers to enable the selection of the correct delivery assets to be utilized.

Order entry will be made to the enterprise and enterprise business rules will identify the supplier to provide the asset ordered.

New procedures for identifying delivery locations will be as simple as providing geographic location codes.

Immediate access to delivery information, central collection of invoices and bill paying will eliminate the administrative burden of the unit to pay bills; and reduce the cycle time to pay providers.

18.14 A9 RETURN – COMMERCIAL PROCESS AND BEST PRACTICE

18.14.1 A9.1 Enterprise View

The Return execution process will include all activities directly involved with and in support of materials to be returned for any reason. This includes damaged or defective materials, returns from predictive maintenance, and excess material. It includes the activities to identify and disposition the material to be returned, the management of the return, and steps required to complete, close and account for the return.

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18.14.2 A9.2 Process Integration

Return is initiated by the identification of failed, damaged or defective materials or by a predictive maintenance activity. It may also be initiated by the identification of excess inventory. These may occur internal to the supply chain during planning, making or delivering activities or may occur externally as by a customer.

It includes the communication and verification of the existence of a need for a return. The determination of disposition and return authorization is part of the Return process.

Determination of credit and adjustment or replacement of materials and accounting for the return is included in the Return process.

Scheduling returns and verifies receipt is included.

18.14.3 A9.3 Current Process Problems

Return delivery locations are not always accurate and prioritization of returns is not dynamically based on inventory positions and the sourcing plan.

Because of data problems, returns are not considered as available assets in the production schedule. Consequently, they are double handled and cycle time is expanded for repairing critical assets.

Retrograde management is usually an afterthought verses a priority process.

18.14.4 A9.4 Future LogEA Attributes/Enablers

The future Air Force Return processes will rely heavily on improved data integrity to significantly enhance the management of returns. The management of retrograde shipments from the locations generating the reparables back to appropriate repair facilities will be a priority in the future LogEA. This process will provide the capability to dynamically replan as return locations change based on sourcing plan, inventory stock position, and repair capacity load balancing.

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19.0 APPENDIX B: SCOR PROCESS MODELS

To be added from Aris.

29.0 APPENDIX C

21.1 B. OPERATIONAL SCENARIOS

This section presents four operations scenarios describing how these important activities will be accomplished under the Logistics Concept of Operations (CONOPS).

The four scenarios are:

- Inventory Supply Planning and Production Planning.
- Flight Line Order Management and Fulfillment.
- Maintenance Cycle.
- Deployment Planning.

These events were selected for elaboration here because of their significance to the Air Force and because they demonstrate the degree of change and improvement included within the CONOPS.

This section is intended for presentation to a very wide Air Force audience.

21.1.1 B1: Inventory Supply Planning and Production Planning

Enterprise goals will be established and communicated by means of Air Force Operations plans, training requirements, theater and expeditionary plans. These plans will be expressed in terms of capabilities rather than the traditional aircraft availability goals. This allows greater flexibility for trade-offs and optimization across weapon systems. For example, a cargo capability requirement can be satisfied with either C-5s or C-17s. The future system would be able to determine which way of satisfying the requirement is most efficient. Air Force Supply Chain planning supports the operational goals through a collaborative effort between the operations, acquisition, supply, maintenance, and transportation communities. It will integrate both internal (AF) and external (other DoD or contractors) partnerships. This planning process will be centralized for all classes of supply as well as for all maintenance and delivery functions, and include trade-offs capabilities between weapon systems. An example of this would be when a B-52 reaches its required performance level but the KC-135 has not, resources would be reallocated to the KC-135 from the B-52.

To effectively deliver weapon system capability, the future logistics enterprise will adopt a total lifecycle systems management philosophy. This philosophy will adopt a “Womb to tomb” management of weapon systems to include providing the Lifecycle Manager with the necessary authority, to include financial “control”, over weapon system life cycle management. The lifecycle manager will be responsible for the overall health of their weapon system to include overall logistics chain management for the weapon system from the customer interface through to suppliers. To support this structure, weapon system logistics chain managers will be responsible for overall logistics chain management. To ensure weapon system health, a key focus includes the optimization of system and sub-system maintenance throughout the product lifecycle.

To effectively achieve product lifecycle management, we will:

- Adopt serialized part tracking, including consumables, as appropriate.
- Capture near real-time failure data, to include tracking causal factors.
- Establish real time engineering change management.
- Integrate financial and resource tracking and control.
- Establish collaborative agreements with suppliers / Original Equipment Manufacturers (OEMs), including organic.

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- Management of Diminishing Manufacturing Sources (DMS).

The single supply chain plan will be dynamic and will support peacetime and wartime operations seamlessly and at times simultaneously. Establishing support for deployed units is of paramount importance. The future process will have re-planning capability to respond to constraints that arise during execution. It will quantify the impact in terms of Mission Capability. For example, if during execution a minor capacity constraint is identified, the mitigation strategy may be as simple as adding an additional shift for a short time to increase capacity and satisfy the specific production requirement. This mitigation strategy will be handled and communicated to other affected parties within the supply chain. If, however, the constraint required the purchase of additional capital equipment, a re-planning signal would be sent up to the Plan Supply Chain process for action. In either case, information regarding the constraint and the response would be shared with the affected internal and external suppliers and customers. Unanticipated constraints will arise and requirements will change at any frequently, therefore the process will be continuous, iterative and proactive.

In the future state, the logistics chain planner will create a forecast of all independent demands. This forecast will be driven by actual usage data collected from orders (historical demand) and projected demand based on predicted flying hours, equipment usage, or other metrics. This plan will forecast the estimated consumption of items over time by location/function using the aggregated demand (historical and projected) and tempered with causal factors while retaining the flexibility to establish special levels for low/no demand items. Causal factors will provide environmental context to the demand pattern and will improve forecast accuracy by associating demand with things such as, geographic location (transportation times), environment (sand, saltwater, snow, etc.), usage environment (frequent take-off and landing, frequent after burn, payload, etc.) and overall factors (age, configuration, maintenance history).

The forecast will be developed in an unconstrained fashion. This requires that ‘true’ demand will be captured at the point of order on the flight line and communicated to the planning functions. Resources (existing inventory, organic repair, non-organic repair, supplier inventory) will then be allocated to meet the forecast. These resources are often limited by factors such as maintenance capacity and funding. The allocation of these limited (constrained) resources will result in an optimized ‘supply plan’, that identifies the time phased inventory requirements, by location/function. This plan will identify the requirements that must be acquired outside the Air Force logistics community. The planner will be responsible for managing the fulfillment of this plan by providing these requirements to organic and non-organic sources (repair and supply). Should the requirements or the resources to fulfill these requirements change, it will be the planner’s responsibility to re-plan and resource the new plan.

The future process will address internal and external relationships across the enterprise. Potential suppliers will be identified and qualified in this process and strategic relationships will be established to integrate the suppliers as key components of the supply chain. Joint Service Agreements and Memorandums of Agreement will be established with government suppliers. Contracts will be structured so that weapon systems that are contractor supported (i.e. CLS, TSPR, TSSR) will have the same visibility of assets and control as their government counterparts. Their structure will make them an integral part of the enterprise and their performance metrics will be consistent with Air Force performance goals. Rather than being fenced off from other systems they will have the flexibility to be included in enterprise performance trade-offs in order to meet Air Force goals. This will ensure that the Supply Chain Plan is integrated and able to respond to requirements from units at home station as well as deployed units.

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These agreements will take into consideration demand and inventory management approaches such as VMI and collaborative demand planning. Strategic partners will operate as full participants in the extended enterprise with shared information, and integrated processes through enterprise application integration, electronic data exchange (EDI) and other technology enablers. For example, Supplier contracting arrangements will be made that provide the contractors visibility into the enterprise and allow them to "push" inventories (bench stock, tires, etc) to the users as needed. Program managers will manage material and systems lifecycles and will be partners in the supply chain management process. They will integrate acquisition and sustainment requirements and will assure continuing supportability with replace/retire strategies.

Air Force production planning for the future state will plan capacity allocation centrally and apply resources for all repair activities, base, depot, and contract. Dynamic workload planning will assure all capacity is considered for execution of the production plan. Constraints will be assessed in terms of their impact on overall mission capability. The maintenance function will move to a predictive, repair-to-forecast model that will minimize cycle times and improve production throughput. Repair will be based on predictive analysis replacing components as they approach the end of their service life.

Maintenance, Repair and Overhaul will become integrated across the enterprise and across Supply. The focus in the new Air Force logistics community will be managing inventory flow to meet customer demand, and will necessarily eliminate the current boundaries between Maintenance and Supply, as well as, those between wholesale and retail. To deliver this enterprise capability, Air Force Logistics will optimize homogeneous repair processes across levels of repair. Key planning functions across all sources of repair will be centrally managed to determine optimum source of repair at an enterprise level, with an eye on deployment needs.

To enable this maintenance philosophy, common processes for maintenance will be established, at all levels of repair. Common systems will be adopted to manage capacity and shop floor planning. Lean manufacturing/load center based maintenance lines will continue to be adopted. Further, we will optimize maintenance outsourcing at the enterprise level balanced with deployment needs and capabilities, with an eye toward minimizing the deployment footprint. To enable central production planning, the capacity and capability of all shops must be known, including surge capacity. Bills-of-materials (BOMs) must be accurate and accessible by all sources of repair. BOMs will be updated on a regular basis with relevant information on a near real time basis. This should include replacement factors, changes as the result of engineering/design changes, suitable substitutes, quantity per application, and source of supply. Decision support tools must be available to support rapid re-planning to achieve balanced loads. Simulation capability will identify additional capacity required.

Improved support for POM inputs will result from the traceability back to meeting stated Air Force performance goals. POM inputs identifying repair, replacement, and modification requirements will be based upon logistics requirements derived directly from these goals and tied to meeting them.

The user will no longer be required to reimburse the stock fund for items used. The resources required for the repair and replacement of the equipment will be part of the overall requirements process and will be allocated to the enterprise as part of the overall weapon system support process. Parts will be issued to the users based upon the requirements allocated to the end item for meeting the overall customer goals. In the future state, the logistics chain planner will create a demand forecast for all end items. This forecast will be driven by actual usage data collected from orders (historical demand) and projected demand based on predicted flying hours, or equipment usage. This plan will forecast the estimated consumption of items over time by location/function using the aggregated demand (historical and projected) and tempered with causal factors. Causal factors provide environmental context to the demand pattern and can improve

forecast accuracy by associating demand with things such as, geographic environment (sand, salt water, snow, etc.), usage environment (frequent take-off and landing, frequent after burn, payload, etc.) and overall factors (age, configuration, maintenance history).

The forecast will be developed in an unconstrained fashion. This requires that 'true' demand is captured at the point of order on the flight line and communicated to the planning functions. Resources (existing inventory, organic repair, non-organic repair, supplier inventory) are then allocated to meet the forecast. These resources are often limited by factors such as maintenance capacity and funding. The allocation of these limited (constrained) resources results in an optimized 'supply plan', that identifies the time phased inventory requirements, by location/function. This plan also identifies the requirements that must be acquired outside the Air Force logistics community. The planner will be responsible for managing the fulfillment of this plan by providing these requirements to organic and non-organic sources (repair and supply). Should the requirements or the resources to fulfill these requirements change, it will be the planner's responsibility to re-plan and resource the new plan.

21.1.2 B2: Flight Line Order Management and Fulfillment

The customer, at the point of use, will have online catalogs, graphical and click-able images, and digitized tech data to identify specific parts required to conduct the repair. The customer will have the ability to query the system to check availability and order as appropriate. This will require an integrated system that ties together the ordering process, interactive electronic technical manuals and bills of material. Additionally, end items may also perform self-diagnostics tests, identify failures (reactively and/or proactively) and send signals to the enterprise and place orders or signal maintenance actions. Self-diagnosis is available today in a number of systems. The Joint Strike Fighter currently being developed will have the ability to communicate with other systems to include the ability to place orders and signal possible maintenance actions.

The customer will order the part using remote devices such as personal digital assistants (PDAs), laptops, RF readers, etc and will place the order through a single system.

This order entry process will provide a means for capturing usage data, causal factors, and environmental considerations as appropriate. This will require an interactive capability that prompts users to provide feedback regarding the specifics of the part being ordered. Business rules will govern how the feedback is provided to the system to ensure accurate data collection via Automatic Information Technology (AIT).

The enterprise will apply appropriate priorities to needs based on mission and enterprise goals and will give shipment parameters (origins, destination, RDD, dimensions, special handling characteristics) to the second/third party transportation provider (routinely TRANSCOM). To ensure that the proper enterprise priority is applied to a requirement, the enterprise will have comprehensive visibility of asset status. This priority will be based upon that demand's contribution to mission goals. In the B-1 community for example, demand for units on the bubble are given a higher priority than non-tasked units.

The transportation provider will be responsible for providing door to door / end-to-end service to the customer.

The enterprise will provide the user with feedback to include a reliable estimated delivery date, periodic shipping status, and other pertinent changes. Improved production, inventory and supply planning will enable the enterprise to more accurately estimate and communicate delivery dates back to the user. Feedback will also include recommendations, where appropriate, to take other actions in situations where a replacement part will not be available in time to meet specific requirements for that particular aircraft, vehicle or piece of equipment. To enable these recommendations automated tech data will be used,

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knowledge management practices put into place to share information across the enterprise. Appropriate engineering approval will be required to take action on these recommendations.

Once the part arrives, the customer will be notified and the part will be delivered to the appropriate receiving/storage site (e.g. tail number bin, combat oriented supply organization). TAV of TNBs and changes to financial policies will be in place to enable the delivery of the part and closing of this portion of the fulfillment process.

Information collected in the above actions will be available in an enterprise database and accessible to program managers, item managers, engineers as well as internal and external suppliers. This information is essential to overall supply chain planning and predictive maintenance.

21.1.3 B3: Maintenance Cycle

The maintenance cycle for depot level repairs (DLRs) will adopt a repair to plan inventory management philosophy. Once a supply plan is established, repair requirements will be defined in the production plans. Accurate capacity and BOM data is required to ensure realistic planning parameters. Enterprise capacity knowledge of all repair activities will enable load balancing decisions to be made, that will identify the new location, and enable the scheduling process at the alternative repair source. Capability constraints feed back to the supply plan to trigger production plan replanning as appropriate. The constrained production plan defines maintenance resources requirements. Maintenance resources will produce to the production plan, rather than to customer orders.

As part of the retrograde process, carcasses will be tested, and broken down upon receipt at a repair facility. This approach accomplishes two key things: First, it returns all items back to service, where a re-test cannot duplicate the reported failure, and it provides an accurate inventory of carcasses that have already been diagnosed, thereby minimizing the unplanned repairs at the production line level.

A key to maintenance cycle will be the integration between the production plans, demand/supply plans, and return plan to ensure dynamic, real-time re-planning based on changing requirements, or changing resources.

The maintenance technician will be provided immediate disposition instructions for the broken part at time of ordering the new part. Additionally, serial number tracking of failed components (SRUs and LRUs) enable repair to migrate from a reactive nature to a more predictive and scheduled nature.

Failure identification and causal factors will be available to the enterprise for the central planner to facilitate production scheduling. All scheduled maintenance events will update a central aircraft record to enable aircraft tail number tracking for “bad actor” analysis, to enable selection of low time tail numbers for AEF deployment in order to minimize the amount of support equipment deployed to the fight, to identify total cost of ownership, and to ensure effective life cycle support.

The maintenance production schedule will be based on planned/predicted workload (aircraft PDM, scheduled in sections, engine overhaul) and predicted failures to ensure parts and capability are available when needed. Retrograde carcasses will be scheduled and included in the production schedule. Compilation of actual failure data (occurrence and causal) will improve predictive maintenance projections. As predictive maintenance capability matures, scheduled actions will increase and schedule variability will decrease.

Maintenance facilities will use common, lean production/load center based lines to increase throughput and minimize cycle times. Integrated shop scheduling tools will enable the balancing of the production requirements with resources and identify the constraints to the schedule. The scheduling process will integrate all sources of repair to include depot, base, CIRF, and non-organic sources and dynamically

rebalance the load based on business rules that will meet the operational requirement. The system will automatically reschedule the repair to an alternative location, outside of lead time based on the enterprise's knowledge of requirements and capacity.

Accurate, reliable data will be the underpinning of successful conversion from demand to production output.

21.1.4 B4: Deployment Planning

In the future state, we will have a dynamic, seamless, single, joint planning process. This process will be implemented through an enterprise-wide, service-integrated system that dynamically communicates combatant commander requirements to all affected communities. Service Components will be seamlessly tasked so that passing requirements to major commands can happen in real time. Through timely communication, the logistics community will respond to theater requirements by optimizing the delivery of force capabilities by sourcing from available Air Force resources. To support this process, the planners will have real-time visibility over resource availability (available equipment, human resources, weapon systems, lift, etc.). They will have access to simulation and modeling capabilities to perform immediate "what-if" analyses based on operating data. The planning horizon will be measured on the order of days versus weeks. The system will also allow providers to accurately reflect true readiness to minimize re-sourcing. The combatant commander will have confidence in his ability to deliver bombs on target by maintaining total process visibility over the Air Force logistics community.

To deliver on these capabilities, we will decrease ownership conflicts; integrate legacy and newly developed systems, which will result in an enterprise wide system; create a collaborative inter-service sharing/exchanging of information between operations and logistics planners that will eliminate latency in requirements determination; react to changes in plans, and clearly define requirements. A key to executing this model is timely decision management; along with an integrated system that will match human resources with equipment requirements to include BOS into one set of homogenous requirements that planners can optimize, to include transportation requirements.

This future logistics structure will provide the Air Force a flexible logistics pipeline that can instantaneously respond to real-time changes in theater requirements based on battlefield conditions. Once deployed, the execution processes will continue to execute, as always, but with new goals as defined through

22.0 ACRONYMS / DEFINITIONS

Acronym	Definition
AA	Aircraft Availability
ACC	Air Combat Command
AEF	Air Expeditionary Force
AF/CIO	Air Force Chief Information Office
AFMC	Air Force Materiel Command
AF/PEO	Air Force Program Executive Office
ALC	Air Logistics Center
AMC	Air Mobility Command
APS	Advanced Planning System
BEA	Business Enterprise Architecture
BOM	Bill of Materials
BSC	Balanced Scorecard
C2	Command and Control
C3I	Command, Control, Communications and Interoperability
C4ISR	Command, Control, Communication, Computers Information, Surveillance and Reconnaissance
CAGE	Commercial And Government Entity
CBM+	Condition-Based Maintenance Plus
CDM	Contract Depot Maintenance
CDMAG	Contract Depot Maintenance Activity Group
CIRF	Centralized Intermediate Repair Facilities
CLR	Chief's Logistics Review
CL-PWSS	Closed-Loop Planning for Weapon System Support
COA	Course of Action
CONOPS	Concept of Operations
CONUS	Continental United States
COTS	Commercial-Off-the-Shelf
DLA	Defense Logistics Agency
DMAG	Depot Maintenance Activity Group
DMRT	Depot Maintenance and Reengineering Transformation
DoD	Department of Defense
ELog21	Enterprise Logistics for the 21st Century
EA	Enterprise Architecture
EAI	Enterprise Architecture Integration
EAIC	Enterprise Architecture Integrated Council
EDI	Electronic Data Interchange
EDW	Enterprise Data Warehouse
ERP	Enterprise Resource Planning
FLE	Federal Logistics Enterprise
FMEA	Financial Management Enterprise Architecture
FOC	Full Operational Capability
FSC	Federal Stock Class
FY	Fiscal Year
FYDP	Future Years Defense Program
GFM	Government Furnished Material

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Acronym	Definition
HAF/SAF	Headquarters Air Force / Secretary Air Force
HR	Human Resources
IL	Installations and Logistics
ILC	Installations & Logistics Communication Operations
ILG	Installations & Logistics Readiness
ILI	Installations & Logistics Innovation and Transformation
ILID	Innovation and Transformation Division
ILIS	Information Technology Division
ILM	Installations & Logistics Maintenance
ILP	Installations & Logistics Resources
IL SPO	Installations & Logistics Special Program Office
IOC	Intermediate Operational Capability (IOC)
IPT	Integrated Project Teams
IPV	Industrial Prime Vendor
IT	Information Technology
JLB	Joint Logistics Board
JROC	Joint Requirements Oversight Council
JTA-AF	Air Force Joint Technical Architecture
LG	Deputy Chiefs of Staff Logistics
LGN	Logistics Process and Integrations
LogEA	Logistics Enterprise Architecture
MAJCOM	Major Command
MC	Mission Capable
MSG	Material Systems Group
NMCM	Not Mission Capable-Maintenance
NSN	National Stock Number
O&S	Operations and Sustainment
OA	Operational Architecture
OC-ALC	Tinker Air Logistics Center
OCONUS	Outside Continental United States
OEM	Original Equipment Manufacturer
OMB	Office of Management and Budget
OO-ALC	Ogden Air Logistics Center
OSC	Operational Support Centers
OSD	Office of Secretary of Defense
OUSD (AT&L)	Office of the Under Secretary of Defense (Acquisition, Technology & Logistics)
PAA	Primary Aircraft Assigned
PBL	Performance-Based Logistics
POC	Proof of Concept
POM	Program Objective Memorandum
PSCM	Purchasing and Supply Chain Management
ROI	Return on Investment
RSS	Regional Supply Squadrons
SA	Systems Architecture
SAF/AQC	Secretary Air Force / Acquisition Contracting
SBSS	Standard Base Supply System

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21.0 | APPENDIX C: OPERATIONAL SCENARIOS

Acronym	Definition
SC	Spares Campaign
SCC	Supply Chain Council
SC-COP	Supply Chain Common Operating Picture
SCME	Supply Chain Manager Evaluator
SCOR	Supply Chain Operational Reference Model
SCP	Supply Chain Portal
SME	Subject Matter Expert
SOW	Statement of Work
SNT	Serial Number Tracking
SRM	Supplier Relationship Management
SSG	Standard Systems Group
TDY	Temporary Duty
TLCSM	Total Life Cycle System Management
TNMCS	Total Not Mission Capable for Supply
TPG	Transformation Planning Guidance
TRANSCOM	Transportation Command
TSPR	Total System Performance Responsibility
TSSR	Total System Support Responsibility
UID	Unique Identifier
UTC	Unit Type Code
VCJCS	Vice Chairman, Joint Chiefs of Staff
VICP	Virtual Inventory Control Point
VMI	Vendor Managed Inventory
V&V	Verification & Validation
WBS	Work Breakdown Structure
WP-AFB	Wright Patterson Air Force Base
WR-ALC	Warner Robins Air Logistics Center
WSA	Weapon System Availability
WS SCM	Weapon System Supply Chain Manager

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