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Information Requirements Analysis: A Qualitative Characterization of the Flightline Expediter for the Integrated Maintenance Information System

John C. Gorla Jr.

INFORMATION REQUIREMENTS ANALYSIS: A QUALITATIVE CHARACTERIZATION OF THE FLIGHTLINE EXPEDITER FOR THE INTEGRATED MAINTENANCE INFORMATION SYSTEM

THESIS

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Having extensive experience as an Aircraft Maintenance Officer, I looked upon this Master's Thesis as an opportunity to investigate an issue that directly impacts those in my career field. The research topics at Armstrong Laboratory presented interesting challenges that could not have been met elsewhere. I look forward to the day when I can return to aircraft maintenance and participate in the effort to bring IMIS into the mainstream.

This thesis was exciting and allowed me the opportunity to learn new concepts in analysis and research methods. I thank my advisor, Dr Kim Campbell, for her great assistance in helping me achieve the goals of this thesis. Her insight, instruction, and guidance were outstanding. I would also like to thank my readers, Lt Col Stephen Atkins, and Barbara Masquelier for their guidance and support in this thesis effort. Thanks to Brian Smith at Armstrong Laboratory for helping me find all the data and technical reports I needed to complete this thesis.

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John Gorla

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Abstract

The Integrated Maintenance Information System (IMIS) concept design includes the addition of management tools to access IMIS databases and provide communication capabilities between flightline technicians and supervisors. Armstrong Laboratory has developed a portable maintenance aid for technicians, and sponsored this research to investigate the requirements for a computer–based tool for the expediter. The basic hardware and software requirements document for IMIS, the System/Segment Specification (SSS), contains task information that closely corresponds to the expediter job description as defined in Air Combat Command Instruction 21-166. This research compiled a list of information requirements for the expediter from the IMIS SSS and analyzed the resulting information using subjective evaluation and theoretical foundations in linguistics. The results support the notion that the expediter is often an intermediary to maintenance information. The recommendations focused on freeing the expediter to do more important tasks by re–engineering the information flow in IMIS, which could result in significant workload reductions for the expediter with proper design of the information processes in an IMIS context.

INFORMATION REQUIREMENTS ANALYSIS: A QUALITATIVE CHARACTERIZATION OF THE FLIGHTLINE EXPEDITER FOR THE INTEGRATED MAINTENANCE INFORMATION SYSTEM

I. INTRODUCTION

Background

Armstrong Laboratory Logistics Research Division (AL/HRG) is developing a revolutionary new system to ease the administrative and technical burdens associated with the legacy database systems used by aircraft maintenance professionals throughout the Air Force. This system, the Integrated Maintenance Information System (IMIS), started as an effort of the Joint Computer Aided Logistics Support (JCALS) initiative to digitally present technical manuals to maintenance technicians via electronic means. The system capability has progressed to where IMIS is now a complete solution for integrating the technical manual databases, maintenance databases such as the Core Automated Maintenance System (CAMS), and the Centralized Engine Management System (CEMS), into a consistent user interface accessible by the technician on a single computer. Moreover, IMIS has the capability to automate all of the maintenance information flow from technician to supervisor to squadron and wing leaders.

Past IMIS research efforts focused on developing the technician's portable maintenance aid and maintenance information workstation; much work remains on developing the conceptual design and testing of a system that can provide maintenance managers with communication capabilities and access to the IMIS database.

The logical starting point for introducing a management tool to access IMIS is with the flightline expediter. The expediter's job is to monitor and control all maintenance and flying activities on his assigned flight of aircraft. He is the manager closest to the maintenance and flying activities and is in direct communication with technicians, the production supervisor, and the maintenance operations center (MOC). The expediter's job involves coordination of all aircraft status changes, maintenance work order start and completion, resource allocation, and a myriad of other requirements. These activities currently involve the use of checklists, reference manuals and operating instructions, a 'grease board' for tracking aircraft and personnel status, and a two–way FM radio for communication with other agencies (Air Combat Command, 1994). Armstrong Laboratory researchers believe the introduction of an IMIS tool for expediters would greatly reduce their administrative burden and workload.

In fact, Armstrong Laboratory reported some preliminary results from concept testing of a management tool which show there is a potential for IMIS to greatly increase the expediter's workload (Ward, et al., 1995). IMIS technology provides the ability to free the expediter from being a mere intermediary, and potential bottleneck, of information flow, but designers must give careful thought to the design of the interface and information flow in the system. This thesis will attempt to provide a foundation for design of the interface and information flow by characterizing the information requirements of the expediter in the context of an IMIS implementation.

Problem Statement

Existing information in computer interface design has shown that merely duplicating an analog system (e.g. a paper–based or manual system) with a computer may not provide any real advantages for the user. For example, Mullet and Sano noted that,

> Even if the metaphor can be realized completely, presenting a software artifact as a direct analog to a physical object almost always imposes unnecessary visual and conceptual restrictions on the design. Most GUI [Graphical User Interface] calculators, for example, simply replicate the heavily moded, poorly labeled and difficult to manipulate designs of existing physical designs. While they may be familiar (to experienced users of the physical analog) these designs do little to leverage the power and flexibility of their computational host. (1995:33)

Those familiar with aircraft maintenance on the flightline know that the expediter's job is not easy. It is fast–paced and information intense.

Merely computerizing the current paradigm might be the simplest way to implement IMIS for the expediter job function. The goal of IMIS, however, is to revolutionize the way maintainers and maintenance managers work. As such, this thesis will provide a foundation for revolutionizing the current paradigm under which the expediter operates through the use of an IMIS tool.

Research Questions

To provide detailed information to designers of an IMIS tool for expediters, this thesis will examine the following:

1. What IMIS requirements established in the System/Segment Specification correspond to the current expediter job description (i.e., 'as–is')?

2. What requirements could or should be automated in the 'to–be' implementation of the expediter Mobile Maintenance Information Workstation (MOMIW)?

3. What expediter requirements necessitate direct access to and manipulation of IMIS information?

4. What IMIS SSS requirements correspond to emergency or urgent action information needed by the expediter?

Early proof–of–concept testing showed that the expediter could become a bottleneck to information flow, resulting in increased task saturation for the expediter (Ward, et al., 1995). The goal for an IMIS management tool for the expediter (hereinafter referred to as the Mobile Maintenance Information Workstation or MOMIW) is to reduce their workload while increasing the accuracy and timeliness of the information flow throughout aircraft maintenance. To this end, evidence to answer these research questions can provide beneficial information to the designers of the MOMIW.

Scope and Limitations

The IMIS System/Segment Specification (SSS) is the primary data source for the research in this thesis. It is a document produced by Armstrong Laboratory and GDE Systems to establish the requirements that the IMIS must fulfill. The difficulty in producing the MOMIW will be in tailoring SSS requirements to individual job positions. The SSS is merely a description of requirements for the entire information system; it doesn't align those requirements with the functional tasks of specific personnel, such as maintenance managers (i.e., expediters). The SSS , however, is useful in compiling information requirements for the tasks performed by an expediter in an IMIS context. The analysis of the IMIS SSS and extraction of those requirements forming an expediter 'job description' are based upon the professional experience of the author as a career aircraft maintenance officer.

Summary

The remainder of this thesis will answer the questions posed in this introduction. The literature review in Chapter II examines the flightline maintenance environment and the expediter's role. It also examines the state of IMIS technology and the rationale for detailed analysis of the expediter's information requirements in building the IMIS MOMIW. Chapter III establishes the research methods employed in analyzing the IMIS SSS and providing a functional description of the expediter's information requirements. Chapter IV presents the results of the qualitative data analysis and answers the research questions. Chapter V will conclude with a summary of the results of this research, future recommendations to extend this research effort, and implications of this research for the Air Force.

II. Literature Review

Introduction

The current USAF wing structure revolves around the smallest combat unit, the flying squadron. Flying squadron commanders exercise full responsibility for mission accomplishment, as well as commanding the maintenance personnel and managing the assets required to sustain combat capability. In concert with operational requirements, the Squadron Maintenance Officer and the maintenance staff within the flying squadron take responsibility to provide mission ready aircraft (Air Combat Command, 1994). The front–line supervisors on the flightline are the expediters and production supervisors, who have responsibility for tracking the maintenance effort on a squadron of aircraft.

In simplest terms, the expediter will track the aircraft flying schedule and aircraft status, while ensuring the crew chiefs have their assigned aircraft ready to fly as scheduled throughout a typical flying day. Expediters additionally monitor maintenance on non–flying aircraft (e.g., phase inspection, unscheduled maintenance, aircraft washes, etc.) and track the location of crew chiefs and specialists (e.g., avionics technicians, weapons loaders, and engine technicians). Should an unforeseen emergency situation arise, they normally are the first supervisor on the scene and comply with emergency action checklists. Thus, the expediter is a key supervisor on the flightline.

In reality, flightline maintenance is a fast–paced, pressure–cooker environment, with the expediter and production supervisor providing the leadership and oversight for diverse activities. In any given day, a unit will fly nearly twenty or thirty missions, or sorties. The expediter and production supervisor provide the key guidance to manage all aspects of sortie production. The crew chiefs prepare aircraft for flight, and launch as many as twelve to eighteen sorties in a two hour period. After recovering the first wave of aircraft, some will be refueled and inspected for further flying in the remainder of the flying day. On surge days, typical fighter units can fly upwards of sixty sorties, with maximum effort placed upon quickly generating and regenerating aircraft for flying.

In between aircraft launches, the expediter may check on aircraft in unscheduled maintenance status, see what personnel may need a meal break, or pick up a priority part. On the return trip the expediter might meet a returning aircraft, check its maintenance status, and relay the status as well as a refueling request to the MOC. The expediter's job is a routine of such activities throughout the duty day. This brief description of the duties of flightline maintenance managers makes it clear that the management challenges associated with the flightline environment are diverse and occasionally overwhelming, regardless of whether the unit is flying fighter aircraft, bombers, tankers, or transports (Katrenak, 1995).

The introduction of the F–22 Advanced Tactical Fighter (ATF) will bring with it an exciting new technology to aircraft maintenance, the Integrated Maintenance Information System (IMIS). IMIS technology has already yielded a solution to integrate the many computer–based technical information systems for crew chiefs and specialists. Part of the IMIS technology will include the use of computing applications to simplify the workload of the expediters and production supervisors, while integrating an advanced messaging system with the technicians' system. The goal of this thesis is to lay the foundation for introducing pen–based computers for flightline maintenance managers. This task will require integrating previous research for the IMIS concept and design, the IMIS portable maintenance aid (PMA) developed for technicians, task analysis for the flightline expediter function, and human computer interface studies for the pen–based computer.

The research reported in this thesis, sponsored by Armstrong Laboratory, will focus on developing a description of expediter information requirements for a pen–based computer for use in the direct aircraft production setting. Potentially, pen–based computers could completely replace traditional paper–based tracking systems within maintenance. Pen–based computers could also provide access to maintenance information and messaging up and down the complete chain of command within a flying unit. Although the research of this thesis will not investigate those areas directly, it will provide results which will be useful in the design of tools for further management access through pen–based computers to the IMIS. In addition, this research will provide a methodology for determining the information requirements of other management personnel in the context of IMIS.

IMIS Introduction

IMIS is a new technology in development by the Logistics Research Division of the Armstrong Laboratory. IMIS technology focuses on computerizing maintenance information systems—from technical orders through messaging systems used by flightline maintenance managers. A major goal of IMIS is to reduce administrative burden for technicians by interfacing all necessary computerized decision support systems into one integrated system and user interface. Current and past development efforts have focused on converting technical data into digital documents and developing 'smart' computerized troubleshooting systems with presentation to technicians as computer–based solutions (Link, 1987:1). Figure 1 on the following page illustrates the integrated components of the IMIS concept.

Although the F–16 System Program Office (SPO) has included IMIS as part of its modernization program, IMIS is only planned for introduction at the technician level with interactive electronic technical manuals and automated diagnostics. Full implementation of the IMIS system is planned for the introduction of the F–22 Advanced Tactical Fighter (Johnson, 1993).

Early conceptual IMIS designs included a system completely integrated throughout the flying squadron maintenance unit. These efforts have, however, been limited to proof of concept field tests only. At the management, as well as technician level, IMIS developers noted,

> The modern maintenance environment is becoming increasingly inundated with additional computer based information systems. Each new maintenance aid forces technicians to learn yet another system. AFHRL is developing the IMIS to facilitate the use of the valuable information these new systems offer. (Link, 1987:1)

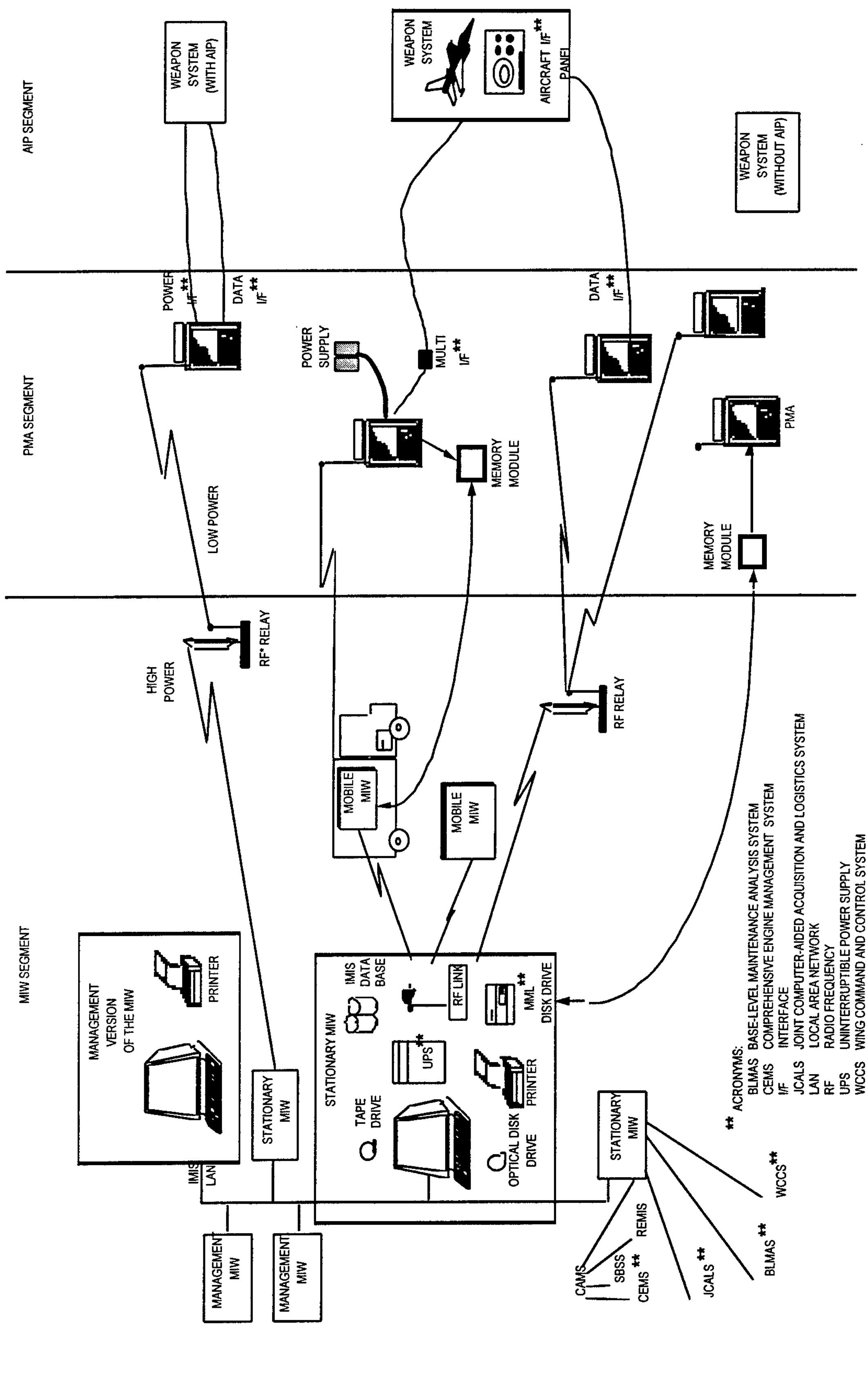

Figure 1, Example of IMIS Operational Concept (GDE Systems, 1993)

As front–line maintenance managers, expediters ensure the needed resources to accomplish maintenance are available, and are directly responsible for the day–to–day flying and maintenance effort. The expediter will require even greater integration of maintenance information systems into a single, easily–managed interface. IMIS will provide maintenance managers more data, to quickly allocate the resources necessary to accomplish the mission and ensure quality maintenance (Von Holle, 1986: 41–42). IMIS will quickly update aircraft status, providing key maintenance managers as well as operational planners, real–time information that could be critical to success.

Proof of concept testing for the IMIS MOMIW took place in the Fall of 1993 at the 58th Fighter Wing (AETC), an F–16 unit located at Luke AFB, Arizona. The tests were accomplished in a simplified classroom environment, using only the IMIS messaging system for the production supervisor and expediter. Armstrong Laboratory also conducted some limited testing using a notebook computer with keyboard input in the actual flightline setting. Evaluators noted that the keyboard input system was cumbersome for the expediter, who usually accomplishes many tasks while driving, such as making annotations on the aircraft status board, or communicating with the MOC (Smith, 1995). Additionally, the MOMIW system will communicate with the technicians' PMA through a wireless radio frequency (RF) local area network (LAN). The performance of the RF LAN was rated as highly desirable by the evaluators participating in the proof of concept testing (Thomas, 1995:2). The RF LAN feature will be critical to successfully integrate the MOMIW portions of IMIS.

Previous Armstrong Laboratory studies showed that the expediter may be best served by a pen–based computer, as it affords mobility, and ease of use while driving a vehicle (Smith, 1995). Moreover, it can be a much faster and simpler interface since the user selects an icon in a Graphical User Interface (GUI) to perform tasks as opposed to typing commands (MacKenzie, Nonnecke, and Riddersma, 1994: 775). The introduction of a pen–based computer to these managers could also eliminate or consolidate the myriad of current management tools. The current expediter paradigm, for example, typically includes all of the following:

1. a 'grease board' for tracking aircraft status
2. a clipboard with a 'to do' list
3. emergency action checklists
4. a two–way FM radio
5. other unit–peculiar and MAJCOM required items.

The expediter communicates with the production supervisor, dispatch section, and MOC to relay aircraft status updates, emergency information, and request assistance or resources. The pen–based computer has the capability of integrating these disjointed and sometimes clumsy tools into a single, easy–to–use management tool.

Information Requirements of Maintenance Managers

With the exception of the IMIS SSS, Armstrong Laboratory has not accomplished much research in this area for maintenance managers. This thesis will directly address an issue that is central to implementing IMIS. The goal of IMIS is integration, and to this end one must understand completely the functions of the expediters and production supervisors; a pen–based computer application should integrate every aspect of these functions for it to be an acceptable alternative to traditional maintenance management tools.

The IMIS SSS is an Air Force requirements document delineating the required features of the IMIS system when it is fielded. It reflects a top–to–bottom analysis of wing level aircraft maintenance, from technician to senior leader. The SSS functionally describes all tasks that are accomplished to provide combat capability from a maintainer's perspective. Moreover, the current version of SSS allocates the required hardware and software functions to the previously developed portable maintenance aid (PMA), maintenance information workstation (MIW) and aircraft interface panel (AIP) systems. It lacks, however, any designation of the information requirements of management specific functions that are necessary to fully integrate IMIS into aircraft maintenance. This thesis starts the process by allocating requirements within the SSS for expediter specific/related requirements. The goal is to build a 'to–be' characterization of how IMIS can revolutionize the expediter's job, while providing valuable information to those who will design the IMIS interface for the MOMIW.

Human Computer Interface (HCI) Issues

Many expediters and production supervisors rise to their positions through the crew chief ranks; this necessitates a system interface that is as consistent as possible between all proposed electronic tools for implementing IMIS (e.g., PMA, pen–based computer, in–shop workstation). Without such consistency, job reassignment or broadening into other tasks will be difficult (Quill et al., 1995: 4).

The HCI issues associated with fielding the PMA have been well documented (Wampler, 1993). There are some general lessons to be learned from development of the PMA. For example, Quill et al. asserted that,

> Obtaining user feedback through *early* testing of software interface requirements (e.g., using state and transition diagram information) provides concise data and software specifications...In this way, the user interface unites and manages all system components into one package which is readily usable. (1995:4)

The pen–based computer (MOMIW) for the expediter and production supervisor will share messaging features with the technicians' PMAs, but will need to support the specific needs of these flightline managers. Since the pen–based computer for maintenance managers will likely use a different interface, as well as present different information, it is necessary that HCI issues involving the maintenance managers' tool be investigated now in order to support development of a prototype pen–based system for use in field tests. Answers to the four research questions listed in the previous chapter will provide a foundation for the design of an effective maintenance manager's tool as part of IMIS.

Summary

This chapter introduced the challenges associated with the job of flightline expediters, the rationale for further research, and how the introduction of an IMIS–based solution can ease the expediters' workload while improving the quality of aircraft maintenance. The goal of this thesis is to provide comprehensive information regarding the information requirements involved in the job of the flightline expediter. From this information, Armstrong Laboratory plans to build a pen–based management tool, the MOMIW, which integrates all the information requirements involved in the job tasks of the expediter.

III. METHODOLOGY

Introduction

This chapter will describe the methods by which the information requirements of the flightline expediter were identified. To that end, the data source (i.e., the SSS) is discussed, the categories for coding the data as well as their theoretical foundations are presented, and, finally, the procedure used to code and analyze the data with NUD•IST software are described.

The System/Segment Specification (SSS)

The IMIS SSS is the primary data source for this thesis. It is a result of nearly 400 interviews of maintenance professionals throughout the Air Force. The data from these interviews are directly traceable through the IMIS Architecture (IMISA) document to the IMIS SSS (GDE Systems, 1995: 1). The IMIS requirements detailed in the SSS are a direct result of user identified needs. The SSS models all tasks performed within maintenance, the relationships between workers, and the associated information flows. In developing the IMIS, Armstrong Laboratory and General Dynamics conducted a top–to–bottom analysis of wing level aircraft maintenance activities in those units studied. This maintenance process analysis encompassed 29

Air Force Specialty Codes (AFSC) within aircraft maintenance at the following Tactical Air Command (TAC) and United States Air Forces–Europe (USAFE) bases (Ward et al., 1995: 8):

- Langley AFB VA
- Homestead AFB FL
- Hahn AB Federal Republic of Germany (FRG)
- Spangdahlem AB FRG
- Sembach AB FRG
- Leipheim AB FRG
- Ramstein AB FRG
- Moody AFB GA
- Shaw AFB SC

This analysis resulted in the IMIS System Segment Specification (IMIS SSS), which gives detailed and complete performance data for all maintenance workers in a wing—from senior leaders to crew chiefs. The SSS document consists of verbal descriptions such as the following examples:

- The IMIS shall: Assist the production superintendent in making decisions about where to park incoming aircraft.

- The IMIS shall: Assist in determining required maintenance actions by comparison with corrective actions having similar histories.

The SSS document was prepared specifically to support those who will "develop hardware, interface, and software requirements specifications" (GDE Systems, 1995: 5). However, the IMIS SSS is not organized by functional job descriptions or by who performs a specified task. Obviously, the design of management tools for specific personnel, like expediters, will require a thorough understanding of the specific information requirements involved in their job tasks. Therefore, one of the desirable end products of the research methodology reported here will be a description of the information requirements for one function or job, namely the flightline expediter in an IMIS context. Additionally, this methodology will characterize these IMIS requirements into categories which can provide meaningful information about revolutionizing the expediter's job, including the reduction of workload, through the use of IMIS.

The Categories for Data Coding

Because there is no generally accepted methodology to perform the kind of information requirements analysis needed in this case, one was developed. In this research effort, the difficulty was developing a methodology to analyze the information already available from Armstrong Laboratory, in a comprehensive, systematic manner. As the two examples in the previous section showed, the SSS data are purely verbal or qualitative. In addition, the questions which focus this research effort to be of maximum use in the design of a management tool for expediters require qualitative answers (e.g., What IMIS requirements established in the System/Segment Specification correspond to an 'as–is' model of the expediter's information requirements? What requirements could or should be automated in the 'to–be' implementation of the expediter interface? etc.)

To answer these questions, the SSS data coding focused on four overall categories which would be necessary to answer the research questions, including the designation of potential tasks for automation in order to reduce expediters' workload. This information was especially desirable to the designers at Armstrong Lab because one of the goals of IMIS is to promote business reengineering. The categories described here are based upon experience as a manager in maintenance, with a theoretical grounding in linguistics. The categories include: Tasks; Timeliness; Speech Act; and Semantic Role.

Tasks. For the purposes of this thesis, the SSS data were examined for those requirements that related directly to the established expediter job description in Air Combat Command Instruction (ACCI) 21–166, Objective Wing Maintenance. The data were then coded as one of the following task categories:

- monitoring and updating aircraft status
- allocating resources (i.e., personnel and equipment)
- monitoring on–going maintenance and the flying schedule
- complying with or initiating emergency/routine checklist procedures

Timeliness. Additionally, requirements were coded into one of the following timeliness categories:

- emergency (i.e., aircraft fire or accident)
- urgent (i.e., aircraft wartime generation, weather warnings)
- routine (i.e., day–to–day operations, status updates)
- low priority (i.e., informational notes, appointment notification)

Speech Act. Furthermore, the requirements were categorized by speech act. The use of Speech Act Theory (Austin, 1962) to determine information requirements for hardware/software designers is novel but appears logical because of the theory's explication of the full range of the uses of language. The coding categories used in this research were suggested by the work of Searle (1969, 1975):

- representative
- directive
- question
- commissive
- declaration
- expressive

In order to clarify their application in this project, the following section borrows definitions and some examples from Parker and Riley (1994: 14–15).

Representative. A representative is an utterance used to describe some state of affairs. This class includes acts of stating, asserting, denying, confessing, admitting, notifying, concluding, predicting, and so on.

simple example: *I have five toes on my right foot.*

SSS example: *IMIS shall: Notify airplane general (APG) flightline expediter, production superintendent, fighter squadron operations section, and MOC of the open work order.*

This SSS requirement is coded as representative because IMIS simply describes the state of affairs (i.e., that a work order has been opened) to the expediter.

Directive. A directive is an utterance used to try to get the hearer to do something. This class includes acts of requesting, ordering, forbidding, warning, advising, suggesting, insisting, recommending, and so on.

simple example: *Turn off the television.*

SSS example: *Recommend the assignment of appropriate facilities or parking locations.*

This SSS requirement is coded as directive because IMIS directs or recommends an action (i.e., a parking location) to the expediter.

Question. A question is an utterance used to get the hearer to provide information. This class includes acts of asking, inquiring, and so on.

simple example: *What time are we meeting?*

SSS example: *IMIS shall allow flightline expediters and production managers to track all personnel dispatched to assigned weapon systems and maintenance tasks.*

This SSS requirement is coded as question because IMIS responds to the query of an expediter (i.e., telling where personnel are currently located).

Commissive. A commissive is an utterance used to commit the speaker to do something. This class includes acts of promising, vowing, volunteering, offering, guaranteeing, pledging, betting, and so on.

> **simple example:** *I'll meet you at the Flywright at 3:00 pm.*
>
> **SSS example:** *IMIS shall allow flightline expediters and production managers to coordinate job start and completion.*

This SSS requirement is coded as commissive because IMIS allows the expediter to commit resources at a particular time or place.

Declaration. A declaration is an utterance used to change the status of some entity. This class includes acts of appointing, naming, resigning, baptizing, surrendering, excommunicating, arresting, and so on.

> **simple example:** *You're out!* (as uttered by an umpire in a baseball game).
>
> **SSS example:** *Report the aircraft status change to 'crew ready.' Subsequent status changes, based on aircrew arrival, engines starting, aircraft taxiing, end–of–runway inspection, and takeoff, are also to be reported as they occur.*

This SSS requirement is coded as declaration because the expediter uses IMIS to change aircraft status (i.e., from crew ready to taxiing to take-off).

Expressive. An expressive is an utterance used to express the emotional state of the speaker. This class includes acts of apologizing, thanking, congratualting, condoling, welcoming, deploring, objecting, and so on.

simple example: *I am sorry for losing the money.*

While it is certain that the expediter engages in expressive speech acts throughout the course of his duties, there were no SSS requirements coded in this category. IMIS is not required to support these type of acts.

Semantic Roles. To supplement the coding of speech acts, the SSS data were also coded into Semantic Roles (Fillmore, 1968). Although linguists do not agree on the exact number of semantic roles (cf. Gee, 1993 with Finegan and Besnier, 1989) in the case of the IMIS SSS, only two of the most central were pertinent to the information requirements of the expediter:

- actor
- patient

In order to clarify the use of these categories in this research effort, definitions and examples of these roles are borrowed from Gee (1993: 62–3) and reproduced below.

Actor. Participant who initiates the action of a simple action, a directed action, or a causative.

> **simple example:** *John hit the ball. (John is the actor).*
>
> **SSS example:** *IMIS shall allow flightline expediters and production managers to track all personnel dispatched to assigned weapon systems and maintenance tasks.*

This SSS requirement is coded actor because the expediter initiates the action described (i.e., tracking personnel) through the use of IMIS.

Patient. Participant directly affected by the action of the Actor in a directed action or the product produced by the action of the Actor in a directed action.

> **simple example:** *John hit the ball to Mary. (The ball is the patient).*
>
> **SSS example:** [IMIS shall] *Recommend the assignment of appropriate facilities or parking locations.*

The SSS requirement is coded patient because the expeditor is the participant directly affected by the action (i.e., the recommendation of a parking location) produced by the actor (i.e., IMIS).

The value of coding both semantic role and speech act for each SSS requirement is the ability to cross–check coding decisions. For example, the

SSS example just discussed, was coded as patient (semantic role of expediter) and directive (speech act). Because directive acts always involve an actor and a patient, it helped us clarify the information requirements of the expediter in this particular case by cross–checking to make sure that the expediter was the patient and IMIS was the actor in this situation. In contrast, in the SSS example discussed earlier, the expediter was coded as actor with IMIS playing the semantic role of instrument. The point here is that the expediter performs duties which involve him or her as both actor and patient in acts involving questioning and directing. It was crucial to characterize this fact in the data coding in order to get an accurate picture of the expediter's information requirements.

Coding and Analysis Procedure Using NUD•IST

Although having the capability to characterize or code the data was crucial to this research, it was even more important to be able to use the coded data to answer the research questions and to explore and develop ideas from the data. To accomplish this, qualitative data analysis software was used. NUD•IST (Non–numerical, Unstructured Data, Indexing, Searching, and Theorizing) software combines the power of indexing and some automatic coding for electronic files (e.g., documents, interview transcripts, maps, etc.)

with the ability to ask questions about the relationships of the categories of coded data (e.g., the intersections of two categories, all the items which follow a category, all categories that overlap, etc.).

The first step involved examining the IMIS SSS line–by–line (requirement–by–requirement) and assigning the task and timeliness codes to each requirement involving the expediter. The second step required coding each of these for speech act and semantic role. In NUD•IST, the result of coding produces a hierarchical tree structure like the one shown in Figure 2 on the following page. The nodes in this tree structure represent the categories used to code the IMIS SSS document.

The third step initiated analysis of the coded data by querying NUD•IST about relationships between nodes. For example, to answer one of the research questions, NUD•IST was asked to present all SSS requirements that included both a *representative* speech act and *patient* semantic role (i.e., an intersection of the representative node and the patient node). In this way, NUD•IST provided a characterization of the information requirements of the expediter.

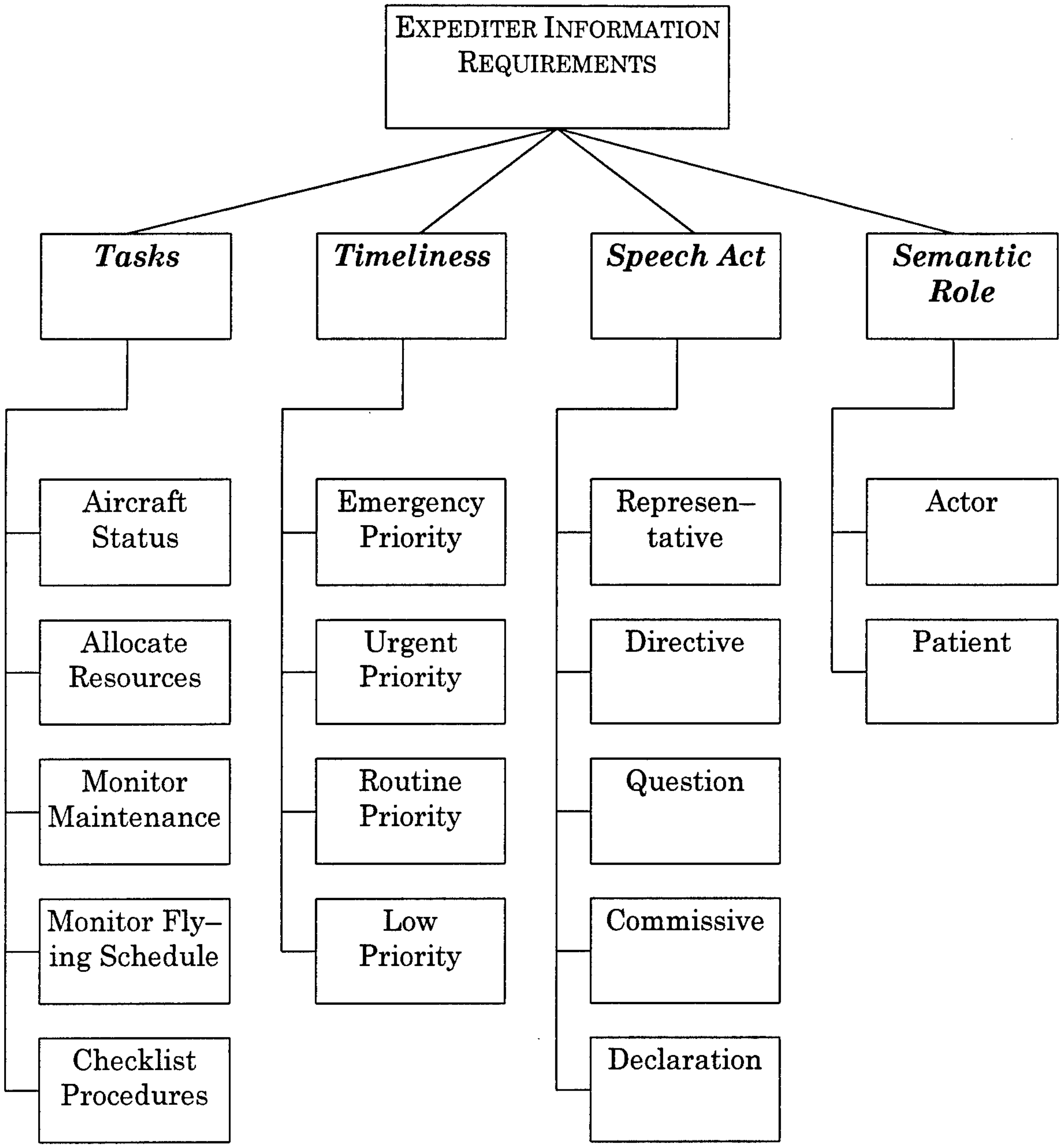

Figure 2, NUD•IST Hierarchical Tree

Conclusion

Providing information to the interface designer goes beyond just telling the designer what the product must accomplish. In the case of the IMIS system, this research analyzes task related information from the System/Segment Specification using the theoretical foundations of Speech Act Theory and Semantic Roles. This make it possible for the interface designer to be aware of these issues from an Air Force users' point of view while the design is in progress, as opposed to building an interface, testing it and then correcting mistakes after the fact.

This chapter described the qualitative methodology employed in this research, including (a) the qualities of the System/Segment Specification document, which was used as the primary data source, (b) the four overall categories into which the data was coded: task, timeliness, speech act, and semantic role, and (c) the procedures used to code and analyze the data with NUD•IST software. The qualitative methodology was developed specifically to answer the questions of interest in this research project. While this methodology is tailored to the specific problem of designing an IMIS tool for use by flightline expediters, it is general enough that it might be applied to the design of other IMIS tools for different users using the SSS document or even to the design of other human–computer interfaces based on different types of qualitative data.

IV. FINDINGS AND ANALYSIS

Overview

Chapter III established the methodology that was used to qualitatively characterize the information requirements of the expediter by analyzing the IMIS System/Segment Specification. This methodology serves two purposes: it identifies functional requirements for the proposed MOMIW, and it identifies key information about how expediters conduct their duties. The SSS requirements describe the hardware components of IMIS and the functional requirements the software must perform. Previously, functional requirements for the MOMIW were not provided in the IMIS SSS. This research proposes allocation of expediter requirements to the MOMIW as contained in Appendix A.

Discussion of Answers to Research Questions

What IMIS requirements established in the System/Segment Specification correspond to the current expediter job description (i.e., 'as–is')?

The first research question concerned how the IMIS SSS requirements aligned with the current expediter job description from ACCI 21–166. Appendix A represents the complete answer to this question by identifying in boldface text all SSS requirements that directly align with the current expediter's job. After the IMIS SSS data were loaded in NUD•IST, the author requested the union of all nodes which were subordinate to the 'Task' node. Of the more than 3200 requirements in the SSS, 102 (3 percent) directly involve the expediter.

What requirements could or should be automated in the 'to–be' implementation of the expediter MOMIW?

The answer to research question two is based upon speech act and semantic role coding. In the IMIS SSS, several types of activities currently associated with the expediter are identified as candidates for automation because they were identified as *representative* acts with *routine* timeliness requirements and the expediter playing the *patient* role. A NUD•IST report on all the requirements that are *representative* and *patient* and *routine* (an intersection of three nodes) shows that 44 percent of all expediter requirements are of this nature. These tasks are identified with boldface, italic text in Appendix A as a subset of all expediter–related requirements from question one.

Under the current expediter paradigm, all requests for fuel, aircraft status updates, exceptional release requests, etc. are made verbally by the crew chiefs to the expediter. The expediter then relays this information to the appropriate agency via two–way radio. Simply computerizing this process by sending requests electronically from the crew chiefs to the expediter is unnecessary. Since IMIS has the capability to allow these requests to be made directly from requester (e.g., a crew chief) to the provider (e.g., egress shop, or MOC for third parties without IMIS connectivity), there appears to be little reason for the expediter to act as an intermediary. If expediter notification is necessary (e.g., request for exceptional release from the production supervisor), the request *should not* be held up while waiting for the expediter to respond. For example, IMIS should simply update the expediter's MOMIW that a request was made and exceptional release is pending. If all such requests still went to the expediter under an IMIS scenario, it becomes apparent that the expediter could become overloaded just responding to and relaying every request.

Task Category Analysis. Additionally, within each task category, there are certain tasks that may benefit from automation. An examination of specific examples within the categories follows:

In the **Status Reporting** and **Perform Maintenance** categories, IMIS can automate many of the aircraft status changes generated by third parties. The current expediter paradigm requires all status change requests to be made verbally to the expediter. The expediter then relays this information to the MOC, which keeps overall status for the wing aircraft. With IMIS, when workorders are opened (Perform Maintenance category), or debriefs completed (Status Reporting category), IMIS should automatically update aircraft status and estimated time in commission (ETIC), which should then be reported to all concerned parties. Instead of having the expediter generate this information, IMIS can reduce expediter workload by reengineering this process so that the electronic 'grease board' is automatically updated.

Similarly, requests for exceptional releases, red X sign–off, etc. can be routed and updated automatically rather than by verbally making such requests through the expediter. Naturally, there should be some means for expediters to view the status of these requests (i.e., waiting for exceptional release) and open workorder information for work in progress, if such information is needed by the expediter.

Within the **Checklist** category, an important automated feature is automatic notification and display of emergency and/or urgent information conditions; IMIS should automatically display the appropriate checklist for the situation. Since the proposed pen–based system will include a two–way FM radio, consideration should also be given to aural warnings, as well as visual warnings on the MOMIW.

Based on the analysis of the coded speech acts and semantic roles in the SSS requirements, there is justification for the concern of AL researchers who noticed that "The use of the mail icon for processing fuel requests, exceptional release requests, and status change requests may become a burden for the expediter" (Ward et al., 1995c: 24). The proof–of–concept demonstration for the expediter MOMIW was limited to a small subset of tasks, and did not include a full demonstration of all activity that would occur with IMIS. Obviously, a field test will require a more realistic number of tasks in order to gauge the expediters' workload during IMIS implementation. The pen–based system design will need to automate as many of the bold, italicized requirements in Appendix A as possible to minimize the burden on the expediter.

What expediter requirements necessitate direct access to and manipulation of IMIS information?

Speech act and semantic role coding of the SSS requirements also provided an answer to this research question. The researcher queried the NUD•IST data structure for the intersection of all nodes in which the expediter was an *actor* (semantic role) and asked a *question* (speech act) because these acts represent tasks where the expediter would need access to or query information contained within IMIS. Appendix A identifies these requirements with †. NUD•IST showed that 23 percent of all expediter requirements in the SSS involved asking questions or requesting information from IMIS. This characterization of requirements is crucial to a designer in that the MOMIW should have the capability to access or query IMIS about the necessary information.

The current expediter paradigm does not provide any capability to access database information other than the data written manually by expediters on their 'grease board' or checklist information carried on a clip board. Since 'grease board' space is at a premium with this manual method, expediters normally do not include every detail of an aircraft's status; sometimes information is forgotten or misplaced. In contrast, all information is updated in real–time in the IMIS database–a feat even the most astute expediter would have difficulty doing. Access to complete, real–time maintenance information and on–demand management tools should allow the expediter improve the quality and timeliness of maintenance activities.

Task Category Analysis. Within each task category there are additional requirements that necessitate direct interface with IMIS databases. For example, in the **Monitor Maintenance** category the expediter will need access to the daily maintenance schedule or AFTO Forms 781K for detailed work scheduling information throughout the duty day. In the **Checklist** category, the expediter will need direct access to maintenance operating instructions or unit developed checklists for maintenance and emergency response situations. While performing **Resource Allocation** tasks the expediter is required to track the availability and location of personnel within his or her control; he or she must have the capability to query IMIS for that information. Similarly, in the **Aircraft Status** category, the expediter needs the ability to inquire into the supply status or maintenance progress of a non–mission capable aircraft.

What IMIS SSS requirements correspond to emergency or urgent action information needed by the expediter?

This research question is similar to the previous question, but the addition of emergency and urgent situations implies the need for the fastest possible access to the information. The NUD•IST query for this question was for all nodes including *emergency* and *urgent* timeliness ratings. This query reported 8 percent of all expediter requirements with these specific timeliness ratings: e.g., severe weather warnings, aircraft accidents, wartime generation checklists, air raid/chemical contamination warnings, etc. These actions are presented in Appendix A with the symbol ††.

Summary

As a result of the coding and analysis procedures described in Chapter III, the requirements in the IMIS System/Segment Specification document are designated as follows in Appendix A:

boldface	= aligns with the job duties of the expediter
boldface + italic	= potentially automated within IMIS
†	= requires access to information in IMIS
††	= requires quickest access possible in IMIS

To provide an overview of the results the NUD•IST analysis provides, Table 1 and Table 2 show the Speech Act and Semantic Role coding breakdown of the SSS requirements. The percentages shown in these tables are not meant to imply any statistical significance between categories; they are shown for illustrative purposes only.

Table 1, Summary of Speech Act Characterization

Speech Act	***Directive***	***Representative***	***Commissive***	***Question***	***Declaration***
Expediter coded SSS requirements	16.1 %	49.4 %	1.1 %	28.7 %	4.6 %

Table 2, Summary of Semantic Role Characterization

Semantic Role	***Patient***	***Actor***
Expediter coded SSS requirements	58 %	42 %

These results provide concrete information about the expediter's work environment, the characteristics of the expediter's communication activities as they exist now, and as they might exist in an IMIS context. The recommendations in Chapter V will integrate this chapter's findings with generally accepted human computer interface design principles in forming specific recommendations for implementing the MOMIW.

V. CONCLUSION AND RECOMMENDATIONS

Introduction

IMIS technology promises great advantages for aircraft maintenance. It provides an integrated solution to taming the multitude of legacy databases used in aircraft maintenance. Armstrong Laboratory's (AL) research and development of IMIS technology has reached the point where it must progress beyond implementation at the technician level. The logical starting point, and the focus of this research, is with the MOMIW for the flightline expediter. Future aircraft system acquisition, like the F–22, will include a complete IMIS system that will incorporate all concept features including integrated database access with a LAN–based messaging and automation system. The data already collected by AL through hundreds of interviews consisted of a System/Segment Specification (SSS) document providing verbal descriptions of all the requirements of the total IMIS. However, these requirements were not organized in a way that facilitated design of specific management tools, like the MOMIW, for use within the overall IMIS.

Thus, the research reported in this thesis used the IMIS SSS to develop a unique methodology for qualitatively characterizing the information requirements of the expediter based on four areas of interest to designers: (a) which requirements are related to the expediter's job duties; (b) which of these might be automated within IMIS in order to reduce expediter workload through business process reengineering; (c) which requirements demand that the expediter have access to information available in IMIS; and (d) which of these involve emergency or urgent activities requiring the fastest possible access to information.

The method involved coding the SSS requirements in four overall categories which would be necessary to answer such questions: Tasks, Timeliness, Speech Act, and Semantic Role. Figure 3 on the following page repeats the NUD•IST hierarchical tree which represents all possible subcategories that were used within each of these broad categories.

The remainder of this Chapter presents a summary of findings, limitations of this research, recommendations for the MOMIW, and suggestions for future research to expand upon this thesis.

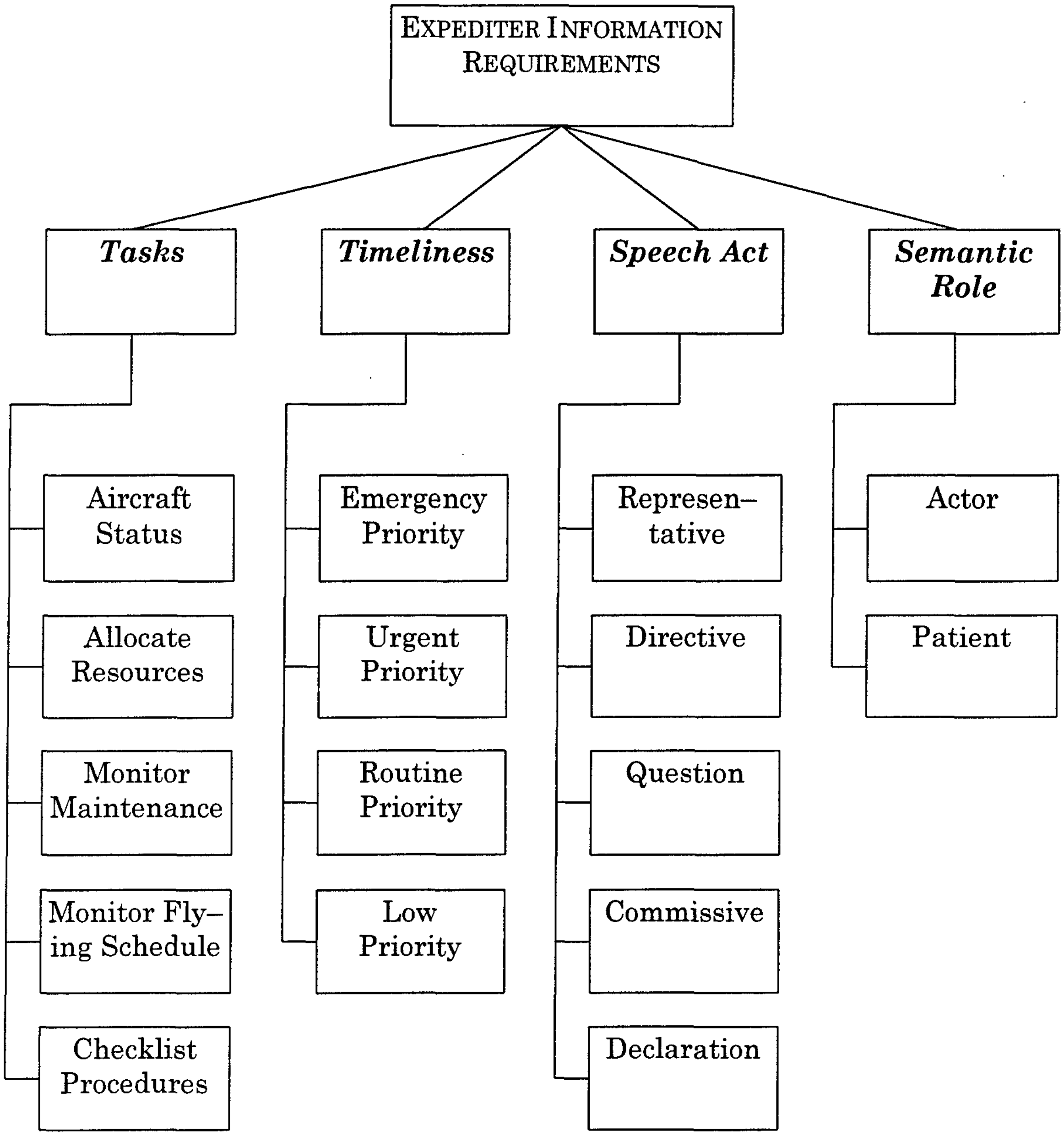

Figure 3, NUD•IST Hierarchical Tree

Summary of Findings

Coding the SSS data and analyzing the interrelationships between certain categories resulted in a number of interesting findings. First, 44% of the SSS requirements involving the expediter were found to have the potential for automation within IMIS. These results demonstrate that the expediter spends much time relaying routine information in the role of patient; that is, he or she is often a go–between, taking no active role in information these information exchanges between other parties. To leverage the computing power of IMIS in revolutionizing the expediter job and reducing his or her workload, the system designers should free the expediter of the restrictions placed upon him by the current paradigm.

Second, 23% of the SSS requirements involving the expediter require access to information which will be available within IMIS. Of these requirements, 8% require the fastest possible access to information because they involve emergency or urgent actions. To ensure that IMIS supports the job duties of the expediter to the fullest extent, the system designers should provide a simple and quick method for accessing this information.

Limitations of This Research

There are inherent limitations in the use of any qualitative method (e.g., reality is subjective; decisions evolve from the data; research design emerges rather than being predetermined) (Creswell, 1992: 5 and Tesch, 1990: 95). In this project, the researcher made all coding decisions. This increases the likelihood that the apparent reliability is inflated (i.e., having multiple coders would have allowed an estimation of how closely the classification decisions approached the truth). Despite the researcher's eight years of professional experience as an aircraft maintenance officer, with extensive experience in a flightline environment, the results reported here should be seen as a first step in the design of a pen–based computer for the expediter. Cusack argues the need for a 'knowledge engineer' in developing knowledge about processes that are computerized, such as in IMIS. This 'knowledge engineer' is expected to rely upon "feelings, rules-of-thumb, hunches--in short, unconscious or sub-conscious processes--as well as book learning, acquired knowledge, and well-thought-out ideas" (1993: 15). Because the usability of the MOMIW will be subject to further testing with a sample of expediters in the field, it was not deemed necessary to have other coders for the data. Further validation and evaluation of these results might also include a focus group setting with experienced expediters.

Recommendations

The expediter is hampered by a system that, as it exists now, makes him an intermediary to all information flow, whether or not the success of a task requires it. IMIS has the capacity to automate the routine information flow, alleviating the expediter of this large burden. The major recommendations of this research relate to the assertion by Mullet and Sano that direct computer–based analogs to physical systems impose unnecessary design restrictions (1995: 33). IMIS designers must avoid the temptation to merely duplicate the maintenance information processes as they exist now.

In response to the research questions addressed in this thesis, there are four recommendations that follow. First, requesters for and providers of services or resources in the maintenance environment should communicate directly with each other in IMIS. This should result in a significant decrease in the expediter's workload because he or she currently acts as an intermediary though apparently providing no additional information within such exchanges. However, the expediter should receive notification about the status of such requests (i.e., that certain actions are in process).

Second, careful interface design will play an important part in user acceptance with the MOMIW. Since the most benefit will be gained from having

IMIS automate as much as possible, many users, especially the expediters, may sense a lack of control since significantly less information will pass directly through them. A feature to consider is a 'user preference' for routine message notification, where a user can request no notification of information changes (e.g., aircraft status changes automatically on MOMIW) or an intrusive method of notification (e.g., dialog box notification of aircraft status change with an auditory signal). Such a feature may be necessary as an interim measure until the user becomes comfortable with IMIS' automated capabilities.

Third, the expediter requires direct access to IMIS database information. Current methods of receiving information are not timely, and sometimes that information is inaccurate. With IMIS, as changes occur to mission needs, the expediter can be kept up to date in real–time. Thus, he or she should be able to tailor the maintenance task force to best meet specific mission requirements. Finally, since the expediter currently uses many different management tools (e.g., checklists, operating instructions, qualification rosters) in their job, IMIS should retain easy access to these tools in an electronic version.

Cusack asserted that the increased availability of computer technology makes it necessary for designers to make systems accessible and easy to use.

Instead of designing a system to accomplish something, the focus must become how to design a system for a particular person to accomplish something (1993: 16). So by focusing on how the expediter operates, designers can achieve a better sense of how IMIS will impact their job. Additionally, Easterby noted that designers must concern themselves not only with the transmission of information, but the literal meanings of that information, as well (1994: 19). This thesis provides a literal foundation in concretely defining the role the expediter plays within the maintenance environment.

Future Research

Armstrong Laboratory's early testing of an expediter prototype system showed that the concept was feasible. Their limited research showed, however, the potential for IMIS to greatly increase the expediter's workload. Since this thesis shows that a literal translation of the current expediter paradigm is likely to cause problems, future research should investigate leveraging IMIS technology and computing capabilites to best serve the needs of maintenance managers such as the expediter. This thesis provides a functional description of the information requirements of the expediter's job in an IMIS context and characteristics of that information. Armstrong Laboratory can now develop a prototype MOMIW to field test these concepts with a pen–based computer. The next step is to validate the findings of this research with actual hardware and software design testing, and perhaps, a focus group review of the findings presented by this thesis.

Many system features identified in this research may be applicable to other maintenance management uses of an MOMIW; in the future, similar research methods can be employed in developing a system for the production supervisor, flight chiefs, and the squadron maintenance officer.

Summary

A cornerstone to fielding a complete IMIS system lies in the information management and messaging capabilities; this thesis supports Armstrong Laboratory's effort to bring an IMIS solution to the flightline expediter. Now that a characterization of the expediter's job is complete, designers can begin building a system that best fulfills these characteristics. An appropriate extension to this research will be in designing future IMIS technology that similarly solves the information needs of other maintenance managers. The research methodology is generalizable and easily applicable for analyzing the needs of all those who will use IMIS.

PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.1.1	DEF STAT	Perform Pilot Interview Function
3.2.1.1.1.1.1	DEF STAT	Receive Aircraft Downlink — The IMIS shall
3.2.1.1.1.1.1-a	DEF STAT	Accept automatic entry of aircraft and systems data from aircraft in flight through RF downlink
3.2.1.1.1.1.1-b	DEF STAT	Open appropriate work orders and Work Center Events (WCEs)
3.2.1.1.1.1.1-c	**DEF STAT**	***Forward aircraft/system information directly to maintenance for assessment***
3.2.1.1.1.1.1-d	**DEF STAT**	***Provide analysis and prognostic tools to assess the current mission capability of the aircraft against requirements for the next scheduled mission***
3.2.1.1.1.1.1-e	DEF STAT	If the assessment dictates:
3.2.1.1.1.1.1-e.1	DEF STAT	Order required parts
3.2.1.1.1.1.1-e.2	DEF STAT	Determine S/TE availability to support the maintenance task
3.2.1.1.1.1.1-e.3	DEF STAT	Determine the quantity of technicians required to perform the repair task
3.2.1.1.1.1.1-e.4	DEF STAT	Determine what qualifications the technician(s) must have to perform the task
3.2.1.1.1.1.1-e.5	**DEF STAT**	***Dispatch technician to effect repair of the aircraft upon landing***
3.2.1.1.1.1.2	DEF STAT	Accept manual entry of aircraft and systems data and condition codes
3.2.1.1.1.1.2-a	DEF STAT	When opening a work order, the IMIS shall perform the following functions:
3.2.1.1.1.1.2-a.1	DEF STAT	Use an IMIS-assigned JCN to open a work order for any discrepancies indicated
3.2.1.1.1.1.2-a.2	DEF STAT	Automatically generate appropriate additional WCEs, based on WUC or past history
3.2.1.1.1.1.2-a.3	DEF STAT	Make automated work order entries for such information as part number, MDS, job priority, location of aircraft, scheduled start time, when discovered code, primary work center, and ETIC date
3.2.1.1.1.1.2-a.4	DEF STAT	Complete work order entries by selecting from menus presenting choices for Work Unit or How Malfunction Codes and other required data

Bold items are those requirements which align with the job duties of the expediter
Italicized Bold items are requirements potentially automated within IMIS
† identifies items in which the expediter requires access to information in IMIS
†† identifies items in which the expediter requires quickest access possible in IMIS

PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.1.1.2-a.5	**DEF STAT**	***Notify APG Flightline Expediter, Production Superintendent, fighter squadron operations section, and MOC of the open work order***
3.2.1.1.1.1.2-b	DEF STAT	In determining the initial resource requirements to support work orders as opened (i.e., tools, S/TE, AGE, or qualifications and number of specialists required to perform work or to acquire additional data from the pilot or aircraft), the IMIS shall perform the following functions
3.2.1.1.1.1.2-b.1	DEF STAT	Access CAMS or use technical data to make this determination of requirements
3.2.1.1.1.1.2-b.2	**DEF STAT**	**Present requirements as recommendations which can be confirmed or changed by production managers**
3.2.1.1.1.1.2-b.3	**DEF STAT**	**Allow production manager to request resources through IMIS when no recommendation is made†**
3.2.1.1.1.1.2-c	DEF STAT	To notify the Fighter Squadron of the incoming flight, the IMIS shall
3.2.1.1.1.1.2-c.1	DEF STAT	Establish WCE
3.2.1.1.1.1.2-c.2	DEF STAT	Send the WCE to the following:
3.2.1.1.1.1.2-c.2.a	DEF STAT	Fighter squadron Dispatch Section
3.2.1.1.1.1.2-c.2.b	**DEF STAT**	***Production Superintendent and the APG/Specialist/Weapons Flightline Expediters in the roving trucks***
3.2.1.1.1.1.2-c.2.c	DEF STAT	ILMFs, such as the Propulsion Flight, the Avionics Flight, the Accessory Flight, and the Fabrication Flight
3.2.1.1.1.1.2-c.3	DEF STAT	Identify and correlate a specific PMA with a specific individual aircraft and task
3.2.1.1.1.1.2-d	DEF STAT	To determine an ETIC for a work order, the IMIS shall
3.2.1.1.1.1.2-d.1	DEF STAT	Use histories of similar Work Unit and How Malfunction codes
3.2.1.1.1.1.2-d.2	DEF STAT	Maintain ETICs from previous work orders
3.2.1.1.1.1.2-d.3	DEF STAT	Calculate ETIC based upon historical data for same maintenance task for the time to troubleshoot and repair, including ABDR
3.2.1.1.1.1.2-d.4	DEF STAT	Review maintenance repair priority designations
3.2.1.1.1.1.2-d.5	**DEF STAT**	***Automatically notify APG/Specialist/Weapons Flightline Expediters, Production Superintendent, and the MOC of ETIC update***
3.2.1.1.1.1.2-e	DEF STAT	In defining the aircraft condition, the IMIS shall
3.2.1.1.1.1.2-e.1	DEF STAT	Based on pilot assessment, the MESL, and all open work orders, set the initial code for:
3.2.1.1.1.1.2-e.1.a	DEF STAT	Aircraft condition

Bold items are those requirements which align with the job duties of the expediter
Italicized Bold items are requirements potentially automated within IMIS
† identifies items in which the expediter requires access to information in IMIS
†† identifies items in which the expediter requires quickest access possible in IMIS

PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.1.1.2-e.1.b	DEF STAT	Aircraft status
3.2.1.1.1.1.2-e.2	DEF STAT	Provide appropriate notification if IMIS-generated code does not agree with the pilot's assessment
3.2.1.1.1.1.2-f	DEF STAT	In order to provide the latest aircraft status when any work order is opened, updated, or closed the IMIS shall
3.2.1.1.1.1.2-f.1	DEF STAT	Maintain a mission status internal to IMIS
3.2.1.1.1.1.2-f.2	DEF STAT	Maintain status of all parts on order/back-order for mission critical aircraft
3.2.1.1.1.1.2-f.3	DEF STAT	Drive large screen status displays in the MOC or other on-base locations
3.2.1.1.1.1.2-f.4	DEF STAT	Maintain the status of aircraft assigned to the wing
3.2.1.1.1.1.2-f.5	DEF STAT	Recommend to the MOC for approval the change of status, if any, appropriate for each work order action
3.2.1.1.1.1.2-g	**DEF STAT**	***In the event that there is some change in aircraft status which must be communicated, the IMIS shall***
3.2.1.1.1.1.2-g.1	**DEF STAT**	***Notify selected Production Managers whenever there is a change in one of the following***
3.2.1.1.1.1.2-g.1.a	**DEF STAT**	***Aircraft status***
3.2.1.1.1.1.2-g.1.b	**DEF STAT**	***Other predetermined criteria (e.g., a possible change to the flying and maintenance schedule or impact on Limiting Factor (LIMFAC) status)***
3.2.1.1.1.1.2-g.1.c	**DEF STAT**	***Parts availability***
3.2.1.1.1.1.2-g.1.d	**DEF STAT**	***Personnel availability***
3.2.1.1.1.1.2-g.1.e	**DEF STAT**	***Facility availability***
3.2.1.1.1.1.2-g.2	**DEF STAT**	***Indicate the change in aircraft status through visual or audio alerts (flashing displays or beeps)***
3.2.1.1.1.1.2-g.3	**DEF STAT**	***Require the user to respond to the alert***
3.2.1.1.1.1.2-g.4	DEF STAT	Notify the appropriate crew chief and specialist dispatch section of the change in status
3.2.1.1.1.1.3	**DEF STAT**	**In the review of maintenance history, the IMIS shall†**
3.2.1.1.1.1.3-a	**DEF STAT**	**Display up to 90 days of aircraft history data†**
3.2.1.1.1.1.3-b	**DEF STAT**	**Display data regarding systems reported as deficient†**
3.2.1.1.1.1.3-c	**DEF STAT**	**Compare this historical data to reported deficiencies†**
3.2.1.1.1.1.3-d	**DEF STAT**	**Identify if the reported discrepancies are repeats or recurs†**
3.2.1.1.1.1.3-e	**DEF STAT**	**Assist in determining required maintenance actions by comparison with corrective actions having similar histories†**
3.2.1.1.1.1.4	DEF STAT	Perform Debrief

Bold items are those requirements which align with the job duties of the expediter
Italicized Bold items are requirements potentially automated within IMIS
† identifies items in which the expediter requires access to information in IMIS
†† identifies items in which the expediter requires quickest access possible in IMIS

PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.1.1.4-a	DEF STAT	To assist in collecting aircraft/system-related maintenance information, the IMIS shall
3.2.1.1.1.1.4-a.1	DEF STAT	Collect data using the AIP and/or, depending on the specific MDS, other aircraft interface locations
3.2.1.1.1.1.4-a.2	DEF STAT	Collect data via download of DTC
3.2.1.1.1.1.4-a.3	DEF STAT	Accept aircraft information manually from the technician to augment the automatic process or when an aircraft interface is unavailable
3.2.1.1.1.1.4-a.4	DEF STAT	Include plain language interpretation of fault and other coded data
3.2.1.1.1.1.4-a.5	DEF STAT	Include capability to swap/input new aircraft MDS designators
3.2.1.1.1.1.4-b	DEF STAT	Based on initial data gathered from the aircraft, the IMIS shall provide a capability to interrogate systems for specific conditions or additional diagnostic information
3.2.1.1.1.1.4-c	DEF STAT	Accumulate and store all reported data with the repair work order
3.2.1.1.1.1.4-d	DEF STAT	To develop debriefing question sets, the IMIS shall
3.2.1.1.1.1.4-d.1	DEF STAT	Analyze information from the pilot and flight data previously collected, as well as inflight recorded failures and parametric data resident on data transfer units carried by crews, or similar data presented through other system interfaces
3.2.1.1.1.1.4-d.2	DEF STAT	Produce a description of in-flight conditions, time when an MFL appeared, and whether additional MFLs appeared as a result of the initial MFL
3.2.1.1.1.1.4-d.3	DEF STAT	Analyze discrepancies, sortie data, flight data, and aircraft and system conditions
3.2.1.1.1.1.4-d.4	DEF STAT	Based on the particular aircraft tail number, access aircraft and associated maintenance histories to compare and present information from this flight and previous flights
3.2.1.1.1.1.4-d.5	DEF STAT	Use previously obtained weapon system data (from manual or automated sources) and related history data to analyze trends and generate appropriate question sets arranged to identify possible failures and additional symptoms
3.2.1.1.1.1.4-d.6	DEF STAT	Generate (in accordance with TOs that govern the debriefing process) questions that are adaptable, to include the following
3.2.1.1.1.1.4-d.6.a	DEF STAT	Feedback from previous debriefings and maintenance actions
3.2.1.1.1.1.4-d.6.b	DEF STAT	Information about the local maintenance organization and policies
3.2.1.1.1.1.4-d.6.c	DEF STAT	Type, model, and age of the system (operating hours)

Bold items are those requirements which align with the job duties of the expediter
Italicized Bold items are requirements potentially automated within IMIS
† identifies items in which the expediter requires access to information in IMIS
†† identifies items in which the expediter requires quickest access possible in IMIS

PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.1.1.4-d.6.d	DEF STAT	Aircraft mission
3.2.1.1.1.1.4-d.6.e	DEF STAT	Environment in which the weapon system must perform (weather, combat)
3.2.1.1.1.1.4-d.7	DEF STAT	Present debrief questions and query for responses
3.2.1.1.1.1.4-d.8	DEF STAT	Accept responses from debrief questions
3.2.1.1.1.1.4-d.9	DEF STAT	Determine if additional information is required, based upon responses, and select and display relevant questions to obtain that information
3.2.1.1.1.1.4-d.10	DEF STAT	Accept questions and responses entered directly by the debriefer
3.2.1.1.1.1.4-d.11	DEF STAT	Consider use of a rule-based or model-based expert system that is smart enough to replace the specialist for pilot debriefing in almost every case and to request a specialist when necessary
3.2.1.1.1.1.4-d.12	DEF STAT	Print out AFTO Forms 781 (flight data) and 781-A (aircraft discrepancy)
3.2.1.1.1.2	DEF STAT	Determine Aircraft Worthiness
3.2.1.1.1.2.1	DEF STAT	Safe and Shutdown Aircraft - The IMIS shall
3.2.1.1.1.2.1-a	DEF STAT	Assist the EOR crew to collect quick-look battle damage and contamination information
3.2.1.1.1.2.1-b	DEF STAT	Assist the production superintendent in making decisions about where to park incoming aircraft
3.2.1.1.1.2.1-c	DEF STAT	Access safe and shutdown procedures if required and present them for use once the aircraft is at the parking location
3.2.1.1.1.2.1-d	DEF STAT	Accept acknowledgment from the maintenance technician upon completion of the safe and shutdown procedures
3.2.1.1.1.2.2	DEF STAT	Determine Inspection Requirements - The IMIS shall
3.2.1.1.1.2.2-a	DEF STAT	Access rotating maintenance and operations schedule
3.2.1.1.1.2.2-b	DEF STAT	Provide recommendations on inspection type (i.e., thruflight, postflight, or combination postflight/preflight) based on planned flying/maintenance requirements
3.2.1.1.1.2.2-c	DEF STAT	Access aircraft status data, to include systems and parts data
3.2.1.1.1.2.3	DEF STAT	Perform Aircraft Inspection - To assist in performing the aircraft inspection, the IMIS shall
3.2.1.1.1.2.3-a	DEF STAT	Present the appropriate instructions required for the technician to perform each inspection through work cards or checklists
3.2.1.1.1.2.3-b	DEF STAT	Save the results of the inspection, including:
3.2.1.1.1.2.3-b.1	DEF STAT	Discrepancy
3.2.1.1.1.2.3-b.2	DEF STAT	Trace of instructions performed

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.1.2.3-b.3	DEF STAT	Time of start and completion
3.2.1.1.1.2.3-b.4	DEF STAT	Name of technician who performed the inspection
3.2.1.1.1.2.3-c	DEF STAT	Automatically document the opening and closing of work orders for recurring maintenance
3.2.1.1.1.2.3-d	DEF STAT	Allow technician to review documentation of maintenance actions
3.2.1.1.1.2.3-e	DEF STAT	Verify signoff authority of inspector
3.2.1.1.1.2.3-f	DEF STAT	Deny unauthorized signoff
3.2.1.1.1.2.3-g	DEF STAT	Open a work order
3.2.1.1.1.2.3-h	DEF STAT	When discrepancies are discovered during inspection, after the needed work order is opened, return the user to the task and step at which he stopped to open the work order
3.2.1.1.1.3	**DEF STAT**	**Review Scheduled Maintenance†**
3.2.1.1.1.3.1	**DEF STAT**	**Provide access to all information pertaining to individual aircraft from the current flying and maintenance schedule†**
3.2.1.1.1.3.2	**DEF STAT**	**Display all scheduled maintenance requirements presently maintained on the AFTO Forms 781K†**
3.2.1.1.1.3.3	**DEF STAT**	**Allow access to other maintenance data, technical data (PMEL schedules, Flight Line Support Equipment (FLSE) periodic inspection data), technical data, and local policies, for the purpose of forecasting and monitoring completion of squadron hourly inspections, special inspections, TCTO), and replacement of time-change items†**
3.2.1.1.1.4	**DEF STAT**	**Set Aircraft Status**
3.2.1.1.1.4.1	**DEF STAT**	***Establish Aircraft Status - The initial aircraft condition code, established after receiving the aircraft downlink or pilot call-in, must be converted to aircraft status based on additional data. To support this function, the IMIS shall***
3.2.1.1.1.4.1-a	DEF STAT	Update the initial aircraft status based on the following
3.2.1.1.1.4.1-a.1	DEF STAT	Pilot assessment (from call-in) by comparing the reported discrepancy against the MESL
3.2.1.1.1.4.1-a.2	DEF STAT	Data collected during debriefing and initial inspection
3.2.1.1.1.4.1-b	**DEF STAT**	***Present the information to maintenance managers for approval or modification***
3.2.1.1.1.4.1-c	DEF STAT	Update aircraft status internally, on Fighter Squadron Operations and MOC MIWs
3.2.1.1.1.4.2	**DEF STAT**	**Allow the "established" aircraft status to be changed only after appropriate maintenance actions have been taken by a production manager†**

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.1.4.3	DEF STAT	Establish Aircraft ETIC - To generate aircraft ETICs, The IMIS shall perform the following functions
3.2.1.1.1.4.3-a	DEF STAT	Evaluate ETICs of each open work order for an individual aircraft
3.2.1.1.1.4.3-b	DEF STAT	Update ETIC after troubleshooting, after parts are obtained, and if any new discrepancies are found during repair
3.2.1.1.1.4.3-c	***DEF STAT***	***Notify designated personnel and work centers of the update***
3.2.1.1.1.4.3-d	DEF STAT	Automatically slip ETICs for air raid warnings Red, Yellow, and Black
3.2.1.1.1.4.3-e	DEF STAT	Adjust tail number sequences on generation/load out plans based on slipped ETICs
3.2.1.1.1.4.3-f	**DEF STAT**	**Monitor and provide necessary warnings if ETICs might affect potential Hangar Queen status or Higher Headquarters (HHQ) LIMFACs††**
3.2.1.1.1.5	DEF STAT	Information Aid
3.2.1.1.1.6	DEF STAT	Define Status for Off-Equipment Maintenance
3.2.1.1.1.6.1	DEF STAT	Define Status for Reparable Assets - To define the status of reparable assets, the IMIS shall
3.2.1.1.1.6.1-a	DEF STAT	Summarize and display maintenance deficiencies
3.2.1.1.1.6.1-b	DEF STAT	Generate a list of tasks to be performed on any asset (aircraft or LRU) by integrating relevant information from within the IMIS, including aircraft forms and data collected during On-Equipment maintenance (e.g., AFTO Form 350 information, including generation of the 350 Tag at or close to the job site when technology permits)
3.2.1.1.1.6.1-c	DEF STAT	Record tasks for each asset once the list has been approved
3.2.1.1.1.6.1-d	DEF STAT	Transmit list of tasks to appropriate work centers
3.2.1.1.1.6.1-e	DEF STAT	Provide failure data/MFLsto ILMFs/ILMSs, either directly, through local or remote network interfaces, or via other systems (e.g.,CAMS)
3.2.1.1.1.6.2	DEF STAT	Define Status for Aircraft, Engines, and FLSE Input into Major Maintenance or Inspection - To support this function, the IMIS shall
3.2.1.1.1.6.2-a	DEF STAT	Support the planning (predock) for a major inspection or maintenance of aircraft, engines, and FLSE
3.2.1.1.1.6.2-b	DEF STAT	Integrate relevant information contained in or accessible through IMIS
3.2.1.1.1.6.2-c	DEF STAT	Overlay other maintenance requirements upon this network and assist dock chief in evaluating impact on output days

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.1.6.2-d	DEF STAT	Maintain a listing of special qualifications of personnel required to perform maintenance phase inspection tasks
3.2.1.1.1.6.2-e	DEF STAT	Maintain constraints imposed by any inspection requirement or other factors such as number of people in the cockpit or "power on"
3.2.1.1.1.6.2-f	DEF STAT	Allow "what if" scenarios in supporting these evaluations
3.2.1.1.1.6.2-g	DEF STAT	Interface with CEMS to acquire pertinent TCTOs, Time Change, and serial number data
3.2.1.1.1.7	DEF STAT	Maintenance Data Collection
3.2.1.1.1.7.1	DEF STAT	Collect Data - To support this data collection capability, the IMIS shall
3.2.1.1.1.7.1-a	DEF STAT	Interactively and automatically record data from maintenance actions
3.2.1.1.1.7.1-b	DEF STAT	Automatically attach standard narratives while at the job site
3.2.1.1.1.7.1-c	DEF STAT	Facilitate edit capability on manual entry of narrative information
3.2.1.1.1.7.1-d	DEF STAT	Obtain information such as the technician's name and the AFSC from the log-on procedures of the IMIS and user profile
3.2.1.1.1.7.1-e	DEF STAT	Prompt the technician for supplementary information which cannot be obtained automatically or in conjunction with the maintenance action
3.2.1.1.1.7.1-f	DEF STAT	Provide technician with lists of valid data entries to facilitate accurate data input, when possible
3.2.1.1.1.7.1-g	DEF STAT	When closing a work order involving removal/ replacement of serial-number controlled parts, provide technician with capability to track/record all serial numbers and time change data
3.2.1.1.1.7.2	DEF STAT	Validate Data - In support of the data validation, the IMIS shall
3.2.1.1.1.7.2-a	DEF STAT	Check validity of data entered by technician
3.2.1.1.1.7.2-b	DEF STAT	Automatically perform syntax and semantic checks on the data to maximize accuracy of the collected data
3.2.1.1.1.7.2-c	DEF STAT	Reject and display incorrect data entries
3.2.1.1.1.7.3	DEF STAT	Distribute Data - Following the approval and validation of collected maintenance data, the IMIS shall
3.2.1.1.1.7.3-a	DEF STAT	Compile maintenance data
3.2.1.1.1.7.3-b	DEF STAT	Transmit maintenance data to the appropriate work centers and external systems
3.2.1.1.1.7.3-c	**DEF STAT**	***Generate a new aircraft status condition, based on the updated work order data***

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.1.7.3-d	**DEF STAT**	***Send appropriate messages to production managers, to include time started and time completed on the work order***
3.2.1.1.2.1	ALLO RES	Collect Wing Status
3.2.1.1.2.1.1	ALLO RES	Collect Aircraft Status - To support the collection of aircraft status, the IMIS shall
3.2.1.1.2.1.1-a	ALLO RES	Accept information on assigned aircraft
3.2.1.1.2.1.1-b	ALLO RES	Accept information on temporary transient aircraft
3.2.1.1.2.1.1-c	ALLO RES	Forward all information concerning maintenance actions taken at a base on transient aircraft to the owning base, using one of the following mechanisms
3.2.1.1.2.1.1-c.1	ALLO RES	Electronically
3.2.1.1.2.1.1-c.2	ALLO RES	By printing information to be given to the aircrew
3.2.1.1.2.1.1-d	ALLO RES	Collect and determine an overall condition code for each aircraft by comparing each individual discrepancy against the MESL for each Wing assigned DOC
3.2.1.1.2.1.1-e	**ALLO RES**	***Collect an overall ETIC for each aircraft***
3.2.1.1.2.1.1-f	**ALLO RES**	***Review the status and severity (red x, red diagonal) of each open work order on a specific aircraft each time the status of any work order on that aircraft changes***
3.2.1.1.2.1.1-g	**ALLO RES**	***Monitor assigned location of each aircraft, to include advising a user that he is attempting to assign an aircraft to a location that cannot accommodate it at that time***
3.2.1.1.2.1.1-h	**ALLO RES**	***Monitor current status of each assigned aircraft's configuration***
3.2.1.1.2.1.1-i	**ALLO RES**	***For a generation/load out and ICTs, monitor progress in executing the plan***
3.2.1.1.2.1.1-j	**ALLO RES**	***For special loads, maintain status of significant steps completed throughout the loading operation (e.g., HAS cleared, Security Police cordon in place)***
3.2.1.1.2.1.1-k	**ALLO RES**	***Review all TCTO, time change, and calendar and special inspection requirements due against the aircraft***
3.2.1.1.2.1.1-l	**ALLO RES**	***Automatically update status to reflect Supply as a reason the A/C isn't FMC when a part is confirmed as back-ordered to a production manager for validation of the status***
3.2.1.1.2.2	ALLO RES	Analyze Maintenance Needs
3.2.1.1.2.2.1	ALLO RES	Perform Discrepancy Analysis - To support the discrepancy analysis, the IMIS shall
3.2.1.1.2.2.1-a	ALLO RES	Establish a maintenance profile for each aircraft by Work Unit Code grouping and numbers of discrepancies in each system

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.2.2.1-b	ALLO RES	For each discrepancy, perform an analysis to determine the following:
3.2.1.1.2.2.1-b.1	ALLO RES	Optimal time to repair discrepancy
3.2.1.1.2.2.1-b.2	ALLO RES	AFSC required for repair
3.2.1.1.2.2.1-b.3	ALLO RES	Number of technicians required
3.2.1.1.2.2.1-b.4	ALLO RES	Special task qualifications of the personnel required
3.2.1.1.2.2.1-b.5	ALLO RES	Type of S/TE required
3.2.1.1.2.2.1-b.6	ALLO RES	Facilities required and their availability
3.2.1.1.2.2.1-b.7	ALLO RES	Parts required and their availability
3.2.1.1.2.2.2	ALLO RES	Collect a parts status listing from SBSS of critical items (Priority 1-4) that have been ordered/back-ordered
3.2.1.1.2.2.3	**ALLO RES**	**Collect Specialist Status - To support the collection of specialist status, the IMIS shall†**
3.2.1.1.2.2.3-a	**ALLO RES**	**Monitor availability of specialists by AFSC†**
3.2.1.1.2.2.3-b	**ALLO RES**	**Show dispatched and dispersed personnel at their current locations†**
3.2.1.1.2.2.3-c	**ALLO RES**	**Access training records to ensure that the selected specialists are qualified, if specific task qualifications are required to perform a job†**
3.2.1.1.2.2.4	**ALLO RES**	**Collect Equipment Status - To support the collection of S/TE status information, the IMIS shall†**
3.2.1.1.2.2.4-a	ALLO RES	Maintain status of all FLSE
3.2.1.1.2.2.4-b	ALLO RES	Include the critical level and status of major maintenance tasks delayed because of a lack of FLSE support
3.2.1.1.2.2.4-c	ALLO RES	When certain FLSE falls below specified threshold availability criteria
3.2.1.1.2.2.4-c.1	ALLO RES	Flash warning on appropriate status screens
3.2.1.1.2.2.4-c.2	ALLO RES	Begin to monitor in-process work status of that S/TE by specific location
3.2.1.1.2.2.4-c.3	**ALLO RES**	***Notify appropriate Production Managers of status***
3.2.1.1.2.2.5	**ALLO RES**	**Collect Facility Status - To support this function, the IMIS shall†**
3.2.1.1.2.2.5-a	ALLO RES	Accept manual entries to monitor status of all facilities
3.2.1.1.2.2.5-b	ALLO RES	Monitor permanent and temporary limitations on facilities,
3.2.1.1.2.2.5-c	ALLO RES	Include information on the status of the following
3.2.1.1.2.2.5-c.1	ALLO RES	Functions being performed in the facility (e.g., debrief, support, storage)
3.2.1.1.2.2.5-c.2	ALLO RES	Estimate of the facility's availability
3.2.1.1.2.2.5-c.3	ALLO RES	Electrical power (type(s) and availability)
3.2.1.1.2.2.5-c.4	ALLO RES	Special equipment availability (e.g., overhead hoist, lube bay, etc.)

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.2.2.5-c.5	ALLO RES	Total personnel assigned to each building of the facility
3.2.1.1.2.2.6	ALLO RES	Collect Off-Equipment Asset Status - To support the collection of Off-Equipment asset status, the IMIS shall
3.2.1.1.2.2.6-a	ALLO RES	Collect and display information on the status of:
3.2.1.1.2.2.6-a.1	ALLO RES	Assets in Awaiting Parts (AWP)
3.2.1.1.2.2.6-a.2	ALLO RES	Assets in Awaiting Maintenance (AWM)
3.2.1.1.2.2.6-b	ALLO RES	Summarize data for a set of similar assets
3.2.1.1.2.2.6-c	ALLO RES	Display the current status of assigned shop specialists and S/TE
3.2.1.1.2.2.6-d	ALLO RES	For those assets in AWM, develop schedule recommendations based on weapon system requirements, scheduled aircraft missions, and specialist and S/TE availability
3.2.1.1.2.2.6-e	ALLO RES	Monitor NRTS code reporting, particularly as it applies to broken S/TE
3.2.1.1.2.2.6-f	ALLO RES	Monitor the status of parts availability necessary for repair of such S/TE
3.2.1.1.2.2.6-g	ALLO RES	Monitor PMEL requirements
3.2.1.1.2.2.6-h	ALLO RES	Alert users when S/TE is due for calibration, annual inspections, and special inspections
3.2.1.1.2.2.6-i	ALLO RES	Track all parts that have been cannibalized to support in-shop repairs
3.2.1.1.2.3	ALLO RES	Build Maintenance Plans and Schedules
3.2.1.1.2.3.1	ALLO RES	Develop Yearly Flying Schedule
3.2.1.1.2.3.1-a	ALLO RES	To evaluate yearly flying resources, the IMIS shall
3.2.1.1.2.3.1-a.1	ALLO RES	Analyze the yearly flying requirements for the impact of these requirements on numbers of assigned personnel, S/TE, facilities, or assigned aircraft
3.2.1.1.2.3.1-a.2	ALLO RES	Report resource adjustments necessary to support yearly flying requirements
3.2.1.1.2.3.1-b	ALLO RES	The IMIS shall allocate the yearly flying hours and sorties by month and quarter, based upon available flying days per month (i.e., subtracting weekends, holidays, and planned training days), historical weather attrition, historical maintenance attrition, available aircraft (PDM and major TCTO/modification schedules), scheduled deployments, spare parts support, personnel availability shortfalls, alert commitments, hourly inspections, special inspections, replacement of time-change items, and sortie surges
3.2.1.1.2.3.1-c	ALLO RES	Support the generation of "what if" scenarios to be used by Fighter Squadron PS&D personnel to assess the impact on mission accomplishment and to evaluate alternatives
3.2.1.1.2.3.2	ALLO RES	Develop Rotating Schedule
3.2.1.1.2.3.2-a	ALLO RES	In generating the rotating schedule, the IMIS shall

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.2.3.2-a.1	ALLO RES	Draft maintenance plans and schedules
3.2.1.1.2.3.2-a.2	ALLO RES	Present draft maintenance plans and schedules to production managers for modification and approval
3.2.1.1.2.3.2-a.3	ALLO RES	Store and update the following information as far in advance as possible:
3.2.1.1.2.3.2-a.3.a)	ALLO RES	Scheduled aircraft maintenance requirements
3.2.1.1.2.3.2-a.3.b)	ALLO RES	TCTOs
3.2.1.1.2.3.2-a.3.c)	ALLO RES	Time changes
3.2.1.1.2.3.2-a.3.d)	ALLO RES	Modification schedules
3.2.1.1.2.3.2-a.3.e)	ALLO RES	Alert commitments
3.2.1.1.2.3.2-a.3.f)	ALLO RES	Scheduled deployments
3.2.1.1.2.3.2-a.4	ALLO RES	Schedule flying requirements by tail number one month in advance
3.2.1.1.2.3.2-a.5	ALLO RES	Schedule PDM and major phases by tail number, as far in advance as practical
3.2.1.1.2.3.2-a.6	ALLO RES	Provide a baseline schedule template indicating form and format for schedulers' inputs into this process
3.2.1.1.2.3.2-a.7	ALLO RES	Generate step-by-step actions to take the user through the schedule development process
3.2.1.1.2.3.2-a.8	ALLO RES	Reduce the complexities of prioritizing and scheduling many operations and maintenance requirements by applying artificial intelligence and linear programming techniques to the process
3.2.1.1.2.3.2-a.9	ALLO RES	Exercise "what-if" scenarios to support development of the flying and maintenance schedule
3.2.1.1.2.3.2-b	ALLO RES	To obtain operational flying and mission requirements, including tail number changes, configuration, call sign, line number, sortie length, and take-off/land times, the IMIS shall
3.2.1.1.2.3.2-b.1	ALLO RES	Access Operations systems, such as WCCS
3.2.1.1.2.3.2-b.2	ALLO RES	Accept manual entry of required data
3.2.1.1.2.3.3	**ALLO RES**	**Support Contingency Flying Schedule†**
3.2.1.1.2.3.3-a	ALLO RES	Evaluate the FRAG by performing the following functions:
3.2.1.1.2.3.3-a.1	ALLO RES	Interfacing with the Operations system that lists these requirements
3.2.1.1.2.3.3-a.2	ALLO RES	Comparing them with current aircraft status/ configuration
3.2.1.1.2.3.3-a.3	ALLO RES	Recommending a reasonable number of sorties and their durations
3.2.1.1.2.3.3-b	**ALLO RES**	**Disseminate changes to priorities and configurations to the appropriate Production Managers††**
3.2.1.1.2.3.4	**ALLO RES**	***Update Schedules and Establish Maintenance Priorities - The IMIS shall***

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3.2.1.1.2.3.4-a	**ALLO RES**	***Integrate new aircraft status information into the rotating flying and maintenance schedule, as it becomes available***
3.2.1.1.2.3.4-b	**ALLO RES**	***Incorporate tail number, configuration, takeoff/land time, line number, and call sign changes (as the changes occur from the WCCS) into the daily and weekly schedules***
3.2.1.1.2.3.4-c	ALLO RES	Obtain approval or authorization of updates from the appropriate level of management
3.2.1.1.2.3.4-d	ALLO RES	Distribute approved schedule updates/changes to appropriate maintenance personnel
3.2.1.1.2.3.4-e	ALLO RES	Sequence maintenance tasks based on the updated weekly and daily flying and maintenance schedules and the overall wing aircraft status to optimize aircraft availability
3.2.1.1.2.4	ALLO RES	Represent Wing Status
3.2.1.1.2.4.1	ALLO RES	Report Status
3.2.1.1.2.4.1-a	ALLO RES	To support the compilation of a single asset/fleet maintenance profile:, the IMIS shall
3.2.1.1.2.4.1-a.1	ALLO RES	Present asset/wingmaintenance profile to:
3.2.1.1.2.4.1-a.1.a)	ALLO RES	Wing Commander
3.2.1.1.2.4.1-a.1.b)	ALLO RES	Logistics Group Commander
3.2.1.1.2.4.1-a.1.c)	ALLO RES	Operations Group Commander
3.2.1.1.2.4.1-a.1.d)	ALLO RES	Fighter Squadron Commander
3.2.1.1.2.4.1-a.1.e)	ALLO RES	Production Managers
3.2.1.1.2.4.1-a.2	ALLO RES	Update these profiles at the beginning of each shift or upon request
3.2.1.1.2.4.1-a.3	ALLO RES	Annotate differences between last profile and current profile
3.2.1.1.2.4.1-b	ALLO RES	To support the preparation of status briefings, the IMIS shall
3.2.1.1.2.4.1-b.1	ALLO RES	Provide various predeveloped layout templates to accommodate standard briefings
3.2.1.1.2.4.1-b.2	ALLO RES	Support establishment of custom layouts for briefing materials
3.2.1.1.2.4.1-b.3	ALLO RES	Insert required briefing data into specified layout when prompted by the user
3.2.1.1.2.4.1-b.4	ALLO RES	Provide packages of briefing materials that can be generated for a given periodic meeting upon request
3.2.1.1.2.4.1-b.5	ALLO RES	Present these materials in the following formats:
3.2.1.1.2.4.1-b.5.a	ALLO RES	Hardcopy (paper or viewgraph)
3.2.1.1.2.4.1-b.5.b	ALLO RES	On-line via an interface to a large display screen or projector device
3.2.1.1.2.4.1-b.6	ALLO RES	Provide automatic computation on summary templates

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.2.4.1-c	ALLO RES	To support production managers with information for status briefings, the IMIS shall
3.2.1.1.2.4.1-c.1	ALLO RES	Provide the following status information to production managers upon request:
3.2.1.1.2.4.1-c.1.a)	ALLO RES	In-progress maintenance by aircraft tail number/asset serial number
3.2.1.1.2.4.1-c.1.b)	ALLO RES	Personnel assigned to each aircraft
3.2.1.1.2.4.1-c.1.c)	ALLO RES	Personnel assigned to each asset
3.2.1.1.2.4.1-c.1.d)	ALLO RES	Equipment assigned to each aircraft
3.2.1.1.2.4.1-c.1.e)	ALLO RES	Equipment assigned to each asset
3.2.1.1.2.4.1-c.1.f)	ALLO RES	Parts status to support aircraft/specific assets
3.2.1.1.2.4.1-c.1.g)	ALLO RES	Total aircraft authorized (fighter squadron/wing)
3.2.1.1.2.4.1-c.1.h)	ALLO RES	Total aircraft assigned (fighter squadron/wing)
3.2.1.1.2.4.1-c.1.i)	ALLO RES	Total aircraft possessed (fighter squadron/wing)
3.2.1.1.2.4.1-c.1.j)	ALLO RES	Total fighter squadron/wing aircraft summary status:
3.2.1.1.2.4.1-c.1.j)1)	ALLO RES	Aircraft Transfer
3.2.1.1.2.4.1-c.1.j)2)	ALLO RES	Depot
3.2.1.1.2.4.1-c.1.j)3)	ALLO RES	Major Maintenance Awaiting AFLC Decision
3.2.1.1.2.4.1-c.1.j)4)	ALLO RES	On-Loan
3.2.1.1.2.4.1-c.1.j)5)	ALLO RES	Mission Capable (MC)
3.2.1.1.2.4.1-c.1.j)6)	ALLO RES	Fully Mission Capable (FMC)
3.2.1.1.2.4.1-c.1.j)7)	ALLO RES	Total Not Mission Capable Maintenance (TNMCM)
3.2.1.1.2.4.1-c.1.j)8)	ALLO RES	Total Not Mission Capable Supply (TNMCS)
3.2.1.1.2.4.1-c.1.j)9)	ALLO RES	Total Not Mission Capable Both (TNMCB)
3.2.1.1.2.4.1-c.1.j)10)	ALLO RES	Total Partially Mission Capable Maintenance (TPMCM)
3.2.1.1.2.4.1-c.1.j)11)	ALLO RES	Total Partially Mission Capable Supply (TPMCS)
3.2.1.1.2.4.1-c.1.j)12)	ALLO RES	Total Partially Mission Capable Both (TPMCB)
3.2.1.1.2.4.1-c.2	ALLO RES	Provide status of parts on backorder
3.2.1.1.2.4.1-c.3	ALLO RES	Allow managers to search through the data available to the IMIS for more details
3.2.1.1.2.4.2	ALLO RES	Report Effectiveness Information - To support the reporting of effectiveness information, the IMIS shall
3.2.1.1.2.4.2-a	ALLO RES	Display products from BLMAS including the following, upon request
3.2.1.1.2.4.2-a.1	ALLO RES	Sorties analysis (scheduled, operations check flights, functional check flights (FCF), cross-countries (XCs), XC returns, adds, losses, effective, flown, ground abort, spared, weather, maintenance, supply, operations, sympathy, and others)
3.2.1.1.2.4.2-a.2	ALLO RES	Hours flown analysis (total and UTE rate)
3.2.1.1.2.4.2-a.3	ALLO RES	Maintenance effectiveness analysis (MC rate, Fully Mission Capable (FMC) rate, PMC rate, TNMCM rate, TNMCS rate, TNMCB rate, TPMCM rate, TPMCS rate, TPMCB rate, and combinations)

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.2.4.2-a.4	ALLO RES	Planning and scheduling effectiveness
3.2.1.1.2.4.2-a.5	ALLO RES	Logistics losses analysis
3.2.1.1.2.4.2-a.6	ALLO RES	Break rate
3.2.1.1.2.4.2-a.7	ALLO RES	Abort rate
3.2.1.1.2.4.2-a.8	ALLO RES	Cannibalization rate
3.2.1.1.2.4.2-a.9	ALLO RES	Fix rate (6, 8, and 12 hours)
3.2.1.1.2.4.2-a.10	ALLO RES	Foreign object damage (FOD) rate
3.2.1.1.2.4.2-a.11	ALLO RES	AWM rate
3.2.1.1.2.4.2-a.12	ALLO RES	AWP rate
3.2.1.1.2.4.2-a.13	ALLO RES	Average repair day analysis
3.2.1.1.2.4.2-b	ALLO RES	Adapt the BLMAS products, which are displayed in textual, tabular, or graphic format, to accommodate the needs and interests of the Production Manager
3.2.1.1.2.4.2-c	ALLO RES	Allow Production Managers to set up thresholds on given criteria and indicators to facilitate monitoring
3.2.1.1.2.4.2-d	ALLO RES	Alert the production manager if a given threshold is reached or exceeded
3.2.1.1.2.4.3	**ALLO RES**	**Enhance Communications**
3.2.1.1.2.4.3-a	**ALLO RES**	**Allow Flight Line Expediters and Production Managers to track all personnel dispatched to assigned weapons systems and maintenance tasks†**
3.2.1.1.2.4.3-b	**ALLO RES**	**Allow flight line expediters and Production Managers to coordinate job start and completion†**
3.2.1.1.2.4.3-c	**ALLO RES**	**Allow coordination with other unit managers and the MOC to update work status in the MOC†**
3.2.1.1.2.4.3-d	**ALLO RES**	**In a contingency or emergency situation, the IMIS shall††**
3.2.1.1.2.4.3-d.1	**ALLO RES**	**Notify all units of the states and stages of alert, such as Air Raid Warning Red, using buzzers and flashing screens††**
3.2.1.1.2.4.3-d.2	**ALLO RES**	**Display appropriate response action checklists; e.g., HAS close up rules, use of NBC protective clothing rules††**
3.2.1.1.2.4.3-d.3	ALLO RES	Display aircraft generation presentations, EWO, general war plans, strike, mass loads, and other special missions data
3.2.1.1.2.4.3-d.4	ALLO RES	Display mobility requirements, to include mobility personnel and S/TE required to meet contingency commitments
3.2.1.1.2.4.3-d.5	**ALLO RES**	**Display aircraft generation order, monitor aircraft status, and revise the preselected sequence as changes occur, by flying squadron††**

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.2.4.3-d.6	ALLO RES	Display IMA authorization to support wartime manpower requirements
3.2.1.1.2.4.3-d.7	ALLO RES	Display status of Alert Force aircraft
3.2.1.1.2.4.3-e	ALLO RES	In providing job turnover status logs, the IMIS shall
3.2.1.1.2.4.3-e.1	ALLO RES	Maintain tail number and shop turnover logs, to include all open work orders, for communicating detailed aircraft status
3.2.1.1.2.4.3-e.2	ALLO RES	Restrict access to these logs to ensure that accurate information is recorded
3.2.1.1.2.4.3-e.3	ALLO RES	Maintain message data collected during shifts
3.2.1.1.2.5	ALLO RES	Assign Resources
3.2.1.1.2.5.1	**ALLO RES**	**Assign Specialist**
3.2.1.1.2.5.1-a	**ALLO RES**	***Recommend assignment of the most qualified specialist to perform the task***
3.2.1.1.2.5.1-b	ALLO RES	Obtain qualifications of available maintenance personnel from the appropriate external data base
3.2.1.1.2.5.1-c	**ALLO RES**	**Allow recommended specialist assignment to be approved†**
3.2.1.1.2.5.1-d	**ALLO RES**	**Allow alternate specialist to be assigned†**
3.2.1.1.2.5.1-e	**ALLO RES**	**Convey that decision to the appropriate production manager/technician in the form of a work order to the affected work center**
3.2.1.1.2.5.1-f	**ALLO RES**	**Ensure that all necessary resources are available and approved for dispatch before dispatching those resources**
3.2.1.1.2.5.2	**ALLO RES**	**Assign Support/Test Equipment - To support the assignment of S/TE, the IMIS shall**
3.2.1.1.2.5.2-a	**ALLO RES**	**Compare S/TE availability against all known requirements**
3.2.1.1.2.5.2-b	**ALLO RES**	**Recommend assignment based on current mission priorities**
3.2.1.1.2.5.2-c	**ALLO RES**	**Allow maintenance technicians or Production Managers to approve recommendations†**
3.2.1.1.2.5.2-d	**ALLO RES**	**Allow maintenance technicians or Production Managers to make alternate selections†**
3.2.1.1.2.5.3	**ALLO RES**	**Assign Facilities - To support the assignment of facilities to be used, the IMIS shall**
3.2.1.1.2.5.3-a	**ALLO RES**	**Recommend the assignment of appropriate facilities or parking locations**
3.2.1.1.2.5.3-b	**ALLO RES**	**Allow Production Managers to approve recommendations†**
3.2.1.1.2.5.3-c	**ALLO RES**	**Allow Production Managers to direct alternate facility choices†**

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.2.5.3-d	**ALLO RES**	**Display types of S/TE and personnel assigned to the facility†**
3.2.1.1.2.5.3-e	**ALLO RES**	**Display what primary function (e.g., support, debrief, etc.) is performed in each building of the facility†**
3.2.1.1.2.5.3-f	**ALLO RES**	**Display what electrical power and communications are available in the facility†**
3.2.1.1.2.5.4	ALLO RES	Cannibalization - To support the decision to cannibalize parts when parts necessary for repair are unavailable from supply, the IMIS shall
3.2.1.1.2.5.4-a	ALLO RES	Compare the following information to determine cannibalization recomendation:
3.2.1.1.2.5.4-a.1	ALLO RES	Individual/overall aircraft ETICs
3.2.1.1.2.5.4-a.2	ALLO RES	Part Priorities
3.2.1.1.2.5.4-a.3	ALLO RES	Mission requirements
3.2.1.1.2.5.4-a.4	ALLO RES	Configuration and completed TCTOs for the aircraft.
3.2.1.1.2.5.4-b	ALLO RES	Recommend identification and location of parts to be cannibalized
3.2.1.1.2.5.4-c	ALLO RES	Collect and control all data required to document cannibalizations, including:
3.2.1.1.2.5.4-c.1	ALLO RES	Generation and issue of cannibalization numbers
3.2.1.1.2.5.4-c.2	ALLO RES	Routing of cannibalization requests for proper approval and verification of approval authority
3.2.1.1.2.5.4-c.3	ALLO RES	DIFM document number of the AWP end item and the due-out document numbers of the associated bits and pieces
3.2.1.1.2.5.4-d	ALLO RES	Ensure that TCTO, Time Change, and configuration records are updated to accurately reflect which part is on which aircraft
3.2.1.1.2.5.4-e	ALLO RES	Ensure that aircraft/asset configurations are updated to reflect moved parts
3.2.1.1.2.5.4-f	ALLO RES	Monitor the list of parts removed from all cannibalized aircraft, so that a new aircraft appropriate for cannibalization might be identified
3.2.1.1.2.5.4-g	ALLO RES	Ensure that parts recommended for cannibalization are properly configured for the new aircraft
3.2.1.1.3	PER MAINT	Perform Maintenance
3.2.1.1.3.1	PER MAINT	Troubleshoot Aircraft
3.2.1.1.3.1.1 (a)	PER MAINT	Provide maintenance personnel access to all previously collected information relating to the discrepancy
3.2.1.1.3.1.1 (b)	PER MAINT	When the technician accesses the assigned work order on the PMA, send to appropriate production managers a task-started message for that work order

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.3.1.2	**PER MAINT**	**Obtain Support/Test Equipment - If, during the troubleshooting phase, additional S/TE is necessary, the IMIS shall**
3.2.1.1.3.1.2-a	**PER MAINT**	**Provide availability information and location of the additional S/TE**
3.2.1.1.3.1.2-b	**PER MAINT**	**Request such S/TE for the job**
3.2.1.1.3.1.3	PER MAINT	Duplicate and Diagnose the Discrepancy
3.2.1.1.3.1.3-a	PER MAINT	Fault isolation - The IMIS shall
3.2.1.1.3.1.3-a.1	PER MAINT	Analyze information collected from different stages of the maintenance process (debriefing, inspections), during troubleshooting, from external systems such as CAMS and SBSS, and from the weapon system in order to identify the aircraft failure, an associated probable cause for the failure, and potential corrective action
3.2.1.1.3.1.3-a.2	PER MAINT	Provide results of analysis to technician
3.2.1.1.3.1.3-a.3	PER MAINT	If insufficient data exists to isolate to a fault:
3.2.1.1.3.1.3-a.3.a)	PER MAINT	Request special assistance
3.2.1.1.3.1.3-a.3.b)	PER MAINT	Document additional data or changes to existing data required to accomplish the job
3.2.1.1.3.1.3-a.4	PER MAINT	Restrict troubleshooting to mission-critical components when so instructed by the production manager (Note: This restricted troubleshooting is used in wartime to expedite the maintenance process based on established priorities)
3.2.1.1.3.1.3-a.5	PER MAINT	Consider implementation of:
3.2.1.1.3.1.3-a.5.a	PER MAINT	Rule-based expert system for failure data analysis
3.2.1.1.3.1.3-a.5.b	PER MAINT	Model-based reasoning for failure data analysis
3.2.1.1.3.1.3-a.5.c	PER MAINT	Pattern recognition techniques or an equivalent implementation to accommodate multiple symptoms
3.2.1.1.3.1.3-a.6	PER MAINT	Integrate the fault isolation implementation with the debriefing and Off-Equipment maintenance tests, so that all of the diagnostic procedures are actually just different sections of the same diagnostic path
3.2.1.1.3.1.3-a.7	PER MAINT	Determine the recommended test sequence for the faulty component, taking the following information into account
3.2.1.1.3.1.3-a.7.a)	PER MAINT	Time required to perform given tests on the weapon system/asset
3.2.1.1.3.1.3-a.7.b)	PER MAINT	Estimate of access to components/test points and maintenance task times for the fault(s)
3.2.1.1.3.1.3-a.7.c)	PER MAINT	Availability of parts on base
3.2.1.1.3.1.3-a.7.d)	PER MAINT	MTBF
3.2.1.1.3.1.3-a.7.e)	PER MAINT	Probable cause of failure of components
3.2.1.1.3.1.3-a.7.f)	PER MAINT	Historical information

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3.2.1.1.3.1.3-a.8	PER MAINT	Provide reasoning for indicated recommendations upon request
3.2.1.1.3.1.3-a.9	PER MAINT	Consider the following capabilities in the IMIS diagnostic tool:
3.2.1.1.3.1.3-a.9.a)	PER MAINT	On-line learning
3.2.1.1.3.1.3-a.9.b)	PER MAINT	Nonlinear pattern matching
3.2.1.1.3.1.3-a.9.c)	PER MAINT	Programmable hypothesis testing look-up table
3.2.1.1.3.1.3-a.9.d)	PER MAINT	Nearest-neighbor response
3.2.1.1.3.1.3-a.10	PER MAINT	Present the best actions, best tests, and best repairs on a given discrepancy, based on historical data, availability of parts, MTTR, MTBF, etc.
3.2.1.1.3.1.3-b	PER MAINT	Theory of Operations, Schematics, Wiring Diagrams, and Design Data Presentation - Upon request, present the following information to support the on-going maintenance action:
3.2.1.1.3.1.3-b.1	PER MAINT	Theory of operations data
3.2.1.1.3.1.3-b.2	PER MAINT	Available schematics, wiring diagrams, and design data for the weapon system or asset
3.2.1.1.3.1.3-c	PER MAINT	Dynamic Overview - To assist the technician in identifying the discrepancy, the IMIS shall
3.2.1.1.3.1.3-c.1	PER MAINT	Maintain and display upon request a functional graphic presentation of a weapon system/asset to indicate which portions of the system have been exonerated with respect to the discrepancy
3.2.1.1.3.1.3-c.2	PER MAINT	Present components and test points involved in troubleshooting
3.2.1.1.3.1.3-c.3	PER MAINT	Present associated weapon system/asset subsystems or components to help orient the user
3.2.1.1.3.1.3-d	PER MAINT	Module Interface - If possible, the IMIS shall interpret test results to confirm failures or serviceability without removing modules from weapon system
3.2.1.1.3.1.3-e	PER MAINT	Use Troubleshooting Data for Repair of LRU - To the extent permitted by weapon system design, the IMIS shall be capable of
3.2.1.1.3.1.3-e.1	PER MAINT	Troubleshooting to the SRU level
3.2.1.1.3.1.3-e.2	PER MAINT	Storing this data for use at Support-Level (Regional or Depot) maintenance facilities to expedite the Off-Equipment repair
3.2.1.1.3.1.3-e.3	PER MAINT	Supporting clear decomposition of test and diagnostic functions to system, rack, and module levels, as modular avionics replace LRUs with LRMs
3.2.1.1.3.1.3-e.4	PER MAINT	Supporting feasible test and evaluation of LRMs, both singularly and as part of the integrated avionics functional group
3.2.1.1.3.1.3-f	PER MAINT	Retrieve LRM/TSMD Data - To support retrieval of LRM/TSMD data, IMIS shall provide

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.3.1.3-f.1	PER MAINT	An interface to retrieve TSMD data resident on LRMs for postflight evaluation and data base storage
3.2.1.1.3.1.3-f.2	PER MAINT	Diagnosis and fault isolation of software as well as hardware and interface problems
3.2.1.1.3.1.3-g	PER MAINT	If the S/TE includes built-in-test/self-test capability, the IMIS shall perform the following:
3.2.1.1.3.1.3-g.1	PER MAINT	Interrogate S/TE built-in-test/self-test to help users troubleshoot defective units
3.2.1.1.3.1.3-g.2	PER MAINT	Query S/TE to obtain current configuration and mission-capable status
3.2.1.1.3.1.3-h	PER MAINT	The IMIS prognostic capabilities shall consist of
3.2.1.1.3.1.3-h.1	PER MAINT	Access and display of available prognostic data, when practical
3.2.1.1.3.1.3-h.2	PER MAINT	Performing related calculations to assist the maintenance technicians
3.2.1.1.3.1.3-h.3	PER MAINT	Predicting the probability of a future mission's success
3.2.1.1.3.1.3-h.4	PER MAINT	Identification of components that could prevent a successful mission or deployment
3.2.1.1.3.1.3-h.5	PER MAINT	Track the remaining life for modules with a predictable service life (e.g., mechanical components and LRMs), either through external systems or, possibly, through an interface with nonvolatile memories on the modules
3.2.1.1.3.1.4	PER MAINT	Aircraft Battle Damage Repair
3.2.1.1.3.1.4-a	PER MAINT	Under automatic download diagnostics, perform the following functions:
3.2.1.1.3.1.4-a.1	PER MAINT	Determine extent of the damage
3.2.1.1.3.1.4-a.2	PER MAINT	Determine degradation in mission capability
3.2.1.1.3.1.4-a.3	PER MAINT	Indicate the extent of repairs required
3.2.1.1.3.1.4-a.4	PER MAINT	Include appropriate checks to determine the following:
3.2.1.1.3.1.4-a.4.a	PER MAINT	Integrity or operability
3.2.1.1.3.1.4-a.4.b	PER MAINT	System serviceability criteria
3.2.1.1.3.1.4-a.4.c	PER MAINT	Data which allow accurate assessments of the time, procedures, and resources required for repair
3.2.1.1.3.1.4-a.5	PER MAINT	Display the aircraft zone breakdown and aircraft line station diagram
3.2.1.1.3.1.4-a.6	PER MAINT	Display Damage Class Assessment data
3.2.1.1.3.1.4-a.7	PER MAINT	Display structure damage categories
3.2.1.1.3.1.4-b	PER MAINT	Manual Diagnostics - Provide access on the following two levels:
3.2.1.1.3.1.4-b.1	PER MAINT	System diagnostics, when an assessor wants to determine damage to a specific system
3.2.1.1.3.1.4-b.2	PER MAINT	Location diagnostics, when an assessor wishes to view and assess all the systems within a specific location on the aircraft

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3.2.1.1.3.1.4-c	PER MAINT	Initial assessment - The IMIS shall perform the following functions
3.2.1.1.3.1.4-c.1	PER MAINT	Present functional test options to aid the technician in quantifying the extent of the damage and the extent of mission degradation
3.2.1.1.3.1.4-c.2	PER MAINT	Provide security information and instructions for classified components
3.2.1.1.3.1.4-c.3	PER MAINT	Aid in collection of special ABDR-type data used for ABDR assessment
3.2.1.1.3.1.4-c.4	PER MAINT	After receiving damage assessment, estimate the reduction of performance capability of the weapon segment/system if the repair (hardware or software) is not accomplished, concentrating on mission capability and functionality of the system under repair
3.2.1.1.3.1.4-c.5	PER MAINT	Estimate reduction of performance capability (total drag count) at different levels of battle damage repair
3.2.1.1.3.1.4-c.6	PER MAINT	Display repair procedures and mission options based on mission and aircraft status assessments; i.e., repair required to meet a known mission or capability of aircraft to meet a known mission without further repair
3.2.1.1.3.1.4-c.7	PER MAINT	Determine and display material required to support the repair
3.2.1.1.3.1.4-d	PER MAINT	Graphics - In support of ABDR, the IMIS shall provide the following graphics capabilities
3.2.1.1.3.1.4-d.1	PER MAINT	Display two- and three-dimensional graphics as they become available in a CALS format
3.2.1.1.3.1.4-d.2	PER MAINT	Provide displays from a static, isometric orientation
3.2.1.1.3.1.4-d.3	PER MAINT	Provide a peel-away graphics presentation to display to the user different views of aircraft components in a layered effect
3.2.1.1.3.1.4-d.4	PER MAINT	Remove successive structural, mechanical, electrical, hydraulic, and other components
3.2.1.1.3.1.4-d.5	PER MAINT	Clearly identify classified equipment or information located within or accessible from the damaged area
3.2.1.1.3.1.4-d.6	PER MAINT	Display all the wire bundles and hydraulic lines of a weapon system
3.2.1.1.3.1.4-d.7	PER MAINT	For user-selected wire bundles and hydraulic lines, display the following:
3.2.1.1.3.1.4-d.7.a	PER MAINT	Source and destination
3.2.1.1.3.1.4-d.7.b	PER MAINT	Related systems capability information
3.2.1.1.3.1.4-d.7.c	PER MAINT	Associated TO data
3.2.1.1.3.1.4-d.8	PER MAINT	Identify software resident in, or applicable to, damaged regions
3.2.1.1.3.1.4-d.9	PER MAINT	Allow the assessor to have the option to specify which graphics are required
3.2.1.1.3.1.4-e	PER MAINT	To support ABDR documentation, the IMIS shall:

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3.2.1.1.3.1.4-e.1	PER MAINT	Automatically document damaged area from initial assessment inputs
3.2.1.1.3.1.4-e.2	PER MAINT	Supply assessor with a data base of symbols which are in accordance with the -39 series TOs to define the given battle damage assessment
3.2.1.1.3.1.4-f	PER MAINT	Provide simulation capability to execute TO-provided models for simulation of the extent of damage to the weapon system and the resultant impacts on capability
3.2.1.1.3.1.4-g	PER MAINT	Maintain a log of actions taken, progress, and results during troubleshooting and ABDR
3.2.1.1.3.1.5	PER MAINT	Record Diagnostic Results - To support the recording of diagnostic results, the IMIS shall
3.2.1.1.3.1.5-a	PER MAINT	Record data accumulated as a result of troubleshooting performed on weapon systems and subsystems
3.2.1.1.3.1.5-b	PER MAINT	Via the routing function in the ICM, transmit the data collected to:
3.2.1.1.3.1.5-b.1	PER MAINT	Appropriate work centers
3.2.1.1.3.1.5-b.2	PER MAINT	Appropriate external systems
3.2.1.1.3.1.5-c	PER MAINT	Retain data from troubleshooting, repair actions, and standard service
3.2.1.1.3.2	PER MAINT	Order Parts
3.2.1.1.3.2.1	PER MAINT	Process Unserviceable Items -To support the processing of unserviceable items, the IMIS shall
3.2.1.1.3.2.1-a	PER MAINT	Extract part identification from aircraft or system history files
3.2.1.1.3.2.1-b	PER MAINT	Extract discrepancy summary from work order data
3.2.1.1.3.2.1-c	PER MAINT	Check failed part identification against a warranty data base to see if the item is still under warranty. Mark and handle warranted part documentation, as required
3.2.1.1.3.2.1-d	PER MAINT	Prefill aircraft ID, JCN, When Discovered Code, WUC, and performing workcenter
3.2.1.1.3.2.1-e	PER MAINT	Prompt the maintenance personnel for any information not available in data bases
3.2.1.1.3.2.1-f	PER MAINT	Transmit a message to SBSS to establish or change the DIFM status
3.2.1.1.3.2.2	PER MAINT	Process Part Requests
3.2.1.1.3.2.2-a	PER MAINT	Supply Status - To provide the most current supply status information, the IMIS shall
3.2.1.1.3.2.2-a.1	PER MAINT	Provide technicians with real-time access to supply information such as stock availability and suitable substitutions
3.2.1.1.3.2.2-a.2	PER MAINT	Provide Production Managers the capability for real-time monitoring of
3.2.1.1.3.2.2-a.2.a)	PER MAINT	Parts usage
3.2.1.1.3.2.2-a.2.b)	PER MAINT	Maintenance and supply transactions

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.3.2.2-a.2.c)	PER MAINT	Part backorder status
3.2.1.1.3.2.2-a.3	PER MAINT	Process inventory requests for parts availability made by stock number, document number, or part number
3.2.1.1.3.2.2-a.4	PER MAINT	Check the following sources to obtain parts availability information
3.2.1.1.3.2.2-a.4.a)	PER MAINT	Parts Store
3.2.1.1.3.2.2-a.4.b)	PER MAINT	Shop Service Center
3.2.1.1.3.2.2-a.4.c)	PER MAINT	Fighter Squadron Ready Supply Point
3.2.1.1.3.2.2-a.4.d)	PER MAINT	Phase Dock
3.2.1.1.3.2.2-a.4.e)	PER MAINT	Local Manufacturers
3.2.1.1.3.2.2-a.4.f)	PER MAINT	War Readiness Spare Kits
3.2.1.1.3.2.2-a.4.g)	PER MAINT	Temporary Mission Support Kits
3.2.1.1.3.2.2-a.4.h)	PER MAINT	Bench Stock
3.2.1.1.3.2.2-a.4.i)	PER MAINT	Repair Cycle Asset Status
3.2.1.1.3.2.2-a.4.j)	PER MAINT	Parts Holding Bin
3.2.1.1.3.2.2-a.4.k)	PER MAINT	Tail Number Bin
3.2.1.1.3.2.2-a.4.l)	PER MAINT	Cannibalization
3.2.1.1.3.2.2-b	PER MAINT	Order Part - To order the required part, the IMIS shall
3.2.1.1.3.2.2-b.1	PER MAINT	Identify the required parts during maintenance using one of the following
3.2.1.1.3.2.2-b.1.a	PER MAINT	QRL
3.2.1.1.3.2.2-b.1.a)1)	PER MAINT	Part Number
3.2.1.1.3.2.2-b.1.a)2)	PER MAINT	WUC
3.2.1.1.3.2.2-b.1.a)3)	PER MAINT	Nomenclature
3.2.1.1.3.2.2-b.1.b	PER MAINT	IPB
3.2.1.1.3.2.2-b.1.c	PER MAINT	The results of fault isolation (last branch of a fault tree in TO data)
3.2.1.1.3.2.2-b.2	PER MAINT	Display an illustration of the identified part to help the technician confirm the selection when the part has been identified by technician entry of the part number, WUC, or nomenclature
3.2.1.1.3.2.2-b.3	PER MAINT	Check the configuration of the aircraft or system against the usable-on code of candidate parts to ensure that the right part is ordered
3.2.1.1.3.2.2-b.4	PER MAINT	Identify any bench stock or hardware that will be required to perform the maintenance task
3.2.1.1.3.2.2-b.5	PER MAINT	When applicable, obtain the part information from the defective part; i.e., in the form of part data onboard the weapon system module
3.2.1.1.3.2.2-b.6	PER MAINT	Support inquiries to SBSS for part availability prior to approval of part requests
3.2.1.1.3.2.2-b.7	PER MAINT	Upon receiving technician approval of the required parts, forward part requests to Production Managers for approval, then on to SBSS

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.3.2.2-b.8	PER MAINT	Accept the acknowledgment of receipt of the order sent by SBSS and present it to the technician
3.2.1.1.3.2.2-b.9	PER MAINT	Replenish bench stock
3.2.1.1.3.2.2-b.10	PER MAINT	Assign a valid delivery priority code, based upon a review of all of the maintenance requirements
3.2.1.1.3.2.2-b.11	PER MAINT	Monitor operating/shop stock
3.2.1.1.3.2.2-b.12	PER MAINT	Monitor SPRAM assets
3.2.1.1.3.2.2-b.13	PER MAINT	Monitor TCTO part kits
3.2.1.1.3.2.2-c	PER MAINT	Validation of Order - Prior to issuing parts request, validate the order by performing the following
3.2.1.1.3.2.2-c.1	PER MAINT	Verify technician's authorization
3.2.1.1.3.2.2-c.2	PER MAINT	When necessary, prompt technician for additional information required for approval
3.2.1.1.3.2.2-c.3	PER MAINT	If parts ordering must be approved by a production manager, automatically route all necessary information about the required part, the technician, and the open work order to the applicable supervisory personnel
3.2.1.1.3.2.2-c.4	PER MAINT	Inform maintenance technician whether or not an order has been denied
3.2.1.1.3.2.2-c.5	PER MAINT	Accept and display denial/reject messages from SBSS facilitate investigation of the denial
3.2.1.1.3.2.2-c.6	PER MAINT	When an order is rejected by SBSS, identify incomplete or incorrect areas of the order
3.2.1.1.3.2.2-c.7	PER MAINT	Attempt to correct a rejected order automatically
3.2.1.1.3.2.2-c.8	PER MAINT	Aid the technician in correcting a rejected order when it cannot be corrected automatically
3.2.1.1.3.2.2-c.9	PER MAINT	If an identical part has already been ordered against a work order, display a message asking the user to review part data
3.2.1.1.3.2.2-c.10	PER MAINT	Inform the technician when the part has been backordered
3.2.1.1.3.2.2-c.11	PER MAINT	Accept part order validation by Production Managers
3.2.1.1.3.2.2-d	PER MAINT	Supply Information Support - Upon the maintenance technician's request, the IMIS shall display or transmit, as appropriate,
3.2.1.1.3.2.2.d.1	PER MAINT	Due-out release messages from SBSS
3.2.1.1.3.2.2.d.2	PER MAINT	Cancellation messages from SBSS
3.2.1.1.3.2.2.d.3	PER MAINT	SBSS cannibalization action reports in either a "preclude MICAP" (F), "terminate MICAP" (G), or "transfer MICAP" (H) format
3.2.1.1.3.2.3	PER MAINT	Provide Back Order Status - In order to determine status of back orders, remain "in-synch" with other base-level external systems, and simplify message traffic among the systems, the IMIS shall

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.3.2.3-a	**PER MAINT**	**Provide Production Managers and technicians with real-time access to supply back order information based on stock number, document number, part number, work center, or aircraft ID†**
3.2.1.1.3.2.3-b	PER MAINT	Access the current status of all parts that have been back ordered (due out status) for their assigned weapon system upon request
3.2.1.1.3.2.3-c	PER MAINT	Accept or reject messages from SBSS for requests for back order status
3.2.1.1.3.2.3-d	PER MAINT	Track all off-base requisitions
3.2.1.1.3.2.3-e	PER MAINT	Accept backorder validation by appropriately authorized Production Managers
3.2.1.1.3.3	PER MAINT	Repair Asset
3.2.1.1.3.3.1	PER MAINT	Perform Maintenance Action
3.2.1.1.3.3.1-a	PER MAINT	Corrective Action - To assist the technician in accomplishing a corrective action on an aircraft or unserviceable part, the IMIS shall
3.2.1.1.3.3.1-a.1	PER MAINT	Select and display from the available technical data the relevant maintenance instructions at the appropriate skill level for the technician
3.2.1.1.3.3.1-a.2	**PER MAINT**	***Provide the Production Managers with status updates and maintenance-identified discrepancies as they occur***
3.2.1.1.3.3.1-a.3	PER MAINT	Generate a WCE when the maintenance action produces an unserviceable item or requires ILMF support
3.2.1.1.3.3.1-a.4	PER MAINT	Collect information to help identify a part being turned in for repair
3.2.1.1.3.3.1-a.5	PER MAINT	Notify appropriate personnel of the part's availability for transport
3.2.1.1.3.3.1-b	PER MAINT	The IMIS shall print a hard copy or bar code label of the AFTO 350 tag to be included with the part or otherwise track the AFTO Form 350 information, with the unserviceable item to be available for reference during repair
3.2.1.1.3.3.2	PER MAINT	Inspect Maintenance Work
3.2.1.1.3.3.2-a	PER MAINT	To allow an inspector to check work in progress and work completed, the IMIS shall
3.2.1.1.3.3.2-a.1	PER MAINT	Determine inspection type requirements
3.2.1.1.3.3.2-a.2	PER MAINT	Determine the type of task-qualified personnel and S/TE to support the inspection of the maintenance task
3.2.1.1.3.3.2-a.3	PER MAINT	Transmit request for a designated person to inspect the work via a WCE
3.2.1.1.3.3.2-a.4	PER MAINT	Adapt the inspection data (according to the situation and level of the technician) prior to presenting it to the technician for use

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.3.3.2-a.5	PER MAINT	Allow the technician to approve or disapprove the IMIS-determined inspection selection
3.2.1.1.3.3.2-a.6	PER MAINT	Allow the technician to select another inspection type if the IMIS-determined inspection selection is not approved
3.2.1.1.3.3.2-a.7	PER MAINT	Present the appropriate instructions to be used by the technician during the performance of the inspection.
3.2.1.1.3.3.2-a.8	PER MAINT	Include the capability to record additional discrepancies into the IMIS, to support updating status of the aircraft or asset
3.2.1.1.3.3.2-b	PER MAINT	Sign-Off Inspection - In signing off an inspection, the IMIS shall
3.2.1.1.3.3.2-b.1	PER MAINT	Save results of the inspection, including:
3.2.1.1.3.3.2-b.1.a	PER MAINT	Trace of every step in the instructions that was performed
3.2.1.1.3.3.2-b.1.b	PER MAINT	Time of start and completion
3.2.1.1.3.3.2-b.1.c	PER MAINT	Identification of technicians performing the inspection
3.2.1.1.3.3.2-b.2	PER MAINT	Allow the inspector to review the results
3.2.1.1.3.3.2-b.3	PER MAINT	Allow the inspector to sign off the inspection
3.2.1.1.3.3.2-b.4	PER MAINT	Verify sign-off authority of the inspector and prevent unauthorized signoff
3.2.1.1.3.3.3	PER MAINT	Record Repair Data - Upon completion of the repair and maintenance actions performed on weapon systems, subsystems, or assets, the IMIS shall record the data accumulated
3.2.1.1.3.4	PER MAINT	Perform Standard Service
3.2.1.1.3.4.1	**PER MAINT**	***Obtain Configuration Requirements - In determining possible reconfiguration requirements, the IMIS shall***
3.2.1.1.3.4.1-a	**PER MAINT**	***Compare current configuration of the aircraft and configuration required for its next mission***
3.2.1.1.3.4.1-b	**PER MAINT**	***Obtain the desired configuration requirements from the aircraft's daily flying and maintenance schedule***
3.2.1.1.3.4.1-c	**PER MAINT**	***Request dispatch of appropriate resources, either through the MOC or through a direct link to the appropriate support agency***
3.2.1.1.3.4.1-d	PER MAINT	Present the required personnel (task-qualified) to perform the tasks
3.2.1.1.3.4.2	**PER MAINT**	**Generate Checklists†**
3.2.1.1.3.4.3	PER MAINT	Upload Executable Instructions - To allow technicians to update weapon system computers that monitor system capabilities regarding current S/TE configuration (including redundancies), health, and predicted minimum life, the IMIS shall
3.2.1.1.3.4.3-a	PER MAINT	Upload executable instructions pertaining to the configuration of the overall weapon system, subsystems, and components

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.3.4.3-b	PER MAINT	Reprogram/reconfigure weapon systems and their components by performing authorized data and embedded software uploads from load modules
3.2.1.1.3.4.3-c	PER MAINT	Upload executable instructions pertaining to the configuration of the S/TE as applicable
3.2.1.1.3.4.4	**PER MAINT**	**Support Exceptional Release - The IMIS shall**
3.2.1.1.3.4.4-a	PER MAINT	Present all the data (work orders) collected on a given aircraft for a given period of time, including identification of the maintenance personnel involved
3.2.1.1.3.4.4-b	PER MAINT	Authenticate the actual exceptional release by checking the special certification roster
3.2.1.1.3.4.4-c	**PER MAINT**	***Report the aircraft status change to "crew ready". Subsequent status changes, based on aircrew arrival, engines starting, aircraft taxiing, end-of-runway inspection, and takeoff, are also to be reported as they occur***
3.2.1.1.3.5	PER MAINT	Provide Technical Orders (TOs)
3.2.1.1.3.5.1	PER MAINT	TO Assembly - To support the assembly of TOs, the IMIS shall
3.2.1.1.3.5.1-a	PER MAINT	Sequence and present applicable TOs upon request
3.2.1.1.3.5.1-b	PER MAINT	Accept CALS Type B or Type C compatible data
3.2.1.1.3.5.1-c	PER MAINT	Reformat data as necessary for IMIS presentation
3.2.1.1.3.5.1-d	PER MAINT	Prepare and provide PMA memory or memory module loads of TO data subsets
3.2.1.1.3.5.1-e	PER MAINT	Query the technician for additional inputs to complete the selection when there is insufficient data in the IMIS for an assigned task
3.2.1.1.3.5.1-f	PER MAINT	Provide a means for the technician to augment the initial TO selection from internal files or to obtain additional procedures either on-line or through an interface with some means (e.g., extended memory module at the job site) of supplementing TO data loaded on the PMA
3.2.1.1.3.5.1-g	PER MAINT	Accept real-time updates of TOs in the MIW data base as they come from the TODO
3.2.1.1.3.5.1-h	PER MAINT	Provide a system of managing the currency of PMA data bases
3.2.1.1.3.5.1-i	PER MAINT	Provide access to all TOs available in JCALS for IMIS support of the maintenance of transient weapon systems; e.g., AMPLE GAINS
3.2.1.1.3.5.2	PER MAINT	Adaptation - To support the adaptation of TO data to conform to the specific situation, the IMIS shall
3.2.1.1.3.5.2-a	PER MAINT	Within limits of adaptation consistent with TO policies and procedures and as controlled by maintenance management, adapt TO data to the following
3.2.1.1.3.5.2-a.1	PER MAINT	Individual technician skill level (e.g., expert or novice)

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.3.5.2-a.2	PER MAINT	Weapon system configuration
3.2.1.1.3.5.2-a.3	PER MAINT	Discrepancy situation (e.g., relevant history, fault tree traversal)
3.2.1.1.3.5.2-b	PER MAINT	Provide more detail than the minimum established for a given skill level upon technician request
3.2.1.1.3.5.2-c	PER MAINT	Prevent inexperienced technicians from choosing displays of less detail than is appropriate for their skill level
3.2.1.1.3.5.3	PER MAINT	Presentation - The IMIS shall
3.2.1.1.3.5.3-a	PER MAINT	Present job-related information randomly accessed according to the technician's selection
3.2.1.1.3.5.3-b	PER MAINT	Display within the same TO instructions related data from other sources
3.2.1.1.3.5.3-c	PER MAINT	Allow technician to selectively view diagnostics, ABDR data, R & R instructions or repair data as appropriate to the task
3.2.1.1.3.5.3-d	PER MAINT	Reference and display local policy requirements (MOIs) and In-Process Inspections at appropriate locations in TO data
3.2.1.1.3.5.3-e	PER MAINT	Allow the user to bookmark a TO display for later retrieval to annotate change recommendations (AFTO Form 22s)
3.2.1.1.3.5.3-f	PER MAINT	Present TO warnings, cautions, and alerts at all levels of adaptation
3.2.1.1.3.5.3-g	PER MAINT	Provide the user with the option of choosing the extent to which lists of tools and other support data are presented
3.2.1.1.3.5.3-h	PER MAINT	Adapt display format to the type of presentation device used (i.e., both the MIW and PMA screens are able to display the same data)
3.2.1.1.3.5.3-i	PER MAINT	Track and record all steps and activities performed during a job as an assist to the technician and also to prevent repetition by other technicians to whom the task may be turned over before its completion
3.2.1.1.3.5.3-j	PER MAINT	Allow technician to print out the step-by-step procedures for a maintenance task while tech data is being displayed on or while connected to an MIW
3.2.1.1.3.5.4	PER MAINT	Accessing Classified Technical Orders - The IMIS shall
3.2.1.1.3.5.4-a	PER MAINT	Access classified TOs
3.2.1.1.3.5.4-b	PER MAINT	Monitor and change access codes for use of classified data
3.2.1.1.4	STAFF SUP	Maintenance Staff Support
3.2.1.1.4.1	STAFF SUP	Manage and Analyze Maintenance Requirements
3.2.1.1.4.1.1	STAFF SUP	Review Long-Term and Short-Term Planning - The IMIS shall

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.4.1.1-a	STAFF SUP	Overlay long- and short-term maintenance and mission requirements on current rotating maintenance plan
3.2.1.1.4.1.1-b	STAFF SUP	Analyze impacts of these changes on maintenance resources
3.2.1.1.4.1.1-c	STAFF SUP	Provide maintenance planners with selectable "what if" scenarios to help evaluate impacts
3.2.1.1.4.1.1-d	STAFF SUP	Interface with the Automated Scheduling Module
3.2.1.1.4.1.1-e	STAFF SUP	Review the Pilot Reporting Discrepancy planning requirement background program for additional sortie information
3.2.1.1.4.1.1-f	STAFF SUP	Review the Workable TCTO Report background program to determine long-range maintenance requirements
3.2.1.1.4.1.2	STAFF SUP	Develop Mobility Plan - To support the development of mobility plans, the IMIS shall
3.2.1.1.4.1.2-a	STAFF SUP	Generate a mobility and dispersal plan, as required, which includes evaluating and assigning appropriate unit resources
3.2.1.1.4.1.2-b	STAFF SUP	Provide a means of tagging specific resources to specific mobility or dispersal requirements
3.2.1.1.4.1.2-c	STAFF SUP	Support Wing plans for developing a mobility load plan, to include packing lists and sequence numbers
3.2.1.1.4.1.2-d	STAFF SUP	Maintain a Capability Assessment of Current Operations to include: recent site surveys, plan implementation checklists, squadron checklists, working papers, operational plans and unit supplements
3.2.1.1.4.1.3	**STAFF SUP**	**Develop Generation Plan - To support the development of a generation plan, the IMIS shall**
3.2.1.1.4.1.3-a	STAFF SUP	Support development of a local generation plan
3.2.1.1.4.1.3-b	STAFF SUP	Once the local generation plan has been approved and implemented, update line numbers according to current aircraft configurations and ETICs
3.2.1.1.4.1.3-c	STAFF SUP	Support design and adjustment of proposed changes required
3.2.1.1.4.1.3-d	STAFF SUP	Integrate proposed changes into the plan
3.2.1.1.4.1.3-e	**STAFF SUP**	**Present to Production Managers an aircraft generation sequence action (per AF Form 2409) schedule to track aircraft in the generation process††**
3.2.1.1.4.1.3-f	**STAFF SUP**	**Save the results of the aircraft generation, including aircraft tail numbers, tasks performed, and actual start and completion time**
3.2.1.1.4.1.3-g	STAFF SUP	Upon request, provide the following to maintenance planners for review
3.2.1.1.4.1.3-g.1	STAFF SUP	Mission requirements (Design Operational Capability)
3.2.1.1.4.1.3-g.2	STAFF SUP	Personnel authorizations and assignments

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3.2.1.1.4.1.3-g.3	STAFF SUP	Facility and S/TE authorizations and assignments
3.2.1.1.4.1.3-h	STAFF SUP	Maintain all HHQ/Wing operational plans requiring support from the maintenance complex
3.2.1.1.4.1.4	**STAFF SUP**	**Support MOIs - To support the development and display of MOIs, the IMIS shall**
3.2.1.1.4.1.4-a	**STAFF SUP**	**Display appropriate MOIs to support necessary maintenance operations and changes†**
3.2.1.1.4.1.4-b	STAFF SUP	Display a title and MOI number that can be sorted, grouped, and selected
3.2.1.1.4.1.4-c	STAFF SUP	Use the text editor capability to support MOI development and updates
3.2.1.1.4.2	STAFF SUP	Provide Information to the Maintenance Complex
3.2.1.1.4.2.1	STAFF SUP	Analyze Maintenance Data - To support the analysis of maintenance data, the IMIS shall
3.2.1.1.4.2.1-a	STAFF SUP	Perform studies to identify possible trends in the maintenance complex
3.2.1.1.4.2.1-b	STAFF SUP	Track possible "bad actors" using tracking being tested under Pacer Actor and "high burner" items
3.2.1.1.4.2.1-c	STAFF SUP	Report identified "bad actors"
3.2.1.1.4.2.1-d	STAFF SUP	Provide trend data to QA
3.2.1.1.4.2.1-e	STAFF SUP	Monitor and report performance that is above predetermined upper control limits and below lower control limits to the Analysis Section
3.2.1.1.4.2.1-f	STAFF SUP	Provide analysis of referrals to solve major problems
3.2.1.1.4.2.1-g	STAFF SUP	Open a maintenance analysis referral (Form 2422) to initiate the referral report
3.2.1.1.4.2.1-h	STAFF SUP	Perform analysis which can be used to improve S/TE usage
3.2.1.1.4.2.1-i	STAFF SUP	Analyze the performance of selected systems, subsystems and components (LRUs) to determine problems affecting the mission of the unit
3.2.1.1.4.2.2	STAFF SUP	Improve Aspects of Maintenance - To improve aspects of the maintenance process, the IMIS shall
3.2.1.1.4.2.2-a	STAFF SUP	Review the following information that may show poor troubleshooting, inadequate repair, or other deficiencies
3.2.1.1.4.2.2-a.1	STAFF SUP	Analysis studies
3.2.1.1.4.2.2-a.2	STAFF SUP	Deferred discrepancy files and lists
3.2.1.1.4.2.2-a.3	STAFF SUP	Document files
3.2.1.1.4.2.2-a.4	STAFF SUP	Debriefing forms
3.2.1.1.4.2.2-a.5	STAFF SUP	Training data
3.2.1.1.4.2.2-b	STAFF SUP	Analyze the performance of selected systems, subsystems, components, and TMDE to identify technical problems that may affect the mission or capabilities of the unit

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.4.2.2-c	STAFF SUP	Recommend improvements relating to:
3.2.1.1.4.2.2-c.1	STAFF SUP	S/TE use
3.2.1.1.4.2.2-c.2	STAFF SUP	Inspection frequency
3.2.1.1.4.2.2-c.3	STAFF SUP	Maintenance procedures
3.2.1.1.4.2.2-c.4	STAFF SUP	Training
3.2.1.1.4.2.2-c.5	STAFF SUP	Manpower
3.2.1.1.4.2.2-c.6	STAFF SUP	System reliability and maintainability
3.2.1.1.4.2.2-c.7	STAFF SUP	Base repair and Intermediate Repair Enhancement Program
3.2.1.1.4.2.2-d	STAFF SUP	By analyzing maintenance data (including manning, unit capabilities, scheduling conflicts, and resource requirements), propose and present additions to the In-Process Inspection listing to Production Managers
3.2.1.1.4.2.2-e	STAFF SUP	Evaluate deviations from the maintenance plan to identify possible system problems
3.2.1.1.4.2.3	STAFF SUP	Utilize Models of the Maintenance Process for Analysis - To use maintenance models for analysis, the IMIS shall
3.2.1.1.4.2.3-a	STAFF SUP	Include an analysis capability that is based on an as yet unspecified model of the maintenance process along with an associated simulation capability
3.2.1.1.4.2.3-b	STAFF SUP	Display a model which depicts the On-Equipment, Off-Equipment, and staff functions of the maintenance environment
3.2.1.1.4.2.3-c	STAFF SUP	Graphically present model for management review
3.2.1.1.4.2.3-d	STAFF SUP	Allow the user to traverse the model by either using a list of all diagrams or by moving from parent to child or vice versa
3.2.1.1.4.2.3-e	STAFF SUP	Allow user to select items from model diagram
3.2.1.1.4.2.3-f	STAFF SUP	Display pertinent data on items selected, such as data elements, data source and sink information, or personnel involved
3.2.1.1.4.2.3-g	STAFF SUP	Support scenarios that can be used to move throughout the model and that will be used to drive the simulation
3.2.1.1.4.2.3-h	STAFF SUP	Include a performance data base that will be used to drive simulations of aspects of the maintenance organization
3.2.1.1.4.2.3-i	STAFF SUP	Allow users to modify these data bases so that specific "what-if" scenarios can be evaluated
3.2.1.1.4.2.4	STAFF SUP	Analyze Aircraft Utilization - In conjunction with the Operations Group and Logistic Group , the IMIS shall
3.2.1.1.4.2.4-a	STAFF SUP	Assess the following for input to the utilization rate:
3.2.1.1.4.2.4-a.1	STAFF SUP	S/TE
3.2.1.1.4.2.4-a.2	STAFF SUP	Personnel capabilities
3.2.1.1.4.2.4-a.3	STAFF SUP	Projected airframe assets
3.2.1.1.4.2.4-a.4	STAFF SUP	Previous flying/maintenance schedules

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.4.2.4-a.5	STAFF SUP	Aircraft configurations
3.2.1.1.4.2.4-a.6	STAFF SUP	Launch and recovery patterns
3.2.1.1.4.2.4-b	STAFF SUP	Input this data in the UTE rate planning process annually and as indicated by the Operations Group or Logistics Group Commanders
3.2.1.1.4.2.4-c	STAFF SUP	Compare this utilization rate with the utilization rate obtained from BLMAS
3.2.1.1.4.2.4-d	STAFF SUP	Identify problems encountered, as necessary
3.2.1.1.4.2.4-e	STAFF SUP	Recommend reallocation of hours or resources to the Fighter Squadrons or Shops, as necessary
3.2.1.1.4.2.5	STAFF SUP	Evaluate Schedule Effectiveness - To evaluate the effectiveness of the maintenance schedules, the IMIS shall
3.2.1.1.4.2.5-a	STAFF SUP	Present maintenance scheduling effectiveness reports that indicate how well the maintenance schedule was followed
3.2.1.1.4.2.5-b	STAFF SUP	Obtain and justify the schedule effectiveness generated by BLMAS
3.2.1.1.4.2.5-c	STAFF SUP	Evaluate deviations from the maintenance plan
3.2.1.1.4.2.6	STAFF SUP	Managers Information Aid - To support the managers' need for information from external data bases, the IMIS shall
3.2.1.1.4.2.6-a	STAFF SUP	Display the products of external systems that perform analysis
3.2.1.1.4.2.6-b	STAFF SUP	Draw data from these systems and perform the analysis internally
3.2.1.1.4.2.7	STAFF SUP	Higher Level Reporting - The IMIS shall
3.2.1.1.4.2.7-a	STAFF SUP	Summarize and format data needed for HHQ reporting and local reports
3.2.1.1.4.2.7-b	STAFF SUP	Continuously monitor status of HHQ identified critical resource LIMFACs and compare those resources to pre-identified standards
3.2.1.1.4.2.7-c	STAFF SUP	Identify potential problems (based on criteria defined by the Operations Group or Logistics Group Commanders) and report these to appropriate agencies
3.2.1.1.4.2.7-d	STAFF SUP	If the unit goes under pre-established HHQ/Wing standards, format and forward the necessary reports to the Operations and/or Logistics Group Commanders for approval and subsequent reporting to HHQ
3.2.1.1.4.2.7-e	STAFF SUP	Retrieve maintenance data and generate quality charts and reports upon request
3.2.1.1.4.2.7-f	STAFF SUP	Compile the information for presentation to Production Managers, squadron managers, the Group Commanders, and the Wing Commander
3.2.1.1.4.2.7-g	STAFF SUP	Provide various predeveloped layout templates to accommodate standard briefings

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.4.2.7-h	STAFF SUP	Establish custom layouts for briefing materials to accommodate the needs and desires of individual managers
3.2.1.1.4.2.7-i	STAFF SUP	When prompted by the user, supply the required data to the specified layout
3.2.1.1.4.2.7-j	STAFF SUP	Establish packages of briefing materials that can be generated for a given periodic meeting upon request
3.2.1.1.4.2.7-k	STAFF SUP	Present these materials in various formats such as paper or viewgraph form or on-line via an interface to a large screen or projector device
3.2.1.1.4.3	STAFF SUP	Regulate and Improve Maintenance Operations
3.2.1.1.4.3.1	STAFF SUP	Quality Support Office
3.2.1.1.4.3.1-a	STAFF SUP	To support the Functional Check Flight program, the IMIS shall
3.2.1.1.4.3.1-a.1	STAFF SUP	Facilitate functional check flights by alerting QA personnel when such flights are to be performed
3.2.1.1.4.3.1-a.2	STAFF SUP	Present all AFTO Form 781A information pertaining to the maintenance that was performed requiring that the FCF be flown
3.2.1.1.4.3.1-a.3	STAFF SUP	Collect administration information from check flight
3.2.1.1.4.3.1-a.4	STAFF SUP	Maintain the data required on AF Form 2400/AETC Form 203 (Functional Check Flight Log)
3.2.1.1.4.3.1-a.5	STAFF SUP	Present an aircraft mission profile
3.2.1.1.4.3.1-a.6	STAFF SUP	Present an FCF Checklist for QA personnel to support the flight
3.2.1.1.4.3.1-b	STAFF SUP	To support the weight and balance program, the IMIS shall
3.2.1.1.4.3.1-b.1	STAFF SUP	Perform the recalculation of the weight and balance upon weapon system reconfiguration
3.2.1.1.4.3.1-b.2	STAFF SUP	Alert QA personnel to situations where center-of-gravity limits are about to be exceeded
3.2.1.1.4.3.1-b.3	STAFF SUP	Present all TCTOs and aircraft modification information to QA personnel for analysis
3.2.1.1.4.3.1-c	STAFF SUP	To support material deficiency reporting and the review of failure trends, the IMIS shall
3.2.1.1.4.3.1-c.1	STAFF SUP	Categorize and analyze information used by the QA personnel to determine the underlying causes of poor maintenance
3.2.1.1.4.3.1-c.2	STAFF SUP	Identify, access, and analyze faulty TO or diagnostic routines upon QA personnel request
3.2.1.1.4.3.1-c.3	STAFF SUP	Identify and display remedial or corrective actions
3.2.1.1.4.3.1-c.4	STAFF SUP	Forward recommendations for changes to TOs through JCALS
3.2.1.1.4.3.1-c.5	STAFF SUP	Support accounting, delivery, and responses for material deficiency reporting

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3.2.1.1.4.3.1-c.6	STAFF SUP	Review debriefing forms and aircraft abort information to assist in the identification of problem aircraft or systems/subsystems
3.2.1.1.4.3.1-c.7	STAFF SUP	Review deferred discrepancy lists for technical errors or negative trends
3.2.1.1.4.3.1-c.8	STAFF SUP	Review repeat and recurring discrepancy lists for problems
3.2.1.1.4.3.1-c.9	STAFF SUP	Support QA personnel in the inspection of maintenance that has been performed, including the presentation of inspection steps and the collection of QA inspection data
3.2.1.1.4.3.1-d	STAFF SUP	To support Quality Maintenance Evaluation Program (QMEP) evaluations, the IMIS shall
3.2.1.1.4.3.1-d.1	STAFF SUP	Support the following QA evaluations, inspections and observation activities:
3.2.1.1.4.3.1-d.1.a	STAFF SUP	Personnel Evaluations
3.2.1.1.4.3.1-d.1.a)1	STAFF SUP	Quality Process Evaluation (QPE)
3.2.1.1.4.3.1-d.1.a)2	STAFF SUP	Evaluator Proficiency Evaluation (EPE)
3.2.1.1.4.3.1-d.1.b	STAFF SUP	Inspections
3.2.1.1.4.3.1-d.1.b)1	STAFF SUP	Management Inspection (MI)
3.2.1.1.4.3.1-d.1.b)2	STAFF SUP	Special Inspection (SI)
3.2.1.1.4.3.1-d.1.b)3	STAFF SUP	Document File Inspection
3.2.1.1.4.3.1-d.1.b)4	STAFF SUP	Aircraft Acceptance Inspection
3.2.1.1.4.3.1-d.1.b)5	STAFF SUP	Task Follow-up Inspection
3.2.1.1.4.3.1-d.1.c	STAFF SUP	Observations
3.2.1.1.4.3.1-d.1.c)1	STAFF SUP	Detected Safety Violation (DSV)
3.2.1.1.4.3.1-d.1.c)2	STAFF SUP	Technical Data Violation (TDV)
3.2.1.1.4.3.1-d.1.c)3	STAFF SUP	Unsatisfactory Condition Report (UCR)
3.2.1.1.4.3.1-d.2	STAFF SUP	For each individual, determine the evaluation frequency and type
3.2.1.1.4.3.1-d.3	STAFF SUP	Allow the inspector to approve or disapprove the IMIS-determined selection and permit selection of another inspection type
3.2.1.1.4.3.1-d.4	STAFF SUP	Present the appropriate technical data to be used by the inspector during the performance of each inspection
3.2.1.1.4.3.1-d.5	STAFF SUP	Save the results of the inspection
3.2.1.1.4.3.1-d.6	STAFF SUP	Maintain a trace of every step in the instructions that was performed, including the time of start and completion
3.2.1.1.4.3.1-d.7	STAFF SUP	Record the technician's name or employee number
3.2.1.1.4.3.1-d.8	STAFF SUP	Allow inspector to review the results
3.2.1.1.4.3.1-d.9	STAFF SUP	Allow inspector to sign off the evaluation form (ACC Form 30, Maintenance Evaluation/ Inspection)
3.2.1.1.4.3.1-d.10	STAFF SUP	Verify sign-off authority of the inspector

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3.2.1.1.4.3.1-d.11	STAFF SUP	Prevent unauthorized sign-off
3.2.1.1.4.3.1-e	STAFF SUP	To support certification and decertification after personnel evaluations are performed, the IMIS shall
3.2.1.1.4.3.1-e.1	STAFF SUP	Assist in the review and update of an individual's training records (AF Form 623, On-the-Job Training (OJT) record and AF Form 797, Job Qualification Standard)
3.2.1.1.4.3.1-e.2	STAFF SUP	Determine whether the individual is considered qualified or decertified (not qualified)
3.2.1.1.4.3.1-e.3	STAFF SUP	Present the results to the QA personnel for verification
3.2.1.1.4.3.1-e.4	STAFF SUP	Analyze the results of personnel evaluations and report maintenance steps that require possible changes in training techniques
3.2.1.1.4.3.1-e.5	STAFF SUP	Analyze the results of personnel evaluations and report maintenance steps that require possible changes in training techniques
3.2.1.1.4.3.1-e.6	STAFF SUP	Update the appropriate external system(s) with training, evaluation, and certification results
3.2.1.1.4.3.1-e.7	STAFF SUP	Interface with the Quality Maintenance Evaluation Program (QMEP) to track personnel evaluations
3.2.1.1.4.3.1-e.8	STAFF SUP	Interface with Quality Assurance Tracking and Trend Analysis System (QANTTAS) to review personnel evaluations
3.2.1.1.4.3.1-f	STAFF SUP	To support the management of TOs, the IMIS shall
3.2.1.1.4.3.1-f.1	STAFF SUP	Support base-level TO activities for the maintenance organization
3.2.1.1.4.3.1-f.2	STAFF SUP	Interface with base-level JCALS functions
3.2.1.1.4.3.1-f.3	STAFF SUP	Provide the necessary data and support to assist in command certification (TO Verification) of appropriate TO procedures
3.2.1.1.4.3.1-f.4	STAFF SUP	Provide a means of initiating required changes to TOs, presently on AFTO Form 22
3.2.1.1.4.3.1-f.5	STAFF SUP	Provide a means of tracking status of these changes
3.2.1.1.4.3.1-f.6	STAFF SUP	Provide record keeping and reporting on compliance with TCTO data
3.2.1.1.4.3.1-f.7	STAFF SUP	Keep records on manual (paper) data assigned to base accounts
3.2.1.1.4.3.1-f.8	STAFF SUP	Perform other TODO functions as determined by Major Command and local policies
3.2.1.1.4.3.1-f.9	STAFF SUP	Update the IMIS-owned data files to provide a near real-time currency for operation in the absence of a JCALS interface

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.4.3.1-f.10	STAFF SUP	Generate the "usage profiles" (required by JCALS Central Administration), including an association of the required TOs for a specific weapon segment or system, and which transfer medium will be required for those TOs
3.2.1.1.4.3.1-f.11	STAFF SUP	Track all One-Time Inspections data, to include estimated manhours to accomplish the inspection, a required completion date, and reporting instructions
3.2.1.1.4.3.1-f.12	STAFF SUP	Maintain all Modification Proposals presently on the AF Form 1067 (Modified Proposal)
3.2.1.1.4.3.2	STAFF SUP	Programs Section - To support this function, the IMIS shall
3.2.1.1.4.3.2-a	STAFF SUP	Provide administrative support to maintain data on the following:
3.2.1.1.4.3.2-a.1	STAFF SUP	Personnel authorizations
3.2.1.1.4.3.2-a.2	STAFF SUP	Personnel assignments
3.2.1.1.4.3.2-a.3	STAFF SUP	Maintenance personnel utilization
3.2.1.1.4.3.2-a.4	STAFF SUP	S/TE utilization
3.2.1.1.4.3.2-a.5	STAFF SUP	Facilities utilization
3.2.1.1.4.3.2-a.6	STAFF SUP	Vehicle Utilization
3.2.1.1.4.3.2-b	STAFF SUP	Prepare financial requirements for inclusion in base financial plan, budget estimates, and operating budget
3.2.1.1.4.3.2-c	STAFF SUP	Provide analysis and "what if" simulation capability to programs and mobility to support evaluation of new and changing mission requirements
3.2.1.1.4.3.3	STAFF SUP	Maintenance Operations Center - The IMIS shall
3.2.1.1.4.3.3-a	STAFF SUP	Store HHQ and depot requirements, including:
3.2.1.1.4.3.3-a.1	STAFF SUP	TCTOs
3.2.1.1.4.3.3-a.2	STAFF SUP	Time changes
3.2.1.1.4.3.3-a.3	STAFF SUP	Programmed Depot Maintenance
3.2.1.1.4.3.3-a.4	STAFF SUP	Warranty Program
3.2.1.1.4.3.3-a.5	STAFF SUP	One Time Inspection requirements
3.2.1.1.4.3.3-a.6	STAFF SUP	Hangar Queen Program status
3.2.1.1.4.3.3-a.7	STAFF SUP	Monitor Alert Force
3.2.1.1.4.3.3-a.8	STAFF SUP	Track ECM and Sensor Pods
3.2.1.1.4.3.3-a.9	STAFF SUP	Aircraft authorizations and assignment
3.2.1.1.4.3.3-b	STAFF SUP	Schedule HHQ and depot requirements in the rotating schedule
3.2.1.1.4.3.3-c	STAFF SUP	Interface with SBSS for TCTOs and time changes to perform the following:
3.2.1.1.4.3.3-c.1	STAFF SUP	Order appropriate kits and parts
3.2.1.1.4.3.3-c.2	STAFF SUP	Monitor their estimated delivery dates of parts
3.2.1.1.4.3.3-c.3	STAFF SUP	Schedule their installation
3.2.1.1.4.3.3-d	STAFF SUP	Monitor time change serial-number-controlled items

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3.2.1.1.4.3.3-e	STAFF SUP	Maintain and display the status and location of all aircraft on station, maintained or supported by the wing.
3.2.1.1.4.3.3-f	STAFF SUP	Present aircraft ETIC to support Production Managers
3.2.1.1.4.3.3-g	STAFF SUP	Update data in real time, with the updated items highlighted until acknowledgment is received
3.2.1.1.4.3.3-h	STAFF SUP	Interface via an MIW display screen or a large screen display that may replace the MOC aircraft status boards
3.2.1.1.4.3.3-i	STAFF SUP	Monitor/schedule munitions delivery priorities with flying squadrons and munitions maintenance activities
3.2.1.1.4.3.3-j	STAFF SUP	Include a "template" for a MOC aircraft status board containing a standard set of data items
3.2.1.1.4.3.3-k	STAFF SUP	Maintain information to support aircraft maintenance nontactical radio program for the Operations and Logistic groups
3.2.1.1.4.3.3-l	STAFF SUP	Monitor the progress of aircraft Functional Check Flight program to support the maintenance program
3.2.1.1.4.3.3-m	**STAFF SUP**	***Display all changes to the weekly/daily flying and maintenance schedules***
3.2.1.1.4.3.3-n	STAFF SUP	Display/track the status of all AGE designated as mission critical
3.2.1.1.4.3.3-o	**STAFF SUP**	**Monitor and display severe weather warnings/emergency messages to appropriate personnel††**
3.2.1.1.4.3.3-p	**STAFF SUP**	**Display procedural checklists to support massloads, combat turnarounds, Broken Arrows, aircraft crashes, flightline fires, severe weather warnings and evacuation procedures††**
3.2.1.1.4.3.3-q	STAFF SUP	Monitor and track Logistic Group Maintenance Squadron specialists working on aircraft scheduled maintenance requirements
3.2.1.1.4.3.3-r	STAFF SUP	Monitor and track Selected Generation Aircraft (SGA) required to support EWO or contingency commitments
3.2.1.1.4.3.3-s	STAFF SUP	Track transient aircraft status and configuration
3.2.1.1.5	TRAINING	Maintenance Training
3.2.1.1.5.1	**TRAINING**	**Familiarization Training**
3.2.1.1.5.1.1	**TRAINING**	**IMIS Familiarization - The IMIS shall**
3.2.1.1.5.1.1-a	**TRAINING**	**Provide familiarization training in the use of IMIS to perform maintenance tasks†**
3.2.1.1.5.1.1-b	**TRAINING**	**Include on-line Computer-Aided Instruction (CAI) pertaining to the operation of all segments of the IMIS†**
3.2.1.1.5.1.1-c	**TRAINING**	**Appropriately tailor CAI to accommodate the individual needs of the technicians†**
3.2.1.1.5.1.1-d	**TRAINING**	**Include, at a minimum, the following in IMIS familiarization training:**

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3.2.1.1.5.1.1-d.1	**TRAINING**	**Overview information on the IMIS†**
3.2.1.1.5.1.1-d.2	**TRAINING**	**Hardware and software information†**
3.2.1.1.5.1.1-d.3	**TRAINING**	**Tutorials on how to operate the IMIS†**
3.2.1.1.5.1.1-e	**TRAINING**	**Provide context-sensitive on-line help instructions in the use of the IMIS†**
3.2.1.1.5.1.2	TRAINING	Maintenance Familiarization
3.2.1.1.5.1.2-a	TRAINING	The IMIS shall provide the following standard training capabilities:
3.2.1.1.5.1.2-a.1	TRAINING	Facilitate technicians' practice of maintenance actions/tasks with the tool (the IMIS) to be used in the performance of the actual maintenance tasks
3.2.1.1.5.1.2-a.2	TRAINING	Obtain training courses/packages from other systems, to ensure that compatibility and control over the overall maintenance training program is kept at the appropriate level
3.2.1.1.5.1.2-a.3	TRAINING	Appropriately tailor computer assisted instruction to accommodate the individual needs of the technicians
3.2.1.1.5.1.2-a.4	TRAINING	Allow training to be scored or unscored
3.2.1.1.5.1.2-a.5	TRAINING	Provide an option to automatically log transactions performed as part of training familiarization
3.2.1.1.5.1.2-b	TRAINING	The IMIS shall provide the following capabilities for the use of the implemented maintenance model during training:
3.2.1.1.5.1.2-b.1	TRAINING	Include a training capability based on the model of the maintenance process
3.2.1.1.5.1.2-b.2	TRAINING	Depict, through the model, the following maintenance environment functions:
3.2.1.1.5.1.2-b.2.a	TRAINING	On-Equipment functions
3.2.1.1.5.1.2-b.2.b	TRAINING	Off-Equipment functions
3.2.1.1.5.1.2-b.2.c	TRAINING	Staff functions
3.2.1.1.5.1.2-b.3	TRAINING	Graphically present the model for user review
3.2.1.1.5.1.2-b.4	TRAINING	Allow the user to traverse the model either by using a list of all diagrams or by moving from parent to child or vice versa
3.2.1.1.5.1.2-b.5	TRAINING	Allow user to select items from a model diagram
3.2.1.1.5.1.2-b.6	TRAINING	Display pertinent data for a selected item, including the following:
3.2.1.1.5.1.2-b.6.a	TRAINING	Narrative of the maintenance tasks involved
3.2.1.1.5.1.2-b.6.b	TRAINING	Data elements
3.2.1.1.5.1.2-b.6.c	TRAINING	Data source information
3.2.1.1.5.1.2-b.6.d	TRAINING	Data sink information
3.2.1.1.5.1.2-b.6.e	TRAINING	Personnel involved
3.2.1.1.5.1.2-b.7	TRAINING	Include a set of scenarios that can be used to move throughout the model

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†† identifies items in which the expediter requires quickest access possible in IMIS

PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.5.1.2-b.8	TRAINING	Instruct the technicians by using the scenarios to simulate given situations and the data base to highlight what must be done in those situations
3.2.1.1.5.1.2-b.9	TRAINING	Facilitate a testing cycle using these scenarios
3.2.1.1.5.1.2-b.10	TRAINING	Highlight parts of the model
3.2.1.1.5.1.2-b.11	TRAINING	Display a number of multiple choice questions to be answered by the trainee
3.2.1.1.5.1.2-b.12	TRAINING	Score each session
3.2.1.1.5.1.2-b.13	TRAINING	Track the score from session to session.
3.2.1.1.5.1.2-b.14	TRAINING	Allow instructors to modify and add to the scenarios and information data bases to set up tailored training sessions
3.2.1.1.5.2	TRAINING	Simulation Control
3.2.1.1.5.2.1	TRAINING	Source of Simulations - The IMIS shall
3.2.1.1.5.2.1-a	TRAINING	Upon request initiate selected simulations obtained from external sources or maintained internal to IMIS
3.2.1.1.5.2.1-b	TRAINING	Accommodate the development of instructor-defined maintenance training simulations, using appropriate tools and functions, so that technicians can learn new weapon systems and practice maintenance of existing weapon systems in an integrated environment of animated graphic models, interactive video displays, and audio presentations
3.2.1.1.5.2.2	TRAINING	Freeze Frame - The simulation function shall include the ability to
3.2.1.1.5.2.2-a	TRAINING	Stop the action/scenario (freeze frame) at any given point
3.2.1.1.5.2.2-b	TRAINING	Restart the scenario at predefined points, including the point of the freeze frame
3.2.1.1.5.2.3	TRAINING	Scoring On/Off - The IMIS shall allow this training to be both scored and unscored
3.2.1.1.5.2.4	TRAINING	Logging - The IMIS shall include an option that will automatically log maintenance tasks performed as part of training simulations
3.2.1.1.5.3	TRAINING	Mock-Up and OJT
3.2.1.1.5.3.1	TRAINING	Develop Training Scenarios - The IMIS shall
3.2.1.1.5.3.1-a	TRAINING	Obtain from external sources situations and scenarios to be used for training on mockups.
3.2.1.1.5.3.1-b	TRAINING	Accept maintenance instructor commands to build tailored scenarios for the purpose of facilitating the development of situations and scenarios used for training on mockups
3.2.1.1.5.3.1-c	TRAINING	Record real maintenance repair situations for use as scenarios
3.2.1.1.5.3.2	TRAINING	Logging of Mock-Up/OJT - The IMIS shall

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.5.3.2-a	TRAINING	Automatically log transactions performed on a mockup or actual OJT
3.2.1.1.5.3.2-b	TRAINING	Allow this logging capability to be enabled or disabled by Production Managers and Training personnel as desired
3.2.1.1.5.3.2-c	TRAINING	Track progress of individuals who are in upgrade and task qualification training
3.2.1.1.5.3.2-d	TRAINING	Assist trainers in their proficiency training
3.2.1.1.5.3.2-e	TRAINING	Upon completion of the current training session, perform one of the following:
3.2.1.1.5.3.2-e.1	TRAINING	Recommend recurring training, if necessary
3.2.1.1.5.3.2-e.2	TRAINING	Provide additional training, if necessary
3.2.1.1.5.3.2-e.3	TRAINING	Proceed to the next appropriate level of training
3.2.1.1.5.3.2-f	TRAINING	Analyze the results of all personnel evaluations conducted by QA and display the areas that indicate the need for possible changes in training techniques
3.2.1.1.5.4	TRAINING	Training Support
3.2.1.1.5.4.1	TRAINING	Administration Assistance - The IMIS shall
3.2.1.1.5.4.1-a	TRAINING	Assist in developing work center Qualification and Training Plans
3.2.1.1.5.4.1-b	TRAINING	Identify areas requiring additional training for each work center
3.2.1.1.5.4.1-c	TRAINING	Record results of training sessions and simulations for the purpose of grading to assess knowledge gained and for discussion between technicians and instructors
3.2.1.1.5.4.1-d	TRAINING	Perform training task planning
3.2.1.1.5.4.1-e	TRAINING	Identify additional training required for less experienced personnel, based on supervisor or instructor inputs
3.2.1.1.5.4.1-f	TRAINING	Display ongoing simulations, mockup sessions, OJT session activities in real time
3.2.1.1.5.4.1-g	TRAINING	Provide the capability for instructor development and enhancement of simulation and scenario conditions used in mockup training in a batch manner
3.2.1.1.5.4.1-h	TRAINING	Display and schedule all formal and ancillary training, based upon an analysis of the entire maintenance operation and the work center training requirements
3.2.1.1.5.4.1-i	TRAINING	Include, as appropriate, intelligent training capabilities that tailor CAI to fit requirements of technicians and work centers
3.2.1.1.5.4.1-j	TRAINING	Track all Cross-Utilization Training (CUT)
3.2.1.1.5.4.1-k	TRAINING	Identify shortfalls in CUT
3.2.1.1.5.4.1-l	TRAINING	Provide and display maintenance training forms for updating training records at the training site
3.2.1.1.5.4.1-m	TRAINING	Display different types of in-depth training schematics for troubleshooting procedures

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PARAGRAPH	MODE	REQUIREMENT
3.2.1.1.5.4.1-n	TRAINING	Maintain Enlisted Speciality Training and Aircraft Maintenance Qualification Programs to support both Logistics and Operations Groups
3.2.1.1.5.4.1-o	TRAINING	Assist in the development and tracking of the Special Qualifications Programs
3.2.1.1.5.4.1-p	TRAINING	Track/schedule the following courses to support training maintenance personnel
3.2.1.1.5.4.1-p.1.	TRAINING	Field Training Detachment Courses
3.2.1.1.5.4.1-p.2.	TRAINING	All individual Proficiency Training
3.2.1.1.5.4.1-p.3.	TRAINING	Familiarization Training
3.2.1.1.5.4.1-q	TRAINING	The IMIS will have the capability to print all Training Schedules
3.2.1.1.5.4.1-r	TRAINING	Assist instructors with the development of training courses
3.2.1.1.5.4.1-s	TRAINING	Track Certified Technician/Master Technician Qualification training
3.2.1.1.5.4.2	TRAINING	Scoring Assistance - The IMIS shall
3.2.1.1.5.4.2-a	TRAINING	Score multiple choice tests by comparing technician's responses to the correct answers
3.2.1.1.5.4.2-b	TRAINING	Use data accumulated from the previously determined levels of training to identify strengths and weaknesses in the technician's procedures
3.2.1.1.5.4.2-c	TRAINING	Compare scores of a given training section to task qualification requirements in order to assess technician levels and recommend task qualification
3.2.1.1.5.4.2-d	TRAINING	Compile scoring results and other pertinent information (technician's name, AFSC, Work Center)
3.2.1.1.5.4.2-d.1	TRAINING	For internal storage
3.2.1.1.5.4.2-d.2	TRAINING	For transmission to the appropriate external system

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APPENDIX B: LIST OF ACRONYMS

ACCI	Air Combat Command Instruction
AETC	Air Education and Training Command
AFSC	Air Force Specialty Code
AFTO	Air Force Technical Order
AIP	Aircraft Interface Panel
AL	Armstrong Laboratory
ATF	Advanced Tactical Fighter
CAMS	Core Automated Maintenance System
CEMS	Centralized Engine Management System
GUI	Graphical User Interface
HCI	Human Computer Interface
IMIS	Integrated Maintenance Information System
JCALS	Joint Computer Aided Logistics Support
LAN	Local Area Network
MIW	Maintenance Information Workstation
MOC	Maintenance Operations Center
MOMIW	Mobile Maintenance Information Workstation
NUD•IST	Non-numerical, Unstructured Data, Indexing, Searching, and Theorizing
PMA	Portable Maintenance Aid
RF	Radio Frequency
SSS	System/Segment Specification
TAC	Tactical Air Command
USAFE	United States Air Forces-Europe

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The Integrated Maintenance Information System (IMIS) concept design includes the addition of management tools to access IMIS databases and provide communication capabilities between flightline technicians and supervisors. Armstrong Laboratory has developed a portable maintenance aid for technicians, and sponsored this research to investigate the requirements for a computer–based tool for the expediter. The basic hardware and software requirements document for IMIS, the System/Segment Specification (SSS), contains task information that closely corresponds to the expediter job description as defined in Air Combat Command Instruction 21-166. This research compiled a list of information requirements for the expediter from the IMIS SSS and analyzed the resulting information using subjective evaluation and theoretical foundations in linguistics. The results support the notion that the expediter is often an intermediary to maintenance information. The recommendations focused on freeing the expediter to do more important tasks by re–engineering the information flow in IMIS, which could result in significant workload reductions for the expediter with proper design of the information processes in an IMIS context.

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