

**United States Military Academy
West Point, New York 10996**

**A DATA WAREHOUSE TO SUPPORT
CONDITION BASED MAINTENANCE (CBM)**

**OPERATIONS RESEARCH CENTER OF EXCELLENCE
TECHNICAL REPORT DSE-TR-0509
DTIC #: ADA434357**

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May 2005

The Operations Research Center is supported by the Assistant Secretary of the Army
(Financial Management & Comptroller)

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Abstract

The United States Army's legacy maintenance strategy for its helicopter fleet is centered on replacing and repairing components based on aircraft hours flown. This strategy overlooks how variations in environmental conditions, component stresses, and other exogenous factors effect the lifetime of specific components across the entire fleet of Army Aviation Aircraft. This report describes the design and implementation of a data warehouse that subsumes many disparate databases currently housing information about these factors. This data warehouse supports a common synchronized "maintenance picture" that includes state, health, usage, and logistics data for any component on any helicopter in the fleet. This view enables researchers and planners to individually manage component maintenance according to a "condition based" policy. This report discusses a systems engineering approach to creating a data warehouse including logical and physical designs, data management strategies, and an implementation plan. Discussion is also included detailing how the warehouse might be adopted for conditioned-based maintenance of all Army systems.

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1. Introduction

1.1 Background

The United State Army's current maintenance regimen for its fleet of helicopters consists of two main components – scheduled maintenance activities and unscheduled maintenance activities. Scheduled maintenance activities are largely preventive, and involve periodic inspection, servicing, replacement and overhaul of various aircraft components. These scheduled maintenance actions are managed in large part according to how long a particular component has operated (measured in aircraft hours flown).

Unscheduled maintenance activities consist of actions taken to correct unplanned faults and failures. Many unscheduled maintenance actions occur as a result of scheduled maintenance actions, though some are reported as degraded system performance by the helicopter's crew.

Arguably, this maintenance system has fared well for decades in maintaining a safe and ready aviation fleet. In a five year period, just one in five Army Aviation accidents was attributable to component failure [1]. However, many believe the advent of sophisticated on-board health monitoring systems and modern data collection capabilities has prompted for a redesign of the current maintenance system.

Potential improvements lie in overhauling sweeping assumptions that the legacy maintenance system makes about how components wear. Current maintenance models presume that a component's condition is mainly a function of age, and ignore such exogenous factors as environmental conditions, how the aircraft flies (usage), manufacturing variances, or preventive maintenance history.

The Army's time-based approach to component aging is incredibly wasteful given the high degree of variance inherent in the operation of Army aircraft. For example, a transmission flown at a quadruple operations tempo in a desert environment at maximum gross aircraft weight is maintained the same as a transmission flown under light load conditions at a training facility in the Southeast United States. Treating such components with a universal maintenance model can lead to premature and superfluous maintenance actions and waste money, materials, and time.

The Army is considering transitioning its existing maintenance management regimen to a Condition Based Maintenance (CBM) strategy. The CBM approach leverages all relevant

information to manage each individual aircraft component throughout its specific lifetime. This new system will incorporate data from a plethora of disparate sources including usage, environment, vibration, and component state data. This will aid in the development of high-fidelity diagnostic and prognostic models for monitoring component health and predicting component failure. Indeed, recent reliability efforts have shown promise in the area of condition based prognostics and diagnostics. McDowell and the Multi-University Center for Integrated Diagnostics have pioneered much work in this area [2]. Likewise, the U.S. Navy maintains an official and fairly mature condition based maintenance program for much of its surface and submarine fleet [3][4].

The goal of CBM is to eliminate unscheduled maintenance and improve scheduled maintenance activities. By leveraging real-time diagnostics and incorporating prognostics many unscheduled maintenance events will move into the realm of scheduled maintenance. In turn, maintenance personnel will order replacement components weeks in advance, reducing priority transportation and shipping costs. A CBM system will also allow maintainers to improve scheduled maintenance activities. Instead of a single maintenance schedule for the entire fleet, maintainers can develop, track, and integrate specific scheduled maintenance actions for each component on each aircraft [5].

This CBM approach is highly reliant on a common, synchronized, and high-fidelity information system. This system must include all relevant data sources from any aspect of a component's life. Currently, such a system does not exist. The incumbent maintenance system does feature many important wellsprings of maintenance information. However, each of these data sources was developed for a specific purpose, and each has its own way of representing various aspects of the maintenance domain. These data subsystems have very different and inconsistent data definitions, data relationships, and data transformation rules.

1.2 Operational Need

What is needed is a common and freely available data warehouse that not only subsumes these existing data sources, but also accommodates any relevant data source from a component's life. This data warehouse will provide a comprehensive picture of all relevant information about the life of a component, and assist analyst, engineers, and managers with making the transition to condition based maintenance.

This report focuses on the design of such a data warehouse to support a CBM Prototype. The CBM Prototype is an initial effort that demonstrates and explores the capabilities of the CBM concept. This prototype includes two primary research efforts. The first effort focuses on the engineering and reliability analysis necessary to realize CBM. The second effort, and the focus of our work, examines the data warehouse needed to support this analytical effort.

1.3 Design Methodology

In an effort to inject process into the development of the data warehouse, we must first adopt an effective systems engineering methodology. A systems engineering methodology represents a systematic way of decomposing a high-level need into a set of well defined requirements and accompanying designs to satisfy these requirements. Many such processes are described and compared in [6]. We will select and apply a modification of a systems engineering methodology known as the Systems Engineering and Management Process (SEMP) in order to address development of the prototype data warehouse. This process, developed at the United States Military Academy, helps engineers systematically design large-scale, complex systems to address problems [7]. The SEMP methodology satisfies the seven fundamental activities required in an effective systems engineering approach as defined by [6], and has been applied to hundreds of civil and military applications.

Our modified SEMP approach involves three phases - Problem Definition, Design and Analysis, and Implementation. In the Problem Definition Phase, we review stakeholders, their requirements, and perform a complete systems decomposition of the CBM Prototype Data Warehouse. In the Design & Analysis Phase, we construct and analyze a logical and physical design for the prototype, as well as define a data management plan. In the Implementation Phase, we suggest a project plan for implementing our design.

This process is modified from the original SEMP in that it (a) does not generate more than one alternative for the data warehouse, (b) does not involve a decision making process, and (c) does not implement and control the design. These steps were omitted in order to speed rapid development of the prototype.

2. Problem Definition

2.1 Needs Analysis

Our first step in defining the data model is to conduct a thorough Needs Analysis of the CBM prototype. A Needs Analysis is a systems engineering process where we scope and bound the system under study and gather important stakeholder requirements. This process allows for creation of alternatives that are within the project scope while satisfying stakeholder requirements.

Needs Analysis begins with a definition of an initial problem statement. The initial problem statement for the CBM Prototype is paraphrased as:

Develop an information system that combines state, vibration, and maintenance data into a common maintenance picture for the UH60, AH64, and CH47 fleet of aircraft. Provide maintenance information to major stakeholders that enables Condition Based Maintenance [8].

Figure 1 shows a diagram of the desired information system. The left hand side of the diagram lists the incoming data sources for the CBM Prototype. Each of these sources represents an existing maintenance management subsystem currently used in the Army. The right hand side of the diagram shows stakeholders involved with the CBM Prototype.

2.2 Stakeholder Analysis

Before designing the data warehouse, we need to understand the requirements of relevant stakeholders who will use the CBM Prototype. In order to accomplish this, we conduct several interviews and meetings that target a variety of stakeholders representing four groups – analyst, managers, sponsors, and decision makers. Each of these relevant stake holders is described below [5].

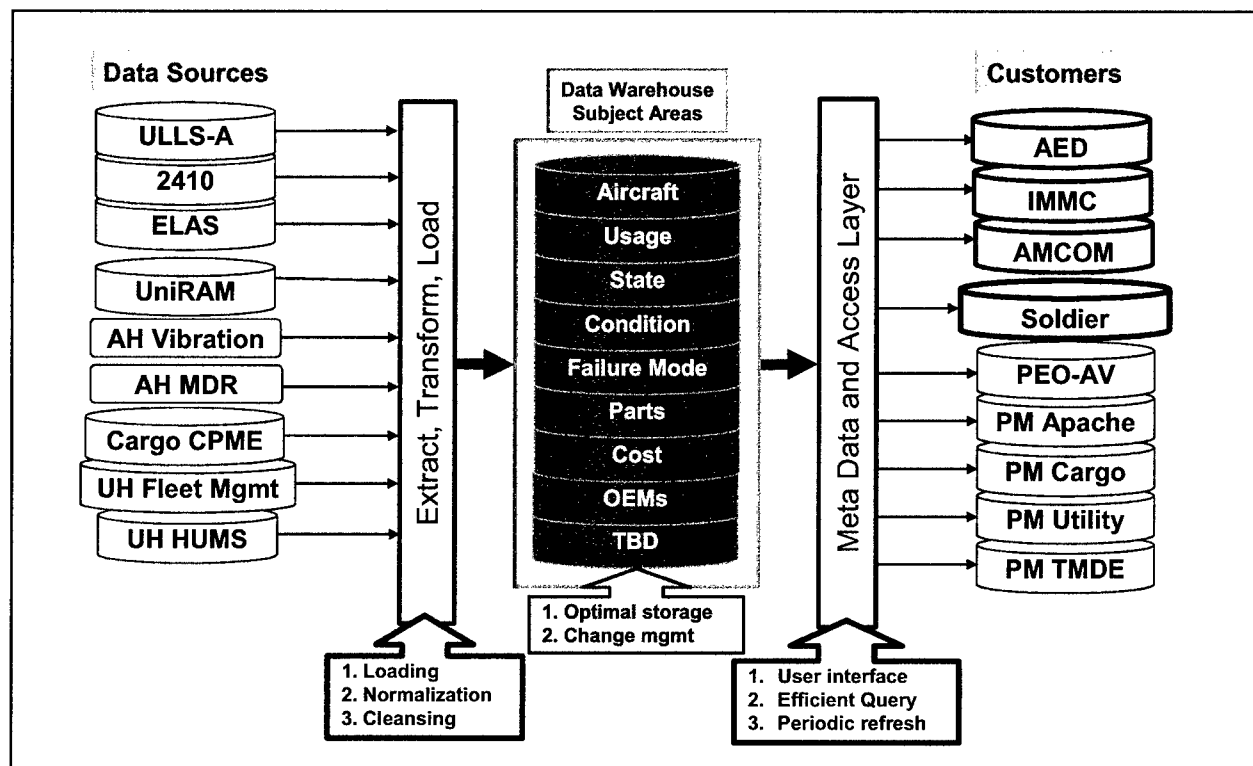


Figure 1 - The CBM Prototype Data Warehouse

Army Soldiers and Units. Soldiers in the field are the prime benefactors of the CBM Prototype. Because they serve as front line implementers of maintenance policy, they will also serve as important users of any CBM Prototype.

Aviation Engineering Directorate (AED). AED serves as the airworthiness authority for Army aircraft. This agency represents the active engineering effort for Army Aviation. They are responsible for researching and analyzing readiness, availability, and maintainability data to establish safety and logistical management policy. They will use the CBM Prototype in execution of these duties.

Integrated Material Management Center (IMMC). IMMC partners with Project Executive Officers and Program Managers, war fighters, and industry to develop, acquire, field, and sustain worldwide logistics support to ensure weapon system readiness in any operation. They are

largely a clearing house of information used by maintenance managers and decision makers. The CBM Prototype will help them provide this information.

Aviation Missile Command (AMCOM). AMCOM is the parent agency of AED, and serves as the overall proponent for development of the CBM Prototype.

Program Executive Office Aviation (PEO-Aviation). PEO-Aviation is overall responsible for management of all Army helicopter systems. Their stake in the CBM Prototype centers on managing the components affected by CBM policy. They are also responsible for the systems and sensors that collect CBM data.

Program Managers (PM). The Program Managers are the individual offices responsible for a specific type of helicopter (AH64, UH60, etc).

During this interview process, we ask each stakeholder a list of questions targeting functional requirements, data scope, data granularity, information latency, required data sources, and existing analytical tools and products. An example interview outline is shown at Appendix A. We next identify over thirty use cases for the CBM prototype from this stakeholder interview process. These use cases document individual stakeholder needs, wants, and desires. A sample of the use cases is shown in Figure 2. Complete use case documentation is available at Appendix B. An analysis of these use cases yields the following collective needs, wants, and desires of the stakeholders:

- (1) For any given component, provide a complete and synchronized view of all possible diagnostic data at any point in that component's life. Show trending of this information along scalable trajectories.
- (2) Produce reliability trending for any of the following populations: individual component, component family, aircraft, major aircraft system, unit, geographical location.
- (3) View the maintenance history of a particular component or component family juxtaposed with reliability information as well as usage and component state information.

(4) For a given component, show a history of its reliability information matched with component configuration and location.

(5) For a given component or aircraft, provide a complete maintenance history including front-line maintenance activity, component installation records, tear down analysis, and fault history.

2.3 System Decomposition

In an effort to scope and bound the data model, we next conduct a detailed system decomposition of the CBM Prototype. To accomplish this we must clearly understand what is meant by system. Because the CBM Prototype will include information from the data sources shown in Figure 1, we know that any resultant system must subsume these individual source data schemas. Each of these data sources is briefly introduced below.

2.3.1 Data Source Overview

Unit Level Logistics System Aviation (ULLS-A). ULLS-A is a unit-based information system that tracks individual aircraft maintenance actions. These maintenance actions describe (in a detailed text-based fashion) the history of all maintenance activities that occur at the unit level. This includes repairs, replacements, and troubleshooting. It does not include major component tear down, overhaul, or detailed failure analysis.

Department of the Army DA Form 2410 Data (2410 Data). The 2410 data describes major component replacements and repairs for certain tracked components. These components are usually major end items with a high dollar value.

Enhanced Electronic Logbook Automation System (ELAS). The ELAS is an information system that tracks individual maintenance actions. It is similar to ULLS-A, but primarily fielded for the AH64.

Stakeholder : Martini, Joe Stakeholder Type: Engineer, Manager Organization : AED Structures & Materials	
Use-Case ID:	UC-15
Use-Case Title:	Predict time or conditions for failure
Priority:	Will Need Eventually
Frequency of Use:	Constantly
Primary Actor:	Analyst
Other Actors:	Analytical Tools Units in the field Aircraft
Pre-Conditions:	Aircraft failures in the field are known. Conditions the aircraft where flown in are known.
Main Success Scenario	1. Analyst enters aircraft type or tail number. 2. Analytical tool mines the database for aircraft history, conditions flown, reliability models, and past failure histories 3. Tool issues a prediction to the analyst as to when the aircraft, or fleet of aircraft will fail.
Variations	The analyst may also be interested in individual component failure.
Post-Conditions:	Analyst receives either an estimated time, or set of conditions when the aircraft will experience failure.
Data sources currently used to meet this requirement:	Qualification Data, 2410, ELAS
Software currently used	Excel, INCODE, VDRI
Additional Comments:	None

Figure 2 - Example CBM Prototype Use Case

Unified Readiness, Availability, and Maintainability Data (UniRAM). UniRAM data is highly cleansed ELAS and ULLS-A data. This data cleaning insures the mostly text-based and manually entered entries in ELAS and ULLS-A are correct and complete.

AH Vibration Data. AH Vibration data consist of vibration measurements calculated in flight for the AH64A/D aircraft by the Vibration Monitoring Enhancement Program (VMEP). The VMEP is an onboard health monitoring system that provides vibration condition indications for dozens of components [9].

AH Maintenance Data Recorder (AH MDR). The data recorder for the AH64A/D aircraft captures state data from hundreds of onboard sensors on the aircraft. These sensors collect information about a variety of aircraft components at a rate of approximately 16Hz. This data includes everything from pilot stick position to aircraft velocity in three axes.

Cargo CPME. Cargo CPME data includes maintenance management information from the CH47 [10].

UH Fleet Management Data (UH Platform Maintenance Environment). The UH60 Platform Maintenance Environment (PME) includes maintenance management information for the UH60 series of aircraft. This information is similar to the ULLS-A and ELAS datasets.

UH60 Health and Usage Monitoring System data (UH HUMS). UH HUMS tracks state and health monitoring data for hundreds of components on the UH60. It is analogous to the AH MDR and VMEP dataset for the AH64.

2.3.2 Individual Data Source Analysis

At the time of this writing, the scope of the CBM prototype and programmatic decisions limited the number of data sources available for analysis. Therefore, in this section, we will only

analyze those data sources that were (a) designated part of the CBM prototype and (b) were readily available for source data analysis and review. This set includes AH64 MDR, VMEP, and ELAS data. However, it is important to note that, despite this restricted data set, our design is a holistic systems engineering approach that will easily accommodate any of the data sources listed in Section 2.3.1.

2.3.2.1 Analysis of AH64D Maintenance Data Recorder (MDR) Data

MDR Overview

The AH64D Maintenance Data Recorder is a digital source collector (DSC) that measures hundreds of parameters for the AH64D aircraft. On board sensors measure recorded parameters and report parameter values using the AH64D MIL STD-1553B Bus protocol. The MDR system was primarily designed to record maintenance exceedences and safety information for aircraft crash investigation purposes.

The MDR system generates a series of recordings for each MDR usage period. A MDR usage period corresponds to a single flight or ground run-up of the aircraft. A MDR usage period is created each time the aircraft has AC power. AC power is generated by the aircraft generators (powered by either the aircraft's auxiliary power unit or aircraft transmission in flight) or an external ground power unit.

MDR Parameters

Data recorded by the MDR includes component state monitoring (pressure, temperature, speed, etc), aircraft usage parameters (how the aircraft was employed), and crew information (cockpit voice recordings, switch positions, pilot inputs). These parameters are dynamically recorded based on a set of on-change triggers, and are not necessarily continuous in nature. For example, if the engine temperature experiences a change of more than 10 degrees Celsius, then the new value is logged. If there is a change of less than 10 degrees Celsius, then no value is recorded. Appendix C lists the entire set of MDR parameters including parameter definition, units, and triggering information.

MDR Data Management

MDR data is managed according to a Boeing proprietary data management process, and was not originally designed to support export to third-party applications. Data from individual aircraft usage periods is stored in onboard data stores, then downloaded by technicians using the LIMSSGAS system. This system is a stand alone data viewer that enables maintenance technicians to view state trajectories and other information provided by the MDR. Data can be exported from LIMSSGAS, but the resultant files are stored in binary format intended to be used by other Boeing products.

In order to translate the MDR data into text that can be read by third-party applications (such as Excel or Matlab), one must use a Boeing-developed proprietary translation tool called MAST. MAST produces a comma separated values (CSV) text file that can be imported into any number of third-part applications.

MDR Schema

Figure 3 shows an extract of the CSV file produced by MAST. As this figure shows, it is a simple one-table data schema listing the date time group (DTG) of a parameter recording, the name of the parameter recorded, and the recorded parameter's value. As previously mentioned, parameters are recorded as they individually change, surpass individual triggers, and report information to the central MIL STD -1553B bus controller. This results in a first changed/first logged chronological order of recorded MDR parameters. Because of the variance of individual component triggers, some parameters are logged frequently (several times a second) while others are logged only one or two times per flight. It is important to note that, as shown in Figure 3, often times a DTG is repeated several times for different parameters that each triggered a recording at the same time.

Gmt_Time	Parameter	Value	Units
11/21/2004-22:17:33.24	0000 - Undefined Fault Code	0	Inactive Fault
11/21/2004-22:17:33.24	0000 - Undefined WCA Code	0	Inactive WCA
11/21/2004-22:17:33.24	Stabilator Position	0.263672	Degrees
11/21/2004-22:17:33.24	True Heading	0	Semicircle
11/21/2004-22:17:33.24	Primary Hydraulic Pressure	2938.25	PSIG
11/21/2004-22:17:33.24	Utility Hydraulic Pressure	2956.08	PSIG
11/21/2004-22:17:33.24	Emer (ACCUM) Hyd Pressure	2881.197	PSIG
11/21/2004-22:17:33.24	Total True Airspeed	0	Knots
11/21/2004-22:17:33.24	Pylon 1 PAC Position	0	Degrees
11/21/2004-22:17:33.24	Engine #1 NGRBX Oil Press	0.683928	PSIG
11/21/2004-22:17:33.24	Engine #1 Oil Pressure	1	PSI
11/21/2004-22:17:33.24	Eng 1 Bleed Air PRSOV Open	0	0=Closed 1=Open
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
11/21/2004-22:17:33.56	Primary Hydraulic Pressure	2938.25	PSIG
11/21/2004-22:17:33.56	Utility Hydraulic Pressure	2952.514	PSIG
11/21/2004-22:17:33.56	Emer (ACCUM) Hyd Pressure	2899.026	PSIG
11/21/2004-22:17:33.56	IAFS Fuel Quantity	0	Pounds
11/21/2004-22:17:33.72	Altitude AGL (RADAR)	4.187308	Feet
11/21/2004-22:17:33.72	Radar Altitude Valid	1	0=Invalid 1=Valid
11/21/2004-22:17:33.72	Altitude Hold	0	0=Off 1=On
11/21/2004-22:17:33.88	Altitude AGL (RADAR)	2.093654	Feet
11/21/2004-22:17:33.88	Radar Altitude Valid	1	0=Invalid 1=Valid
11/21/2004-22:17:33.88	Altitude Hold	0	0=Off 1=On
11/21/2004-22:17:33.88	Hover Hold Mode	0	0=Off 1=On
11/21/2004-22:17:33.88	Attitude Hold	0	0=Off 1=On
11/21/2004-22:17:33.88	Lateral Airspeed	-5.2887	Knots
11/21/2004-22:17:33.88	Side Slip Angle	-16.8915	Degrees
11/21/2004-22:17:33.88	Lateral TAS Unfiltered	-5.2887	Knots
11/21/2004-22:17:34.04	Side Slip Angle	-19.3854	Degrees

Figure 3 - Example MAST Output

MDR Analysis

We performed two main tasks during analysis of the MDR data. In our first data analysis task, we designed a simple data transformation tool that transposes each MDR parameter onto a common timeline. This tool, created in Microsoft Access, uses a Visual Basic for Application (VBA) code sequence to import the original MAST-generated CSV and then create a single output table in DBASE IV format. The DBASE IV format can then be read by third-party applications such as Excel, Matlab, or Minitab. Figure 4 shows a screen shot of the user interface for this tool.

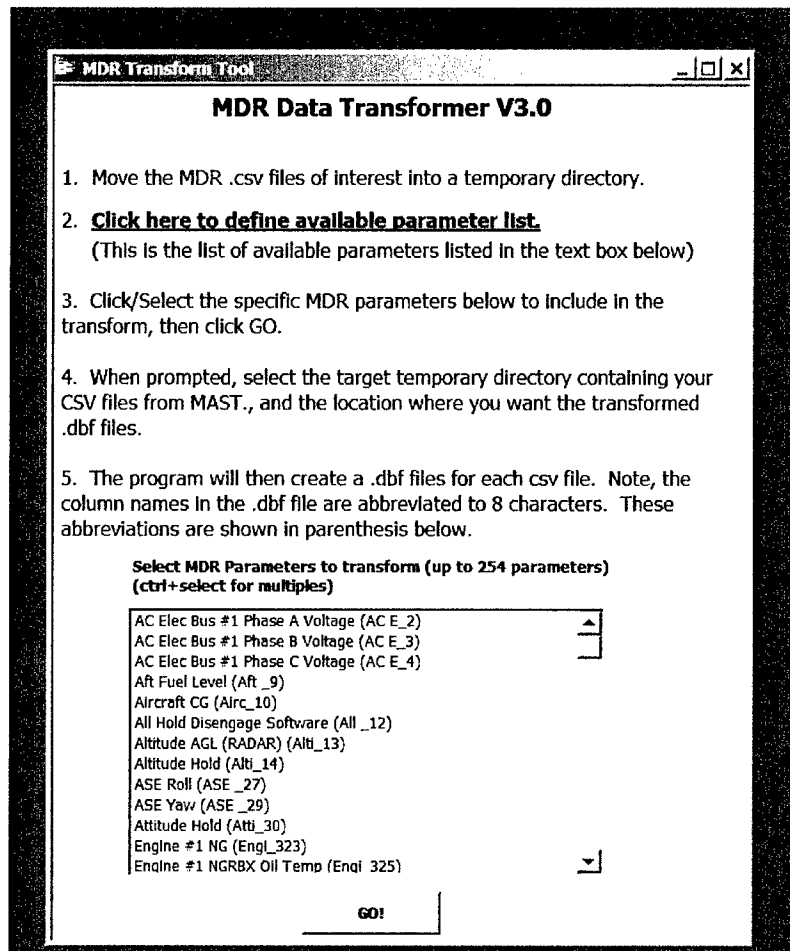


Figure 4 - Screen Shot of MDR Transform Tool

Each unique DTG in the source CSV corresponds to a single row in the resultant DBASE VI table. For each row, we add a column for up to 255 possible MDR parameters of interest selectable by the analyst or engineer (Figure 4). If a parameter triggered a recording at that row's DTG, then the new parameter value is inserted into the parameter's column. If no value

was recorded for a parameter at the row's DTG, then a null value is inserted. Figure 5 shows an extract of the table produced by this tool. This figure shows one common mission timeline, with any corresponding data recorded during each time interval.

DTG	ENG#1 TGT	ENG#2 TGT
11/17/2004-13:04:07.72	11.23596	11.23596
11/17/2004-13:04:08.04	11.72447	11.72447
11/17/2004-13:04:11.72		
11/17/2004-13:04:15.06		
11/17/2004-13:09:47.54		1.46556
11/17/2004-13:09:47.70		
11/17/2004-13:09:48.02		
11/17/2004-13:09:58.58		11.72447
11/17/2004-13:09:59.54		12.21299
11/17/2004-13:09:59.70		10.74744
11/17/2004-13:09:59.86		11.72447
11/17/2004-13:10:00.98		12.70151
11/17/2004-13:10:01.14		
11/17/2004-13:10:02.42		12.21299
11/17/2004-13:10:03.70		14.16707
11/17/2004-13:10:05.14		
11/17/2004-13:10:05.94		24.42599
11/17/2004-13:10:06.10		
11/17/2004-13:10:06.26		43.47826
11/17/2004-13:10:06.42		56.17978
11/17/2004-13:10:06.58		67.41573
11/17/2004-13:10:06.74		82.55984
11/17/2004-13:10:06.90		97.70396
11/17/2004-13:10:07.06		113.82511
11/17/2004-13:10:07.22		129.45774
11/17/2004-13:10:07.38		143.62482
11/17/2004-13:10:07.54		157.30337
11/17/2004-13:10:07.70		172.44748
11/17/2004-13:10:07.86		185.14900
11/17/2004-13:10:08.02		198.82755
11/17/2004-13:10:08.18		211.04055

Figure 5 - Example MDR Transform Tool Output

This tool allows an analyst or engineer to easily conduct time series analysis of several MDR parameters simultaneously. It also aids us in conducting profiling and basic descriptive analysis of the underlying data. Figure 6 show an example chart produced by Excel with data from our tool. This type of analytical product was previously not available before this transformation.

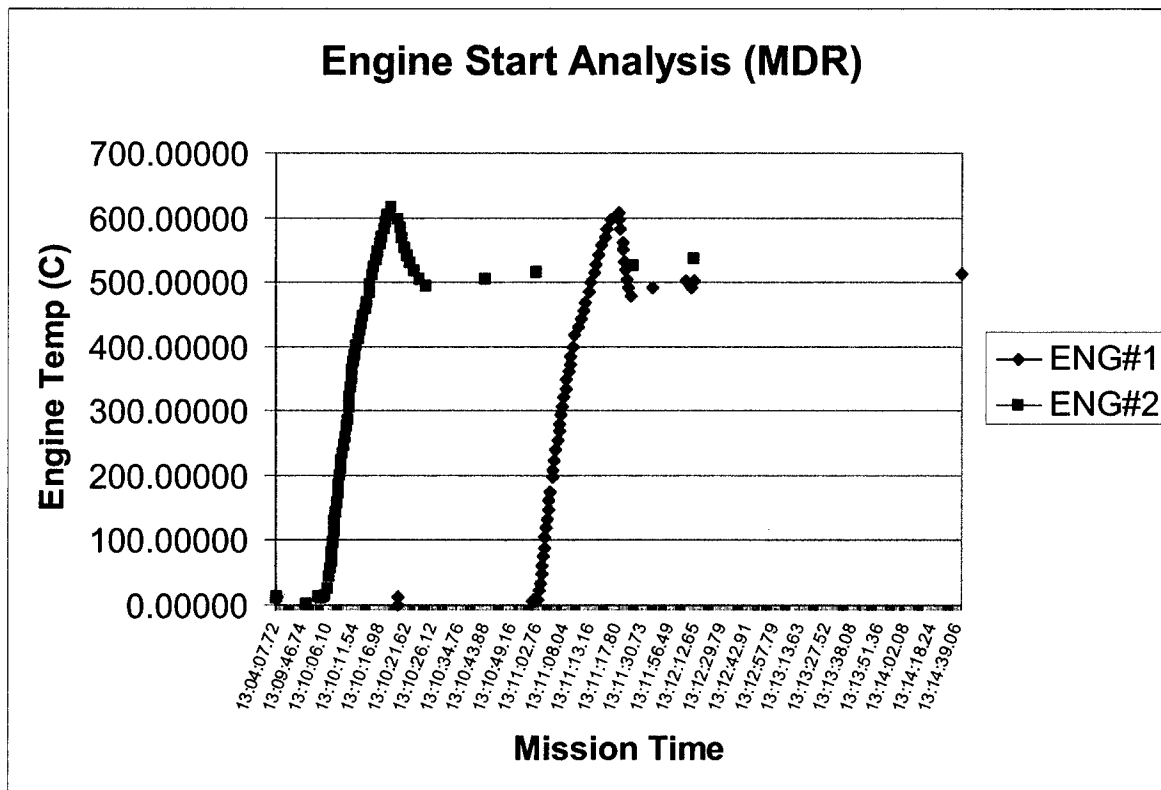


Figure 6 - Example MDR Analysis Using Transformed Data

The second data analysis task we performed on the MDR data was to profile the frequency at which MDR parameters are actually recorded in the field. We examined 23 individual MDR usage periods from field units, and examined which parameters were tracked, and how often. We then conducted a Pareto analysis to ascertain which parameters were the main contributors to the MDR data file.

The results of this analysis are shown in Appendix D. This analysis leads us to the following conclusions:

- The average number of MDR recorded values per usage period (summation of all parameters) is 81347.13 individual parameter recordings.

- The most frequently recorded MDR parameter produces an average of 2546.9 individual data recordings per usage period.
- The least frequently recorded MDR parameter is recorded at an average of 0 times per usage period. A total of 90 parameters share this distinction.
- Roughly 10% of the available parameters cause 80% of the logged values.

MDR Issues

At this point, we identify two main issues with the MDR source data. First, the data is not truly continuous. Because data is only recorded when parameters exceed individual trigger points, some type of interpolation is required to fill in the “gaps.” This is easily noted in the extract from our MDR translation tool shown in Figure 4. If no parameter value was logged for a particular DTG, we log a null value. However, this is not quite accurate; the parameter did have some value at that time (it just wasn’t recorded). In order to make the data truly continuous, some value must be entered for the null values. Possible entries might be the last known value, average or mode of last and next value, or individual linear/non-linear functions based on known parameter characteristics.

The second issue we identify with MDR data stems from the sheer volume of information recorded. We suggest that in future implementations of the CBM Data Warehouse, some efforts are made to scope the amount of MDR parameters that are actually loaded into the warehouse. This scoping decision could be based on the needs of analysts and engineers. For example, perhaps no one is interested in the Co-Pilot Gunner’s Master Arm Switch Position, so this MDR parameter is never loaded.

2.3.2.2 Analysis of Vibration Monitoring and Enhancement (VMEP) Data

VMEP Overview

The Vibration Monitoring and Enhancement Program is a digital source collector that records vibration information for components on the AH64A, AH64D, UH60A, and CH47 aircraft. In the CBM Proof of Principle, we will only be using AH64D VMEP data. The VMEP system

consists of a set of 21 sensors mounted on the aircraft, and a centralized processing unit (CPU) that collects and processes information from each sensor. VMEP is a dual purpose system that (1) provides information used to gauge the health of components (from a vibration perspective) and (2) is used to perform "rotor smoothing" for the main and tail rotor systems of the aircraft. A detailed explanation of the entire VMEP system is available at [9].

The VMEP system generates a series of recordings for each VMEP usage period. A VMEP usage period corresponds to a single "mission" or use of the VMEP system. A VMEP usage period is created each time the VMEP system is powered on and the aircraft main rotor RPM exceeds 90% available rotor speed.

VMEP Parameters

The VMEP system periodically logs Condition Indicators (CIs) for several components of interest on the aircraft. These CIs serve as surrogates for the level of vibration exuded by each component. These CIs are listed and described in Figure 7.

VMEP Data Management

The VMEP CPU samples each VMEP sensor at a frequency of roughly 20 Hertz. The CPU then uses on board software to produce the CIs listed above at a rate of 0.5 Hz. A technician periodically connects to the VMEP CPU with a laptop (VMEP Ground Station) and downloads the CI values. Maintenance personnel and analyst can then use the VMEP Ground Station to view the CIs, including CI historical trends. This information can be used to manually trigger certain maintenance actions such as increased component inspections or component removals.

In order to convert the VMEP data into a text form readable by third-party software (and loading into the CBM Data Warehouse), one must first use the VMEP Ground Station to export the VMEP data to a binary file. This binary file is then translated to readable text using a translation tool provided by the VMEP manufacturer, Intelligent Automation Corporation (IAC).

CL ID	DESCRIPTION	MIN VALUE	MAX VALUE	UNITS
64D-AP-13	AH64D APU drive shaft 1R frequency in monitor mode	0	10000	IPS
64D-AP-14	AH64D APU drive shaft 2R frequency in monitor mode	0	10000	IPS
64D-AP-15	AH64D APU gas generator 1R vibration in monitor mode	0	10000	IPS
64D-AP-17	AH64D APU high frequency vibration	0	10000	IPS
64D-AP-19	AH64D APU clutch bearing fault vib from AM demodulation of high frequency vib energy measured by APU sensor	0	10000	IPS
64D-G-25	AH64D intermediate gear box input shaft 1R as measured by IGB sensor in monitor mode	0	10000	IPS
64D-G-26	AH64D intermediate gear box modulation ratio as measured by IGB sensor in monitor mode	0	10000	IPS
64D-MR-MA-LAT-01	AH64D main rotor 1R vib as measured by Lat sensor in monitor mode	0	10000	IPS
64D-MR-MA-LAT-02	AH64D main rotor 1R phase as measured by Lat sensor in monitor mode	0	10000	IPS
64D-MR-MA-LAT-03	AH64D main rotor 4R vib as measured by Lat sensor in monitor mode	0	10000	IPS
64D-MR-MA-VRT-01	AH64D main rotor 1R vib as measured by Vert sensor in monitor mode	0	10000	IPS
64D-MR-MA-VRT-02	AH64D main rotor 1R phase as measured by Vert sensor in monitor mode	0	10000	IPS
64D-MR-MA-VRT-03	AH64D main rotor 4R vib as measured by Vert sensor in monitor mode	0	10000	IPS
64D-TG-25	AH64D tail rotor 1R as measured by IGB sensor in monitor mode	0	10000	IPS
64D-TG-26	AH64D tail rotor modulation ratio as measured by IGB sensor in monitor mode	0	10000	IPS
64D-TR-10	AH64 tail rotor gear box output shaft 1R as measured by IGB sensor in monitor mode	0	10000	IPS
64D-TR-12	AH64 tail rotor gear box output shaft 1R as measured by Tail Lat sensor in monitor mode	0	10000	IPS
64D-TR-20	AH64 tail rotor 1R vib as measured by Tail sensor in monitor mode	0	10000	IPS
64D-TR-21	AH64D tail rotor 2R vib as measured by Tail sensor in monitor mode	0	10000	IPS
64D-TR-22	AH64 tail rotor 1R phase as measured by Tail sensor in monitor mode	0	10000	IPS

Figure 7 - VMPE Parameter List

The program name for this translation tool is exporttotext.exe. This tool produces a series of flat text files. These files fit into three general categories – system test files, rotor smoothing files, and CI measurement files. The files of interest to the CBM Prototype Data Warehouse are the CI measurement files (labeled All_CI.txt).

VMEP Schema

Each All_CI.txt file consists of a flat text file broken down into 10 lines of header information and 6 lines of recurring CI data. An extract of a sample All_CI.txt file is shown in Figure 8. The header information lists information about the particular aircraft and VMEP system settings. The recurring CI data portion logs each CI's value every 120 seconds of the VMEP usage period.

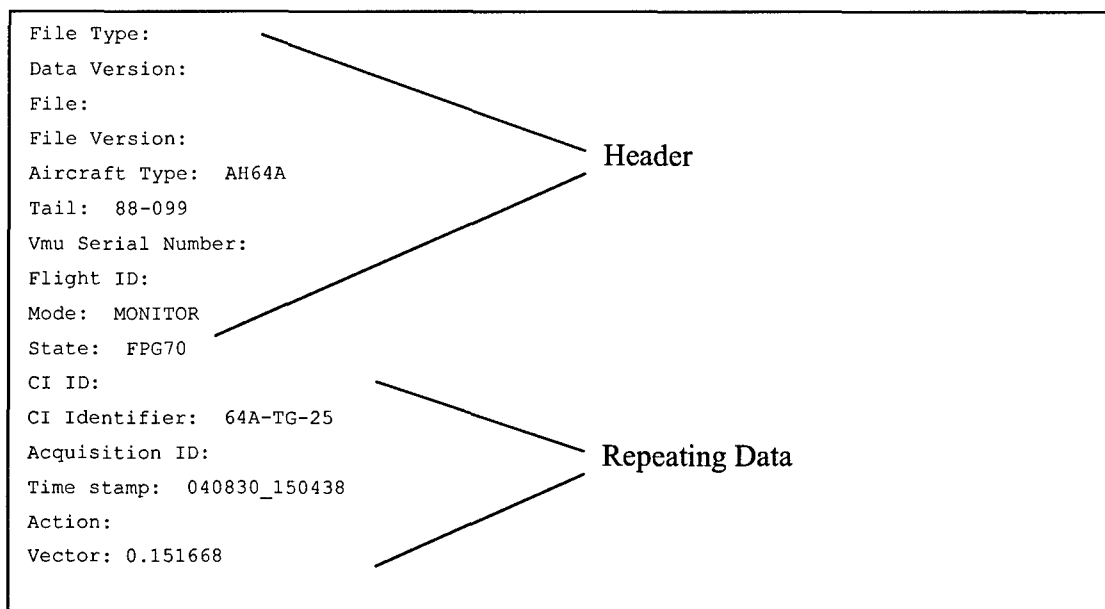


Figure 8 - Example VMEP All_CI.txt file

VMEP Data Analysis

VMEP data recordings follow a regular established pattern as described above. Each VMEP usage period generates a uniform number of recordings for each of the 20 available CIs. Profiling of 30 VMEP usage period reveals that each VMEP usage period produces an average of 120 recordings per CI.

VMEP Issues

Like the MDR Data, the VMEP CIs are not truly continuous. Each CI is a snap-shot in time, and extrapolation is required to ascertain what is occurring between each CI recording.

2.3.2.3 Analysis of Enhanced Electronic Log Book (ELAS) Data

ELAS Overview

The Enhanced Electronic Logbook Automation System (ELAS) is a maintenance management system deployed within Army Aviation units. This system is the primary source of information for all low-level maintenance tasks and faults occurring at the unit level. DA Pam 738-751 specifies manual records that must be maintained on each Army aircraft [11]. ELAS automates many of the records electronically, including information about maintenance tasks, general aircraft usage, aircraft configuration, parts ordering, fault information, fuel information, and crew manning. In the CBM Data Warehouse Prototype, we are primarily interested in using ELAS to obtain what maintenance actions are performed on the aircraft as well as failure and fault information for components.

ELAS Data Management

ELAS is fielded as a stand alone graphical user interface built on a Microsoft Access (MS Access) backend database. Each aircraft has its own database, and Army units combine each aircraft database into a single database for the unit. This database is easily exported or copied, and readable by MS Access or a variety of ODBC-enabled database technologies.

ELAS Schema

Appendix E lists the schema information for ELAS. Tables of particular interest to the CBM Prototype Data Warehouse include: FAULT, COMPONENT, AIRCRAFT, FLIGHT, and ACTION.

ELAS Data Analysis

Figure 9 shows our analysis and profiling information taken from three months worth of ELAS data involving 24 AH64D helicopters.

ELAS Table	Total Entries
FAULT	24033
COMPONENT	6937
AIRCRAFT	24
FLIGHT	1841
ACTION	23378

Figure 9 - ELAS Data Profiling

This table shows that, from a data volume point of view, the ELAS data set is very manageable.

ELAS Data Issues

The main issues with ELAS fall into two general categories – standardized coding errors and human text errors. Figure 10 introduces these errors. The standardized coding errors are caused when a maintainer fails to enter the correct DA PAM 738-751 prescribed codes for one of the following– Work Unit Code (WUC), Date/Time, Aircraft Hours, When Discovered Code, How Recognized Code, Malfunction Code, and Maintenance Action Code. ELAS does not necessarily enforce logical entries for these codes, and the maintainer is free to enter whatever values they wish. Therefore it is completely possible that, due to a training deficiency or (more likely) operational necessity, the maintainer will enter an incorrect code. Much of this problem is due to the clumsiness of DA PAM 738-751. Additionally, ELAS could benefit from an intelligent graphical user interface that guides the user to make correct and logical entries based on the context of the maintenance action or fault. For example, if a generator fails on an aircraft,

then ELAS might limit the 11 possible How Recognized Codes to only those that make sense for a generator.

DTG and aircraft times must be checked/synched

Work Unit Code (WUC) must reflect correct component. In this example 00 is the WUC for the AH64. Should equal the WUC for driveshaft/drivetrain.

"ENG to XMSN D/S" must be translated into the actual Par#/NSN for #3 AH-64 Drive Shaft

Failure "CORRODED" must be classified as an appropriate failure code

Action Code must match action. Here S stands for "Install". Should read as "X", the code for replaced.

Coresponding sub maintenance action (Drive shaft bolt replacement) must be linked as parent child actions

Component replacement must be captured as separate entity. Must capture serial # of replaced parts (if applicable). Corresponding supply action must be captured as separate entity

Figure 10 - Example ELAS Data Errors

The human text errors are more problematic. Most of the critical information about a maintenance action or fault is contained in the Fault/Remarks portion of the ELAS generated form shown in Figure 10. This is where the maintainer records the nature and description of the actual maintenance task or fault. Likewise, other important information, such as part number & serial number are also recorded here. This information is free text, and extremely difficult to extract. For example, for a failed drive shaft the maintainer might enter any of the following - "Failed Drive Shaft", "Failed D/S" or "Number 3 Drive Shaft Failed on Run Up." Translating this to a standard database entry is extremely difficult. Likewise, if the maintainer fails to enter the part number, stock number, or serial number, we have no way of tracking the particular component involved.

2.3.2.4 Analysis of UniRAM Data

UniRAM Overview

The UniRAM data set is analogous to the ELAS dataset. Developed for use by the Aviation Technical Test Center (ATTC), UniRAM is a more logical and stringent approach to managing DA PAM 738-751 data. More importantly, the Army maintains an experienced cadre of professional technicians at Fort Rucker, Alabama that are well versed at translating ELAS data into UniRAM data. Because of this fact, we will opt to use a UniRAM version of ELAS data for the maintenance task and fault information for the CBM Prototype Data Warehouse.

UniRAM Data Management

The UniRAM Data Management process begins with an ELAS data set. The ELAS dataset is scrubbed by technicians at Fort Rucker who perform one or more of the following tasks:

Match, lookup, and record ELAS component information - This process consists of matching components listed in electronic 2408-13-1 narratives with components listed in actual Army maintenance manuals and supply data sources. This includes matching NSN, NIIN, part number, work unit codes (WUC), position codes, serial number, and TSI/TSN. This process will require a human or intelligent system to derive this information from narrative entries.

Match, lookup, and record ELAS maintenance actions - This process involves matching the maintenance action listed on the 2408-13-1 (codes and narratives) to standardized maintenance actions specified in Army maintenance doctrine. This includes maintenance function, maintenance interval, maintenance level, tools, man hours required, etc.

Match, lookup, and record ELAS failure information - This process involves matching the failure event information on the 2408-13-1 (codes and narratives) to recognized failure modes in the Army maintenance doctrine. This includes failure codes, malfunction effect, how recognized, when discovered, when occurred, and failure measurements (e.g. "axial bearing play is 0.334").

Normalize ELAS timings and sequencing - This process involves matching and correcting DTG and aircraft hour entries on the 2408-13-1 electronic entry. For example, if the unit records local time, convert it to GMT. Or, ensure the aircraft hours match time at failure.

Check all 2408 ELAS codes - This process involves checking all 2408 codes for logical consistency. For example, the “how discovered” code for a cracked rotor blade should say “post flight” not “during flight.”

Match, lookup, and record ELAS supply actions - This process involves matching and tagging 2408-13-1 entries that involve supply actions. For example –Was the component replaced? What component (by serial number) replaced the failed component? When did the replacement occur?

It is important to note that only a subset of the above tasks are performed for the CBM Prototype Data Warehouse. However, we believe that all tasks will need to be performed in future generations of the CBM Data Warehouse unless errors are corrected at the source.

The results of the UniRAM Data Management set is a populated Oracle-based UniRAM data set containing all relevant maintenance actions and faults.

UniRAM Schema

UniRAM schema information is located at Appendix F. A complete set of documentation is available at [12].

UniRAM Data Analysis

Our profiling and analysis of the UniRAM data set is identical to that of ELAS.

UniRAM Data Issues

The main issue with the UniRAM dataset stems from the manpower required to perform the ELAS translation and cleansing. We estimate that the average data technician can translate

roughly two ELAS entries per hour. This represents a significant financial investment for the Army to cleanse and normalize maintenance and fault information.

2.3.2.5 Analysis of Other Relevant Data Sources

There are several other data sources required to meet stake holder needs in the CBM Data Warehouse Prototype. Most of these represent on-change data sources in the sense that they are only populated once (per major schema change), and are not regularly updated data sets like MDR, VMEP, or ELAS. Each of these is briefly discussed below.

Unit Information – We need a source of data for the units providing information to the CBM Data Warehouse. For purposes of the CBM Prototype, we will use the unit information contained in the ELAS data set.

General Catalog of Components – In order to facilitate maintenance tracking and planning, we need a list of all possible components that might exist for a certain aircraft. This information, often referred to as a legitimate code file (LCF), must include component nomenclature, logistics numbering (National Stock Number and manufacturer's part number), position codes, assembly information, and other relevant information. Currently, we identify three main sources for this information. First, the ELAS and UniRAM LCFs contain part tables for common components maintained on the AH64D. However, these databases only include components maintained in the past, and might not include all possible components. Second, Boeing maintains a LCF containing over 80,000 components for the AH64D. Third, the IMMC maintains a LCF of expensive and flight safety critical components for all Army aircraft. It is important to note that each of these data sources is slightly different, and they are not all in agreement. Therefore, for purposes of the CBM Prototype Data Warehouse, we will use a combination of the three. This data source will be manually populated by merging the relevant general component tables in ELAS, UniRAM, Boeing Component List, and IMMC DA Form 2410 Database.

General Catalog of Maintenance Tasks – Another data source required to perform maintenance planning is a catalog of common maintenance tasks required for all components on an aircraft. This data source would list standard repairs, tasks, and inspections. This information is vital if we are going to forecast future maintenance tasks and repair parts based on prognostic predictions. Currently, we know of only one data source for this information. The AH64D Integrated Electronic Technical Manual (IETM) is an automated tool that reflects Army technical manuals prescribing common maintenance tasks. However, the IETM source database is a proprietary product, and extracting the general catalog of maintenance tasks was not possible at the time of this writing. For purposes of the CBM Prototype Data Warehouse, we will manually enter sample information from the IETM or hard copy technical manuals.

· General Catalog of Failures - In order to manage and forecast component failures, the CBM Prototype Data Warehouse requires a catalog of detailed failures for each aircraft. This information could be obtained by mining the ELAS or UniRAM databases, but again, we are limited to those failures that have occurred in the past. This information is also available in the IETM, but as mentioned above, the raw data is proprietary. For purposes of this design, we will use ELAS and UniRAM fault information.

General Failures to General Maintenance Task Mappings – In order to plan which maintenance tasks are required to address certain observed or predicted failures, we need a mapping of general maintenance tasks to general failures. This data resides electronically in the IETM, but is unavailable. Therefore, we will manually populate this data with sample information from the IETM or hard copy technical manuals.

Tools & Publications – Automated maintenance planning and maintenance analysis will require a list of supporting tools and publications for certain component maintenance tasks and repairs. This information also resides electronically in the IETM, and will be manually populated for this design.

Manufacturer Information – Several stakeholders expressed interest in being able to view manufacturer information during CBM component analysis. Several existing LOGSA data sources can provide this information.

2.3.2.6 Required Future Data Sources

As we alluded to in the beginning of Section 3.2.1.1, all relevant data sources were not directly available for incorporation into the CBM Prototype Data Warehouse. However, these sources must be added in order to support comprehensive CBM analysis across the Army Aviation fleet. Each of these is briefly described below.

IMMC 2410 Data. The Army IMMC maintains a comprehensive database of all DA Form 2410 tracked items. This database, known as the Maintenance Consolidated Database System (MCDS), contains installation, removal, overhaul, and repair information for high-dollar and flight critical components. This data must be integrated with the other data sources listed above in order to provide detailed part tracking and failure information to our stakeholders.

CH47 and UH60 Health Usage Monitoring System (HUMS) Data. The CBM Prototype Data Warehouse needs an MDR/VMEP equivalent data source for the UH60 and CH47 aircraft. This information is vital to support state, usage, and vibration analysis of components on these aircraft. Currently, the UH60 community does have a Goodrich developed HUMS, and this data is collected into a separate database maintained by the UH60 Program Manager. This information could be readily integrated once made available. The CH47 community is still developing its own HUMS program.

CH47 and UH60 Maintenance Management System. The CBM Prototype Data Warehouse also needs an ELAS-like source of maintenance tasks and fault information for the CH47 and UH60 aircraft. The CH47 maintains a Cargo Platform Maintenance Environment (CPME) which was made available toward the end of our design. The UH60 also maintains a similar system which could be easily integrated once made available.

Integrated Electronic Technical Manual. The CBM Prototype Data Warehouse needs an electronic source of data for the data sources described in Section 2.3.2.5. The Integrated Electronic Technical Manuals for each airframe could provide much of this information if raw source data schemas from these manuals were made available.

2.3.2.7 Source Data Issues of Concern

Before concluding data analysis, we will first comment on two major issues that cut across much of the aforementioned analysis of data sources. These issues fall into two categories - unique component identification and component configuration identification.

Unique Component Identification Issues. In order to facilitate accurate and meaningful analysis of components failures (a key tenant to CBM) analysts and engineers must be able to isolate individual components across the fleet. Because of the way components are tracked in the Army supply system, this is often a very difficult task. A short primer on parts tracking illuminates this point. Currently each component in the Army parts system is slotted against a National Stock Number (NSN). However, for each NSN, there can be literally dozens of varied components that satisfy this NSN. These components are identified by a government or commercial part identification code known as a part number. Typically part numbers correspond to a certain series of the component, perhaps based on manufacturing group or configuration. More than one part number may be associated with an NSN, however all parts associated will be the same in fit, form and function. Note, part numbers are not unique, and it's possible to have the same part number for two completely different parts satisfying completely different NSNs.

For some part numbers, individual parts are tracked by serial number. However, many parts of interest to engineers and analysts are not tracked by serial number, or are assigned locally managed serial numbers (setting up the possibility of two fleet-wide components sharing a local serial number). Until all parts of interests are able to be uniquely identified, CBM implementation will be limited. This is not a novel problem, and is currently being address by the DoD Unique Identifier (UID) Program [13]. Future generations of the CBM Data Warehouse will greatly benefit from this initiative.

Component Configuration Issues. The second major data source issue deals with how component configuration is described by the Army Aviation Management System. Currently, configuration information establishing where components might be installed on Army Aircraft is specified by a Work Unit Code (WUC). The work unit code is a hierarchical encoding specifying at what level of assembly a component is installed. This code represents the lowest owning sub-assembly and higher assemblies that encapsulate a given component. For example a WUC of 04A is an AH64D Engine Assembly, 04A01 is the engine's cold section module, and 04A01B is the cold section's power take-off assembly. For each WUC, there are many different NSN/part number combinations that might fulfill the WUC. Moreover, an NSN/ part number combination might be capable of fulfilling multiple WUCs, and might appear on more than one helicopter. For example, a particular bearing might be a subassembly for both main engines on the AH64 as well as UH60 aircraft. Additionally, some WUCs are entirely conceptual, and have no satisfying part number.

Of major concern is the fact that WUCs are not recognized outside of the Army Aviation Maintenance Community. Therefore, there is no recognized standard for cross referencing WUCs to NSNs/part numbers. Several agencies, such as IMMC, AED, UH60 Program Office, and ATTC have devised effective cross-references using technical manuals and procurement records. However, these references are not in agreement and are not recognized Army-wide. Therefore, within some of our source data systems, WUCs are not in agreement.

We recommend that the Army adopt, publish, and enforce an easy to use and accepted standard for representing where components might be installed on Army systems. This reference must accommodate existing references, and must hierarchically specify every component on the system from the end-item to the lowest washer or rivet.

2.3.3 Source Data Misconceptions

During our study of the aforementioned data sources, we encountered several common misconceptions. These misconceptions have fueled reluctance to fully embrace the design and implementation of a CBM Data Warehouse. The first misconception encountered was that many of the source data systems, particularly the UH60 and CH47 Platform Maintenance

Environments (PMEs), already provide the functionality required by the CBM Data Warehouse. The second misconception is that only one copy of the data should exist, and allowing data to be copied to another data store creates confusion and contradictory information.

The first misconception is addressed by examining the difference between Online Transactional Processes (OLTP) and Online Analytical Processes (OLAP) [15]. Figure 11 summarizes these differences. OLTP processes, such as the PMEs, are systems that provide fast mission-critical data primarily used for management and decision making purposes. This information is typically of a low-grained and aggregate nature. These processes are built on relatively simple queries that touch a small amount of data (one or two tables at a time). These queries must be executed within seconds. OLTP processes also have many updates, and typically store months of data. Dimensional data modeling is sufficient for these processes, as complex database relationships are not required.

On-Line Analytical Processing (OLAP) Analytical Data Warehouse	On-Line Transactional Processing (OLTP) Fleet Management System
- Analytical data - High level of granularity - Many slow transactions (minutes) - Complex queries - Queries touch large amounts of data - Store years worth of data - Relational based data model - Read only - Fed by OLTP data <u>Example:</u> What where the preceding temperature, oil pressure, and vibration levels of all nose gearboxes replaced during winter months on all helicopters in Afghanistan?	- Mission critical data - Low level of granularity - Many fast transactions (seconds) - Simple queries - Queries touch small amount of data - Store months worth of data - Dimensional based data model - Many, frequent updates - Provide base information and updates to OLAP <u>Example:</u> What helicopters in Afghanistan have nose gearboxes from vendor X with more than 500 hours of operating time?

Figure 11 - Differences between OLAP and OLTP Systems

OLAP processes, represented by the CBM Data Warehouse, are systems that provide slow access and extremely high-grained data used for analytical purposes. These processes touch large amounts of data (dozens of tables) at the same time and are built on complex queries. Such queries can take minutes to execute. OLAP processes are largely read-only, and can involve

years worth of data. These systems are largely based on relational data models in order to support the complex nature of analytical queries.

Before moving on to the second misconception, it is important to note that OLTP and OLAP systems are not compatible, and must exist as independent information systems. The reasons for this are found in their different modeling requirements, their different data source requirements, and their different performance requirements. OLTP systems require de-normalized, streamlined data models while OLAP systems required highly-normalized ones. OLTP systems target a relatively few number of specific business processes, and as a result, their designs reflect the peculiarities of these processes. OLAP systems integrate data from many different and unrelated processes, and their designs focus on the processes commonalities. Finally, OLTP systems require near instant transaction times while OLAP systems can wait minutes. From a design standpoint, these systems should not have to fight for the same computer resources.

The second misconception, the one stating that only one copy of data should exist, represents a decision making issue, not a data management issue. The desire to restrict data to a lone source stems from decision makers and managers wanting to retain control of decisions that are made with the data. This is a very valid concern given the very wide group of stakeholders who will use the CBM Data Warehouse. However, in our opinion, this concern should be addressed by controlled decision making policy not controlled data management policy. Limiting access to data severely limits the positive benefits reaped by a full and honest review of information contained in that data. In the arena of intellectual and analytical ideas, open and honest disagreement about different conclusions drawn from the same data is very positive. If two engineers, working for two independent agencies arrive at different conclusions, then the resultant discussion and analysis helps forge improvements for the entire community. This idea is analogous to the open-source software movement, where open and unrestricted access to source code by independent users has produced products that far surpass the capabilities and performance of their commercial counterparts [16].

2.3.4 Common System Components

After an analysis of pertinent source data, we are ready to decompose and extract the common data objects from all data sources. These objects will form the principal components of

the CBM Data Warehouse. While decomposing these individual data sources, we avoided decomposing the system according to existing entities, attributes, and relationships. Doing so would have resulted in creation of a data model that is simply a conglomeration of disparate data schemas forced into a single schema. Such an approach would not necessarily alleviate the inconsistent data definitions, data relationships, and data transformation rules. In short we needed an approach that focused on the “what” not the “how.”

In conducting our system decomposition, we also examined the common thread running through each data source – the Total Army Maintenance Management System Aviation (TAMMS-A). The TAMMS-A represents the actual maintenance system as it exists in practice, and incorporates all possible aspects of Army Aviation Maintenance [11]. Indeed, each current maintenance data source serves as a lens through which researchers and managers examine specific aspects of the entire TAMMS-A system. There are many shortcomings with TAMMS-A, a discussion of which goes beyond the scope of our research. Because of this we opted not to base our model on TAMMS-A. However, any design we devise must be capable of encapsulating the objects and concepts outlined in TAMMS-A.

We use an Affinity Diagramming process to help understand the important elements of our system. During this process we analyze the source data source schemas, the stakeholder interviews, and TAMMS-A to extract all relevant objects, processes, and concepts. This process follows the object-oriented systems development approach outlined in [14]. The process first uses a brainstorming technique to collect all relevant objects and concepts. We then group like-sounding objects into groups, and eliminated duplicate entries. Finally, we attempt to attach meaningful titles to each group. The results of this process, shown in Figure 12, provide an initial loose grouping of system components for information contained in the CBM Prototype system.

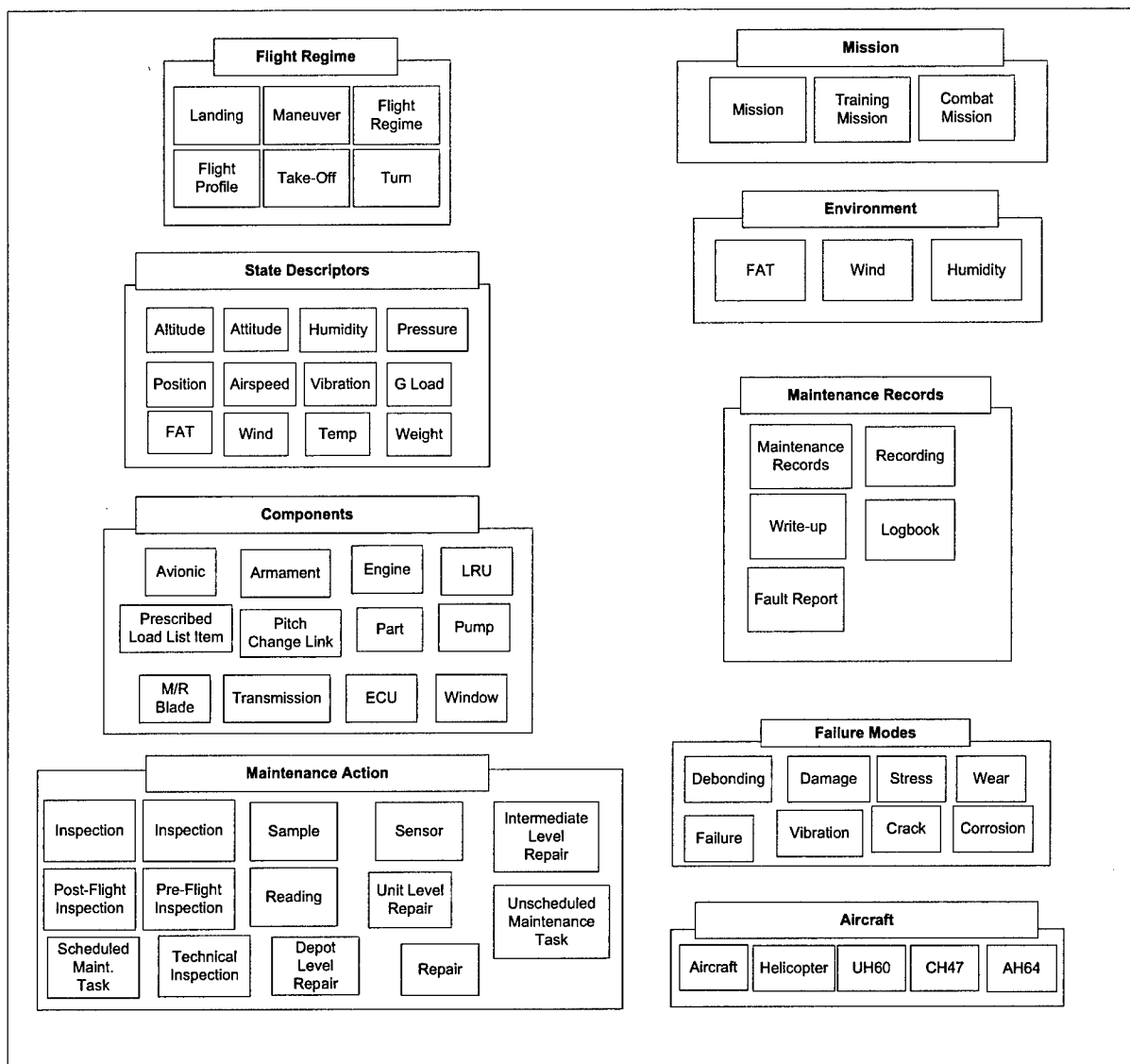


Figure 12 - Affinity Diagram of CBM Data Warehouse Components

2.4 Functional Analysis

Our next step in the needs analysis is to conduct a functional analysis of the CBM Prototype Data Warehouse. This functional analysis will include a functional decomposition that lists the major data warehouse functions, a functional hierarchy that orders these functions into parent-child relationships, and a functional flow analysis that details how these functions interact.

2.4.1 Functional Decomposition.

The major top level functions required by the data warehouse are:

Download Data (Function 1.0)

Store Data (Function 2.0)

Transport Data (Function 3.0)

Translate Data (Function 4.0)

Process Data (Function 5.0)

Load Data into CBM Data Warehouse (Function 6.0)

Optimize Data for Presentation (Function 7.0)

The following paragraphs define each of these top level functions, and further specify important sub functions.

Function 1.0 - Download Data

This function consists of all actions required to capture the information from onboard aircraft collection equipment, or aircraft paired equipment (enhanced log books). The function is decomposed by data type below.

Function 1.1 - Download VMEP Data from Aircraft

This function consists of downloading the VMEP data from each individual aircraft into a VMEP ground station. This is accomplished by linking a VMEP ground station computer to the aircraft and then downloading pertinent files. This process takes approximately 20 minutes per aircraft. The data is stored in a Microsoft Access database (mdb) on the VMEP ground station. One can view the data using the VMEP ground station application, export the data as comma delimited text, or use any software package capable of reading 'mdb' data.

Function 1.2 - Download MDR Data from Aircraft

This function consists of downloading the MDR data from each individual aircraft into a computer. This is accomplished with a MDR-specific software application (LIMSSGAS)

running on a laptop computer. This process takes approximately 30 minutes per aircraft. This data is viewable only with computers equipped with the MDR-specific proprietary software.

Function 1.3 - Download ELAS Data from Logbook

This function consists of downloading data from each individual aircraft electronic logbook (each aircraft's laptop) into a central ELAS computer file (Battalion Production Control Computer). This process is near instantaneous and accomplished as part of normal ELAS standing operating procedures. The electronic logbooks – laptops paired with each aircraft - are continually updated after each flight. The central ELAS computer file is a single ELAS database that stores all faults for a fleet of aircraft. This file is in Microsoft Access format (mdb) and readable by the ELAS software application or any software package capable of reading 'mdb' data.

Function 2.0 - Store Data

Store Data consists of storing the data as it is transferred from one location to the next.

Function 2.1 - Store Raw VMEP Data

Store Raw VMEP Data consists of storing VMEP Data in its native form (from a VMEP ground station) onto a local storage device (backup hard drive) or a removable storage media (CD). This process, akin to a data backup, is normally accomplished once per week, and takes approximately 12 minutes.

Function 2.2 - Store Raw MDR Data

Store Raw MDR Data consists of storing the MDR data collected with the MDR-specific computer into a local storage device (backup hard drive) or removable storage device (CD). This process, akin to a data backup, is normally accomplished once per week, and takes approximately 12 minutes. This massive data set (100MB+ per flight), is in binary format, and unusable for analysis until translated.

Function 2.3 - Store Raw ELAS Data

Store Raw ELAS Data consists of storing a copy of the unit ELAS database (a single 'mdb' file) on a local storage device (backup hard drive) or removable storage device (CD). This process, akin to a data backup, is normally accomplished once per week, and takes approximately 12 minutes.

Function 2.5 - Store Processed MDR Data

Store Processed MDR consists of storing the "clean" or usable MDR data after it has been processed by the data process function (see Function 4.2)

Function 2.6 - Store Processed ELAS Data

Store Processed ELAS consists of storing the clean ELAS data after it has been processed by the data process function (see Function 4.3)

Function 2.7 - Store Processed VMEP Data

Store Processed VMEP consists of storing the clean VMEP data after it has been processed by the data process function (see Function 4.1)

Function 3.0 - Translate Data

The Translated Data function consists of all functions required to translate maintenance data from one form (syntax/schema) to another.

Function 3.1 - Translate Raw MDR Data

The Translate Raw MDR Data function consists of using the MAST program to translate raw MDR data (in binary form) to interpretable text data (ASCII CSV).

Function 3.2 - Translate Raw VMEP Data

The Translate Raw VMEP Data function consists of using the exporttotext.exe program to translate raw VMEP data (in binary form) to interpretable text data (ASCII CSV).

Function 4.0 - Process Data

The Process Data function consists of preparing the various data sources for storage as standard data warehouse entities. This consists of the following general functions – error correction, time synchronization, information correlation, redundant information control, and implicit information extrapolation.

Function 4.1 - Process VMEP Data

The Process VMEP Data Function consists of preparing the VMEP data source for storage as standard data warehouse entities, and includes the following sub-functions.

Function 4.1.1 - Correct VMEP Errors

The Correct VMEP Errors Function consists of scanning the VMEP data set for obvious errors – failed sensors (flat-lines), dropped sample points, corrupted data, etc.

Function 4.1.2 - Standardize VMEP Timing

The Standardize VMEP Timing Function consists of synchronizing the VMEP GMT time with that of MDR. This is vital if vibration events (captured with VMEP) are to be correlated with usage events (captured mostly with MDR). The results of the exporttotext.exe program translate all times into the local machine time running the exporttotext.exe program.

Function 4.2 - Process MDR Data

The Process MDR Data Function consists of preparing the MDR data source for storage as standard data warehouse entities, and includes the following sub-functions.

Function 4.2.1 - Correct MDR Errors

The Correct MDR Errors Function consists of scanning the MDR data set for obvious errors – failed sensors (flat-line readings), data outside realistic ranges (super low temperatures, other improbable readings), corrupted data, etc.

Function 4.2.2 - Standardize MDR Timing

The Standardize MDR Timing Function consists of synchronizing the MDR GMT time with that of an outside/universal time, if required.

Function 4.3 - Process ELAS Data

The Process ELAS Data Functions consist of preparing the ELAS data source for storage as standard data warehouse entities.

Function 4.3.1 - Match, lookup, and record ELAS component information

This process consists of matching components listed in electronic DA Form 2408-13-1 narratives with components listed in actual Army maintenance manuals and supply data sources. This includes matching NSN, NIIN, part number, work unit codes (WUC), position codes, serial number, and TSI/TSN. This process will require a human or intelligent system to derive this information from narrative entries.

Function 4.3.2 - Match, lookup, and record ELAS maintenance actions

This process involves matching the maintenance action listed on the DA Form 2408-13-1 (codes and narratives) to maintenance actions specified in Army maintenance doctrine. This includes maintenance function, maintenance interval, maintenance level, tools, man hours required, etc.

Function 4.3.3 - Match, lookup, and record ELAS failure information

This process involves matching the failure event information on the DA Form 2408-13-1 (codes and narratives) to recognized failure modes in the Army maintenance doctrine. This includes failure codes, malfunction effect, how recognized, when discovered, when occurred, and failure measurements (e.g. "axial bearing play is 0.334").

Function 4.3.4 - Normalize ELAS timings and sequencing

This process involves matching and correcting DTG and aircraft hour entries on the DA Form 2408-13-1 electronic entry. For example, if the unit records local time, convert it to GMT. Or, ensure the aircraft hours match time at failure.

Function 4.3.5 - Check all 2408 ELAS codes

This process involves checking all DA From 2408 codes for logical consistency. For example, the “how discovered” code for a cracked rotor should say “post flight” not “during flight.”

Function 4.3.6 - Match, lookup, and record ELAS supply actions

This process involves matching and tagging DA From 2408-13-1 entries that involve supply actions. For example – Was the component replaced? What component (by serial number) replaced the failed component? When did the replacement occur?

Function 5.0 - Transport Data

The Transport Data function involves those functions required to move data from point A to point B. These Functions might be accomplished with mailed CDs or electronic transmission (SATCOM, FTP, SFTP, SIPRNET, etc).

Function 5.1 - Transport Raw VMEP Data from Aircraft to Unit HQ

This process includes all functions required to get the raw VMEP data from the aircraft to a centralized location in the unit. This is currently accomplished with cable-connected laptops (running VMEP ground station) or local wireless LANs inside the unit.

Function 5.2 - Transport Raw ELAS Data from Aircraft to Unit HQ

This process includes all functions required to get the raw ELAS data from the aircraft to a centralized location in the unit. This is currently a native function of each aircraft’s ELAS laptop (either cable connected or wireless).

Function 5.3 - Transport Raw MDR Data from Aircraft to Unit HQ

This process includes all functions required to get the raw MDR data from the aircraft to a centralized location in the unit. This is currently accomplished only with a cable-connected MDR-specific laptop.

Function 5.4 - Transport VMEP Raw Data from Unit to Data Processors

This process includes all functions required to get the raw VMEP data from the unit to the CBM Data Processors (those individuals tasked with processing and translating raw CBM data). This function will entail periodically transporting copies of the unit's central VMEP ground station data base via CD, ftp, or other means to data processors.

Function 5.5 - Transport MDR Raw Data from Unit to Data Processors

This process includes all functions required to get the raw MDR data from the unit to the CBM Data Processors. This will entail periodically transporting copies of the unit's MDR-specific laptop data set via CD, ftp, or other means to data processors.

Function 5.6- Transport ELAS Raw Data from Unit to Data Processors

This process includes all functions required to get the raw ELAS data from the unit to the CBM Data Processors. This will entail periodically transporting copies of the unit's central ELAS data base via CD, ftp, or other means to data processors.

Function 5.7 - Transport Processed VMEP Data from Data Processors to Data Warehouse

This process includes all functions required to get the processed VMEP data from Data Processors to the Data Warehouse.

Function 5.8 - Transport Processed MDR Data from Data Processors to Data Warehouse

This process includes all functions required to get the processed MDR data from Data Processors to the Data Warehouse.

Function 5.9 - Transport Processed ELAS Data from Data Processors to Data Warehouse

This process includes all functions required to get the processed ELAS data from Data Processors to the Data Warehouse.

Function 6.0 - Load Data into CBM Data Warehouse

This process includes all functionality required to load processed data into the CBM Data Warehouse

Function 6.1 - Translate VMEP Entities to DW Entities

This process includes all functionality required to store clean VMEP entities into the data warehouse entities. This is an automated process that will take place as the data is loaded.

Function 6.2 - Translate MDR Entities to DW Entities

This process includes all functionality required to store clean MDR entities into data warehouse entities. This is an electronic process that will take place as the data is loaded.

Function 6.3 - Translate ELAS Entities to Data Warehouse Entities

This process includes all functionality required to translate clean ELAS entities into data warehouse entities. This is an electronic process that will take place as the data is loaded.

Function 6.4 - Load Data Warehouse Entities

This process, a database function, takes translated Data Warehouse entities and stores them in appropriate tables in the data warehouse.

Function 7.0 - Optimize Data for Presentation

This process, a database function, involves organizing and optimizing the loaded data for use by the stakeholders.

2.4.2 Functional Hierarchy

The next step involved with the Functional Analysis is to organize these functions hierarchically according to parent child relationships. Figure 13 shows the resultant Functional Hierarchy for the CBM Prototype Data Warehouse.

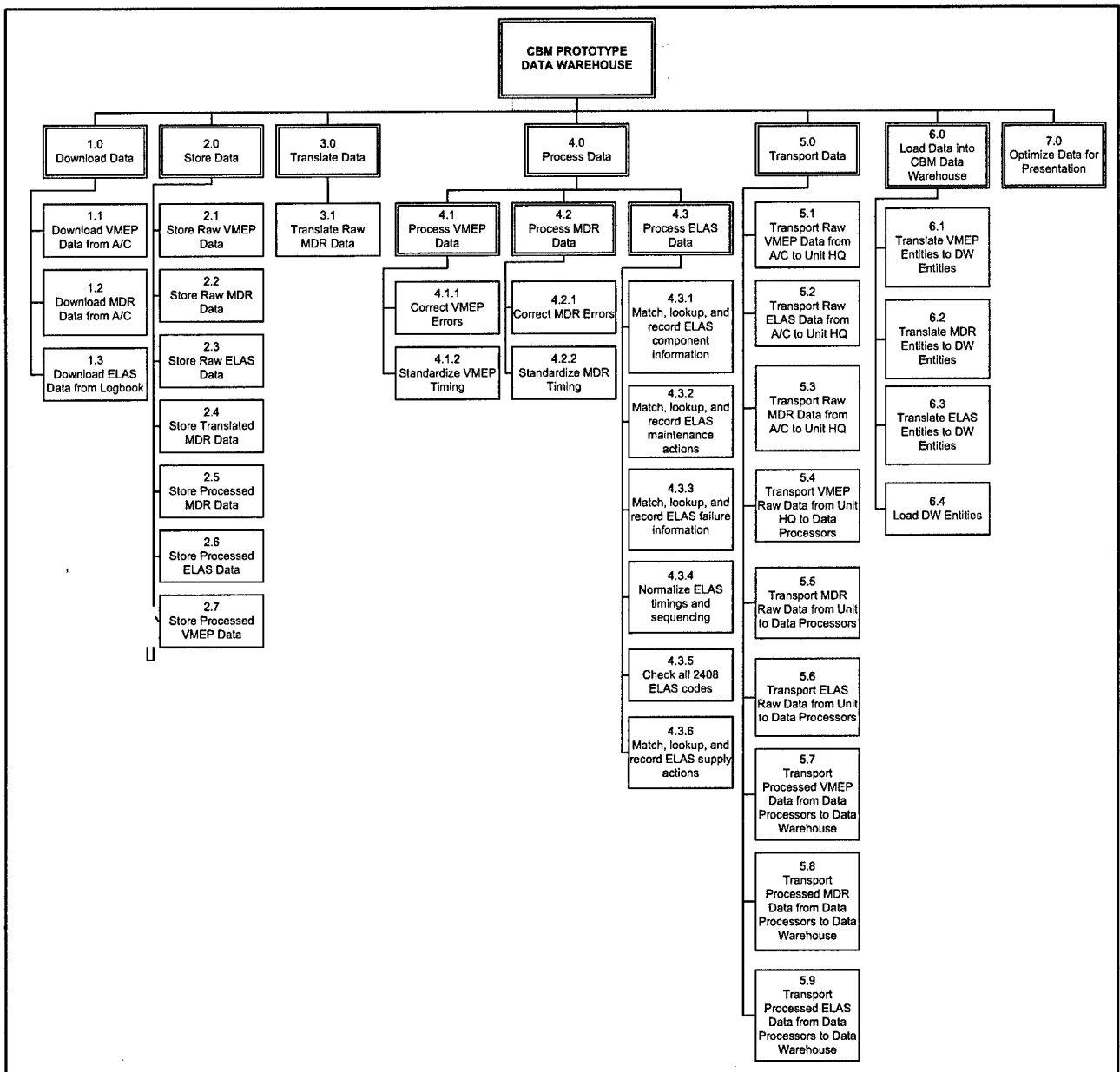


Figure 13 - Data Warehouse Functional Hierarchy

2.4.3 Functional Flow Analysis

The final step of the functional analysis is to organize the functions into the sequence they will follow in the data warehouse information system. The resultant top level functional flow diagram is shown in Figure 14. Figures 15 thru 17 show sublevel functional flow diagrams focusing on specific data sources.

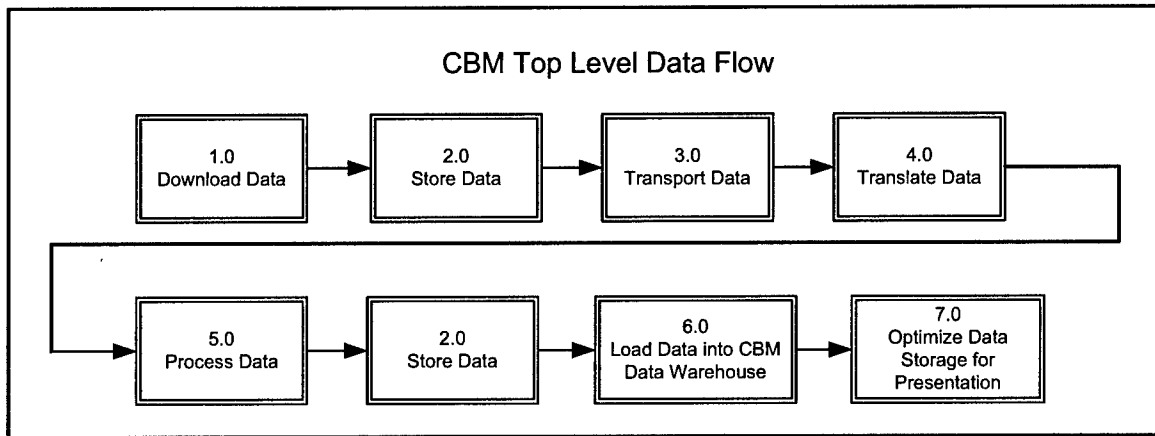


Figure 14 - Data Warehouse Functional Flow

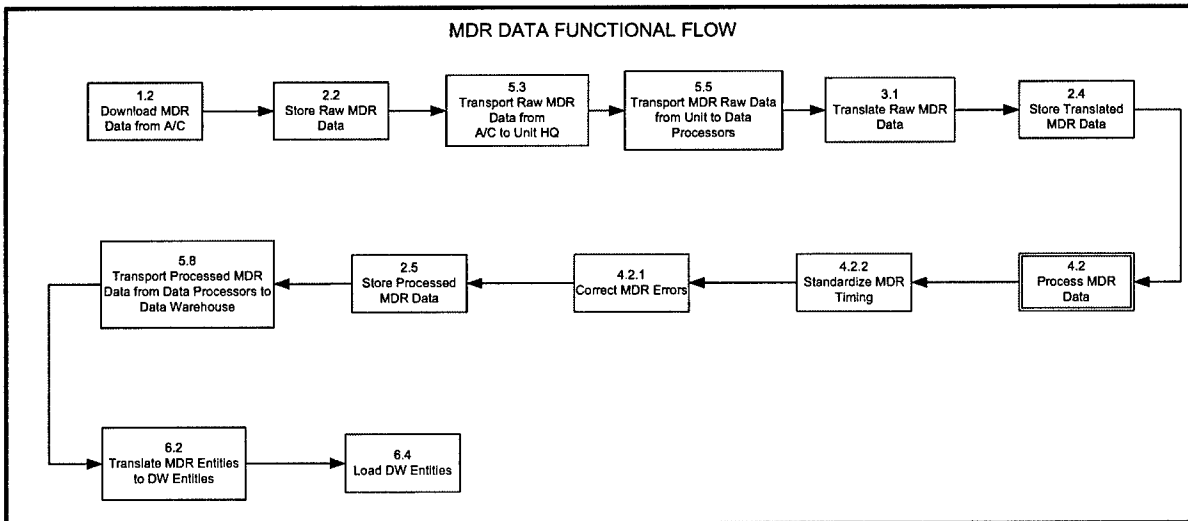


Figure 15 - MDR Data Functional Flow

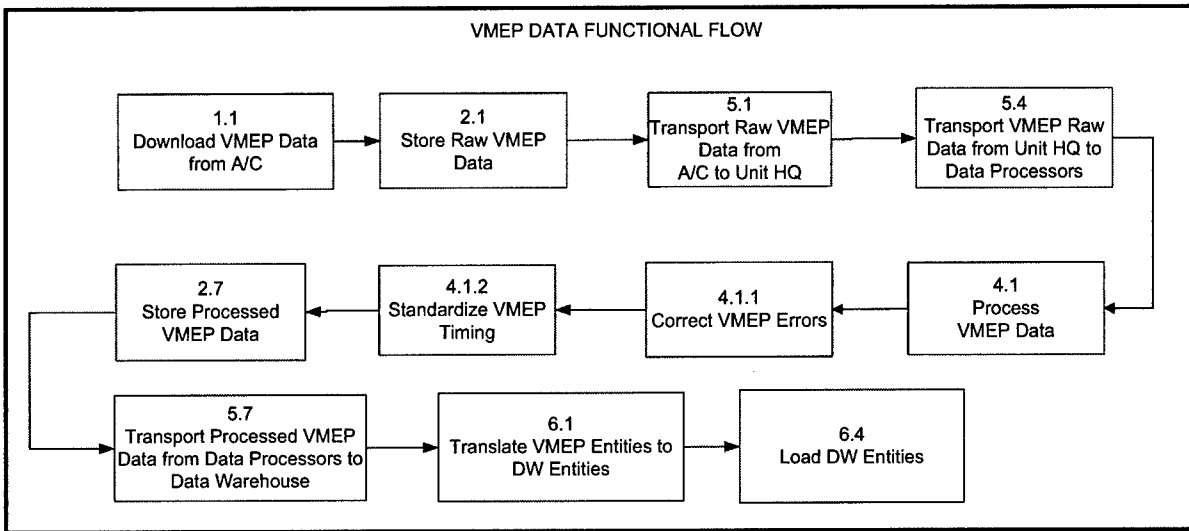


Figure 16 - VMEP Data Functional Flow

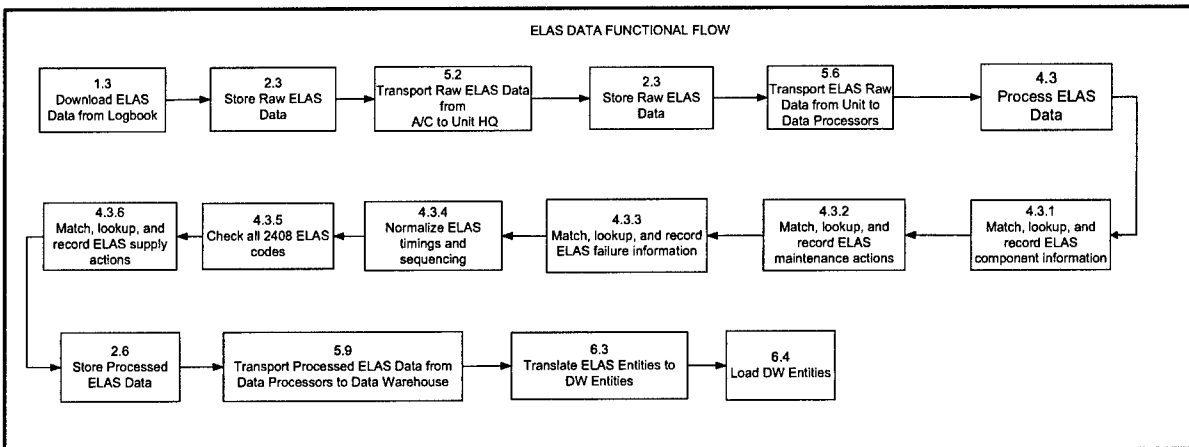


Figure 17 - ELAS Data Functional Flow

2.5 Revised Problem Statement

At the end of the Needs Analysis Process we arrive at a Revised Problem Statement. This revised problem statement captures the essence of the engineering design task at hand, sets the scope of the system, and reflects the major needs, wants, and desires of our stakeholders.

The Revised Problem Statement for the CBM Prototype is:

Develop a data warehouse for the CBM Prototype. This warehouse shall include all relevant and available state, vibration, and maintenance information from designated Army units. Design a management plan for this data including translating and loading of the data into the data warehouse. This data warehouse must be scalable and support design iterations beyond the CBM Prototype. The data warehouse will combine diagnostic, configuration, and maintenance data to form a composite investigative picture at any point in a component's lifetime. This data warehouse shall provide sufficient information to major stakeholders that enable development of detailed diagnostic and prognostic models to support CBM.

3. Design & Analysis

3.1 Design & Analysis Overview

After completing the Problem Definition phase of our design process, we next turn to the Design & Analysis phase of our design process. In this phase, we will first develop and analyze the prototype logical and physical architectures supporting the CBM Prototype Data Warehouse. We then introduce our source data management design and our extract, transform, load design.

3.3 Software Architecture Design

After a thorough review of our prototype data sources, we are ready to begin our software architecture design. The software architecture design for the CBM Data Warehouse consists of all software-based systems required by the data warehouse. This includes source data products, offline data stores, database systems, and software processes used to extract, translate, and load (ETL) source data. Implementations of these software processes might range from commercial off-the-shelf software solutions to custom built applications and routines.

Our software architecture includes two primary designs – logical and physical. The logical design consists of an abstract representation of the entire data warehouse as well as object and relational models for data staging, ETL processing, and eventual data storage. The physical design represents a set of products that establishes the formal software definitions of the logical

model and support easy implementation. Both the logical and physical models are defined in sections 3.3.1 and 3.3.2 below.

3.3.1 Data Warehouse Software Logical Design

Figure 18 describes the high-level logical design for the CBM prototype data warehouse. This figure shows an overall data warehouse divided into two primary logical partitions – a pre-processed partition and a unified partition. Each of these partitions plays an important role in meeting the needs of the stakeholders described above.

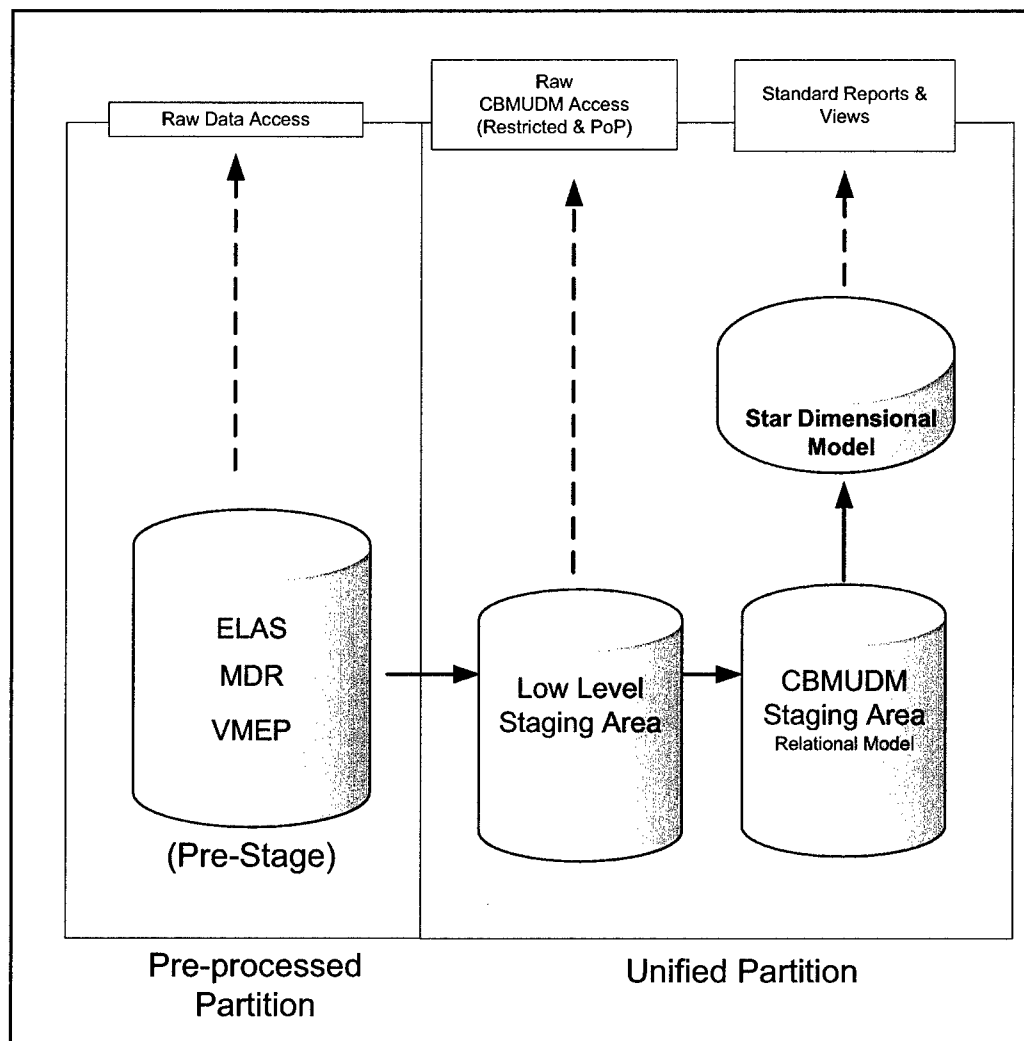


Figure 18 – High Level CBM Data Warehouse Logical Design

The pre-processed partition, or P3, is a “raw” data store area used to collect source data. The P3 is designed to fulfill two primary purposes. First, the P3 provides a single contiguous area where all the source data can be stored for further processing. This centralization of source data greatly simplifies the data management and ETL processes described in subsequent sections. Second, the P3 immediately satisfies the stated need of engineers, analysts, and decision makers to have access to source data for the CBM Proof of Principle data analysis tasks described in the introduction.

Data in this area satisfies one requirement – it must be readable by commercial off-the-shelf analytical tools such as MS Excel or Matlab. The data is deemed “pre-processed” because it is stored only within native data contexts, and is not combined or normalized. Likewise, source-data schemas and granularity are maintained, and no data cleansing or error checking is performed.

It is important to note that, because the P3 does not call for data cleansing or normalization, it might be implemented in any number of ways. These might range from a set of flat-files on a computer file share to binary files stored inside a database. It is also important to note that the P3 is only open to use by engineers and other stakeholders during the prototype phase of the CBM data warehouse. In an eventual CBM data warehouse implementation, we will want to restrict views of source data to the unified partition. This is to avoid users having potentially conflicting views of the information stored in the same data warehouse.

The unified partition of the data warehouse represents the area where all source data is combined into a unified representation of the complete aviation maintenance system. This area consists of three primary layers. The base layer is a low-level stage where data is loaded from the P3 into actual database structures in the implementing database system. The purpose of this layer is to facilitate loading within an implementing database system.

The middle layer, or CBM Unified Data Model (CBMUDM), represents a relational data structure where source data from the low-level staging layer is combined into a single-unified set of related database objects. Here, we have made a deliberate and careful decision to develop a relational staging area. Despite the enormous effort that will be involved in designing and implementing the CBMUDM, we believe it is essential to combining all data sources [17]. The purpose of this layer is to allow related data from independent data sources to be combined and collated. For example, aircraft part data taken from an independent set of maintenance records is

paired with pertinent sensor data taken from independent sensor data records. Because the CBMUDM is relational and involves complex, slow queries to access data, it is only used for staging purposes.

The top layer, or presentation layer, represents optimized data structures used to view the information in the data warehouse. This layer is based on efficient dimensional and cube modeling structures designed to satisfy specific stakeholder needs. It is a read-alone based information repository, and built from queries ran against the CBMUDM layer. It is the primary source of information provided to the stakeholders.

3.3.1.1 Low-level Stage Logical Design

The low-level stage is designed as an area where source data from the P3 can be loaded into database objects. This layer consists of flat database structures that loosely correspond to the individual data source schemas. Some relational modeling is done at this level, but only enough to facilitate efficient data loading.

The low-level stage design is broken into three sub designs– MDR, VMEP, and UniRAM. The MDR logical design consists of three entities. The MDR Parameter Entity models the meta-data for each MDR parameter – description, units, minimum value, maximum value, etc. This allows us to load each parameter’s meta-data once, and not repeat it for each entry of actual MDR Data. The MDR Data Entity models the actual MDR data recordings. Here we store a foreign key linking the data to its corresponding parameter information in the MDR Parameter Entity. We also record the data’s recorded value, the start date/time of the recording, and the end date/time of the recording. We add the concept of an end time to facilitate future efforts to address the discontinuities in the MDR data set described in Section 2.3.2.1. The final entity in the MDR low-level stage logical design is the MDR Mission table. This is where we record information common the the entire MDR usage period, such as aircraft identification, usage period start time, and usage period end time.

The VMEP logical design is very similar to the MDR logical design. The VMEP Parameter entity stores meta-data about each VMEP parameter or CI – CI name, description, units, etc. The VMEP Data Entity stores the actual VMEP recorded data with start and end date time groups. The VMEP Mission Entity tracks information about the entire VMEP usage period.

The UniRAM logical design is an exact copy of the current UniRAM schema. Because UniRAM is a mature information existing within an actual database, this data is already modeled and loaded by technicians at Fort Rucker.

Our other relevant on-change data sources, described in Section 2.3.2.5, are modeled in our low-level stage as comma delimited files. These files are created by third-party tools, such as MS Excel or MS Access, and serve as direct inputs to our extract, transform, and load process.

3.3.1.2 CBMUDM Logical Design

The construction of the CBMUDM naturally flows from the Affinity Diagramming process conducted during our Problem Definition Phase. We designate the major group headers and ungrouped objects of our Affinity Diagram (Figure 12) as entities in our model. We then revisit the data sources and stakeholder interviews at a much finer level of detail and identify attributes for the various entities and identify the relationships between our chosen entities. This is a largely iterative process where we continually review the results with subject matter experts and the stakeholders to ensure our model captures all pertinent information in the Aviation Maintenance System. Our resultant logical model for the CBMUDM is an Entity-Relationship (ER) diagram located in illustrated in Appendix G. In the interest of brevity, we have only included pertinent attributes in the ER diagram. Each of the model's entities is discussed below.

The Component Entity represents the central element of our model. It is the object driving the entire shift to Condition Based Maintenance. Each component is a specific physical part in the Aviation Maintenance System. It contains attributes used to describe an individual component such as serial number, manufacturer lot number, and component weight.

The component maintains a reflexive relationship with other components. This allows us to capture the hierarchical installation history of components that are sub-elements of larger components. For example, an engine turbine section might be a sub-component of an aircraft engine. The reflexive component to component relationship allows one to track what particular engine contained a particular engine turbine section, and when the turbine section was installed or removed.

The End Item Entity maintains an "is-a" relationship with the Component Entity. An end item is a specialized component that represents the top-level component in a component hierarchy. This entity allows us to query information about an end item without doing a complex

join on the larger component entity. For scalability reasons, we term this object as an “end item” to allow our CBMUDM model to be extended to any Army system – aircraft, truck, tank, missile, etc. The specialized Aircraft Entity in our model allows us to capture attributes specific to end items classified as aircraft (e.g. aircraft status, current operating hours, etc).

Each Component Entity in our model instantiates a General Component Entity. This very important entity describes the set of all abstract components that *might* occur in various facets of the Aviation Maintenance System. This modeling of hypothetical components is required for several reasons. First, it allows us to model information common to all components of a certain type. For example, there is certain information common to all UH60 aircraft transmissions that we want to model. Procurement personnel may want to track a list of all possible manufactures for the transmission. Maintenance planners may want to capture a list of standard transmission repairs they might encounter with any transmission. Finally, analyst may want to view a list of sensors that report information about all transmissions. The general component entity allows us to capture this type information.

The second reason we need the general component entity is to capture components in the system that will eventually show up as specific components. For example, a crew chief may determine that a specific serial-numbered gear box has failed on an AH64D helicopter. To fix the repair, the crew chief needs to know what components are generally required to fix the failed gearbox – e.g. a new gearbox and new mounting hardware. The crew chief can then requisition these general components through the supply system. Until specific parts are shipped from a supply depot to fulfill the supply request, we need a way to capture the concept of the replacement parts. The general component entity allows us to handle this situation.

The Unit Entity allows us to track which particular organization possesses or “owns” a component. A unit represents actual operational Army units to include supply depots and maintenance facilities. This information is useful in determining where a component is physically located (i.e. what transmissions are in Afghanistan) as well as where a component has been in the past.

The Manufacturer Entity allows us to track information about what particular manufacturer supplied the component to the Army. This information is invaluable to logistics planners, reliability engineers, and safety investigators.

The Usage Period Entity records the individual uses of the aircraft or end item. This allows us to record when, and for how long, the end-item was used. A usage period might correspond to a full two-hour mission, or a simple fifteen minute maintenance operational check.

The State Descriptor Entity is used to capture the data describing the Usage Period and General Component Entities. State descriptor data ranges from the temperature of a nose gearbox to the bank angle of the aircraft in flight. The relationship between the State Descriptor entity and the Usage Period Entity allows us to capture specific state descriptor recordings during a specific usage period. For example, we can record all left hand nose gearbox temperature values for AH64D #446 during a three-month period. By using the relationship between End Item and Component, we can burrow down and match these temperature values to the specific serial numbered nose gearbox (or gearboxes) installed on AH64D #446 during the same period.

The relationship between State Descriptor and General Component allows us to record what state descriptors generally describe a particular component. For example, for all CH47 transmissions, we might have four state descriptors that provide relevant information – transmission oil temperature, transmission oil pressure, transmission oil level, and transmission vibration. This information is useful to analysts who want to see what types of data are reported for certain components.

The most important feature provided by the State Descriptor entity is its ability to standardize data from disparate Digital Source Collectors mounted on aircraft. A Digital Source Collector (DSC) is any aircraft sensor that provides information about aircraft components. As of this writing, there are literally dozens of different DSC's, each manufactured by different vendors, and each with its own native data schema and data protocols. Many of these different DSC's track information about the same set of components. Combining information from these non-standardized data collection devices has been problematic for the aviation community [5]. The State Descriptor Entity allows us to combine data from any of these DSC's into a common logical object.

In some respects, state descriptors are actually time variant attributes. However, following the rules for entity selection outlined in [16], we decided to track state descriptors as separate entities as opposed to object attributes for two reasons. First, state descriptor information will serve as both dependent and independent variables in component failure analysis. Because of

this fact, researchers and analysts will want constant access to this data. Second, state descriptors are used to describe several other entities in or model.

One of those entities is the Flight Regime Entity. A flight regime (or maneuver) is defined by an ordered combination of certain state descriptor trajectories experienced in flight. For example, a right turn might be defined as the aircraft attitude (as measured by on board sensors) experiencing a 10 degree right bank for more than 30 seconds. Several CBM Prototype stakeholders specifically mentioned this entity during our stakeholder analysis.

The Failure Entity is used to capture the concept of a degraded component. A failure is a specific failure event related to a specific component. For example, if a night-vision site on a specific AH64D fails in flight, then we would generate a specific failure for this event.

Each failure is described by one or more Failure Mode Entities which serve as standardized objects for categorizing component degradation. The failure mode allows us to specify exactly what we mean by a "failure." This entity is needed for several reasons. First, several stakeholders expressed dismay at the lack of failure specificity provided in the current Aviation Maintenance System. Simply saying a component "failed" is often times not enough information to conduct meaningful analysis. For example, if the night-vision system for an AH64D fails in flight, the pilots might report "night vision system unusable for flight." This is sufficient information from the pilots' perspective, as the system simply isn't working. However, there are several different ways the night-vision system could become "unusable." Perhaps the night-vision picture went black, or maybe it turned solid green, or maybe it was just too dim for effective use. From a component and failure analysis perspective, each of these represents a distinct failure mode of the system requiring independent analysis. Current failure information that exists in the Aviation Maintenance System is largely based on the pilot's or unit's perspective, forcing engineers and analyst to combine very different failure modes into a single aggregated definition of failure.

The second reason we need a Failure Mode entity stems from the way failure modes are ascertained at various levels of repair in the Army Maintenance System. Because of the level of repair for the night-vision system, the actual nature of the failure might not be known until the system is rebuilt at a repair facility. This opens up the possibility that two descriptions for the same failure are entered into the Aviation Maintenance System for the same failure – one related

to the pilots perspective and one from the repair facility perspective. The pilot reports an “unusable system” when the factory reports “failed signal processor.”

A third reason we need a Failure Mode entity relates to the way the current Aviation Maintenance System (TAMMS-A) standardized failure codes. Current maintenance policy as defined by DA PAM 738-751 provides for 216 standardized codes describing failure. These range from “Incorrect Antenna Gain” to “Buckled or Twisted.” However, this is a relatively limited number of codes given the potentially thousands of specific failure modes across the entire fleet of aviation components.

The Failure Mode entity addresses these issues. First, the Failure Mode Entity allows for a very specific definition of failure modes because each failure mode in the CBMUDM is described by one or more state descriptors trajectories. For example, in the night-vision site scenario, one failure mode might be described by a state descriptor measuring the night-vision power supply voltage below some nominal value. By using state descriptors to describe failure modes, we can encapsulate all the existing failure codes in DA PAM 738-751 as well as any failure code imaginable. Second, the many-many relationship of failure event to failure mode allows us to handle the situation of different levels of repair providing more detailed information about the same failure.

When a failure occurs, it is addressed by a Maintenance Action entity. A maintenance action is any maintenance activity (not just unscheduled maintenance actions) and will involve one or more components. A maintenance action might also require replacement of general components, which are in turn satisfied by components in the supply system.

The General Maintenance Action Entity is used to describe regularly scheduled maintenance actions required for component maintenance. This entity also describes prescriptive maintenance actions that might be used to assuage a particular failure mode. This allows us to capture vital planning data, which along with entities such as Tool, General Component (for replacement), Maintenance Personnel, and Publications can be valuable in forecasting maintenance requirements. If we experience an actual failure mode or, more interesting, predict a failure mode based on prognostics, we can automatically plan for its repair. This plan could take the form of a semi-automated P4T2S (Plan, People, Parts, Publications, Tools, Time, Safety) maintenance analysis, a common management practice in today’s Army Aviation community [19].

The Sensor entity is used to model information about DSC's and other sensors that provide information to state descriptors. This entity provides vital meta-data to engineers about the inner workings of each sensor. For example, an engineer may want to find out what vendor manufactures a certain sensor, or view information particular to a certain fielded version of a sensor.

3.3.1.3 Star-Dimensional Logical Design

The star-dimensional layer of our overall logical design is an efficient, read-only presentation layer that will serve as the primary mechanism for accessing the data warehouse by stakeholder. This layer is largely designed for future versions of the CBM Data Warehouse, when stakeholders start regular access to the warehouse. We feel that, for purposes of the CBM Prototype proof of principle, the CBMUDM layer can provide most the information for the demonstration. Therefore, this layer is beyond our original scope of work. However, we will provide a cursory review of what future designs of this layer might look like in the future.

At this level, we envision a set of independent dimensional models specifically designed to address common stakeholder needs. These models will largely follow techniques described by Kimball [17]. We will describe and analyze one such example model here.

Several of our stakeholder expressed interest in being able to examine usage/state data for components. These stakeholders want to be able to examine the following for any component on the aircraft – unit information, aircraft information, and usage/state indicators trajectories at any point in the component's life.

At the center of the star-dimensional model is the Component State fact table. This fact table contains foreign keys to the following dimensions (each taken from the CBMUDM layer) – Unit, Component, State Descriptor, and Usage Period. The fact table also contains an attribute for state descriptor values, start DTG for the state descriptor value, and end DTG for the state descriptor value.

Each row in the fact table corresponds to an individual state descriptor value and its start and end DTG. For each of these values, we record the foreign keys to the following entities - the usage period when it was recorded, the components it monitors, and the unit that owned the aircraft.

This model would allow engineers to query the component state information in a variety of ways – by unit, aircraft, component, state descriptor, or time period. These queries, involving only single-level joins built off binary indices, would be very efficient. However, they would also involve a tremendous volume of information. The following back of the envelop calculation demonstrates this point:

1 unit X 24 aircraft per unit X 1400 components per aircraft X 5 state descriptors per component (AVG) X 20 usage periods per month (AVG) X 123 state descriptor entries per usage period (AVG) = **413 Million fact table entries per month***

**Based on MDR analysis at Appendix D*

This calculation demonstrates the heavy storage cost involved with providing efficient access to the CBM Data Warehouse. It is clear that future versions of the warehouse will grow to terabyte levels if efficient access to the data is desired.

3.3.2 Data Warehouse Physical Design

We produced physical designs for both the low-level stage and CBMUDM. These designs specify the database objects required to implement the logical design in an actual database architecture (Oracle, Sybase, MS-SQL, etc). This design includes table definitions, comments, specification of table attributes, primary and foreign key identification, and specification and implementation of relationships.

3.3.2.1. Low-level Stage Physical Design

Appendix H contains the physical design for the MDR and VMED portions of the low-level stage. Readers are referred to Appendix F for the UniRAM portion of the physical design.

3.3.2.2. CBMUDM Physical Design

Appendix I contains the physical design for the CBMUDM.

3.4 Source Data Management Plan

The data management design describes the general process used to gather source data from various disparate data sources and load it into the data warehouse. This includes how data is downloaded, copied, moved, translated, and loaded. Our source data management plan only includes those data source for the CBM prototype that provide frequent and dynamic data – state and usage data from MDR, vibration data from VMEP, and maintenance data from UniRAM.

Our data management plan is a detailed elaboration of our functional analysis conducted in the Problem Definition Phase of our design process. It describes how the functional flow should be implemented to achieve the functionality of our system. Figure 19 shows an overview of our data management plan. This plan is broken into ten steps, each shown in a square labeled with a number. We briefly describe each step below.

STEP 1 - Receive Raw Data. This data management step represents Functions 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 5.1, 5.2, 5.3, 5.4, 5.5, and 5.6 in the functional analysis. In this step, raw data is received from the field, most likely on compact disk media. In the future, this data transfer may occur over Army networks. The agency receiving the raw data is primarily responsible for preparing the data for loading into the data warehouse.

STEP 2 - Upload Disk to Temporary File Server. This step corresponds to Functions 2.1, 2.2, and 2.3 in the functional analysis. In this data management step, the receiving agency temporarily stores the raw data to local storage for further processing.

STEP 3: Secure Original Disks. This data management step (Functions 2.1, 2.2, and 2.3), represents permanent archiving of the raw data.

STEP 4: Upload VMEP Data to VMEP Data Store. This step represents Function 2.7 in the functional analysis. In this step, the receiving agency uploads to VMEP binary files to the IAC Website. The IAC Website is a standard Army repository for all VMEP data from Army Aircraft.

STEP 7: Upload Pre-processed Data to Data Warehouse. This step corresponds to Functions 2.5, 2.6 and 2.7. This step represents the loading and storage of all pre-processed data into the data warehouse. We use the term “pre-processed” to indicate all data that is text readable but not correlated in a unified fashion.

STEP 8: Upload Pre-processed Data to Data Warehouse Pre-processed Partition. In this step, largely an extension of step 7, we store the text readable files in the pre-processed partition of the data warehouse. This allows engineers and analyst to immediately use the raw data, albeit in a non-unified and uncorrelated form.

STEP 9: Execute Extract, Transform, Load Processes. This data management step covers Function 6.0 in the functional analysis. In the step, we begin loading the unified partition and convert source data entities to CBMUDM layer entities. This step begins with loading raw data into the low-level stage and ends with source data objects translated to unified objects in the CBMUDM. This process is described in more detail in Section 3.6 below.

STEP 10: Replicate UniRAM Data. In this data management step, covered under Function 5.9 of our functional analysis, the post processed UniRAM data is transferred directly into the low-level stage of the data warehouse.

3.6. Extract, Transform, Load Design Processes

A significant part of our research involved an actual design of the extract, transform, load mechanisms (ETL) to transfer data from source data schemas into the unified CBMUDM. This represents Step 9 of our data management plan. In this section we will outline the general information processes required to populate the unified partition of data warehouse. It is important to note that these are independent processes, and might be implemented with custom software routines, off-the shelf ETL software, or other implementations.

We will use a series of *data flow diagrams* to describe our ETL design. Figure 20 lists the legend for these data flow diagrams.

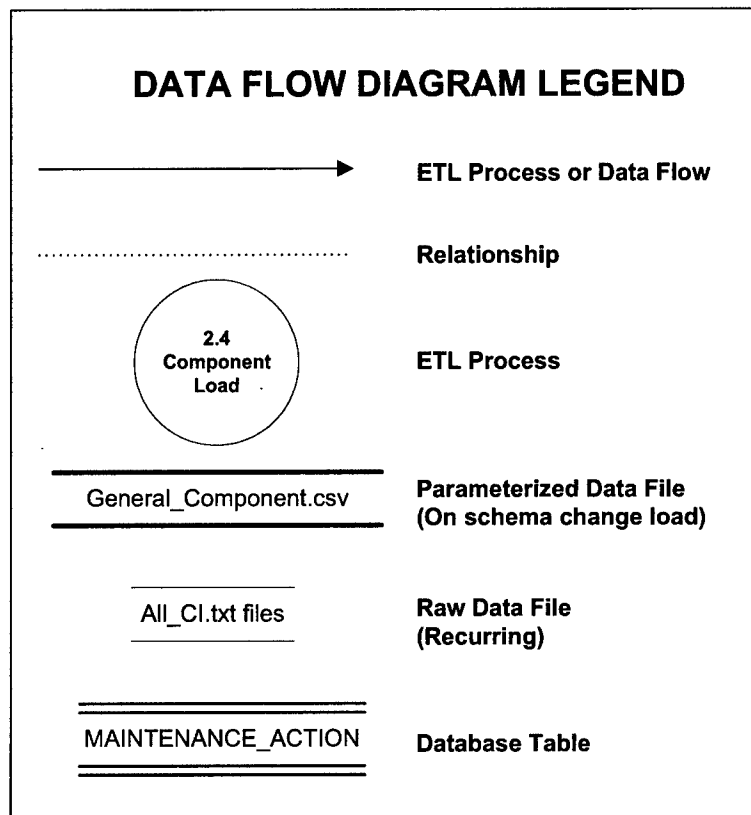


Figure 20 - Data Flow Diagram Legend

Figure 21 shows our top level ETL processes.

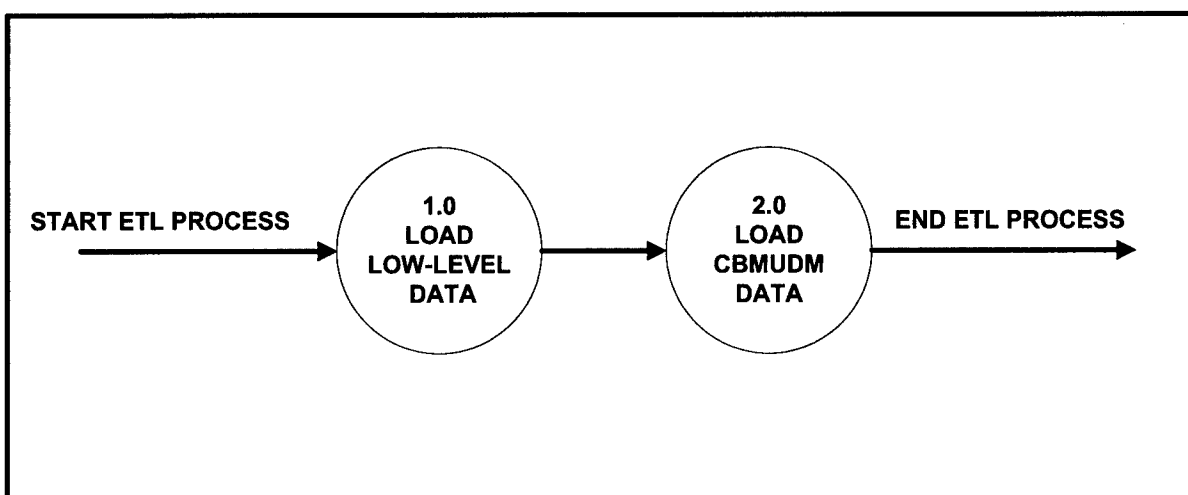


Figure 21 - Top Level ETL Processes

Process 1.0, Load low-level data, is responsible for loading the pre-processed data into the low-level stage. Process 2.0 is responsible for loading the data from the low-level stage to the CDMUDM stage.

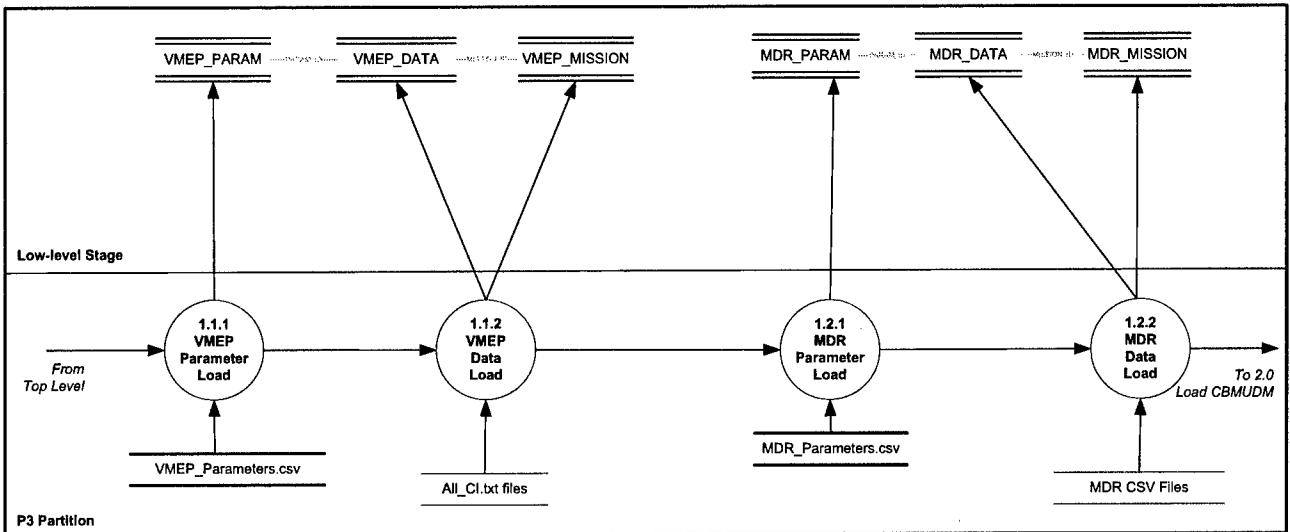


Figure 22 -- Low-level Stage ETL Processes

Figure 22 shows the ETL processes for the low-level stage. Process 1.1.1 (VMEP Parameter Load) loads meta-data about the various VMEP parameters, such as CI identifier, units, etc. This data originates in an MS Excel generated flat CSV file, and is stored in the VMEP_PARAM table. Process 1.1.2 (VEMP Data Load) loads the individual data files. For each VMEP data file (All_CI.txt), the process creates a “VMEP Mission” which corresponds to an individual VMEP usage period. It then creates one row per CI reading in the VMEP_DATA Table. Please refer to Section 3.3.1.1 for more details about the low-level VMEP schema. Process 1.2.1 and 1.2.2 perform the same tasks for MDR data.

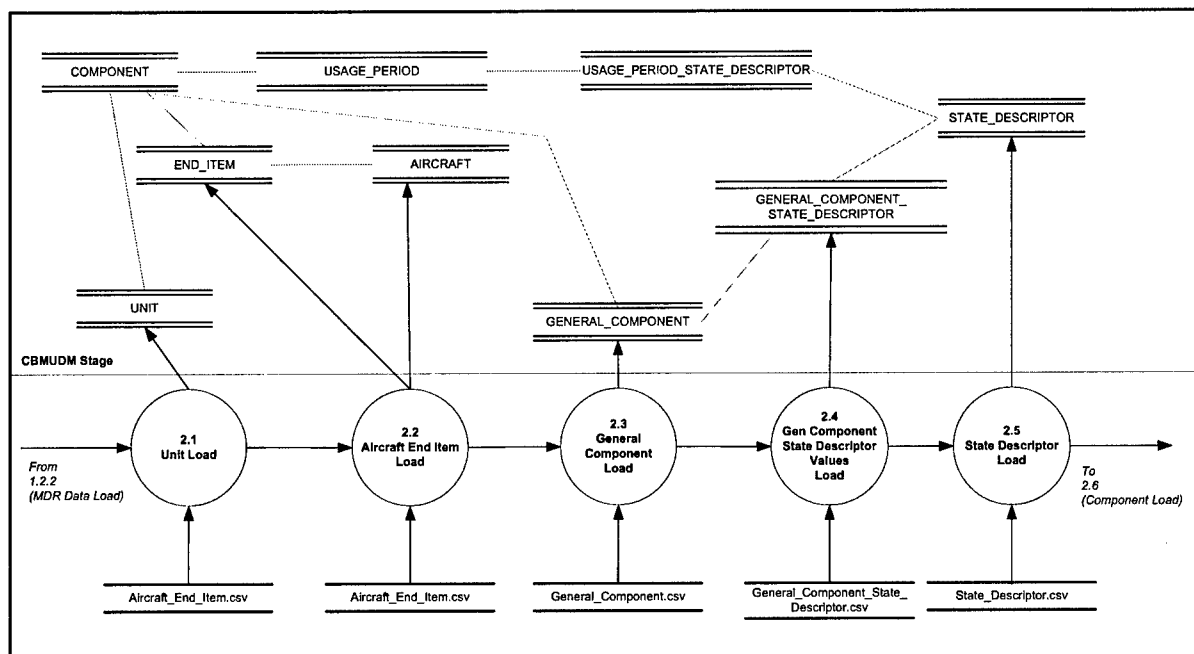


Figure 23 - CBMUDM ETL Processes 2.1 thru 2.5

Figures 23 thru 29 show the ETL processes for the CBMUDM stage. Processes 2.1 thru 2.5 (Figure 23) are simple loaders used to populate several of the on-change entities in the database. The source files for each process are built with MS Excel and MS Access, and are used to load the information in the CBMUDM that is not a continuous update. Sources for this data are discussed in Section 2.3.2.5. Each process generates one row in the corresponding CBMUDM table for each row in the source data file.

Process 2.6 (Figure 24) is used to load all specific components into the CBMUDM. This process mines the appropriate UniRAM tables for all unique components in existence. It then looks up the corresponding general component in the CBMUDM General Component table (using WUC), then adds an entry into the CBMUDM Component table with the matching general component foreign key and specific information about the physical component (serial number, installation history, etc).

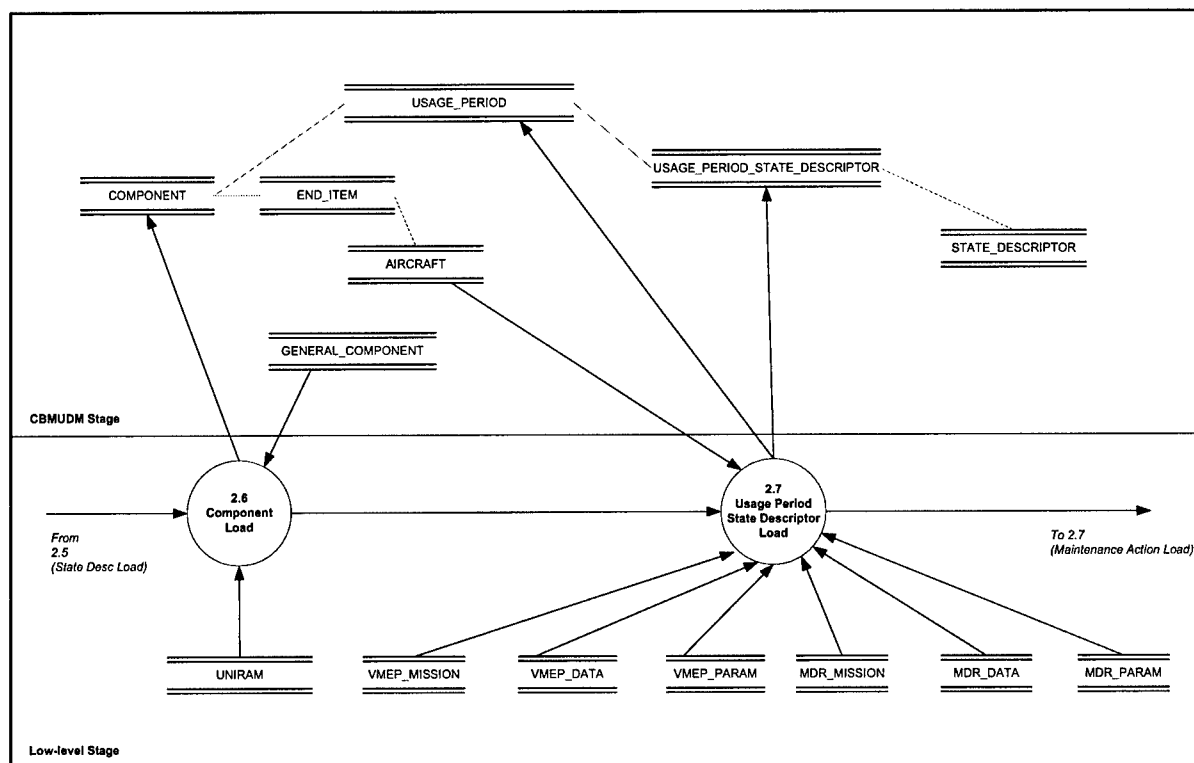


Figure 24 - CBMUDM ETL Processes 2.6 and 2.7

Process 2.7 (Figure 24) is used to load state descriptor data and match it to the aircraft/end-item usage period. The process first looks up all MDR usage periods (using the MDR_MISSION table in low-level stage). An entry is then made in the CBMUDM Usage Period table corresponding to the MDR MISSION. Here we are defining a one-one mapping of aircraft usage periods to MDR usage periods. We feel this is a logical choice, as the aircraft as in use any time the MDR is recording data.

For each usage period, Process 2.7 makes entries in the Usage Period State Descriptor table containing the actual state descriptor values (from MDR_DATA) corresponding to each recorded MDR parameter. The process then looks for matching VMEP usage periods contained within the aircraft usage period. Note, there could be a one-zero or one-many mapping of aircraft usage periods to VMEP usage periods. This is due to several reasons. First, it is possible that the VMEP system was not activated during the usage period (rotor never activated, VMEP control left off). Or, during a single usage period, the VMEP recorder might be cycled by multiple rotor stops and starts.

For each VMEP usage period encapsulated within an aircraft usage period (as defined by MDR usage period), Process 2.7 makes an entry in the Usage Period State Descriptor table containing the actual state descriptor values (from VMEP_DATA) corresponding to VMEP parameters.

Process 2.8 (Figure 25) is responsible for loading the General Maintenance Action table in the CBMUDM. This process reads a text file containing all general maintenance actions. Process 2.9 loads the General Component Requires General Maintenance table using a similar text file. Process 2.10 loads a list of standard failure modes using a text file of standard failure modes. Process 2.11 loads a text file that maps standard failure modes to general maintenance actions. Note, the aforementioned text files, which are on-change data sources populated manually from hard copy publications, might be replaced in the future pending access to existing electronic data sources in the Army Aviation community. Refer to Section 2.3.2.6 for a discussion about these data sources.

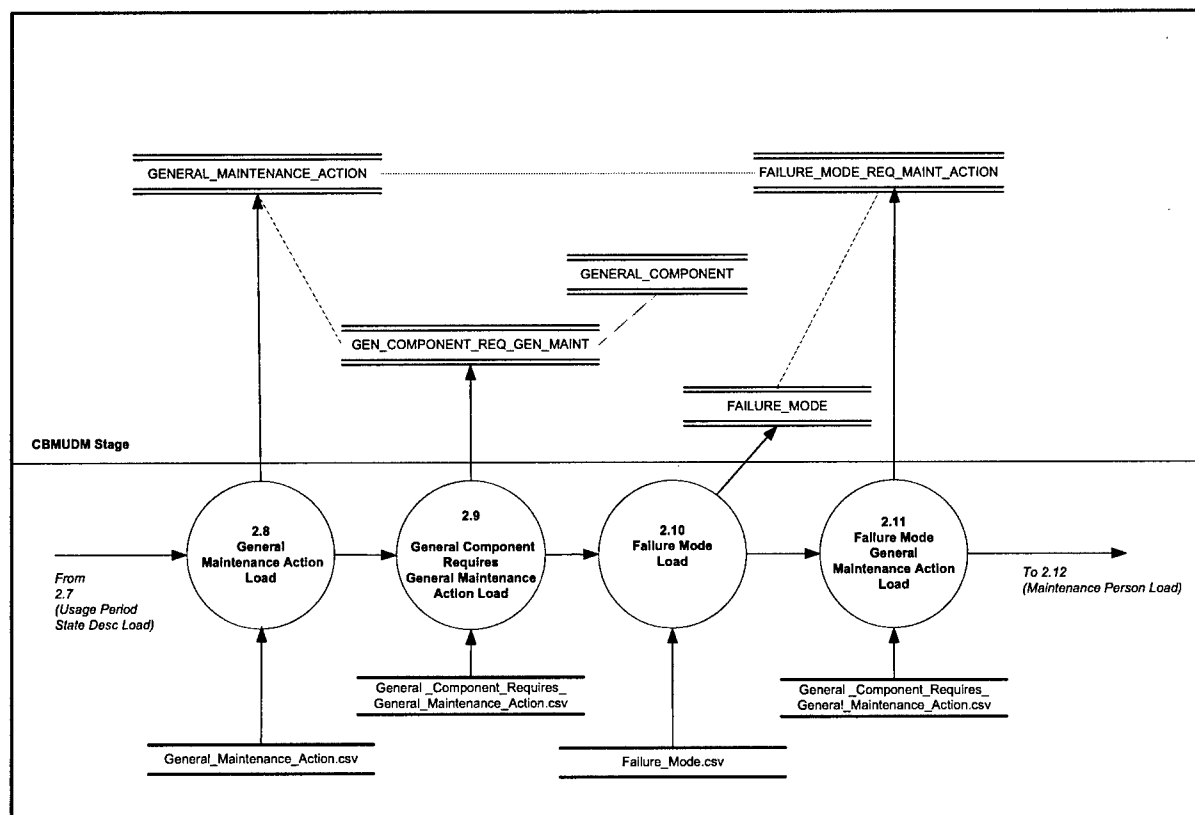


Figure 25 - CBMUDM ETL Processes 2.8 thru 2.11

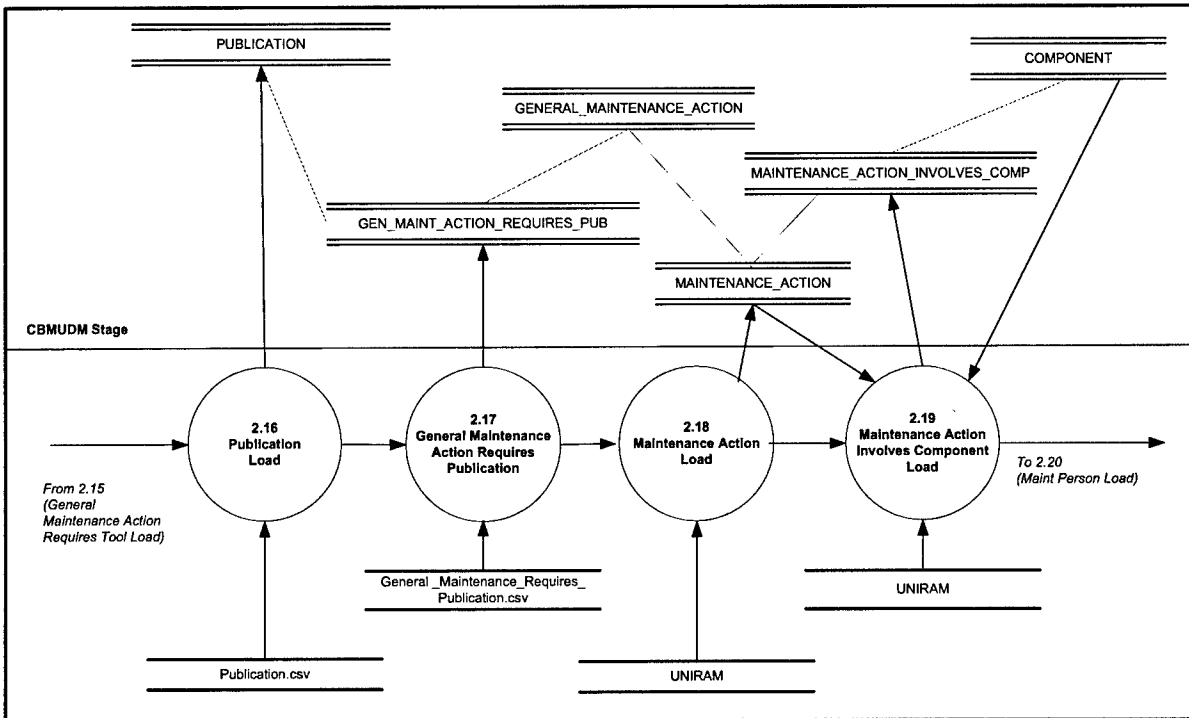


Figure 27 - CBMUDM ETL Processes 2.16 and 2.19

Process 2.18 (Figure 27) mines the UniRAM database and loads the CBMUDM Maintenance Action with all existing maintenance actions. This consists of inspections, repairs, and other aircraft maintenance activities that were physically performed by the unit. For each of the maintenance actions, Process 2.19 matches the physical components involved in the maintenance action to physical components in the CBMUDM Component table, and records this information in the CBMUDM Maintenance Action Involves Component table

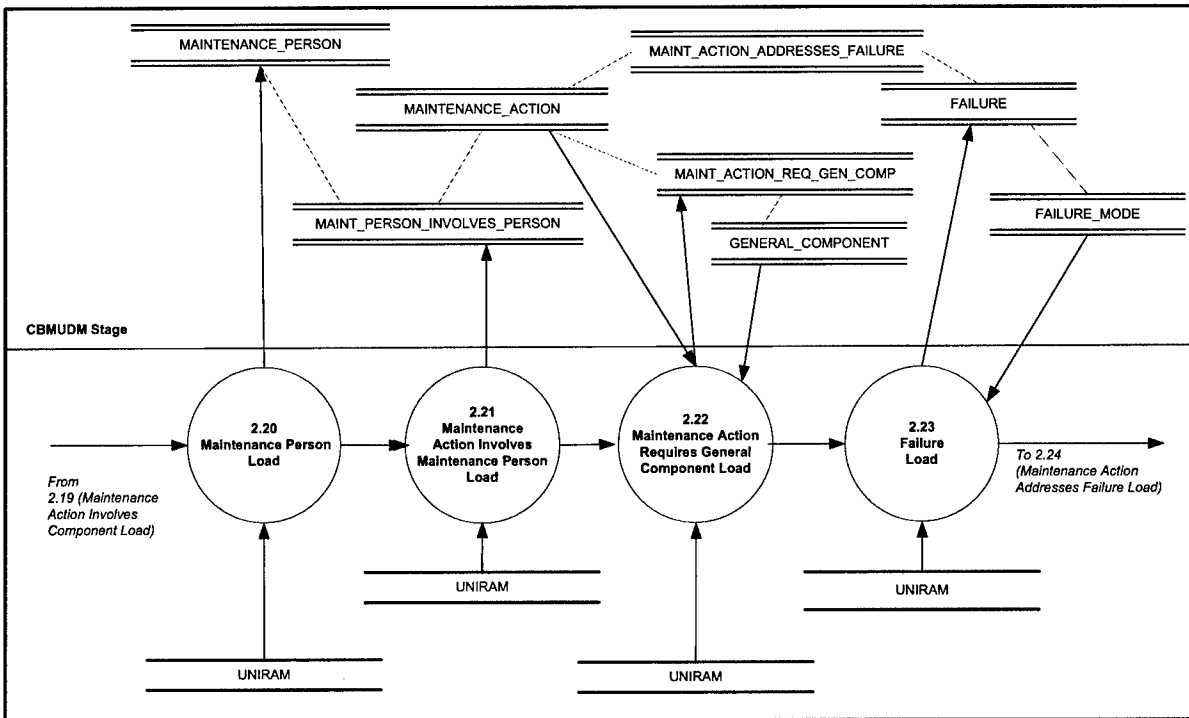


Figure 28 - CBMUDM ETL Processes 2.20 thru 2.23

Process 2.20 (Figure 28) mines the UniRAM database for all actual maintenance personnel (by name) involved in maintenance tasks. It then loads this information into the CBMUDM Maintenance Person table. Process 2.21 matches these individuals against actual maintenance actions in the CBMUDM. Process 2.22 is used to track what replacement parts are required for certain maintenance action. This process examines supply information contained in UniRAM, and matches part requisitions against actual maintenance actions. Each part requisition matches a general component in the CBMUDM. Process 2.23 examines each maintenance record in UniRAM, and identifies those maintenance actions that were related to failed or degraded components. It uses failure mode information stored in the CBMUDM in identifying these failures.

4. Implementation

The final phase of our design process is the actual implementation of our physical data warehouse design and data management design. This task was beyond the scope of our involvement. However, we provide the outline of an implementation plan which represents one possible approach to design implementation.

Appendix J contains a detailed example project plan for implementing the data warehouse [20]. This project plan is broken down into the seven phases described below

Phase 1 : Hardware And Software Installation

The purpose of this phase is to install the base software and hardware architecture required to operate the data warehouse. In this phase, we recommend first installing and configuring the development hardware for the data warehouse. This includes installing all hardware, databases, and translation software described in our data management plan.

Phase 2: Data Warehouse Configuration & Administration

The purpose of this phase is to configure the core data warehouse applications needed to maintain the warehouse once it is up and running. This includes security, user accounts, backup, indexing, and logging. We recommend first establishing user accounts on the data warehouse environment. We then recommend designing and implementing job scheduling – which includes back-up/restore processes, database logging, notification, and reporting. We next recommend implementing the back-up/restore processes, and the programming of any regularly scheduled jobs (auditing, record cleaning, etc).

Phase 3: Pre-Process Partition Design And Implementation

The purpose of this phase is to establish the physical implementation of the pre-processed partition of the data warehouse. We recommend first establishing physical locations for storage of all low-level data in an area where it can be accessed by stakeholders. We recommend using a simple networked file system on an existing Army LAN. This phase also includes loading raw VMEP data into the IAC web store (<https://imds.iac-online.com/index.asp>) discussed in Step 4 of the data management plan. This resource is a mature system which can immediately provide

value to our stakeholders. This phase shall be completed when all current field data is loaded into these pre-processed partition.

Phase 4: Post-Process Design Implementation

The purpose of this phase is to implement the physical design of the data warehouse unified partition. We recommend first implementing ETL Process 1.0 and then using it to load all UniRAM, MDR, and VMEP raw data into a set of independent low-level staging tables located in an industrial strength database environment. We next recommend implementing the physical design for the CBMUDM in the same database environment. We recommend next using ETL Process 2.0 to load data from the low-level staging tables into the CBMUDM physical model. We next propose developing a series of fact tables and dimension (a star-dimensional model) that will be populated from the CBMUDM. We recommend focusing this star-dimension implementation on data requirements common to multiple stakeholders.

Phase 5: Implement Applications

The purpose of this phase is to construct the applications that will be used to demonstrate the CBM Prototype. We first recommend developing a sample set of cross-cutting use-cases that will best demonstrate the novel capabilities of CBM. We next suggest designing actual applications required to produce these use-cases. These applications might use the dimensions provided by our star-dimensional physical model, ad hoc queries ran against the CBMUDM, or both.

Phase 6: System Integration And Testing

The purpose of this phase is to integrate and test the complete data warehouse design – population of data into the pre-processed partition, loading of the data into the unified partition, and viewing required information with prototype applications. We recommend first ensuring all current data is loaded into the pre-processed and unified partitions. We then suggest executing these applications, and testing them for the desired functionality.

Phase 7 : Implementation

The purpose of this phase is to implement the data warehouse and end-user applications. We recommend first reviewing and addressing any shortcomings identified in the system integration and testing phase. We then suggest finalizing design changes to the data warehouse and end user applications. We then recommend implementing a regularly scheduled data management routine for load incoming data from the field.

5. Recommendations

Before closing, we offer several recommendations pertaining to the future of CBM Data Management. These recommendations recap many ideas presented in previous sections of this report, and target the data integrity and physical growth of the future CBM data warehouse.

Army Aviation Maintenance Management System Overhaul. In our opinion, many of the complex data management tasks addressed in our design are the result of an outdated maintenance management system. The Total Army Maintenance Management System (TAMMS-A) specified in DA PAM 738-751 is a legacy system developed before the advent of modern information system technologies. This system, based on physical hard-copy records, does not address many of the complex data modeling issues required to achieve Condition Based Maintenance. As a result, any attempt to use information streaming from systems based on TAMMS-A will be clumsy, burdensome, and resource intensive. We recommend further research efforts focus on a redesign of TAMMS-A that fully supports the data requirements of CBM as well as satisfying other requirements of current TAMMS-A stakeholders.

Maintenance Data Entry Overhaul. This recommendation is closely related to the previous, and focuses on the procedures used to enter maintenance and failure data. Currently, the burden for entering low-level detailed information about maintenance actions and component failure information rests solely on operational units. These units are manned with hard working pilots, crew engineers, and technicians whose primary mission is keeping aircraft flying to support on-going operations in the field. These individuals are also responsible for a myriad of other important tasks not related to aviation maintenance. The extra time required to maintain the

meticulous level of data integrity required by CBM is often legitimately sacrificed in the name of operational necessities. Future work must address this issue. Automated systems must be fielded that allow the end-users to quickly and effortlessly provide low-level details about maintenance actions and component failures without compromising their primary mission.

CBM Data Scoping. As previously mentioned, the amount of data required to field a CBM program is enormous. The problem is compounded by a natural paradox encountered in the fielding of large scale data warehouses [21]. This paradox pits the yet to be discovered benefits of having lots of data in a single location against the resources required to explore these benefits. The antidote for this paradox is to carefully and frequently review data requirements as new capabilities are realized. We recommend regularly examining the granularity requirements of CBM, as well as what specific data elements are actually being used. For example, do we still need to retain the co-pilot's radio select switch position in future MDR data loads?

Standard Cataloging of Abstract Maintenance Objects. Current maintenance information systems are very good at classifying and tracking physical objects and actions – e.g. specific components, maintenance tasks, and failures. However, the tracking and modeling of abstract maintenance concepts – such as what and where components might be installed on a helicopter or what standard maintenance actions might involve these components, is severely underdeveloped. Future research efforts involving aviation maintenance information systems must target this issue, and focus on producing Army-wide acceptable open source standards.

Open-Source Access to All Data. To reap the benefits proposed by the CBM concept, we recommend allowing full access to the widest population and lowest level of source data possible. We also recommend making this data set available to a broad audience of stakeholders. Maximizing the number of people that can access the data, and then engage in professional discourse will ensure we realize the full potential of CBM for the entire Army Aviation Community.

6. Conclusion

The Army's transition to a condition based maintenance regimen promises to increase safety and availability while decreasing cost. This approach is highly reliant on advanced prognostic and diagnostic models that will require combining inputs from a plethora of disparate data sources. We believe that the data warehouse design offered in this report offers a good starting point for meeting this need.

7. Appendices

Appendix A – Stakeholder Interview Outline

Appendix B - Results of Stakeholder Interviews

Appendix C – Data Dictionary of MDR Parameters

Appendix D – Pareto Analysis of MDR Data

Appendix E – ELAS Schema Information

Appendix F – UniRAM Schema Information

Appendix G – CBMUDM Entity Relationship Diagram

Appendix H – MDR and VEMP Low-Level Stage Physical Design

Appendix I – CBMUDM Physical Design

Appendix J – Suggested Implementation Project Plan

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APPENDIX A : CBM Data Warehouse Stakeholder Interview Outline

STAKEHOLDER NAME/ORGANIZATION/DUTY POSITION/CONTACT INFO

STAKEHOLDER TYPE

1. Using one sentence answers, what are the top 3-5 uses or tasks you would have involving information stored in the Data Warehouse. Or, put another way, why would you access the data warehouse? (These will become more detailed use cases later).

2. In executing the tasks described in (1), how many users in your organization would use information in the Data Warehouse?

3. How would you categorize the interface preference/skills of these users? Please fill in the percentage of users in each category?

a. Basic Database User – knows how to browse and run pre-built queries and applications. Needs the application developers to construct data views. No SQL programming experience.

b. Power Database User – knows how to used semi-advanced query tools. Can use query design tools and wizards to develop simple views of the data. Little SQL programming experience. 33%

c. Database Designer – knows how to use SQL and other development tools to build custom views of the data.

4. This next question targets database loading. For the uses described in (1), how often would you access the Data Warehouse? Once a day? Once a Minute? Once a Month?

5. This next question targets expected access times. Please indicate, in each row, how much of your total information requirements fit into each category.

APPENDIX A : CBM Data Warehouse Stakeholder Interview Outline

Access Category	Access Time	Percentage of Your Total Information Requirements Residing in this Category?	Timeline of Information in this Category <i>- current month's data, last three years, etc.</i>
Real Time	I can wait 5 seconds		
Online	I can wait 30 seconds		
Near Line	I can wait 5 minutes		
Archive	I can wait can wait 48 hours		

6. This next question targets information refresh times. In general, how often do you need your information refreshed/updated? This is not how often you access the information, but when you do access it, how current is it?

APPENDIX A : CBM Data Warehouse Stakeholder Interview Outline

Refresh Rate	Refresh Interval of Data	Percentage of Your Total Information Requirements Residing in this Category?	Age of Information in this Category <i>- i.e. current month's data, last three years, etc</i>
Real Time	Current as of Now		
Daily	Current as of this Morning		
Weekly	Current as of last Monday		

7. What existing software products or tools do you currently use that rely on information that would be contained in the Data Warehouse? What features (views, reports) of these tools do you use the most?

8. What types of views and reports do you wish you could produce – but currently cannot - from Army Aviation Maintenance Data?

9. What data sources, other than those listed in the introduction, should be included in the Data Warehouse?

10. Are there any other stakeholders who we should interview?

APPENDIX B – CBM Stakeholder Use Cases

Stakeholder : Walker, Kris

Stakeholder Type: Engineer

Organization : AMRDEC-RAM

Phone: 256-842-9203

Email: kris.walker@rdec.redstone.army.mil

Use-Case ID: UC-11

Use-Case Title: Operational Readiness Analysis

Use-Case Priority: must_have_now

Frequency of Use: weekly

Primary Actor: Data Analysis Tool

Other Actors: Data warehouse Aviation units in the field

Pre-Conditions:

1. 1352 Status Reports must be filled out correctly at unit 2. Status reports must be forwarded to central collection agency. 3. Status reports must be entered into computer. Must break down Non-Mission Capable (Supply) and Non-Mission Capable (Maintenance) time. Also - partially mission capable time.

Main Success Scenario:

1. Analyst selects aircraft. 2. Analyst selects time period. 3. Data Analysis Tool goes into the database and pulls the aircraft readiness (1352) information on the selected aircraft during the selected time period. 4. Data Analysis Tool produces the outputs listed in the post-conditions. 5. System returns to step 1

Variations:

Complete time period not available - prompt user for another period Partial time period not available - advise user Incomplete/Erroneous readiness data set - advise user

Post-Conditions:

(a) Pie chart showing selected aircraft non-mission capable (NMC) time incurred during the selected time window. This pie chart shows total NMC time broken down into primary causes of status: repairs, phase, maintenance work order (MWO), safety of flight (SOF), and schedule. (b) Pie chart showing total status on aircraft broken down by fully mission capable, non-mission capable, and partially mission capable. (c) Bar chart showing, for the non-mission capable time caused by repairs, what components caused these repairs (top 10 offenders - Pareto analysis) (d) Three month "trend" bar chart showing most repaired parts & number of repairs for each incurred in last 3 months (by month)

APPENDIX B – CBM Stakeholder Use Cases

Data Sources currently used to meet the requirement:

1352 status reports emailed to team Should get this info from a LOGSA data sources

Software currently used to meet this requirement:

(SAMS?) Excel

Additional Comments:

See power point presentation (RAMEngineerUseCase.ppt)

Stakeholder : Walker, Kris

Stakeholder Type: Engineer

Organization : AMRDEC-RAM

Phone: 256-842-9203

Email: kris.walker@rdec.redstone.army.mil

Use-Case ID: UC-12

Use-Case Title: Recap Analysis

Use-Case Priority: must_have_now

Frequency of Use: periodically

Primary Actor: Data Analyst

Other Actors: Data warehouse Analysis Application

Pre-Conditions:

1. 2410 Data Current and Complete 2. All part histories known 3. All part location known

Main Success Scenario:

1. Analyst selects 2410 type part (serial number tracked item) using NSN/NINN 2. Analyst selects time period of interest 3. Application mines the data warehouse for the information 4. Application produces the results listed in the post conditions

Variations:

Part not found - Advise user, reenter Time period incorrect - Advise user, reenter Aircraft Specific Filtering - For those parts on multiple platforms, the user may want to filter by aircraft type Unit Specific Filtering - The user might want to restrict analysis to a certain unit Location Specific Filtering - The user may want to restrict analysis to a certain location

Post-Conditions:

APPENDIX B – CBM Stakeholder Use Cases

Application produces the following metrics for each part: (a) Total accumulated flight hours the part type was flown on the aircraft (total component life) in time window (b) Number of chargeable removals in time window (c) Mean Time Between Repair of the component in the time window (d) List of details for each removal in the window. Note: These statistics included all parts with the entered NSN/NINN

Data sources currently used to meet this requirement:

ELAS AMSAA 2410 Data Quality Deficiency Reports (QDR)

Software currently used to meet this requirement:

Excel

Additional Comments:

See PowerPoint slide show (RAMEngineerUseCase.ppt) for more details. Excel tools available on request.

Stakeholder : Walker, Kris

Stakeholder Type: Engineer

Organization : AMRDEC-RAM

Phone: 256-842-9203

Email: kris.walker@rdc.redstone.army.mil

Use-Case ID: UC-13

Use-Case Title: Sample Data Collection Analysis

Use-Case Priority: must_have_now

Frequency of Use: periodically

Primary Actor: Data Analyst

Other Actors: Analysis Tool Data Warehouse

Pre-Conditions:

ELAS data entered and correct. Flight Hours entered and correct.

Main Success Scenario:

1. Analyst selects time period. 2. Analyst specifies one or more of the following - aircraft type(s), unit(s), location(s). 3. Analysis Tool mines the warehouse for component failures matching the criteria specified in (2). 4. Analysis Tool calculates Mean Time Between Mission Failure, Mean Time Between System Failure. 5. Analysis Tool lists the info in (4) in several groupings - by aircraft type, by location, by unit.

APPENDIX B – CBM Stakeholder Use Cases

Variations:

Time period incorrect - advise user and reenter. Time period incomplete - advise user and prompt for reentry

Post-Conditions:

Analysis Tool predicts Mean Time Between Mission Failure, and Mean Time Between System Failure displayed to the analyst and grouped by aircraft type, unit, and location.

Data sources:

Software currently used to meet this requirement:

ELAS AMSAA Flight Hours from 2404-12
Excel & Access

Additional Comments:

See PowerPoint presentation (RAMEngineerUseCase.ppt)

Stakeholder : Walker, Kris

Stakeholder Type: Engineer

Organization : AMRDEC-RAM

Phone: 256-842-9203

Email: kris.walker@rdec.redstone.army.mil

Use-Case ID: UC-14

Use-Case Title: Vendor Analysis

Use-Case Priority: must_have_now

Frequency of Use: weekly

Primary Actor: Data Analyst

Other Actors: Analysis Tool. Data warehouse.

Pre-Conditions:

2410 Data complete and comprehensive.

Main Success Scenario:

1. Analyst selects component by NSN/NINN. 2. Analyst specifies one or more filters - unit, location, aircraft, vendors for inclusion/exclusion. 3. Analysis tool mines the database for failures involving the said component. 4. Analysis tool calculates average life estimates, top ten failure modes, and failure distribution as a function of

APPENDIX B – CBM Stakeholder Use Cases

time for the component of interest. 5. Analysis tool displays information to analyst. 6. System prompts for restart.

Variations:

Post-Conditions:

For each manufacturer of a particular component tool displays the following
GROUPED BY COMPONENT VENDOR - (1) total flight hours for component, number of failures, and mean time between component replacement (2) Top ten failure modes for vendor (3) Failure distribution (pdf) for vendor.

Data sources currently used to meet this requirement:

2410 Data Failure Code List

Software currently used to meet this requirement:

Excel, Access, Minitab

Additional Comments:

See power point presentation (RAMEngineerUseCase.ppt) for more information.

Stakeholder : Biddlecombe, Kathy

Stakeholder Type: Manager, Analyst

Organization : AMRDEC

Phone: 256-705-9854

Email: kathy.biddlecombe@us.army.mil

Use-Case ID: UC-10

Use-Case Title: maintenance performance evaluation

Use-Case Priority: must_have_now

Frequency of Use: constantly

Primary Actor: Component Analysis Branch or Weapons System Team support

Other Actors: IMMC system team leader, PM or individual item manager

Pre-Conditions:

Access to TAMMS-A, LOGSA flying hours, CCSS, CDDDB and NMP or OSMIS data. Process can sort history by source -where was it made, has it been repaired if so when and who by... Are there enough samples of data to be significant? How long does each item last (what is range of confidence) and what was invested to obtain this value?

APPENDIX B – CBM Stakeholder Use Cases

Main Success Scenario:

Integrate Condition Based Maintenance information with maintenance, supply and transportation programs. Ability to make coherent support decisions based on data rather than opinion. Make a solid case for reduction of specific configurations, increase modification program application rates, identify items to be phased out of inventory and ride them out of the inventory... Identify impact on inventory and readiness of changes in TBO, finite life. Relate SOF, ASAM or other supply and maintenance actions on out-year requirements and fleet behavior.

Variations:

Run all related NIIN and part number sequences to identify a family related by Work Unit Code (WUC) to evaluate differences between configurations.

Post-Conditions:

Change in supply study and stratification of funding/requirements. Potential change in maintenance and transport processes. Re-alignment of funds.

Data sources currently used to meet this requirement:

Component history is compared to cost to provide a performance factor = hours of use obtained for each dollar invested. Primary source of data may be cost of new procurement or cost of repair. Repair cost stems from the facility and level of repair. Depot costs are normally for depot work. Unit cost can be for unit repair or a National Maintenance Program cost for a repair returning the item to like new condition... Granularity beyond Std OSMISS output supports evaluation of the repair stations.

Software currently used to meet this requirement:

At-LAST model, SAS, Oracle

Additional Comments:

Stakeholder : Biddlecombe, Kathy

Stakeholder Type: Manager, Analyst

Organization : AMRDEC

Phone: 256-705-9854

Email: kathy.biddlecombe@us.army.mil

Use-Case ID: UC-20

Use-Case Title: Maintenance planning and scheduling

Use-Case Priority: will_need_eventually

Frequency of Use: daily

Primary Actor: Maintenance Planner

APPENDIX B – CBM Stakeholder Use Cases

Other Actors: Decision Support Tool (DST)

Pre-Conditions:

Complete picture of OPTEMPO, supply assets

Main Success Scenario:

1. Planner selects an appropriate level of analysis or scope. This ranges from the individual part all the way up to DOD level 2. The DST produces the post-conditions output for the selected level.

Variations:

Post-Conditions:

Analytical Tool answers the following questions at the desired level: (1) What do we need? (2) How many do we need? (3) Where do we need them? (4) When do we need them? (5) How much does it cost? Where cost is in terms of one or more of the following: Cash flow, cycle time, parts, consumables, transportation assets, readiness, lives, safety

Data sources currently used to meet this requirement:

OSMISS, CCSS, QDRS, CDDB

Additional Comments:

Stakeholder : Kellogg, Gary

Stakeholder Type: Manager

Organization : AED Propulsion Division

Phone: 256-319-5201

Email: gary.kellogg@rdec.redstone.army.mil

Use-Case ID: UC-27

Use-Case Title: Maintenance policy effect on readiness

Use-Case Priority: must_have_now

Frequency of Use: daily

Primary Actor: Analyst

Other Actors: Data Analysis Tool

APPENDIX B – CBM Stakeholder Use Cases

Pre-Conditions:

Readiness levels known for engines. Complete and correct failure information (type, cause, etc) is known. Maintenance policy (schedule, regime, etc) known.

Main Success Scenario:

Analyst selects component. Tool mines the database for failure information and statistics. Tool also mines corresponding maintenance activity impact the selected component. Tool provides a composite view of the component's failure history vis-à-vis maintenance policy. Tool will also provide limited modeling and simulation capability to study effects of an altered maintenance policy.

Variations:

Analyst can limit analysis to certain subsets of population - engine type, location, configuration, unit, etc. Analyst can also filter for certain periods of time.

Post-Conditions:

Analyst can correlate and study the impact of maintenance policy on readiness. For example, if a TBO is extended, how will it impact the readiness or performance of the component?

Data sources currently used to meet this requirement:

OSMIS, 2410, ELAS

Additional Comments:

Stakeholder : Martin, Ed

Stakeholder Type: Engineer, Manager

Organization : AED Structures & Materials

Phone: 256-705-9674

Email: edwinmartin2@us.army.mil

Use-Case ID: UC-19

Use-Case Title: Reliability analysis on waivers

Use-Case Priority: will_need_eventually

Frequency of Use: daily

Primary Actor: Analyst

Other Actors: Analytical Tool, Maintenance database, Maintenance decision maker

APPENDIX B – CBM Stakeholder Use Cases

Pre-Conditions:

Aircraft component maintenance history complete, known, correct. Component usage history known, correct, complete. Component failure record complete, known, correct.

Main Success Scenario:

1. Maintenance decision maker expresses interest in altering maintenance procedures - i.e. extending mandatory replacement times, inspection intervals, etc. 2. Analyst selects component. 3. Analytical tool displays current maintenance information (regime), usage data, and failure data. 4. Tool facilitates (via simulation, modeling, etc) study of how waiver would alter (3) above.

Variations:

Post-Conditions:

Analyst can inform the decision maker how the waiver would impact component failure (implications in the area of cost, reliability, safety, etc)

Data sources currently used to meet this requirement:

VMEP, MDR, ELAS, Maintenance records

Additional Comments:

Stakeholder : Martin, Ed

Stakeholder Type: Engineer, Manager

Organization : AED Structures & Materials

Phone: 256-705-9674

Email: edwinmartin2@us.army.mil

Use-Case ID: UC-15

Use-Case Title: Predict time or conditions for failure

Use-Case Priority: will_need_eventually

Frequency of Use: constantly

Primary Actor:

Analyst

Other Actors: Analytical Tools Units in the field Aircraft

Pre-Conditions:

Aircraft failures in the field are known. Conditions the aircraft where flown in are known.

APPENDIX B – CBM Stakeholder Use Cases

Main Success Scenario:

1. Analyst enters aircraft type or tail number. 2. Analytical tool mines the database for aircraft history, conditions flown, reliability models, and past failure histories 3. Tool issues a prediction to the analyst as to when the aircraft, or fleet of aircraft will fail.

Variations:

The analyst may also be interested in individually component failure.

Post-Conditions:

Analyst receives either an estimated time, or set of conditions when the aircraft will experience failure.

Data sources currently used to meet this requirement:

Qualification Data, 2410, ELAS

Software currently used to meet this requirement:

Excel, INCODE, VDRI

Additional Comments:

Stakeholder : Martin, Ed

Stakeholder Type: Engineer, Manager

Organization : AED Structures & Materials

Phone: 256-705-9674

Email: edwinmartin2@us.army.mil

Use-Case ID: UC-16

Use-Case Title: Link usage to failure

Use-Case Priority: will_need_eventually

Frequency of Use: daily

Primary Actor:

Analyst

Other Actors: Field aircraft. Analytical tool.

Pre-Conditions:

Individual component failures from the aircraft fleet are known and well documented. Failure causes are well known and correct. Conditions component experienced over its lifetime are well known (flight conditions, environmental forces, rebuilds, etc).

APPENDIX B – CBM Stakeholder Use Cases

Main Success Scenario:

1. Analyst selects component. 2. Analytical tool mines database for failure information about the component, usage history (flight conditions, loads, maintenance records, etc) 3. Tool provides a cross-cutting view to the analyst consisting of failure type/mode/details and complete usage history. Data in relatively raw form so analyst can run separate tools.

Variations:

The tool may also incorporate built in analytical tools (aggregation of population data, filtering, etc.) as a pre-processing step for the analyst.

Post-Conditions:

Tool provides a cross-cutting view to the analyst consisting of failure type/mode/details and complete usage history. Data in relatively raw form so analyst can run separate tools.

Data sources currently used to meet this requirement:

VMEP, 2410, OEM, ELAS, MDR

Software currently used to meet this requirement:

INCODE, Excel, VRMI

Additional Comments:

Stakeholder : Martin, Ed

Stakeholder Type: Engineer, Manager

Organization : AED Structures & Materials

Phone: 256-705-9674

Email: edwinmartin2@us.army.mil

Use-Case ID: UC-17

Use-Case Title: Examine mitigation treatments on component failure

Use-Case Priority: will_need_eventually

Frequency of Use: daily

Primary Actor: Analyst

Other Actors: Aircraft data from field. OEM data.

APPENDIX B – CBM Stakeholder Use Cases

Pre-Conditions:

Individual component failures from the aircraft fleet are known and well documented. Failure causes are well known and correct. Conditions component experienced over its lifetime are well known (flight conditions, environmental forces, rebuilds, etc). Maintenance procedures (TBO times, inspection intervals, preventative maintenance schedules, etc), manufacturing processes, and other treatments are well known.

Main Success Scenario:

1. Analyst selects component and one of several screening criteria (see variations below). 2. Analytical tool mines database for failure information about the component, usage history (flight conditions, loads, maintenance records, etc) 3. Tool provides a comprehensive view of the component consisting of failure information usage, and maintenance treatment information.

Variations:

Analyst may select to focus on specific manufacturers, or other component subset (by unit, age, location, etc).

Post-Conditions:

Tool provides a cross-cutting view to the analyst consisting of failure type/mode/details and complete usage history. View also includes complete discussion of maintenance treatments - OEM information, manufacturer info, inspection intervals, TBOs, preventative maintenance schedule, etc. Data in relatively raw form so analyst can run separate tools.

Data sources currently used to meet this requirement:

VMPE, ELAS, MDR, 2410

Software currently used to meet this requirement:

Excel, INCODE

Additional Comments:

Stakeholder : Martin, Ed

Stakeholder Type: Engineer, Manager

Organization : AED Structures & Materials

Phone: 256-705-9674

Email: edwinmartin2@us.army.mil

Use-Case ID: UC-18

Use-Case Title: Compare and manipulate time-dependent data

Use-Case Priority: must_have_now

APPENDIX B – CBM Stakeholder Use Cases

Frequency of Use: daily

Primary Actor: Analyst

Other Actors: Field data from aircraft fleet

Pre-Conditions:

Aircraft DSC information known and complete.

Main Success Scenario:

1. Analyst selects one or more time dependent data sets (VMEP, MDR, HUMS, etc)
2. Within each data set, analyst selects certain components - i.e. frequency ranges, attitude, flight regimes. 3. Analyst selects certain time interval. 4. Tool produces a composite view of the selected data sources on common synchronized timeline.

Variations:

Analyst selects multiple components. Analyst specifies time scale. Analyst selects type of composite view - bar chart, plot, side by side plots, multi-dimensional plots, etc..

Post-Conditions:

Tool provides a composite view - chart, plot, etc - which shows two or more time dependent variable sets on the same view, and synched according to common timeline.

Data sources currently used to meet this requirement:

VMEP, MDR

Software currently used to meet this requirement:

INCODE

Additional Comments:

Stakeholder : Kochoff-Platt, Michele

Stakeholder Type: Manager

Organization : PM Apache

Phone: 256-313-4037

Email: MicheleKochoff.Platt@PeoAvn.Redstone.Army.Mil

Use-Case ID: UC-21

Use-Case Title: PM Attack Metric Calculation

Use-Case Priority: will_need_eventually

Frequency of Use: daily

APPENDIX B – CBM Stakeholder Use Cases

Primary Actor: Analyst

Other Actors: Analytical tool, field units, decision makers

Pre-Conditions:

Data sources complete, correct, and accessible.

Main Success Scenario:

1. Analyst selects entire fleet or subset of fleet (see variations). 2. Analyst selects one or more metrics for evaluation. 3. Analyst selects time period for evaluation. 4. Analytical tool calculates metrics matching user input

Variations:

Analyst can restrict aircraft to a certain sub-population: unit, tail-number series, configuration, geographical location

Post-Conditions:

Analytical tool produces metrics in a variety of different forms - list, table, etc.

Data sources currently used to meet this requirement:

IMMC, OSMIS, 7-101 at FTCKY, TACTS 2410 and -16, ELAS, IMPS, 1352, ULLSA

Software currently used to meet this requirement:

Excel

Additional Comments:

See "Fleet Metric Dictionary" (Excel file) maintained by M.Platt. This list shows all pertinent metrics of interest.

Stakeholder : Kochoff-Platt, Michele

Stakeholder Type: Manager

Organization : PM Apache

Phone: 256-313-4037

Email: MicheleKochoff.Platt@PeoAvn.Redstone.Army.Mil

Use-Case ID: UC-22

Use-Case Title: Parts and configuration tracking

Use-Case Priority: must_have_now

Frequency of Use: daily

Primary Actor: Analyst

APPENDIX B – CBM Stakeholder Use Cases

Other Actors: Analytical tool, field units

Pre-Conditions:

Data sources complete and correct

Main Success Scenario:

1. Analyst selects component of interest. 2. Tool mines the database to determine component locations and configurations. 3. System displays information to analyst.

Variations:

Analyst restrict use-case to various subsets of the component population - vendor, configuration, location, unit, etc.

Post-Conditions:

Analytical tool displays location of selected component in a variety of various groupings: location, unit, configuration, manufacturer, etc.

Data sources currently used to meet this requirement:

2410, ELAS, IMPS

Additional Comments:

Stakeholder : Berry, John

Stakeholder Type: Engineer

Organization : AED - Rotor, dynamics, aero

Phone: 256-705-9602

Email: john.berry@us.army.mil

Use-Case ID: UC-23

Use-Case Title: Vibration vis-à-vis maintenance action

Use-Case Priority: must_have_now

Frequency of Use: daily

Primary Actor: Analyst

Other Actors: Analytical tool, field data

Pre-Conditions:

Complete VMEP dataset. Complete maintenance action data set.

APPENDIX B – CBM Stakeholder Use Cases

Main Success Scenario:

1. Analyst selects a VMEP sensor 2. Analytical tool mines the database for vibration levels and any maintenance activity near the sensor 3. Tool displays composite view to user showing vibration data (history) and maintenance history.

Variations:

Post-Conditions:

User can monitor vibration data and how maintenance actions might have effected it. For example, was a component replaced? If so, what happened to the vibration level??

Data sources currently used to meet this requirement:

VMEP, ELAS, 2410

Additional Comments:

Stakeholder : Carter, Jim

Stakeholder Type: Manager, Engineer

Organization : IMMC

Phone:

Email: James.W.Carter@us.army.mil

Use-Case ID: UC-24

Use-Case Title: Failure statistics

Use-Case Priority: must_have_now

Frequency of Use: constantly

Primary Actor: Analyst

Other Actors:

Analytical tool, field units, decision makers

Pre-Conditions:

Failure dataset complete, correct, accessible. Conditions dataset complete, correct, accessible. Analyst or decision makers interested in component failure information.

Main Success Scenario:

1. Analyst selects component. 2. Analytical tool mines database for failure matching this component, and conditions leading to the failure. 3. Analytical tool displays information (distributions, stats) to analyst

APPENDIX B – CBM Stakeholder Use Cases

Variations:

Analyst can restrict output to one of several subsets of entire component population - by unit, location, vendor, etc.

Post-Conditions:

System displays the following - mean time between unscheduled repairs, failure distribution (based on time and/or conditions), what where the causes of failure (based on tear-down analysis).

Data sources currently used to meet this requirement:

2410, ELAS, MDR, OSMIS

Additional Comments:

Stakeholder : Fealy, John

Stakeholder Type: Analyst

Organization : Clockwork Solutions

Phone: 512-338-1945 x104

Email: john.fealy@clockwork-solutions.com

Use-Case ID: UC-25

Use-Case Title: State of the fleet

Use-Case Priority: must_have_now

Frequency of Use: constantly

Primary Actor:

Analyst

Other Actors:

Analysis tool, field units

Pre-Conditions:

Location of all aircraft, their configuration, and component location is known. Status of aircraft is known. Age of components known. OPTEMPO of unit known. Supply activities (Depot, transportation, etc) and expected performance known.

Main Success Scenario:

1. Analyst selects a component (or aircraft). 2 Analyst applies one of several filters (see variations) 3. Analysis tool mines database for component locations, status, OPTEMPO, and life information. 4. Analysis tool displays composite information about status, expected repair times, expected readiness.

Appendix C - MDR Data Dictionary

Catalog of available MDR parameters (data elements)

Reference: Longbow Integrated Maintenance Support System Ground Analysis Software (Version 8) User's Guide dated 17 March 2004

The Maintenance Data Recorder (MDR) is a crash survivable, on-aircraft data storage device used on the Apache Longbow (AH-64D). The MDR interfaces with a MIL-STD-1553B data bus as a Remote Terminal (RT) Line Replaceable Unit (LRU) and provides a means of recording and downloading maintenance and safety data while installed on the aircraft. MDR recorded data is high-speed downloaded to the Soldier's Portable On-system Repair Tool (SPORT) via a 1553 interface, where Ground Analysis Software (GAS), for example, resolves multiple fault ambiguity and launches the Interactive Electronic Technical Manual (IETM). The MDR has sufficient storage capability to record multiple flights of safety and maintenance data.

The MDR records data at a rate of 6.5 hz (6.5 times a second).

The information on the following pages details the Fault and Excedance parameter and safety download parameters.

Appendix C - MDR Data Dictionary

Fault & Exceedance Aircraft Operating Mode Parameter List

Description	Minimum Value	Full Scale Value	Units and Operating State
SP SQUAT SW	0	1	0=In Air 1=On Ground
SP Operating Mode	0	1	0=SP1 1=SP2
System Processor Sel Switch	0	3	0=Secondary 1=Spare 2=Auto 3=Primary
DP1 Operating Mode	0	7	0=No Operation 1=Single 2=Normal Sec 3=Normal Primary
DP2 Operating Mode	0	7	0=No Operation 1=Single 2=Normal Sec 3=Normal Primary
WP1 Operating Mode	0	1	0=Normal Primary 1=Normal Secondary
WP2 Operating Mode	0	1	0=Normal Primary 1=Normal Secondary
Generator 1 Inhibit	0	1	0=No Inhibit 1=Inhibit
Generator 2 Inhibit	0	1	0=No Inhibit 1=Inhibit
Weapons Triggers	0	1	0=No Trigger 1=WPN Trigger
GPU Trip Status	0	3	0=Spare 1=Not Tripped 2=Tripped 3=Spare
Generator 1 Trip Status	0	3	0=Spare 1=Not Tripped 2=Tripped 3=Spare
Generator 2 Trip Status	0	3	0=Spare 1=Not Tripped 2=Tripped 3=Spare
AC Elec Bus #1 Phase A Voltage ¹	0	165	Volts AC
AC Elec Bus #1 Phase B Voltage ¹	0	165	Volts AC
AC Elec Bus #1 Phase C Voltage ¹	0	165	Volts AC
Battery Voltage ¹	0	41	Volts DC
Battery Elec Bus #1 Voltage ¹	0	41	Volts DC
DC Elec Bus #1 Voltage ¹	0	41	Volts DC
AC Elec Bus #2 Phase A Voltage ¹	0	165	Volts AC
AC Elec Bus #2 Phase B Voltage ¹	0	165	Volts AC
AC Elec Bus #2 Phase C Voltage ¹	0	165	Volts AC
Battery Elec Bus #2 Voltage ¹	0	41	Volts DC
DC Elec Bus #2 Voltage ¹	0	41	Volts DC
BUCS Mode	0	1	0=Off 1=On
Pilot Master Arm	0	1	0=Safe 1=Arm
CPG Master Arm	0	1	0=Safe 1=Arm
Boost Pump On	0	1	0=Off 1=ON
Lateral Airspeed	-100	100	Knots
Longitudinal Airspeed	-256	256	Knots
Long Accel (Ax)	-128	128	meters/second/second
Lateral Accel (Ay)	-128	128	meters/second/second
Vertical Accel (Az)	-128	128	meters/second/second
Pitch Angle	-1	1	Semicircle
Roll Angle	-1	1	Semicircle
Side Slip Angle	-180	180	Degrees
Roll Rate	-4	4	Semicircle
Pitch Rate	-4	4	Semicircle
Yaw Rate	-4	4	Semicircle
Primary Hydraulic Pressure	0	7299.2701	PSI Gauge

¹ Electrical Bus Voltages, CPG Controls Positions and IAFS Commands are only available for aircraft with Version 6 or later SP software installed in them.

Appendix C - MDR Data Dictionary

Description	Minimum Value	Full Scale Value	Units and Operating State
Utility Hydraulic Pressure	0	7299.2701	PSI Gauge
PLT/CPG Emer Hyd Sel	0	1	0=Not Active 1=Active
Engine #1 TGT	0	1000	Degrees Celsius
Engine #1 Torque	0	282.0568	Percent
Engine #1 NG	0	130	Percent
Engine #1 NP	0	130	Percent
Engine #2 TGT	0	1000	Degrees Celsius
Engine #2 Torque	0	282.0568	Percent
Engine #2 NG	0	130	Percent
Engine #2 NP	0	130	Percent
Engine #1 Oil Pressure	0	2047	Pounds/Square Inch
Engine #2 Oil Pressure	0	2047	Pounds/Square Inch
Engine #1 NGRBX Oil Press	0	100	Pounds/Square Inch Gauge
Engine #1 NGRBX Oil Temp	-25	300	Degrees Fahrenheit
Engine #2 NGRBX Oil Press	0	100	Pounds/Square Inch Gauge
Engine #2 NGRBX Oil Temp	-25	300	Degrees Fahrenheit
LH Main Xmsn Oil Temp	-25	300	Degrees Fahrenheit
LH Main Xmsn Oil Pressure	0	100	Pounds/Square Inch Gauge
RH Main Xmsn Oil Temp	-25	300	Degrees Fahrenheit
RH Main Xmsn Oil Pressure	0	100	Pounds/Square Inch Gauge
CPG #1 Throttle Off	0	1	0=On 1=Off
CPG #1 Throttle Lockout	0	1	0=On 1=Off
CPG #1 Throttle Idle	0	1	0=On 1=Off
CPG #1 Throttle Fly	0	1	0=On 1=Off
CPG #2 Throttle Off	0	1	0=On 1=Off
CPG #2 Throttle Lockout	0	1	0=On 1=Off
CPG #2 Throttle Idle	0	1	0=On 1=Off
CPG #2 Throttle Fly	0	1	0=On 1=Off
Eng 1 Bleed Air PRSOV Open	0	1	0=Closed 1=Open
Eng 2 Bleed Air PRSOV Open	0	1	0=Closed 1=Open
Fuel Crossfeed Mode	0	3	0=Fail 1=Off 2=On 3=Fail
Fuel Crossfeed Select	0	3	0=Fail 1=Off 2=On 3=Fail
IAFS Pump Command ¹	0	1	0=On 1=Off
IAFS Transfer Mode ¹	0	1	0=Off 1=On
IAFS DC Command ¹	0	4	0=Spare 1=Off 2=On 3=Spare
IAFS Pump Status ¹	0	4	0=Spare 1=Off 2=On 3=Spare
IAFS DC Status ¹	0	4	0=Spare 1=Off 2=On 3=Spare
Man Fuel Xfer Aft Sel	0	3	0=Spare 1=Off 2=On 3=Spare
Man Fuel Xfer Fwd Sel	0	3	0=Spare 1=Off 2=On 3=Spare
Left Wing Fuel SOV Open	0	1	0=Not Open 1=Open
Left Wing Fuel SOV Closed	0	1	0=Not Closed 1=Closed
Right Wing Fuel SOV Open	0	1	0=Not Open 1=Open
Right Wing Fuel SOV Closed	0	1	0=Not Closed 1=Closed
Aft Fuel Cell SOV Open	0	1	0=Closed 1=Open
Forward Fuel Cell SOV Open	0	1	0=Closed 1=Open

Appendix C - MDR Data Dictionary

Description	Minimum Value	Full Scale Value	Units and Operating State
APU Fuel SOV Open	0	1	0=Not Open 1=Open
APU Fuel SOV Closed	0	1	0=Not Closed 1=Closed
Engine #1 Fire Ext Arm	0	1	0=Off 1=On
Engine #2 Fire Ext Arm	0	1	0=Off 1=On
APU Fire Ext Arm	0	1	0=Off 1=On
Fire Ext #1 DSCH	0	1	0=Off 1=On
Fire Ext #2 DSCH	0	1	0=Off 1=On
PLT BUCS On CLTV	0	1	0=Off 1=On
PLT BUCS On YAW	0	1	0=Off 1=On
PLT BUCS On ROLL	0	1	0=Off 1=On
PLT BUCS On PITCH	0	1	0=Off 1=On
CPG BUCS On CLTV	0	1	0=Off 1=On
CPG BUCS On YAW	0	1	0=Off 1=On
CPG BUCS On ROLL	0	1	0=Off 1=On
CPG BUCS On PITCH	0	1	0=Off 1=On
PLT Collective ARDD	0	1	0=Coupled 1=Decoupled
PLT Direct ARDD	0	1	0=Coupled 1=Decoupled
PLT Lateral ARDD	0	1	0=Coupled 1=Decoupled
PLT Long ARDD	0	1	0=Coupled 1=Decoupled
CPG Collective ARDD	0	1	0=Coupled 1=Decoupled
CPG Direct ARDD	0	1	0=Coupled 1=Decoupled
CPG Lateral ARDD	0	1	0=Coupled 1=Decoupled
Pilot Pitch Stk Pos	-8.6243	8.6243	Inches
Pilot Roll Stk Pos	-7.2287	7.2287	Inches
Pilot Cltv Stk Pos	-9.5505	9.5505	Inches
Pilot Yaw Pedal Pos	-5.3953	5.3953	Inches
CPG Pitch Stk Pos ¹	-8.6243	8.6243	Inches
CPG Roll Stk Pos ¹	-7.2288	7.2288	Inches
CPG Cltv Stk Pos ¹	-9.5505	9.5505	Inches
CPG Yaw Pedal Pos	-5.5258	5.5258	Inches
Pitch RAM A Actuator	-3.2013	3.2013	Inches
Roll RAM A Actuator	-3.2013	3.2013	Inches
YAW RAM A Actuator	-3.2013	3.2013	Inches
Cltv RAM A Actuator	-3.2013	3.2013	Inches
Hover Hold Mode	0	1	0=Off 1=On
Altitude Hold	0	1	0=Off 1=On
Radar Altitude Valid	0	1	0=Invalid 1=Valid
Altitude Hold	0	1	0=Off 1=On
ASE Collective	0	1	0=Off 1=On
ASE Yaw	0	1	0=Off 1=On
ASE Roll	0	1	0=Off 1=On
ASE Pitch	0	1	0=Off 1=On
ASE Trim	0	1	0=Off 1=On
ASE NOE/Approach	0	1	0=Off 1=On
Gun Actioned	0	1	0=Not Actioned 1=Actioned

Appendix C - MDR Data Dictionary

Description	Minimum Value	Full Scale Value	Units and Operating State
TCB Fire Inhibit	0	1	0=Inhibited 1=Not Inhibited
Battleshort Enabled	0	3	0=No Change 1=Open 2=Closed 3=Spare
Pylon 1 Rocket Arm Pwr Stat	0	1	0=Not Present 1=Present
Pylon 1 PAC Position	-20	20	Degrees
Pylon 2 Rocket Arm Pwr Stat	0	1	0=Not Present 1=Present
Pylon 2 PAC Position	-20	20	Degrees
Pylon 3 Rocket Arm Pwr Stat	0	1	0=Not Present 1=Present
Pylon 3 PAC Position	-20	20	Degrees
Pylon 4 Rocket Arm Pwr Stat	0	1	0=Not Present 1=Present
Pylon 4 PAC Position	-20	20	Degrees
ECS 1 CPG Evap. Return Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 Pilot Evap. Return Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 CPG Evap. Supply Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 Pilot Evap. Supply Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 Compressor Phase A Current	-327680	327680	Milliamps
ECS 1 Compressor Phase B Current	-327680	327680	Milliamps
ECS 1 Compressor Phase C Current	-327680	327680	Milliamps
ECS 1 Compressor Suction Press.	-3276.8	3276.8	Pounds/Square Inch
ECS 1 Compressor Discharge Press.	-3276.8	3276.8	Pounds/Square Inch
ECS 1 RH EFAB Evap. Return Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 LH EFAB Evap. Return Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 Condenser Fan1 Phase A Amps	0	65535	Milliamps
ECS 1 Condenser Fan2 Phase A Amps	0	65535	Milliamps
ECS 1 APS Fan Phase A Amps	0	65535	Milliamps
ECS 1 Compressor Suction Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 Compressor Discharge Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 RH EFAB Evap. Supply Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 LH EFAB Evap. Supply Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 Condenser Inlet Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 1 Condenser Discharge Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS1 CPG Temp. Control Valve Pos.	0	65535	Percent
ECS 1 Compressor Motor Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 Pilot Evap. Return Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 CPG Evap. Return Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 Pilot Evap. Supply Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 CPG Evap. Supply Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 Compressor Phase A Current	-327680	327680	Milliamps
ECS 2 Compressor Phase B Current	-327680	327680	Milliamps
ECS 2 Compressor Phase C Current	-327680	327680	Milliamps
ECS 2 Compressor Suction Press.	-3276.8	3276.8	Pounds/Square Inch
ECS 2 Compressor Discharge Press.	-3276.8	3276.8	Pounds/Square Inch
ECS 2 RH EFAB Evap. Return Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 LH EFAB Evap. Return Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 Condenser Fan1 Phase A Amps	0	65535	Milliamps
ECS 2 Condenser Fan2 Phase A Amps	0	65535	Milliamps

Appendix C - MDR Data Dictionary

Description	Minimum Value	Full Scale Value	Units and Operating State
ECS 2 APS Fan Phase A Amps	0	65535	Milliamps
ECS 2 Compressor Suction Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 Compressor Discharge Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 RH EFAB Evap. Supply Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 LH EFAB Evap. Supply Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 Condensor Inlet Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS 2 Condenser Discharge Temp.	-3276.8	3276.8	Degrees Fahrenheit
ECS2 PLT Temp. Control Valve Pos.	0	65535	Percent
ECS 2 Compressor Motor Temp.	-3276.8	3276.8	Degrees Fahrenheit
VCR Power Control	0	1	0=Off 1=On
Pilot Guard Selected	0	1	0=Selected 1=Not Selected
CPG Guard Selected	0	1	0=Selected 1=Not Selected
Guard Receiver Mode	0	1	0=Off 1=On
IFF Emergency Selected	0	3	0=No Change 1=Disable 2=Enable 3=Spare
CPG IFF Emergency Selected	0	1	0=Selected 1=Not Selected
Pilot IFF Emergency Selected	0	1	0=Selected 1=Not Selected
CPG Zeroize Selected	0	1	0=Selected 1=Not Selected
Pilot Zeroize Selected	0	1	0=Selected 1=Not Selected
FCR Zeroized	0	1	0=Not Zeroized 1=Zeroized
TADS Laser Arm	0	1	0=Safe 1=Arm
Comm Zeroized	0	3	0=Spare 1=Off 2=Zero 3=Spare
Left Squat Switch	0	1	0=Ground 1=Airborne
WP1 SQUAT SW	0	1	0=In Air 1=On Ground
WP2 SQUAT SW	0	1	0=In Air 1=On Ground
DP1 SQUAT SW	0	1	0=In Air 1=On Ground
DP2 SQUAT SW	0	1	0=In Air 1=On Ground
CIU Squat Switch	0	1	0=Off 1=On
Engine #1 Anti-Ice Valve Stat	0	3	0=Spare 1=Off/Open 2=On/Clsd 3=Spare
Engine #1 Anti-Ice Heater Stat	0	3	0=Spare 1=Off 2=On 3=Spare
Engine #2 Anti-Ice Valve Stat	0	3	0=Spare 1=Off/Open 2=On/Clsd 3=Spare
Engine #2 Anti-Ice Heater Stat	0	3	0=Spare 1=Off 2=On 3=Spare

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Safety Data Parameters

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
100	2	Combination						
	00-11	Engine #1 TGT	0	1000	4.8828125E-1	UNSIGNED	10	DEG C
	12	Engine #1 Throttle Fly	0=ON	1=OFF		DISCRETE	Change	
	13	Engine #1 Throttle Idle	0=ON	1=OFF		DISCRETE	Change	
	14	Engine #1 Throttle Lockout	0=ON	1=OFF		DISCRETE	Change	
	15	Engine #1 Throttle Off	0=ON	1=OFF		DISCRETE	Change	
101	2	Combination						
	00-11	Engine #1 Torque	0	130	1.37723069E-1	UNSIGNED	1	Percent
	12	Engine #1 Fire Ext Arm	0=OFF	1=ON		DISCRETE	Change	
	13	Spare						
	14	CPG Master Arm	0=Selected	1=Not Selected		DISCRETE	Change	
	15	Pilot Master Arm	0=Selected	1=Not Selected		DISCRETE	Change	
102	2	Combination						
	00-11	Engine #1 NG	5	110	6.3476563E-2	UNSIGNED	0.5	Percent
	12-13	Engine #1 Anti-Ice VLV'S Status	0=SPARE, 1=OFF/OPEN, 2=ON/CLSD, 3=SPARE			CODED	Change	
	14-15	Engine #1 Anti-Ice HTR Status	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
103	2	Combination						
	00-11	Engine #1 NP	30	125	6.3476563E-2	UNSIGNED	1	Percent
	12	EGI Body Velocity Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	13	EGI Attitude Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	14	EGI True Heading Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	15	EGI Inertial System Valid	0=NOT VALID	1=VALID		DISCRETE	Change	

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
104	2	Combination						
	00-11	Engine #2 TGT	0	1000	4.8828125E-1	UNSIGNED	5	DEG C
	12	Engine #2 Throttle Fly	0=ON	1=OFF		DISCRETE	Change	
	13	Engine #2 Throttle Idle	0=ON	1=OFF		DISCRETE	Change	
	14	Engine #2 Throttle Lockout	0=ON	1=OFF		DISCRETE	Change	
	15	Engine #2 Throttle Off	0=ON	1=OFF		DISCRETE	Change	
105	2	Combination						
	00-11	Engine #2 Torque	0	130	1.37723069E-1	UNSIGNED	1	Percent
	12	Engine #2 Fire Ext Arm	0=OFF	1=ON		DISCRETE	Change	
	13	Spare						
	14	Refuel Valve Closed	0=NOT CLOSED	1=CLOSED		DISCRETE	Change	
	15	Refuel Valve Open	0=NOT OPEN	1=OPEN		DISCRETE	Change	
106	2	Combination						
	00-11	Engine #2 NG	5	110	6.3476563E-2	UNSIGNED	0.5	Percent
	12-13	Engine #2 Anti-Ice VLVS Status	0=SPARE, 1=OFF/OPEN, 2=ON/CLSD, 3=SPARE			CODED	Change	
	14-15	Engine #2 Anti-Ice HTR Status	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
107	2	Combination						
	00-11	Engine #2 NP	30	125	6.3476563E-2	UNSIGNED	1	Percent
	12	EGI Earth Velocity Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	13	EGI Mag Variation Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	14	EGI INU ID	0=INU1	1=INU2		DISCRETE	Change	
	15	EGI TAG Valid	0=NOT VALID	1=VALID		DISCRETE	Change	

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
108	2	Combination						
	00-11	Main Rotor RPM	5	130	6.3476563E-2	UNSIGNED	1	Percent
	12	Stab Trail Edge Up	0=NOT BEEP UP	1=BEEP UP		DISCRETE	Change	
	13	Stab Trail Edge Down	0=NOT BEEP DOWN	1=BEEP DOWN		DISCRETE	Change	
	14	Man Stab	0=MANUAL	1=AUTOMATIC		DISCRETE	Change	
	15	Spare						
109	2	Combination						
	00-11	Altitude AGL (RADAR)	0	1428.57	-6.97543945E-1	2'S COMP	See Note 1	Feet
	12	Altitude Hold	0=OFF	1=ON		DISCRETE	Change	
	13	Radar Altitude Valid	0=INVALID	1=VALID		DISCRETE	Change	
	14	Attitude Hold	0=OFF	1=ON		DISCRETE	Change	
	15	Hover Hold Mode	0=OFF	1=ON		DISCRETE	Change	
110	2	Vertical Airspeed	-5000	5000	+3.051757812E-1	2'S COMP	50 ft./min	ft./minute
111	2	CPG Head Pos. I	-1	+9.999694824E-1	+3.051757812E-5	2'S COMP	0.0999984	Directional Cosines
112	2	CPG Head Pos. J	-1	+9.999694824E-1	+3.051757812E-5	2'S COMP	0.0999984	Directional Cosines
113	2	CPG Head Pos. K	-1	+9.999694824E-1	+3.051757812E-5	2'S COMP	0.0999984	Directional Cosines
114	2	PLT Head Pos. I	-1	+9.999694824E-1	+3.051757812E-5	2'S COMP	0.0999984	Directional Cosines
115	2	PLT Head Pos. J	-1	+9.999694824E-1	+3.051757812E-5	2'S COMP	0.0999984	Directional Cosines
116	2	PLT Head Pos. K	-1	+9.999694824E-1	+3.051757812E-5	2'S COMP	0.0999984	Directional Cosines

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
117	2	Altitude MSL	-2300	+2000	+1.000000000E+0	2'S COMP	50	Feet
118	2	Outside Air Temp	-55	+5.49983215E+1	+1.678466796E-3	2'S COMP	2	DEG C
119	2	Lateral Airspeed	-50	+50	+3.051757812E-3	2'S COMP	2	Knots
120	2	Longitudinal Airspeed	-50	+210	+7.812500000E-3	2'S COMP	2	Knots
121	2	Long Accel (Ax)	-128	+1.279960937E+2	+3.906250000E-3	2'S COMP	0.5	m/s/s
122	2	Lateral Accel (Ay)	-128	+1.279960937E+2	+3.906250000E-3	2'S COMP	0.5	m/s/s
123	2	Vertical Accel (Az)	-125	+1.279960937E+2	+3.906250000E-3	2'S COMP	0.98	m/s/s
124	2	Pitch Angle	-0.5	+0.5	+3.051757812E-5	2'S COMP	0.011111	Semicircles
125	2	Roll Angle	-1	+9.999694824E-1	+3.051757812E-5	2'S COMP	0.011111	Semicircles
126	2	Side Slip Angle	-180	+1.799945068E+2	+5.493164062E-3	2'S COMP	2	Degrees
127	2	Roll Rate	-4	+3.999877929E+0	+1.220703125E-4	2'S COMP	0.011111	Semicircles /sec
128	2	Pitch Rate	-4	+3.999877929E+0	+1.220703125E-4	2'S COMP	0.011111	Semicircles /sec
129	2	Yaw Rate	-4	+3.999877929E+0	+1.220703125E-4	2'S COMP	0.011111	Semicircles /sec
130	2	Combination						
00-11		Pilot Pitch Stk Pos	-4.281442000E+0	+5.592933000E+0	+4.211230468E-3	2'S COMP	0.1	Inches
	12	Pilot Master Warning Acknowledge	0=SELECTED	1=NOT SELECTED		DISCRETE	Change	
	13	Pilot Master Caution Acknowledge	0=SELECTED	1=NOT SELECTED		DISCRETE	Change	
	14	CPG Master Warning Acknowledge	0=SELECTED	1=NOT SELECTED		DISCRETE	Change	
	15	CPG Master Caution Acknowledge	0=SELECTED	1=NOT SELECTED		DISCRETE	Change	

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Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
131	2	Combination						
	00-11	Pilot Roll Stk Pos	-4.418152300E+0	+4.372274000E+0	+3.529785156E-3	2'S COMP	0.1	Inches
	12	ASE Pitch	0=OFF	1=ON		DISCRETE	Change	
	13	ASE Roll	0=OFF	1=ON		DISCRETE	Change	
	14	ASE Yaw	0=OFF	1=ON		DISCRETE	Change	
	15	ASE Collective	0=OFF	1=ON		DISCRETE	Change	
132	2	Combination						
	00-11	Pilot Cltv Stk Pos	-5.663252000E+0	+5.416180000E+0	+4.663465625E-3	2'S COMP	0.25	Inches
	12	ASE NOE/Approach	0=OFF	1=ON		DISCRETE	Change	
	13	ASE Trim	0=OFF	1=ON		DISCRETE	Change	
	14-15	Spare						
133	2	Combination						
	00-11	Pilot YAW Pedal Pos	-2.507613000E+0	+2.954104000E+0	+2.6345214843E-3	2'S COMP	0.0225	Inches
	12	EGI Altitude Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	13	EGI Wander Frame Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	14	EGI Vertical Velocity Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	15	EGI Health Status	0=NOT VALID	1=VALID		DISCRETE	Change	
134	2	Combination						
	00-11	Pitch RAM A Actuator	-1.790000000E+0	+1.790000000E+0	+1.5631542968E-3	2'S COMP	0.038	Inches
	12	EGI Doppler Aiding	0=NOT APPLIED	1=APPLIED		DISCRETE	Change	
	13-15	Spare						

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
135	2	Combination						
	00-11	Roll RAM A Actuator	-1.79	+1.79	+1.5631542968E-3	2'S COMP	0.038	Inches
	12-13	Right Probe Count	0	3	1	UNSIGNED	Change	Count
	14-15	Left Probe Count	0	3	1	UNSIGNED	Change	Count
136	2	Combination						
	00-11	Yaw RAM A Actuator	-0.915	+0.729	+1.5631542968E-3	2'S COMP	0.016	Inches
	12-15	Spare						
137	2	Combination						
	00-11	Cliv RAM A Actuator	-1.79	+1.79	+1.5631542968E-3	2'S COMP	0.038	Inches
	12-15	Spare						

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Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
138	2	Combination						
	00-02	Pilot Radio Select	0=SPARE,1=R1 VHF,2=R2 UHF,3=R3 FMI,4=R4 FM2,5-7=SPARE			CODED	Change	
	03-05	CPG Radio Select	0=SPARE,1=R1 VHF,2=R2 UHF,3=R3 FMI,4=R4 FM2,5-7=SPARE			CODED	Change	
	06	Pilot Intercom	0=NO SELECT	1=SELECT		DISCRETE	Change	
	07	CPG Intercom	0=NO SELECT	1=SELECT		DISCRETE	Change	
	08	Pilot Radio Xmit	0=NO SELECT	1=SELECT		DISCRETE	Change	
	09	CPG Radio Xmit	0=NO SELECT	1=SELECT		DISCRETE	Change	
	10	APU Fire Ext Arm	0=OFF	1=ON		DISCRETE	Change	
	11	Weapons Triggers	0=NO TRIGGER	1=WPN TRIGGER		DISCRETE	Change	
	12	TADS System Fail	0=NO FAILURES	1=FAILURES PRESENT		DISCRETE	Change	
	13	PNVS System Fail	0=NO FAILURES	1=FAILURES PRESENT		DISCRETE	Change	
	14	PLT/CPG Emer Hyd Sel	0=NOT ACTIVATED	1=ACTIVATED		DISCRETE	Change	
	15	Guard Receiver Mode	0=OFF	1=ON		DISCRETE	Change	

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Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
139	2	Combination						
	00-01	Man Fuel Xfer Fwd Sel	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
	02-03	Man Fuel Xfer Aft Sel	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
	04-05	Fuel Crossfeed 1 Fwd	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
	06-07	Fuel Crossfeed 1 Aft	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
	08-09	Fuel Crossfeed 1 Norm	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
	10-11	Fuel Crossfeed 2 Fwd	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
	12-13	Fuel Crossfeed 2 Aft	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
	14-15	Fuel Crossfeed 2 Norm	0=SPARE, 1=OFF, 2=ON, 3=SPARE			CODED	Change	
140	2	Combination						
	00-01	Fuel Trans MAN/AUTO Select	0=NO CHNG, 1=AUTO, 2=MANUAL, 3=SPARE			CODED	Change	
	02-03	Fuel Xfer Mode	0=NO CHNG, 1=FWD, 2=AFT, 3=NORMAL			CODED	Change	
	04-05	Fuel Crossfeed Select	0=NO CHNG, 1=AFT, 2=FWD, 3=NORMAL			CODED	Change	
	06-07	Fuel Crossfeed Mode	0=OFF, 1=AFT, 2=FWD, 3=NORMAL			CODED	Change	
	08	Boost Pump On	0=OFF	1=ON		DISCRETE	Change	
	09	Left Squat Switch	0=GROUND	1=AIRBORNE		DISCRETE	Change	
	10	Clu Squat Switch	0=OFF	1=ON		DISCRETE	Change	
	11	DP1 SQUAT SW	0=IN AIR	1=ON GND		DISCRETE	Change	
	12	DP2 SQUAT SW	0=IN AIR	1=ON GND		DISCRETE	Change	
	13	WP1 SQUAT SW	0=IN AIR	1=ON GND		DISCRETE	Change	
	14	WP2 SQUAT SW	0=IN AIR	1=ON GND		DISCRETE	Change	
	15	SP SQUAT SW	0=IN AIR	1=ON GND		DISCRETE	Change	

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Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
141	2	Combination						
	00	CPG Long ARDD	0=COUPLED	1=DECOUPLED		DISCRETE	Change	
	01	CPG Lateral ARDD	0=COUPLED	1=DECOUPLED		DISCRETE	Change	
	02	CPG Direct ARDD	0=COUPLED	1=DECOUPLED		DISCRETE	Change	
	03	CPG Collective ARDD	0=COUPLED	1=DECOUPLED		DISCRETE	Change	
	04	PLT Long ARDD	0=COUPLED	1=DECOUPLED		DISCRETE	Change	
	05	PLT Lateral ARDD	0=COUPLED	1=DECOUPLED		DISCRETE	Change	
	06	PLT Direct ARDD	0=COUPLED	1=DECOUPLED		DISCRETE	Change	
	07	PLT Collective ARDD	0=COUPLED	1=DECOUPLED		DISCRETE	Change	
	08	GPS Time Sync	0=GPS Time sync not in progress, 1=GPS Time sync in progress			CODED	Change	
	09-15	Spare						
142	2	Calibrated Airspeed	0	210	+7.8125E-3	2's COMP	2 Knots	Knots
143	2	Combination						
	00-11	CPG Pitch Stick Position	-4.28144200E+0	+5.59293300E+0	4.211230468E-3	2's COMP	0.1	Inches
	12	Long SCAS Solenoid Status	0=DISENGAGED	1=ENGAGED		DISCRETE	Change	
	13	Lat SCAS Solenoid Status	0=DISENGAGED	1=ENGAGED		DISCRETE	Change	
	14	Dir SCAS Solenoid Status	0=DISENGAGED	1=ENGAGED		DISCRETE	Change	
	15	Cliv SCAS Solenoid Status	0=DISENGAGED	1=ENGAGED		DISCRETE	Change	
144	2	Combination						
	00-11	CPG Roll Stick Position	-4.418152300E+0	+4.372274000E+0	+3.529785156E-3	2's COMP	0.1	Inches
	12	Long BUCS Solenoid Status	0=DISENGAGED	1=ENGAGED		DISCRETE	Change	
	13	Lat BUCS Solenoid Status	0=DISENGAGED	1=ENGAGED		DISCRETE	Change	
	14	Dir BUCS Solenoid Status	0=DISENGAGED	1=ENGAGED		DISCRETE	Change	
	15	Cliv BUCS Solenoid Status	0=DISENGAGED	1=ENGAGED		DISCRETE	Change	

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
145	2	Combination						
	00-11	CPG Yaw Pedal Position	-2.501750000E+0	+2.947197000E+0	+2.698222456E-3	2'S COMP	0.0225	Inches
	12	Pitch SAS Saturated	0=OFF	1=ON		DISCRETE	Change	
	13	Roll SAS Saturated	0=OFF	1=ON		DISCRETE	Change	
	14	Yaw SAS Saturated	0=OFF	1=ON		DISCRETE	Change	
	15	Cliv SAS Saturated	0=OFF	1=ON		DISCRETE	Change	
146	2	Combination						
	00-11	CPG Cliv Stick Position	-5.663252000E+0	+5.416180000E+0	4.663476562E-3	2'S COMP	0.25	Inches
	12	Pitch Stick Moved	0=NOT MOVED	1=MOVED		DISCRETE	Change	
	13	Roll Stick Moved	0=NOT MOVED	1=MOVED		DISCRETE	Change	
	14	Yaw Stick Moved	0=NOT MOVED	1=MOVED		DISCRETE	Change	
	15	Cliv Stick Moved	0=NOT MOVED	1=MOVED		DISCRETE	Change	
147	2	Combination						
	00-11	Longitudinal SAS Sleeve Position	-0.044	+0.088	5.6523437E-5	2'S COMP	0.0011305	Inches
	12	Long SAS Sleeve Position Frame	0=FRAME A	1=FRAME B		DISCRETE	Change	See Note 2
	13	Any Tracers Invalid	0=NOT VALID	1=VALID		DISCRETE	Change	
	14	Turn Coordination	0=OFF	1=ON		DISCRETE	Change	
	15	Static Air Temperature Valid	0=VALID	1=NOT VALID		DISCRETE	Change	
148	2	Combination						
	00-11	Lateral SAS Sleeve Position	-0.088	+0.088	5.6523437E-5	2'S COMP	0.0011305	Inches
	12	Lat SAS Sleeve Position Frame	0=FRAME A	1=FRAME B		DISCRETE	Change	See Note 2
	13	Long/Lat Not Filtered Valid	0=VALID	1=NOT VALID		DISCRETE	Change	
	14	Long TAS Filtered Valid	0=VALID	1=NOT VALID		DISCRETE	Change	
	15	Lat TAS Filtered Valid	0=VALID	1=NOT VALID		DISCRETE	Change	

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Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
149	2	Combination						
	00-11	Directional SAS Sleeve Position	-0.044	+0.044	5.6523437E-5	2's COMP	0.0011305	Inches
	12	Dir SAS Sleeve Position Frame	0=FRAME A	1=FRAME B		DISCRETE	Change	See Note 2
	13-15	Spare						
150	2	Combination						
	00-11	Collective SAS Sleeve Position	-0.088	+0.088	5.6523437E-5	2's COMP	0.0011305	Inches
	12	Cliv SAS Sleeve Position Frame	0=FRAME A	1=FRAME B		DISCRETE	Change	See Note 2
	13-15	Spare						
151	2	FMC Pressure Altitude	-2300	20,000	1	2's COMP	50	Feet
152	2	Combination						
	00-12	Pilot Longitudinal RVDT Position	-20	+20	4.39453125E-2	2's COMP	0.4	Degrees
	13	BUCS CPG LVDT	0=NOT SELECTED	1=SELECTED		DISCRETE	Change	
	14	Rotor Brake Engaged	0=NOT ENGAGED	1=ENGAGED		DISCRETE	Change	
	15	All Hold Disengage Software	0=NOT SELECTED	1=SELECTED		DISCRETE	Change	
153	2	Combination						
	00-12	Pilot Lateral RVDT Position	-20	+20	4.39453125E-2	2's COMP	0.4	Degrees
	13	Yaw Ground Mode	0=OFF	1=ON		DISCRETE	Change	
	14	Hover Box Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	15	EGI Source In Progress	0=RADAR ALT	1=BARO ALT		DISCRETE	Change	

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Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
154	2	Combination						
	00-12	Pilot Directional RVDY Position	-20	+20	4.39453125E-2	2'S COMP	0.4	Degrees
	13	Preflight Test Status	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	14	Maintenance Test Status	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	15	CPC BUCS LVDT	0=NOT SELECTED	1=SELECTED		DISCRETE	Change	
155	2	Combination						
	00-12	Pilot Collective RVDY Position	-20	+20	4.39453125E-2	2'S COMP	0.4	Degrees
	13-15	ECI CTS Horizontal Dilution of Precision	0=NO DATA, 1=0-1, 2=1-2, 3=2-3, 4=3-4, 5=4-5, 6=5-6, 7=>6			DISCRETE	Change	
156	2	Combination						
	00-12	CPC Longitudinal RVDY Position	-20	+20	4.39453125E-2	2'S COMP	0.4	Degrees
	13	Weapon Training Mode Status	0=OFF	1=ON		DISCRETE	Change	
	14	HADS Valid	0=NOT VALID	1=VALID		DISCRETE	Change	
	15	HADS Fail	0=NOT FAIL	1=FAIL		DISCRETE	Change	
157	2	Combination						
	00-12	CPC Lateral RVDY Position	-20	+20	4.39453125E-2	2'S COMP	0.4	Degrees
	13	Probe Switch	0=NOT TRUE	1=TRUE		DISCRETE	Change	
	14	HIADC Change Probe Request Override	0=NOT TRUE	1=TRUE		DISCRETE	Change	
	15	Spare						

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
158	2	Combination						
	00-12	CPG Directional RVDY Position	-20	+20	4.39453125E-2	2'S COMP	0.4	Degrees
	13	FMC Pressure Altitude Valid	0=VALID	1=NOT VALID		DISCRETE	Change	
	14	FMC Long TAS Selected Valid	0=VALID	1=NOT VALID		DISCRETE	Change	
	15	FMC Lat TAS Selected Valid	0=VALID	1=NOT VALID		DISCRETE	Change	
159	2	Combination						
	00-12	CPG Collective RVDY Position	-20	+20	4.39453125E-2	2'S COMP	0.4	Degrees
	13-15	TESS MODE	0=INACTIVE 1=NOT RDY 2=RDY 3-7=SPARE			DISCRETE	Change	
172	2	Combination						
	00-07	DP1 Cumulative Throughput	0	100	1	UNSIGNED	See Note 3	Percent
	08-15	DP2 Cumulative Throughput	0	100	1	UNSIGNED	See Note 3	Percent
173	2	Combination						
	00-07	CPG LH MPD Display Format	0	255	1	UNSIGNED	1	Format
	08-15	CPH RH MPD Display Format	0	255	1	UNSIGNED	1	Format
174	2	Combination						
	00-07	PLT LH MPD Display Format	0	255	1	UNSIGNED	1	Format
	08-15	PLT RH MPD Display Format	0	255	1	UNSIGNED	1	Format

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
175	2	Combination						
	00-02	CPG LH MPD Video Underlay	0=NONE 1=TADS 2=CHMD 3=SPARE 4=CSIGHT 5=PSIGHT 6=PHMD 7=SPARE			UNSIGNED	Change	
	03-05	CPG RH MPD Video Underlay	0=NONE 1=TADS 2=CHMD 3=SPARE 4=CSIGHT 5=PSIGHT 6=PHMD 7=SPARE			UNSIGNED	Change	
	06-08	PLT LH MPD Video Underlay	0=NONE 1=TADS 2=CHMD 3=SPARE 4=CSIGHT 5=PSIGHT 6=PHMD 7=SPARE			UNSIGNED	Change	
	09-11	PLT RH MPD Video Underlay	0=NONE 1=TADS 2=CHMD 3=SPARE 4=CSIGHT 5=PSIGHT 6=PHMD 7=SPARE			UNSIGNED	Change	
	12-15	Spare						
176	2	Combination						
	00-02	DP1 Mode Command	0=NO OPERATION 1=SINGLE DP 2=NORMAL SECONDARY 3=NORMAL PRIMARY 4-7=SPARE			UNSIGNED	Change	
	03-05	DP2 Mode Command	0=NO OPERATION 1=SINGLE DP 2=NORMAL SECONDARY 3=NORMAL PRIMARY 4-7=SPARE			UNSIGNED	Change	
	06	DP1 CRGP1 Video Underlay	0=VALID 1=INVALID			DISCRETE	Change	
	07	DP1 CRGP2 Video Underlay	0=VALID 1=INVALID			DISCRETE	Change	
	08	DP2 CRGP1 Video Underlay	0=VALID 1=INVALID			DISCRETE	Change	
	09	DP2 CRGP2 Video Underlay	0=VALID 1=INVALID			DISCRETE	Change	
	10-15	Spare						
177	2	Combination						
	00	DP1 MPD1 PBIT In Progress	0=NOT IN PROGRESS 1=IN PROGRESS			DISCRETE	Change	
	01	DP1 MPD2 PBIT In Progress	0=NOT IN PROGRESS 1=IN PROGRESS			DISCRETE	Change	
	02	DP1 MPD3 PBIT In Progress	0=NOT IN PROGRESS 1=IN PROGRESS			DISCRETE	Change	

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
	03	DP1 MPD4 PBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	04	DP2 MPD1 PBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	05	DP2 MPD3 PBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	06	DP2 MPD3 PBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	07	DP2 MPD4 PBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	08	DP1 MPD1 IBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	09	DP1 MPD2 IBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	10	DP1 MPD3 IBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	11	DP1 MPD4 IBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	12	DP2 MPD1 IBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	13	DP2 MPD2 IBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	14	DP2 MPD3 IBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	
	15	DP2 MPD4 IBIT In Progress	0=NOT IN PROGRESS	1=IN PROGRESS		DISCRETE	Change	

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
178	2	Combination						
	00-03	DP1 CRGP1 Palette	0=DAY A 1=DAY B 2=DAY C 3=DAY D 4=DAY E 5=NIGHT A 6=NIGHT B 7=NIGHT C 8=NIGHT D 9=NIGHT E 10=MONO 11-15=SPARE			DISCRETE	Change	
	04-07	DP1 CRGP2 Palette	0=DAY A 1=DAY B 2=DAY C 3=DAY D 4=DAY E 5=NIGHT A 6=NIGHT B 7=NIGHT C 8=NIGHT D 9=NIGHT E 10=MONO 11-15=SPARE			DISCRETE	Change	
	08-11	DP2 CRGP1 Palette	0=DAY A 1=DAY B 2=DAY C 3=DAY D 4=DAY E 5=NIGHT A 6=NIGHT B 7=NIGHT C 8=NIGHT D 9=NIGHT E 10=MONO 11-15=SPARE			DISCRETE	Change	
	12-15	DP2 CRGP2 Palette	0=DAY A 1=DAY B 2=DAY C 3=DAY D 4=DAY E 5=NIGHT A 6=NIGHT B 7=NIGHT C 8=NIGHT D 9=NIGHT E 10=MONO 11-15=SPARE			DISCRETE	Change	
179	2	Combination						
	00-05	DP1 MPD1 Soft Key Selections		See Note 5		DISCRETE	Change	
	06-11	DP1 MPD2 Soft Key Selections		See Note 5		DISCRETE	Change	
	12-15	Spare						
180	2	Combination						
	00-05	DP1 MPD3 Soft Key Selections		See Note 5		DISCRETE	Change	
	06-11	DP1 MPD4 Soft Key Selections		See Note 5		DISCRETE	Change	
	12-15	Spare						
181	2	Combination						
	00-05	DP2 MPD1 Soft Key Selections		See Note 5		DISCRETE	Change	
	06-11	DP2 MPD2 Soft Key Selections		See Note 5		DISCRETE	Change	
	12-15	Spare						

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
182	2	Combination						
	00-05	DP2 MPD3 Soft Key Selections		See Note 5		DISCRETE	Change	
	06-11	DP2 MPD4 Soft Key Selections		See Note 5		DISCRETE	Change	
	12-15	Spare						
183	2	Combination						
	00-03	DP1 Unhandled Exceptions	0	15	1	UNSIGNED	1	Exceptions
	04-07	DP2 Unhandled Exceptions	0	15	1	UNSIGNED	1	Exceptions
	08-11	DP1 Start Number	0	15	1	UNSIGNED	1	Starts
	12-15	DP2 Start Number	0	15	1	UNSIGNED	1	Starts
184	2	Combination						
	00-03	DP1 CRGP1 Reset Counter	0	15	1	UNSIGNED	1	Resets
	04-07	DP1 CRGP2 Reset Counter	0	15	1	UNSIGNED	1	Resets
	08-11	DP2 CRGP1 Reset Counter	0	15	1	UNSIGNED	1	Resets
	12-15	DP2 CRGP2 Reset Counter	0	15	1	UNSIGNED	1	Resets
185	2	Longitudinal Velocity (Vx)	-256	+255.9921875	7.8125E-3	2'S COMP	1	meters/sec
186	2	Lateral Velocity (Vy)	-256	+255.9921875	7.8125E-3	2'S COMP	1	meters/sec
187	2	Vertical Velocity (Vz)	-256	+255.9921875	7.8125E-3	2'S COMP	0.254	meters/sec
188	2	Inertial Altitude	-700	+8191.75	0.25	2'S COMP	15	meters
189	2	Inertial Position Error	0	127.998046875	1.953125E-3	UNSIGNED	0.01524	kilometers
190	2	Inertial Velocity Error	0	511.9921875	7.8125E-3	UNSIGNED	1	meters/sec
191	2	Inertial Heading Error	0	1	3.0517578E-5	UNSIGNED	0.0002572	semicircles
192	2	FMC Pitot Airspeed	0	210	7.8125E-3	2'S COMP	2	Knots
193	2	Longitudinal TAS, Filtered	-50	+210	7.8125E-3	2'S COMP	2	Knots
194	2	Lateral TAS, Filtered	-50	+50	3.051757812E-5	2'S COMP	2	Knots

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
195	2	Static Air Temperature	-55	-54.9983213332	1.678466796E-3	2'S COMP	2	Deg C
196	2	Longitudinal TAS, Unfiltered	-50	210	7.8125E-3	2'S COMP	2	Knots
197	2	Lateral TAS, Unfiltered	-50	+50	3.051757812E-5	2'S COMP	2	Knots
198	2	FMC Long TAS Selected	-50	+210	7.8125E-3	2'S COMP	2	Knots
199	2	FMC Lat TAS Selected	-50	+50	3.051757812E-5	2'S COMP	2	Knots
212	4	Combination						
	00-31	Time (Zulu)	00:00:00.00	23:59:59.99	00:00:00.01	BCD	1 Minute	Time
	00-03	System Time - Hours 10's	0	2	1	BCD		
	04-07	System Time - Hours 1's	0	9	1	BCD		
	08-11	System Time - Minutes 10's	0	5	1	BCD		
	12-15	System Time - Minutes 1's	0	9	1	BCD		
	16-19	System Time - Seconds 10's	0	5	1	BCD		
	20-23	System Time - Seconds 1's	0	9	1	BCD		
	24-27	System Time - Seconds .1's	0	9	1	BCD		
	28-31	System Time - Seconds .01's	0	9	1	BCD		

Appendix C - MDR Data Dictionary

Safety Data Parameters (Continued)

Type	Bytes	Description	MINVAL	MAXVAL	Resolution	Data Type	Threshold	Units
233	10	Combination						
	00-07	DP1 5 Hz Throughput	0	100	1	UNSIGNED	See Note 4	Percent
	08-15	DP2 5 Hz Throughput	0	100	1	UNSIGNED	See Note 4	Percent
	16-23	DP1 CRGP1 Throughput	0	100	1	UNSIGNED	See Note 4	Percent
	24-31	DP1 CRGP2 Throughput	0	100	1	UNSIGNED	See Note 4	Percent
	32-39	DP1 RGP3 Throughput	0	100	1	UNSIGNED	See Note 4	Percent
	40-47	DP1 RGP4 Throughput	0	100	1	UNSIGNED	See Note 4	Percent
	48-55	DP2 CRGP1 Throughput	0	100	1	UNSIGNED	See Note 4	Percent
	56-63	DP2 CRGP2 Throughput	0	100	1	UNSIGNED	See Note 4	Percent
	64-71	DP2 RGP3 Throughput	0	100	1	UNSIGNED	See Note 4	Percent
	72-79	DP2 RGP4 Throughput	0	100	1	UNSIGNED	See Note 4	Percent

Note 1: Radar altitude threshold is 1 foot when the previous value is below 20 feet, 2 feet when between 20 and 50 feet and 10 feet above 50 feet.

Note 2: The SAS Sleeve Positions are sampled for MDR recording at 12.5Hz. The rest of the MDR data is sampled at 6.25Hz. The FRAME bit indicates if the time of the sample is in-line with the other data (FRAME=0) or if an extra 80ms should be added to the time of occurrence for the SAS Sleeve Position data (FRAME=1).

Note 3: Data Type 172, DP Cumulative Throughput, is recorded once every 5 seconds.

Note 4: Data Type 233, DP Throughputs, is recorded once every 1 seconds.

Note 5: MPD Key selection data is encoded using the MSB of the 6 bit value to indicate the source of the selection (0=MPD Bezel Button, 1=Cyclic Cursor) and the 5 least significant bits to indicate which button/function was selected. The button selection encoding is shown in the table below.

Appendix C - MDR Data Dictionary

Button Code	Button Label	Button Code	Button Label	Button Code	Button Label	Button Code	Button Label	Button Code	Button Label
0	None	8	T1	16	B3	24	L5		
1	FCR	9	T2	17	B4	25	L6		
2	WPN	10	T3	18	B5	26	R1		
3	TSD	11	T4	19	B6	27	R2		
4	A/C	12	T5	20	L1	28	R3		
5	COM	13	T6	21	L2	29	R4		
6	VID	14	B1	22	L3	30	R5		
7	*	15	B2	23	L4	31	R6		

[illegible]

MDR PARAM ID	PARAMETER COUNT BY MDR CSV FILE ID (COLUMN HEADERS IS FILE ID)																				% OF ALL MDR					
	MSNF1	MSNF2	MSNF3	MSNF4	MSNF5	MSNF6	MSNF7	MSNF8	MSNF9	MSNF10	MSNF11	MSNF12	MSNF13	MSNF14	MSNF15	MSNF16	MSNF17	MSNF18	MSNF19	MSNF20	Avg	Count				
339	4	3	376	865	2127	2	3	3	3	4	1	3	3	0	1	3	82	71	1	3	1284	2057	415	418.1304	0.756104	
634	0	3	159	1188	1281	3	5	3	1	3	0	1	3	0	1	10	2	5	4	1738	2834	412	412.9545	0.7611292		
124	3	63	307	827	1	48	4	4	4	4	3	38	5	3	3	3	50	39	3	3	974	2094	329	373.5217	0.7656746	
451	3	63	307	827	1	48	4	4	4	4	3	38	5	3	3	3	50	39	3	3	974	2094	329	373.5217	0.77022	
61	1	76	270	795	3	38	1555	2125	3	60	1	0	1	30	2	2	57	44	3	3	950	2018	316	363.1739	0.7746395	
104	1	76	270	795	3	38	1555	2125	3	60	1	0	1	30	2	2	57	44	3	3	950	2018	316	363.1739	0.7790659	
431	1	76	270	795	3	38	1555	2125	3	60	1	0	1	30	2	2	57	44	3	3	950	2018	316	363.1739	0.7834765	
102	3	54	321	748	4	49	1550	2164	2	45	4	2	33	44	5	2	45	36	3	3	957	1637	378	360.3913	0.7876641	
499	3	54	321	748	4	49	1550	2164	2	45	4	2	33	44	5	2	45	36	3	3	957	1637	378	360.3913	0.7922497	
103	1	71	307	755	2	32	1880	2140	2	50	2	4	29	34	1	2	60	39	3	3	957	1837	378	360.3913	0.7962487	
498	1	71	307	755	2	32	1880	2140	2	50	2	4	29	34	1	2	60	39	3	3	957	1837	378	360.3913	0.7966353	
57	2	56	316	497	1	50	1205	1732	1	35	3	3	29	34	1	2	60	39	3	3	985	1737	335	359.7391	0.801013	
111	2	56	316	497	1	50	1205	1732	1	35	3	3	29	34	1	2	60	39	3	3	985	1737	335	359.7391	0.8053907	
429	2	56	316	497	1	50	1205	1732	1	35	3	3	29	34	1	2	60	39	3	3	985	1737	335	359.7391	0.8053907	
62	2	38	193	483	1	26	1525	2089	1	40	4	4	2	18	4	2	40	32	4	8	1295	1717	490	348.6087	0.8180063	
80	2	38	193	483	1	26	1525	2089	1	40	4	4	2	18	4	2	40	32	4	8	1295	1717	490	348.6087	0.8225485	
122	1	66	287	486	2	40	1182	1690	2	44	0	0	1	31	0	1	53	40	3	7	1329	2466	275	348.087	0.8310266	
449	1	66	287	486	2	40	1182	1690	2	44	0	0	1	31	0	1	53	40	3	7	1329	2466	275	348.087	0.8352625	
519	1	40	153	508	4	22	1550	2071	2	54	1	0	1	10	3	1	42	21	2	5	1272	1663	464	343.0435	0.839437	
588	2	38	193	483	1	26	1525	2089	1	40	4	4	2	18	4	2	40	32	4	8	1295	1717	490	348.6087	0.843601	
519	1	40	153	508	4	22	1550	2071	2	54	1	0	1	10	3	1	42	21	2	5	1272	1663	464	343.0435	0.843601	
26	2	54	297	430	2	35	1271	1714	3	43	2	3	1	27	2	3	57	36	3	8	1321	2153	298	337.6087	0.8477094	
29	2	54	297	430	2	35	1271	1714	3	43	2	3	1	27	2	3	57	36	3	8	1321	2153	298	337.6087	0.8518718	
504	2	54	297	430	2	35	1271	1714	3	43	2	3	1	27	2	3	57	36	3	8	1321	2153	298	337.6087	0.8559262	
503	1	40	153	508	4	22	1550	2071	2	54	1	0	1	10	3	1	42	21	2	5	1272	1663	464	343.0435	0.8600338	
563	1	40	153	508	4	22	1550	2071	2	54	1	0	1	10	3	1	42	21	2	5	1272	1663	464	343.0435	0.8600338	
24	5	63	326	445	3	57	1145	1651	3	41	4	3	5	34	6	2	47	37	7	10	1321	2151	328	334.5217	0.8641046	
27	5	63	326	445	3	57	1145	1651	3	41	4	3	5	34	6	2	47	37	7	10	1321	2151	328	334.5217	0.8641046	
584	0	0	176	775	0	0	1097	1293	1	2	0	1	0	1	1	1	1	0	1	0	1071	2468	313	909.09	0.8719854	
573	1	2	356	547	2	21	1368	1756	3	3	1	3	2	2	2	3	20	7	3	1	575	1647	284	280.7391	0.874884	
269	133	141	316	401	28	98	623	727	191	532	197	27	82	218	113	34	166	390	72	184	865	697	294	240.5217	0.879849	
88	1	81	339	305	1	0	832	1106	0	527	212	0	1	1	1	1	0	242	372	0	1	894	1024	512	260.5217	0.8823627
439	297	9	140	820	3	2	889	945	2	3	2	3	1	1	1	1	0	242	372	0	1	894	1024	512	260.5217	0.8823627
86	3	46	297	338	1	2	1080	1160	1	381	203	1	1	3	2	0	202	440	1	1	570	845	108	218.1739	0.8852476	
528	1	165	429	666	1	2	635	692	1	707	139	2	1	1	1	1	90	322	321	128	105	483	695	312	236.5217	0.8890953
526	2	153	360	570	2	3	982	697	4	406	79	4	4	2	2	2	146	230	290	183	93	316	746	255	240.3913	0.8890953
627	4	3	151	306	2	2	1905	2055	2	2	2	2	2	1	2	1	3	2	1	2	2	2	2	228	4091	0.8937795
454	6	3	82	868	0	1	769	818	2	2	2	2	2	1	2	1	3	2	1	2	2	2	2	228	4091	0.8937795
515	2	2	58	115	2	2	1048	424	1	4	2	2	2	2	2	2	108	76	3	1	4.95	657	77	224.7826	0.9005149	
321	2	2	243	260	47	146	850	916	3	1	2	2	2	2	2	2	108	76	3	1	4.95	657	77	224.7826	0.9005149	
320	2	2	228	253	34	148	870	928	1	2	2	0	1	2	2	2	116	90	0	3	4.76	653	256	177.5217	0.9028683	
323	2	2	228	253	34	148	870	928	1	2	2	0	1	2	2	2	116	90	0	3	4.76	653	256	177.5217	0.9028683	
248	78	46	95	232	1	24	517	767	71	285	24	6	92	159	13	7	146	334	28	85	371	377	235	176.0435	0.909131	
331	4	2	236	243	54	108	834	837	2	3	3	2	2	2	2	2	116	90	0	3	4.76	653	235	176.0435	0.909131	
330	0	2	218	235	49	114	791	853	2	3	3	2	2	2	2	2	116	90	0	3	4.76	653	235	176.0435	0.909131	
333	0	2	218	235	49	114	791	853	2	3	3	2	2	2	2	2	116	90	0	3	4.76	653	235	176.0435	0.909131	
444	3	3	82	46	2	4	644	21	3	396	110	3	2	1	2	1	100	69	2	1	4.86	590	257	164.3478	0.9174177	
8	3	3	82	46	2	4	644	21	3	396	110	3	2	1	2	1	100	69	2	1	4.86	590	257	164.3478	0.9174177	
9	1	1	80	30	1	1	652	21	1	382	136	1	1	0	1	1	100	69	2	1	4.86	590	257	164.3478	0.9174177	
445	1	1	80	30	1	1	652	21	1	382	136	1	1	0	1	1	100	69	2	1	4.86	590	257	164.3478	0.9174177	
58	3	58	122	177	5	26	819	903	3	44	3	4	3	3	3	3	31	25	5	1	3.26	505	98	154.2609	0.927046	
457	1	0	123	303	1	0	1004	1077	1	16	0	7	11	1	1	1	0	267	17	61	1841	72	47	159.6957	0.92313043	
363	3	3	119	317	1	4	996	1037	2	18	2	10	15	3	2	2	9	3	2	2	3.26	505	98	154.2609	0.927046	
365	1	3	99	240	2	2	917	1159	1	17	3	2	2	2	2	2	9	3	2	2	3.26	505	98	154.2609	0.927046	
49	2	3	109	304	2	3	953	1031	2	14	3	2	2	2	2	2	9	3	2	2	3.26	505	98	154.2609	0.927046	
624	1	5	114	300	2	3	883	968	2	21	9	49	108	3	3	2	8	4	1	3	3.21	460	97	145.3043	0.9342707	
582	1																									

[illegible]

[illegible]

[illegible]

MDR PARAM ID	PARAMETER COUNT BY MDR CSV FILE ID (COLUMN HEADER IS FILE ID)																											% OF ALL MDR
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602	2	2	2	1	2	2	1	0	2	1	2	1	2	2	2	4	0	2	2	2	2	2	2	2	2	2	2	1.818182 0.9979048
401	2	2	2	2	2	2	2	1	2	2	2	1	2	2	3	4	0	2	2	2	2	2	2	2	2	2	2	1.73913 0.997926
411	3	1	1	2	2	1	0	3	2	1	2	1	2	2	2	1	1	3	1	3	1	3	1	3	1	3	2	1.695652 0.9979466
413	3	1	1	2	2	1	0	3	2	1	2	1	2	2	2	1	1	3	1	3	1	3	1	3	1	3	2	1.695652 0.9979673
645	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	4	0	2	2	2	2	2	2	2	2	1	1.681818 0.9979877
76	1	4	0	3	1	2	2	2	2	0	3	1	0	1	1	2	2	3	0	2	3	0	1	4	1	3	3	1.681818 0.9979877
78	1	4	0	3	1	2	2	2	2	0	3	1	0	1	1	2	2	3	0	2	3	0	1	4	1	3	3	1.681818 0.9979877
420	1	4	0	3	1	2	2	2	2	0	3	1	0	1	1	2	2	3	0	2	3	0	1	4	1	3	3	1.681818 0.9979877
520	1	4	0	3	1	2	2	2	2	0	3	1	0	1	1	2	2	3	0	2	3	0	1	4	1	3	3	1.681818 0.9979877
522	1	4	0	3	1	2	2	2	2	0	3	1	0	1	1	2	2	3	0	2	3	0	1	4	1	3	3	1.681818 0.9979877
19	2	2	2	2	2	2	2	1	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9981015
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40	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.99812
42	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9981385
46	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.998157
48	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.998157
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287	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9981756
316	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9981941
319	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9982126
350	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9982311
352	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9982496
382	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9982681
386	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9982867
388	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9983052
388	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9983237
463	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9983422
465	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9983607
469	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9983793
471	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9983978
474	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9984163
476	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9984348
539	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9984533
541	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9984718
570	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.521739 0.9984904
572	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.5 0.9985086
590	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.5 0.9985269
593	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.5 0.9985451
615	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.5 0.9985634
617	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.5 0.9985816
426	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.5 0.9985999
559	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.434783 0.9986173
562	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9986345
568	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9986516
581	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9986688
596	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9986859
598	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9987031
610	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9987202
631	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9987374
633	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9987545
640	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9987717
648	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.409091 0.9987888
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MDR PARAM ID	PARAMETER COUNT BY MDR CSV FILE ID (COLUMN HEADER IS FILE ID)																											% OF ALL MDR		
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360	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9991109		
403	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9991279		
415	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9991448		
418	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9991617		
422	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9991787		
491	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9991956		
493	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9992125		
501	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9992295		
506	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9992464		
508	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9992633		
510	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9992802		
537	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	1.391304	0.9992972		
407	0	2	2	1	1	2	1	2	0	1	3	1	2	1	2	1	2	1	2	0	2	0	2	0	1	1	1.304348	0.9993131		
409	0	2	2	1	1	2	1	2	0	1	3	1	2	1	2	1	2	1	2	0	2	0	2	0	1	1	1.304348	0.9993299		
410	0	2	2	1	1	2	1	2	0	1	3	1	2	1	2	1	2	1	2	0	2	0	2	0	1	1	1.304348	0.9993448		
160	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.26087	0.9993601		
82	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.127391	0.999375		
211	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.956522	0.9993866	
201	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.956522	0.9993966	
15	0	0	1	0	0	1	0	0	1	2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.826087	0.9993966	
51	0	0	1	0	0	1	0	0	1	2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	0.782609	0.9994062
64	0	0	1	0	0	1	0	0	1	2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	0.782609	0.9994157
427	0	0	1	0	0	1	0	0	1	2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	0.782609	0.9994252
479	0	0	1	0	0	1	0	0	1	2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	0.782609	0.9994347
517	0	0	1	0	0	1	0	0	1	2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	0.782609	0.9994443
53	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	0.782609	0.9994538
91	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9994617	
95	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9994697	
109	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9994776	
112	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9994855	
114	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9994935	
118	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995014	
126	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995093	
142	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995173	
199	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995252	
242	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995332	
290	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995411	
292	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.999549	
347	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.999557	
357	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995649	
359	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995728	
402	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995808	
414	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995887	
417	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9995966	
421	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9996046	
490	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9996125	
492	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9996205	
500	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9996284	
505	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9996363	
507	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9996443	
509	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.852174	0.9996522	
536	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									

MDR PARAM ID	PARAMETER COUNT BY MDR CSV FILE ID (COLUMN HEADER IS FILE ID)																								AVG COUNT	% OF ALL MDR
	MSNF1	MSNF2	MSNF3	MSNF4	MSNF5	MSNF6	MSNF7	MSNF8	MSNF9	0	1	2	3	4	5	6	7	8	9	0	1	2	3			
641	0	0	1	0	0	0	2	0	1	0	1	0	1	0	0	1	0	3	0	0	1	1	0	1		
647	1	1	0	1	0	0	1	1	0	1	1	0	1	1	0	0	1	0	1	1	1	0	0	0		
649	1	1	0	1	0	0	1	1	0	1	1	0	1	1	0	1	0	1	1	1	1	0	0	0		
661	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	0	3	0	0	1	1	1	1	1		
569	0	0	1	0	0	0	1	2	0	1	2	0	1	0	0	1	0	0	0	0	1	1	1	1		
571	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	0	0	0	1	1	1	1		
591	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	1	1	1	1		
592	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
614	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
616	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
18	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
37	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
39	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
41	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
45	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
47	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
286	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
315	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
318	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
349	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
351	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
381	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
385	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
397	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
462	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
464	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
468	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
470	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
473	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
475	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
538	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
540	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
157	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
144	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
208	0	0	0	0	0	0	1	2	0	1	2	0	1	0	0	1	0	1	0	0	0	1	1	1		
55	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Appendix D - MDR Pareto Analysis

[illegible]

		PARAMETER COUNT BY MDR CSV FILE ID (COLUMN HEADER IS FILE ID)																											% OF ALL					
MDR	PARAM ID	MSNF1	MSNF2	MSNF3	MSNF4	MSNF5	MSNF6	MSNF7	MSNF8	MSNF9	0	1	2	3	4	5	6	7	8	9	MSNF1	MSNF2	MSNF3	MSNF4	MSNF5	MSNF6	MSNF7	MSNF8	MSNF9	AVG	COUNT	MDR		
All Param Count																																		
		8244	13605	63223	159407	5207	15841	306915	366136	9568	52566	20437	4912	10235	11604	8132	7416	27882	39512	7452	18319	265977	381861	65544	82060.16									
																						Average (Indiv. Param Count)		123.9579										
																						Max (Param Count)		2546.909										
																						Min (Param Count)		0										
																						Average (All Param Count)		81335.63										

Entity report

Entity name	Entity type	Primary key	# attributes
AC_HISTORY	independent	MDS, SER_NO, DATE, ENTRY_NUM	12
ACTION_CODE	independent	ACTION_CODE	6
ACTIONS	independent	MDS, SER_NO, SYS_CODE, FAULT_DATE, FAULT_NO, ACT_NO	14
AIRCRAFT	independent	MDS, SER_NO	43
CNVRT	independent	LAS_TXT	7
COMP_HIST	independent	MDS, SER_NO, WUC, CONFIG_Code, PN, PART_SN, DATE, ENTRY_NUM	16
COMPONENTS	independent	MDS, SER_NO, WUC, CONFIG_CODE, PN, PART_SN, LOCATION	35
ComponentWriteups	independent	MDS, SER_NO, WUC, CONFIG_CODE, PN, PART_SN, LOCATION, SYS_CODE, FAULT_DATE, FAULT_NO	18
CONFIG_CODE	independent	MDS, CONFIG_CODE	7
DELAY	independent	DELAY_CODE	6
DTY_SYMBOL	independent	DTY_SYM	6
ENG_COMPNTS	independent	MDS, SER_NO, WUC, CONFIG_CODE, PN, PART_SN	63
Eng_MODEL_LCF	independent	Eng_Model	8
FAILCODE	independent	FAIL_CODE	6
FAULT	independent	MDS, SER_NO, SYS_CODE, FAULT_DATE, FAULT_NO	60
FAULT_TIME_TEMP	independent	MDS, SER_NO, SYS_CODE, FAULT_DATE, FAULT_NO	7
FLIGHT	independent	MDS, SER_NO, MSN_DATE, FLIGHT_NO	61
FLIGHT_CREW	independent	MDS, SER_NO, MSN_DATE, FLIGHT_NO, PID_SEQ	33
FLIGHT_MISS_RPT	independent	MDS, SER_NO, MSN_DATE, FLIGHT_NO, TIME_START, PID	17
FUNCTION_CODE	independent	FUNCTION_CODE	6
GEN_2410	independent	UIC, CNTRL_NUM, COPY	74
HOW_REC	independent	HOW_REC_CODE	6
INSP_LCF	independent	MDS, SYS_CODE, INSP_NO	20
MAINT_LVL_LCF	independent	MAINT_LEVEL	7
MAINTENANCE_SUMMARY_REPORT	independent		16
MAJOR_NARR	independent	MDS, SER_NO	4
MALFUNC_EFFECT	independent	MALFUNC_EFFECT	6
MSN_SUFFIX	independent	MSN_SUFFIX	6
MSN_SYMBOL	independent	MSN_SYMBOL	6
PARTS_LCF	independent	MDS, WUC, PN, CONFIG_CODE	31
PRINT_2410	independent	UIC, CNTRL_NUM, COPY	74
REL_MAINT	independent	MDS, SER_NO, SYS_CODE, FAULT_DATE, FAULT_NO, RM_SEQ_NO	22
REM_ENG_COMPNTS	independent	MDS, SER_NO, WUC, CONFIG_CODE, PN, PART_SN, SEQ_NO	63
REM_MWO_COMPNT	independent	MDS, SER_NO, WUC, CONFIG_CODE, PN, PART_SN, LOCATION, MWO_NUMBER	17
REMOVED_COMPONENTS	independent	MDS, SER_NO, WUC, CONFIG_CODE, PN, PART_SN, LOCATION, SEQ_NO	35
RM_ACTIONS	independent	MDS, SER_NO, SYS_CODE,	15

		FAULT_DATE, FAULT_NO, RM_SEQ_NO, RM_ACT_NO	
SCH_INSP	independent	MDS, SER_NO, SYS_CODE, INSP_NO	23
SERV_CODE	independent	SERVICE_CODE	6
SERVICING	independent	MDS, SER_NO, MSN_DATE, FLIGHT_NO, SRV_SEQ	37
STATUS	independent	STATUS	8
T700_LCF	independent	EN_MODEL, FAT, PRESALT	4
TRANS_CODE	independent	TRANS_CODE	6
UNIT_LCF	independent	UIC	26
UTIL_LCF	independent	UTIL_CODE	6
WHEN_DISC	independent	WHEN_DISC	6
WORK_ORDERS	independent	CNTRL_NO	62
WUC	independent	MDS, WUC	9

Entity 'AC_HISTORY'

Entity name	AC_HISTORY
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
PK	DATE	Date/Time	YES	NO	Date Remarks were Entered
PK	ENTRY_NUM	Integer	YES	NO	Entry Number
	REMARKS	Memo	NO	NO	Remarks
	ORG	Text	NO	NO	Organization Making Entry
	LOC	Text	NO	NO	Location of Aircraft when Entry is Made
	PID	Text	NO	NO	PID of Person Making Entry
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'ACTION_CODE'

Entity name	ACTION_CODE
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	ACTION_CODE	Text	YES	NO	Action Code
	CODE_NARR	Text	NO	NO	Action Code Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'ACTIONS'

Entity name	ACTIONS
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Aircraft Serial Number
PK	SYS_CODE	Text	YES	NO	System Code
PK	FAULT_DATE	Date/Time	YES	NO	Date of Fault
PK	FAULT_NO	Integer	YES	NO	Fault Number
PK	ACT_NO	Byte	YES	NO	Maintenance Record Sequence Number
	PID_ACTION	Text	NO	NO	Action Code
	PID	Text	NO	NO	Personal Identification
	LVL_MAINT	Text	NO	NO	Level of Maintenance
	MAN_HOURS	Single	NO	NO	Man Hours
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'AIRCRAFT'

Entity name	AIRCRAFT
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Mission Design Series
PK	SER_NO	Text	YES	NO	Serial Number of Aircraft
	UIC	Text	NO	NO	Unit Identification Code
	STATION	Text	NO	NO	Station of Unit (Location)
	START_HRS	Single	NO	NO	Automation Start Hours for Aircraft
	START_DATE	Date/Time	NO	NO	Automation Start Date
	CURR_HRS	Single	NO	NO	Current Hours
	DATE	Date/Time	NO	NO	Date of Last Mission
	START_RNDS	Long Integer	NO	NO	Automation Start Rounds
	CURR_RNDS	Long Integer	NO	NO	Current Rounds
	PHASE_DUE	Single	NO	NO	Hours Next Phase is Due
	PHASE_NUM_DUE	Byte	NO	NO	Number of Next Phase (1,2,3,4)
	CYCLE_NUM_DUE	Byte	NO	NO	Cycle Number Due (1,2,3,4)
	LAST_FP	Date/Time	NO	NO	Date Last Flight Pack was Generated
	APU_HOURS	Single	NO	NO	Current APU Hours
	APU_STARTS	Long Integer	NO	NO	Current APU Starts
	APU_METER_HOURS	Long Integer	NO	NO	Current APU Meter Hours
	EngApuReadingsDate	Date/Time	NO	NO	Date of last engine APU readings
	EngApuReadingsPID	Text	NO	NO	PID of person who took engine APU readings
	Eng1Starts	Long Integer	NO	NO	Current starts for engine 1
	Eng2Starts	Long Integer	NO	NO	Current starts for engine 2
	HSF	Long Integer	NO	NO	Hot Section Factors
	CYCLES	Long Integer	NO	NO	Current Cycles
	LANDINGS	Long Integer	NO	NO	Current number of Std Landings
	LANDINGS_AUTO	Long Integer	NO	NO	Current number of Auto Landings
	CREW_CHIEF_NAME	Text	NO	NO	Crew Chiefs Name
	SUPERVISOR_NAME	Text	NO	NO	Supervisors Name
	STATUS_AC	Text	NO	NO	ACFT STATUS
	STATUS_EL	Text	NO	NO	ELECT. STATUS
	STATUS_AR	Text	NO	NO	WEAPON STATUS
	STATUS_OT	Text	NO	NO	OTHER STATUS
	TAG_ID	Text	NO	NO	Uniquely identifies this MDS&SER_NO in logbook migration filenames.
	DATE10HR14DAY	Date/Time	NO	NO	Date last 10 Hour/14 Day Inspection was performed
	HRS10HR14DAY	Single	NO	NO	Aircraft Hours when last 10 Hour/14 Day Inspection was performed
	PMD_DATE	Date/Time	NO	NO	Date Last Preventive Maintenance Daily was performed.
	PMD_HOURS	Single	NO	NO	Aircraft hours at time last PMD was performed.
	PMD_PID	Text	NO	NO	PID of person who performed last PMD.
	LASTMIGDATE	Date/Time	NO	NO	Last Date Migration file was received from this aircraft.
	LASTMIGTIME	Date/Time	NO	NO	Last Time Migration file was received from this aircraft.
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'CNVRT'

Entity name	CNVRT
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	LAS_TXT	Text	YES	NO	LAS conversion text file name (AIRCRAFT.TXT)
	ELAS_TABLE	Text	NO	NO	Corresponding ELAS table data is transferred to
	ELAS_REC_NUM	Long Integer	NO	NO	Number of records in the ELAS table once transfer is complete
	ERR_TABLE	Text	NO	NO	Error table name, if created
	ERR_REC_NUM	Long Integer	NO	NO	Number of records in the error table
	DATE	Date/Time	NO	NO	
	REMARKS	Text	NO	NO	Remarks as needed

Entity 'COMP_HIST'

Entity name	COMP_HIST
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
PK	WUC	Text	YES	NO	
PK	CONFIG_Code	Byte	YES	NO	
PK	PN	Text	YES	NO	Part Number
PK	PART_SN	Text	YES	NO	Part Serial Number
PK	DATE	Date/Time	YES	NO	Date Remarks were Entered
PK	ENTRY_NUM	Integer	YES	NO	Entry Number
	REMARKS	Memo	NO	NO	Remarks
	ORG	Text	NO	NO	Organization Making Entry
	LOC	Text	NO	NO	Location of Aircraft when Entry is Made
	PID	Text	NO	NO	PID of Person Making Entry
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'COMPONENTS'

Entity name	COMPONENTS
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
PK	WUC	Text	YES	NO	Discovery Work Unit Code
PK	CONFIG_CODE	Byte	YES	NO	Code that Identifies Unique Configurations
PK	PN	Text	YES	NO	Part Number
PK	PART_SN	Text	YES	NO	Part Serial Number
PK	LOCATION	Text	YES	NO	Location of Part Serial Number
	SEQ_NO	Byte	NO	NO	Sequence Number
	NEXT_HIGH_WUC	Text	NO	NO	WUC of the Next Highest Level Component
	NEXT_HIGH_CONFIG	Byte	NO	NO	Configuration Code of the Next Highest Level Component
	NEXT_HIGH_PN	Text	NO	NO	Part Number of the Next Highest Level Component
	NEXT_HIGH_SN	Text	NO	NO	Serial Number of the Next Highest Level Component
	NEXT_HIGH_LOC	Text	NO	NO	Location of the Next Highest Level Component
	NO_OVHLS	Text	NO	NO	Number of Overhauls
	N INST HRS	Long Integer	NO	NO	Hours on Nomenclature at Installation
	N RMVL HRS	Long Integer	NO	NO	Hours on Nomenclature at Removal
	C INST HRS	Long Integer	NO	NO	Hours on Component at Installation
	C RMVL HRS	Long Integer	NO	NO	Hours on Component at Removal
	TSOH	Text	NO	NO	Time Since Overhaul
	REPLACE_DUE	Long Integer	NO	NO	Replacement Due Hours
	RETIREMENT_DUE	Long Integer	NO	NO	Retirement Due Hours
	REMARKS	Memo	NO	NO	Significant Historical Data on Part
	INSTALL_STATUS	Text	NO	NO	Status of Part (Installed/Removed/Cannibalized)
	PRINT_FLAG_2410	Yes/No	NO	NO	Has a 2410 been Printed?
	DATE_INST	Date/Time	NO	NO	Date Part was Installed
	DATE_RMVL	Date/Time	NO	NO	Date Part was Removed
	SERV_CODE	Text	NO	NO	Serviceability Code for 2410 Generation
	FAIL_CODE	Text	NO	NO	Failure Code
	AOAP	Yes/No	NO	NO	Is this part in the -20 Army Oil Analysis Program
	CNTRL_NUM	Text	NO	NO	2410 Control Number
	QDR_REPORT_CONTROL_NO	Text	NO	NO	RCN Generated by QDARS system
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'ComponentWriteups'

Entity name	ComponentWriteups
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
PK	WUC	Text	YES	NO	Discovery Work Unit Code
PK	CONFIG_CODE	Byte	YES	NO	Code that Identifies Unique Configurations
PK	PN	Text	YES	NO	Part Number
PK	PART_SN	Text	YES	NO	Part Serial Number
PK	LOCATION	Text	YES	NO	Location of Part Serial Number
PK	SYS_CODE	Text	YES	NO	System Code
PK	FAULT_DATE	Date/Time	YES	NO	Date of Fault
PK	FAULT_NO	Integer	YES	NO	Fault Number
	REPLACE_DUE	Long Integer	NO	NO	Replacement Due Hours
	IsA161	Yes/No	NO	NO	Is this Write-up for a 2408-16-1 component?
	UpgradedFaultDate	Date/Time	NO	NO	Date of upgraded Fault
	UpgradedFaultNo	Integer	NO	NO	Upgraded Fault number
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'CONFIG_CODE'

Entity name	CONFIG_CODE
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model Design Series
PK	CONFIG_CODE	Double	YES	NO	Configuration Code number. Used to identify the change to TBO times and text
	CONFIG_TEXT	Text	NO	NO	Reason or reference for configuration code
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'DELAY'

Entity name	DELAY
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	DELAY_CODE	Text	YES	NO	DELAY CODE
	DELAY_CODE_NARR	Text	NO	NO	Delay Code Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'DTY_SYMBOL'

Entity name	DTY_SYMBOL
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	DTY_SYM	Text	YES	NO	Duty Symbol
	DTY_SYM_NARR	Text	NO	NO	Duty Symbol Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'ENG_COMPNTS'

Entity name	ENG_COMPNTS
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
PK	WUC	Text	YES	NO	Discovery Work Unit Code
PK	CONFIG_CODE	Byte	YES	NO	Code that Identifies Unique Configurations
PK	PN	Text	YES	NO	Part Number
PK	PART_SN	Text	YES	NO	Part Serial Number
	SEQ_NO	Byte	NO	NO	Sequence Number
	LOCATION	Text	NO	NO	Location of Part Serial Number
	NEXT_HIGH_WUC	Text	NO	NO	WUC of the Next Highest Level Component
	NEXT_HIGH_CONFIG	Byte	NO	NO	Configuration Code of the Next Highest Level Component
	NEXT_HIGH_PN	Text	NO	NO	Part Number of the Next Highest Level Component
	NEXT_HIGH_SN	Text	NO	NO	Serial Number of the Next Highest Level Component
	LCF1_LN1	Long Integer	NO	NO	LCF-1 Total Counts on Component at Installation
	LCF1_LN2	Long Integer	NO	NO	LCF-1 History Recorder Reading at Installation
	LCF1_LN3	Long Integer	NO	NO	LCF-1 History Recorder Reading at Removal
	LCF1_LN4	Long Integer	NO	NO	LCF-1 Time Since Install (Line 3 minus Line 2)
	LCF1_LN5	Long Integer	NO	NO	LCF-1 Total Counts on Component at Removal (Line 4 plus Line 1)
	LCF2_LN1	Long Integer	NO	NO	LCF-2 Total Counts on Component at Installation
	LCF2_LN2	Long Integer	NO	NO	LCF-2 History Recorder Reading at Installation
	LCF2_LN3	Long Integer	NO	NO	LCF-2 History Recorder Reading at Removal
	LCF2_LN4	Long Integer	NO	NO	LCF-2 Time Since Install (Line 3 minus Line 2)
	LCF2_LN5	Long Integer	NO	NO	LCF-2 Total Counts on Component at Removal (Line 4 plus Line 1)
	TTI_LN1	Long Integer	NO	NO	TTI Total Counts on Component at Installation
	TTI_LN2	Long Integer	NO	NO	TTI History Recorder Reading at Installation
	TTI_LN3	Long Integer	NO	NO	TTI History Recorder Reading at Removal
	TTI_LN4	Long Integer	NO	NO	TTI Time Since Install (Line 3 minus Line 2)
	TTI_LN5	Long Integer	NO	NO	TTI Total Counts on Component at Removal (Line 4 plus Line 1)
	OPH_LN1	Long Integer	NO	NO	OPHRS Total Counts on Component at Installation
	OPH_LN2	Long Integer	NO	NO	OPHRS History Recorder Reading at Installation
	OPH_LN3	Long Integer	NO	NO	OPHRS History Recorder Reading at Removal
	OPH_LN4	Long Integer	NO	NO	OPHRS Time Since Install (Line 3 minus Line 2)
	OPH_LN5	Long Integer	NO	NO	OPHRS Total Counts on Component at Removal (Line 4 plus Line 1)
	REV_NHA_LCF1_INST	Long Integer	NO	NO	Reverse Side NHA LCF1 Inst Component Counts
	REV_NHA_LCF2_INST	Long Integer	NO	NO	Reverse Side NHA LCF2 Inst Component Counts
	REV_NHA_TTI_INST	Long Integer	NO	NO	Reverse Side NHA TTI Inst Component Counts
	REV_NHA_OPHRS_INST	Long Integer	NO	NO	Reverse Side NHA OP Hrs Inst Component Counts

REV_NHA_LCF1_RMV L	Long Integer	NO	NO	Reverse Side NHA LCF1 Rmvl Component Counts
REV_NHA_LCF2_RMV L	Long Integer	NO	NO	Reverse Side NHA LCF2 Rmvl Component Counts
REV_NHA_TTI_RMV	Long Integer	NO	NO	Reverse Side NHA TTI Rmvl Component Counts
REV_NHA_OPHRS_R MVL	Long Integer	NO	NO	Reverse Side NHA OP Hrs Rmvl Component Counts
REV_SUB_LCF1_INST	Long Integer	NO	NO	Reverse Side SUB LCF1 Inst Component Counts
REV_SUB_LCF2_INST	Long Integer	NO	NO	Reverse Side SUB LCF2 Inst Component Counts
REV_SUB_TTI_INST	Long Integer	NO	NO	Reverse Side SUB TTI Inst Component Counts
REV_SUB_OPHRS_I NST	Long Integer	NO	NO	Reverse Side SUB OP Hrs Inst Component Counts
REPLACE_DUE	Long Integer	NO	NO	Replacement Due Hours
RETIREMENT_DUE	Long Integer	NO	NO	Retirement Due Hours
HIST_RCDR_SN	Text	NO	NO	History Recorder Serial Number
REMARKS	Memo	NO	NO	Significant Historical Data on Part
INSTALL_STATUS	Text	NO	NO	Status of Part (Installed/Removed/Cannibalized)
PRINT_FLAG_2410	Yes/No	NO	NO	Has a 2410 been Printed?
DATE_INST	Date/Time	NO	NO	Date Part was Installed
DATE_RMV	Date/Time	NO	NO	Date Part was Removed
AC_HRS_INST	Long Integer	NO	NO	Hours on AC at eng component install
AC_HRS_RMV	Long Integer	NO	NO	Hours on AC at eng component removal
SERV_CODE	Text	NO	NO	Serviceability Code for 2410 Generation
FAIL_CODE	Text	NO	NO	Failure Code
AOAP	Yes/No	NO	NO	Is this part in the -20 Army Oil Analysis Program
CNTRL_NUM	Text	NO	NO	2410 Control Number
QDR_REPORT_CON TROL_NO	Text	NO	NO	RCN Generated by QDARS system
DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
PID_STAMP	Text	NO	NO	Last Transaction PID
DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'Eng_MODEL_LCF'

Entity name	Eng_MODEL_LCF
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	Eng_Model	Text	YES	NO	Engine model number
	Eng_Desc	Text	NO	NO	Engine descriptions
	Eng_Forms	Text	NO	NO	Applicable dash 19 form numbers for engine. i.e. any combination of 1, 2, and 3.
	TGT_Header	Text	NO	NO	Heading used for Block 11 on the 2408-19-2
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'FAILCODE'

Entity name	FAILCODE
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	FAIL_CODE	Text	YES	NO	Failure Code from DA PAM 738-751
	FAIL_CODE_NARR	Text	NO	NO	Failure Code Description
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'FAULT'

Entity name	FAULT
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Aircraft Serial Number
PK	SYS_CODE	Text	YES	NO	System Code
PK	FAULT_DATE	Date/Time	YES	NO	Date of Fault
PK	FAULT_NO	Integer	YES	NO	Fault Number
	DISC_TIME	Date/Time	NO	NO	Fault Discovery Time
	STATUS	Text	NO	NO	Status of Fault
	DISC_PID	Text	NO	NO	PID of Personnel Discovering Fault
	AC_HRS	Single	NO	NO	Aircraft Hours at Fault Discovery
	APU_HOURS	Single	NO	NO	Number of APU Hours at Fault Discovery
	APU_STARTS	Long Integer	NO	NO	Number of APU Starts at Fault Discovery
	RNDS	Long Integer	NO	NO	Number of Rounds at Fault Discovery
	CYCLES	Long Integer	NO	NO	Number of Landing Gear Cycles at Fault Discovery
	LANDINGS	Long Integer	NO	NO	Number of Landings at Fault Discovery
	WHEN_DISC	Text	NO	NO	When Discovered Code
	HOW_REC	Text	NO	NO	How Recognized Code
	MAL_EFF	Text	NO	NO	Mission Malfunction Effect Code
	WUC	Text	NO	NO	Discovery Work Unit Code
	MAINT_TYPE	Text	NO	NO	Maintenance Type
	DELAY	Text	NO	NO	Delay Field (Concatenates WO_NO, REQ_NO, OTHER) change in 738-751 for ELAS 3.3
	AUTO_14	Yes/No	NO	NO	Treat Fault as a -14 (Y or N)
	PID_14	Text	NO	NO	PID Authorizing Transfer to -14
	DATE_14	Date/Time	NO	NO	Date Transferred to -14
	DELAY_1	Text	NO	NO	Fault Delay 1 Code
	DAYS_1	Integer	NO	NO	Number of Days Delayed (1)
	DELAY_2	Text	NO	NO	Fault Delay 2 Code
	DAYS_2	Integer	NO	NO	Number of Days Delayed (2)
	DELAY_3	Text	NO	NO	Fault Delay 3 Code
	DAYS_3	Integer	NO	NO	Number of Days Delayed (3)
	FAULT	Memo	NO	NO	Fault Narrative
	CORR_DATE	Date/Time	NO	NO	Fault Correction Date
	CORR_TIME	Date/Time	NO	NO	Fault Correction Time
	CORR_WUC	Text	NO	NO	Correction WUC
	CORR_AC_HRS	Single	NO	NO	Aircraft Hours at Correction
	CORR_RNDS	Long Integer	NO	NO	Rounds at Correction
	CORR_APU_HOURS	Single	NO	NO	APU Hours at Correction
	CORR_APU_STARTS	Long Integer	NO	NO	APU Starts at Correction
	CORR_CYCLES	Long Integer	NO	NO	Number of Landing Gear Cycles at Correction
	CORR_LANDINGS	Long Integer	NO	NO	Landings at Correction
	ACT_CODE	Text	NO	NO	Action Taken Code to Correct Fault
	ACTION	Memo	NO	NO	Corrective Action Narrative
	TI_PID	Text	NO	NO	Technical Inspector PID
	TI_LVL	Text	NO	NO	Level of Maintenance of TI
	TI_MMH	Single	NO	NO	Technical Inspector Man-Hours
	FMF_CODE	Text	NO	NO	Field Monitor Function Code
	FMC_CODE	Text	NO	NO	Field Monitor Charge Code
	FM_FLAG	Yes/No	NO	NO	Field Monitor Off/On Flag
	SYS_GEN	Yes/No	NO	NO	Is this a System Generated Fault
	CLOSED	Yes/No	NO	NO	Has this Fault been Closed

	INSP_CODE	Text	NO	NO	Applicable Inspection Code
	PST_CODE	Text	NO	NO	Parts Summary Transaction Code
	PSF_CODE	Text	NO	NO	Parts Summary Fail Code
	PS_WUC	Text	NO	NO	Parts Summary WUC
	PS_NOMEN	Text	NO	NO	Parts Summary Nomenclature
	PS_PN_NSN	Text	NO	NO	Parts Summary Part Number or NSN
	PS_QTY	Integer	NO	NO	Parts Summary Quantity
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'FAULT_TIME_TEMP'

Entity name	FAULT_TIME_TEMP
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Aircraft Serial Number
PK	SYS_CODE	Text	YES	NO	System Code
PK	FAULT_DATE	Date/Time	YES	NO	Date of Fault
PK	FAULT_NO	Integer	YES	NO	Fault Number
	DISC_TIME	Text	NO	NO	Fault Discovery Time
	CORR_TIME	Text	NO	NO	Fault Correction Time

Entity 'FLIGHT'

Entity name	FLIGHT
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Aircraft Serial Number
PK	MSN_DATE	Date/Time	YES	NO	Mission Date
PK	FLIGHT_NO	Byte	YES	NO	Flight Number
	CUR_HOURS	Single	NO	NO	Current Hours on Aircraft at Time of Mission
	STATION1	Text	NO	NO	Station at Start of Flight
	STATION2	Text	NO	NO	Intermediate Stop
	STATION3	Text	NO	NO	Station at End of Flight
	TIME_START	Date/Time	NO	NO	Time of Mission Start
	IMD_TIME	Date/Time	NO	NO	Time at Intermediate Stop
	TIME_STOP	Date/Time	NO	NO	Time at Mission Stop
	FLT_HRS	Single	NO	NO	Flight Hours
	LAND_STD	Byte	NO	NO	Number of Standard Landing
	LAND_AUTO	Byte	NO	NO	Number of Autorotations
	MSN_SYMB	Text	NO	NO	Mission Symbol
	MSN_PEC	Text	NO	NO	Mission Peculiar
	MSN_SUFFIX	Text	NO	NO	Mission Suffix
	RHC	Integer	NO	NO	Rescue Hoist Landing Cycles
	E&R	Integer	NO	NO	Refuel Probe Extensions and Retractions
	CONN	Integer	NO	NO	Refuel Probe Connections
	CONFIG	Text	NO	NO	Mission Configuration
	LOAD_INT	Long Integer	NO	NO	Internal Load in Pounds
	LOAD_EXT	Long Integer	NO	NO	External Load in Pounds
	PAX	Byte	NO	NO	Number of Passengers
	CYCLES	Byte	NO	NO	Number of Landing Gear Cycles
	HSF	Long Integer	NO	NO	Hot Section Factors
	HIT_TEST1	Text	NO	NO	HIT Results, Engine 1
	HIT_TEST2	Text	NO	NO	HIT Results, Engine 2
	HOT1	Byte	NO	NO	Hot Starts, Engine 1
	HOT2	Byte	NO	NO	Hot Starts, Engine 2
	HOT_APU	Byte	NO	NO	Hot Starts, APU
	APU_HOURS	Single	NO	NO	Hours on APU
	APU_HR_METER	Single	NO	NO	Hours on APU Meter
	FLT_REMARKS	Text	NO	NO	Flight Remarks
	STAT_762	Text	NO	NO	Status of 7.62
	STAT_20	Text	NO	NO	Status of 20
	STAT_30	Text	NO	NO	Status of 30
	STAT_40	Text	NO	NO	Status of 40
	STAT_RKT	Text	NO	NO	Status of Rocket
	STAT_TOW	Text	NO	NO	Status of TOW
	WPN_OTHER	Text	NO	NO	Name of Other Weapon System
	STAT_OTHER	Text	NO	NO	Status of Other Weapon
	RNDS_762	Long Integer	NO	NO	Number of Rounds Fired 7.62
	RNDS_20	Long Integer	NO	NO	Number of Rounds Fired 20
	RNDS_30	Long Integer	NO	NO	Number of Rounds Fired 30
	RNDS_40	Integer	NO	NO	Number of Rounds Fired 40
	RNDS_RKTS	Integer	NO	NO	Number of Rounds Fired Rockets
	RNDS_TOW	Byte	NO	NO	Number of Rounds Fired TOW
	RNDS_OTHER	Long Integer	NO	NO	Number of Rounds Fired Other Weapon
	ENG1_LCF1	Long Integer	NO	NO	Engine 1 LCF-1 Reading for T700 Series Engines
	ENG1_LCF2	Long Integer	NO	NO	Engine 1 LCF-2 Reading for T700

					Series Engines
	ENG1_TTI	Long Integer	NO	NO	Engine 1 Time/Temp Index Reading for T700 Series Engines
	ENG1_OP_HRS	Long Integer	NO	NO	Engine 1 Operating Hours Reading for T700 Series Engines
	ENG2_LCF1	Long Integer	NO	NO	Engine 2 LCF-1 Reading for T700 Series Engines
	ENG2_LCF2	Long Integer	NO	NO	Engine 2 LCF-2 Reading for T700 Series Engines
	ENG2_TTI	Long Integer	NO	NO	Engine 2 Time/Temp Index Reading for T700 Series Engines
	ENG2_OP_HRS	Long Integer	NO	NO	Engine 2 Operating Hours Reading for T700 Series Engines
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'FLIGHT_CREW'

Entity name	FLIGHT_CREW
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Aircraft Serial Number
PK	MSN_DATE	Date/Time	YES	NO	Mission Date
PK	FLIGHT_NO	Byte	YES	NO	Flight Number
PK	PID_SEQ	Byte	YES	NO	PID Sequence Number
	PID	Text	NO	NO	Personal Identifier
	SSAN	Text	NO	NO	Social Security Number
	NAME	Text	NO	NO	Name of Crew Member
	RANK	Text	NO	NO	Rank of Crew Member
	CREW_DS_1	Text	NO	NO	Crew Duty Symbol (1)
	CREW_FS_1	Text	NO	NO	Crew Flight Symbol (1)
	CREW_HRS_1	Single	NO	NO	Crew Hours at Duty (1)
	CREW_DI_1	Text	NO	NO	Crew Duty Identifier (1)
	SEAT_1	Text	NO	NO	Seat (Front or Back)
	CREW_DS_2	Text	NO	NO	Crew Duty Symbol (2)
	CREW_HRS_2	Single	NO	NO	Crew Hours at Duty (2)
	CREW_FS_2	Text	NO	NO	Crew Flight Symbol (2)
	CREW_DI_2	Text	NO	NO	Crew Duty Identifier (2)
	SEAT_2	Text	NO	NO	Seat (Front or Back)
	CREW_DS_3	Text	NO	NO	Crew Duty Symbol (3)
	CREW_HRS_3	Single	NO	NO	Crew Hours at Duty (3)
	CREW_FS_3	Text	NO	NO	Crew Flight Symbol (3)
	CREW_DI_3	Text	NO	NO	Crew Duty Identifier (3)
	SEAT_3	Text	NO	NO	Seat (Front or Back)
	CREW_DS_4	Text	NO	NO	Crew Duty Symbol (4)
	CREW_HRS_4	Single	NO	NO	Crew Hours at Duty (4)
	CREW_FS_4	Text	NO	NO	Crew Flight Symbol (4)
	CREW_DI_4	Text	NO	NO	Crew Duty Identifier (4)
	SEAT_4	Text	NO	NO	Seat (Front or Back)
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'FLIGHT_MISS_RPT'

Entity name	FLIGHT_MISS_RPT
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Aircraft Serial Number
PK	MSN_DATE	Date/Time	YES	NO	Mission Date
PK	FLIGHT_NO	Byte	YES	NO	Flight Number
PK	TIME_START	Text	YES	NO	Time of Mission Start
PK	PID	Text	YES	NO	Personal Identifier
	TIME_STOP	Text	NO	NO	Time at Mission Stop
	FLT_HRS	Single	NO	NO	Flight Hours
	MSN_SYMB	Text	NO	NO	Mission Symbol
	WEATHER	Single	NO	NO	
	HOOD	Single	NO	NO	
	NIGHT_VFR	Single	NO	NO	
	NIGHT_GOGGLES	Single	NO	NO	
	NIGHT_SYSTEM	Single	NO	NO	
	DAY_VFR	Single	NO	NO	
	DAY_GOGGLES	Single	NO	NO	
	DAY_SYSTEM	Single	NO	NO	

Entity 'FUNCTION_CODE'

Entity name	FUNCTION_CODE
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	FUNCTION_CODE	Text	YES	NO	Function Code
	FUNCTION_CODE_NARR	Text	NO	NO	Function Code Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'GEN_2410'

Entity name	GEN_2410
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	UIC	Text	YES	NO	Unit Identification Code
PK	CNTRL_NUM	Text	YES	NO	DA Form 2410 Control Number
PK	COPY	Byte	YES	NO	Which copy of 2410 is this record for (1, 2, or 3)
	NOMENCLATURE	Text	NO	NO	Component Nomenclature
	NSN	Text	NO	NO	Component National Stock Number
	PN	Text	NO	NO	Component Part Number
	SN	Text	NO	NO	Component Serial Number
	CAGE	Text	NO	NO	Contractor and Government Entity (CAGE) code
	PREVOH	Text	NO	NO	Component Number of Previous Overhauls
	TSINST	Long Integer	NO	NO	Component Hours Last Installed
	TSNEW	Long Integer	NO	NO	Component Time Since New
	TSOH	Text	NO	NO	Component Time Since Overhaul
	FAIL	Text	NO	NO	Component Failure Code
	POSITION	Text	NO	NO	Component Position Code
	HSF	Long Integer	NO	NO	Hot Section Factor
	METER_HRS	Long Integer	NO	NO	See 341-01 for items that are tracked by Hour Meter.
	WUC	Text	NO	NO	Component Work Unit Code
	LCF1	Long Integer	NO	NO	Component LCF1 Reading at Removal
	LCF2	Long Integer	NO	NO	Component LCF2 Reading at Removal
	TTI	Long Integer	NO	NO	Component TTI Reading at Removal
	OPHRS	Long Integer	NO	NO	Component OPHRS Reading at Removal
	APU_SSN	Long Integer	NO	NO	APU Starts Since New
	APU_HRS	Long Integer	NO	NO	APU Total Hours
	APU_SSO	Long Integer	NO	NO	APU Starts Since Overhaul
	VERSION	Text	NO	NO	Software Version (If it was software that was removed.)
	NHA_NOMEN	Text	NO	NO	Nomen of Next Higher Assembly (NHA)
	NHA_NSN	Text	NO	NO	NSN of Next Higher Assembly (NHA)
	NHA_PN	Text	NO	NO	PN of Next Higher Assembly (NHA)
	NHA_SN	Text	NO	NO	SN of Next Higher Assembly (NHA)
	NHA_HOURS	Long Integer	NO	NO	Hours of Next Higher Assembly (NHA) at removal of component
	NHA_LCF1	Long Integer	NO	NO	NHA LCF1 Reading at Removal
	NHA_LCF2	Long Integer	NO	NO	NHA LCF2 Reading at Removal
	NHA_TTI	Long Integer	NO	NO	NHA TTI Reading at Removal
	NHA_OPHRS	Long Integer	NO	NO	NHA OPHRS Reading at Removal
	APU_HR_METER	Long Integer	NO	NO	For -16-1 Apu's that have an Hour Meter (Reading at Time of Removal)
	APU_START_METER	Long Integer	NO	NO	For -16-1 Apu's that have a Start Meter (Reading at Time of Removal)
	HIST_REC_SN	Text	NO	NO	History Recorder Serial Number of NHA
	HIST_LCF1	Long Integer	NO	NO	History Recorder LCF1 Reading at Removal
	HIST_LCF2	Long Integer	NO	NO	History Recorder LCF2 Reading at Removal
	HIST_TTI	Long Integer	NO	NO	History Recorder TTI Reading at Removal
	HIST_OPHRS	Long Integer	NO	NO	History Recorder OPHRS Reading at Removal
	MDS	Text	NO	NO	Model Aircraft component removed from
	SERNO	Text	NO	NO	Aircraft Serial Number component

					removed from
	MAINTLEV	Text	NO	NO	Maintenance Level that removed component
	REMOVAL_DATE	Date/Time	NO	NO	Date component was removed from major
	MAN_HOURS	Single	NO	NO	Man Hours to remove the component.
	PID	Text	NO	NO	PID of person removing component.
	PHONE	Text	NO	NO	Telephone Number of UIC
	MALFUNC_EFFECT	Text	NO	NO	Malfunction Effect Code
	WHEN_DISC	Text	NO	NO	When Discovered Code
	PRINT_FLAG_2410	Yes/No	NO	NO	Has the 2410 been Printed for this component or not
	REMARKS	Memo	NO	NO	Remarks entered at time of removal.
	SENT	Byte	NO	NO	Has 2410 been sent/Verified (0 = no, 1 = verified, 2 = sent)
	MACHINE_TAG	Text	NO	NO	Machine Tag
	RCODE	Text	NO	NO	Reason Code
	IACD_CD	Text	NO	NO	Inspection Action Code
	CONTRACT	Text	NO	NO	Contract Number
	ACT_FCODE	Text	NO	NO	Actual Failure code
	SRA	Text	NO	NO	Special Repair Authorization ('Y'/'N')
	NEW_NSN	Text	NO	NO	New National Stock Number
	NEW_PN	Text	NO	NO	New Part Number
	NEW_SN	Text	NO	NO	New Serial Number
	LOSS_TO	Text	NO	NO	Name of activity doing the Loss (DRMO)
	LOSS_DT	Text	NO	NO	UIC of activity doing the Loss
	LOSS_LOC	Text	NO	NO	Location of activity doing the Loss
	DATE_CHK_SHIP	Date/Time	NO	NO	Date component was Checked (Copy 2) or Shipped (Copy 3)
	UIC_ACTION	Text	NO	NO	Unit Identification Code for this Action (Copy 2)
	MAINTLEV_ACTION	Text	NO	NO	Maintenance Level for this Action (Copy 2)
	CORR_COPY	Yes/No	NO	NO	Is this a Corrected Copy 2410?
	FINALIZED	Yes/No	NO	NO	Is this 2410 Finalized? (Used for Copy 2)
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'HOW_REC'

Entity name	HOW_REC
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	HOW_REC_CODE	Text	YES	NO	How Recognized Code
	HOW_REC_NARR	Text	NO	NO	How Recognized Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'INSP_LCF'

Entity name	INSP_LCF
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SYS_CODE	Text	YES	NO	System Code
PK	INSP_NO	Integer	YES	NO	Inspection Number
	WUC	Text	NO	NO	Work Unit Code
	FRQ_TYPE_1	Text	NO	NO	Frequency Type 1
	FREQ_1	Single	NO	NO	First Frequency
	Tolerance1	Single	NO	NO	Frequency 1 Tolerance
	Extension1	Single	NO	NO	Automatic Extension applied to Frequency 1
	FRQ_TYPE_2	Text	NO	NO	Frequency Type 2
	FREQ_2	Single	NO	NO	Second Frequency
	Tolerance2	Single	NO	NO	Frequency 2 Tolerance
	Extension2	Single	NO	NO	Automatic Extension applied to Frequency 2
	NextDueCalc	Byte	NO	NO	How NextDue is calculated
	AlwaysOn1st	Yes/No	NO	NO	Is Monthly or Yearly Inspection always due on 1st of the month?
	REF	Text	NO	NO	Technical Reference for Inspections
	INSP	Memo	NO	NO	Inspection Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'MAINT_LVL_LCF'

Entity name	MAINT_LVL_LCF
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MAINT_LEVEL	Text	YES	NO	Maintenance Level Code
	MAINT_LEVEL_NARR	Text	NO	NO	Maintenance Level Code Narrative
	MAJOR LV FLAG	Yes/No	NO	NO	Is it a major level flag?
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'MAINTENANCE_SUMMARY_REPORT'

Entity name	MAINTENANCE_SUMMARY_REPORT
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
	UIC	Text	NO	NO	Unit identifier used as filter criteria
	SER_NO	Text	NO	NO	FAULT.SER_NO used as filter criteria
	DATE	Date/Time	NO	NO	FAULT.MSN_DATE used as filter criteria
	MDS	Text	NO	NO	FAULT.MDS
	WUC	Text	NO	NO	FAULT.WUC
	DESCRIPTION	Text	NO	NO	WUC.WUC_NOMEN
	FLIGHTS	Double	NO	NO	Count of FLIGHT.SER_NO
	FLT_HRS	Single	NO	NO	Sum of FLIGHT.FLT_HRS
	STATUS	Text	NO	NO	FAULT.STATUS
	CORR_DATE	Date/Time	NO	NO	FAULT.CORR_DATE
	CLOSED	Yes/No	NO	NO	FAULT.CLOSED
	CORRECTIVE_ACTIONS	Text	NO	NO	FAULT.ACT_CODE
	FAULT_MANHOURS	Single	NO	NO	FAULT.TI_MMH
	ACTIONS_MANHOURS	Single	NO	NO	ACTIONS.MAN_HOURS
	RELMAINT_MANHOURS	Single	NO	NO	REL_MAINT.RM_TI_MMH
	RMACTIONS_MANHOURS	Single	NO	NO	RM_ACTIONS.RM_MAN_HOURS

Entity 'MAJOR_NARR'

Entity name	MAJOR_NARR
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
	TIME_NARR	Memo	NO	NO	Time Change Narrative
	COND_NARR	Memo	NO	NO	Condition Change Narrative

Entity 'MALFUNC_EFFECT'

Entity name	MALFUNC_EFFECT
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MALFUNC_EFFECT	Text	YES	NO	Malfunction Effect Code
	MALFUNC_EFFECT_NARR	Text	NO	NO	Malfunction Effect Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'MSN_SUFFIX'

Entity name	MSN_SUFFIX
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MSN_SUFFIX	Text	YES	NO	Mission Suffix
	MSN_SUFFIX_NARR	Text	NO	NO	Mission Suffix Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Alternative keys

Name	Attributes
MSN_SYMBOL	MSN_SUFFIX

Entity 'MSN_SYMBOL'

Entity name	MSN_SYMBOL
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MSN_SYMBOL	Text	YES	NO	Mission Symbol
	MSN_SYMBOL_NARR	Text	NO	NO	Mission Symbol Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'PARTS_LCF'

Entity name	PARTS_LCF
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	WUC	Text	YES	NO	Discovery Work Unit Code
PK	PN	Text	YES	NO	Part Number
PK	CONFIG_CODE	Byte	YES	NO	Code that Identifies Unique Configurations
	PART_NOMEN	Text	NO	NO	Part Nomenclature
	NSN	Text	NO	NO	NSN
	CAGE	Text	NO	NO	Manufacturer of Part
	ENG_MODEL	Text	NO	NO	Engine Model
	QPA	Byte	NO	NO	Quantity per Assembly
	COMP_TYPE	Text	NO	NO	Component Type (CC, RC, TC, HR)
	RPT_CYC_D	Yes/No	NO	NO	Is this Part Have a Reporting Cycle of 'D'
	RPT_CYC_E	Yes/No	NO	NO	Is this Part Have a Reporting Cycle of 'E'
	RPT_CYC_F	Yes/No	NO	NO	Is this Part Have a Reporting Cycle of 'F'
	RPT_CYC_G	Yes/No	NO	NO	Is this Part Have a Reporting Cycle of 'G'
	RPT_CYC_I	Yes/No	NO	NO	Is this Part Have a Reporting Cycle of 'I'
	RPT_CYC_J	Yes/No	NO	NO	Is this Part Have a Reporting Cycle of 'J'
	TBO	Long Integer	NO	NO	Time Between Overhaul/Repair
	Extension	Single	NO	NO	Extension for TBO
	RetirementLife	Long Integer	NO	NO	Maximum operating hours before retirement
	UseLowestReplaceDue	Yes/No	NO	NO	True when the lowest subcomponent replacement due value should be used
	WARR_DAYS	Integer	NO	NO	Warranty Period in Days
	WARR_HRS	Long Integer	NO	NO	Warranty Period in Aircraft Hours
	AIMIX	Yes/No	NO	NO	AIMIX Item (Yes/No)
	REF	Text	NO	NO	Source Document Reference
	NEXT_HIGH_WUC	Text	NO	NO	WUC of the Next Highest Level Component
	AOAP	Yes/No	NO	NO	Is this part in the -20 Army Oil Analysis Program
	SYSTEMCOMPONENT	Yes/No	NO	NO	Whether the System is in AOAP.
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'PRINT_2410'

Entity name	PRINT_2410
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	UIC	Text	YES	NO	Unit Identification Code
PK	CNTRL_NUM	Text	YES	NO	DA Form 2410 Control Number
PK	COPY	Byte	YES	NO	Which copy of 2410 is this record for (1, 2, or 3)
	NOMENCLATURE	Text	NO	NO	Component Nomenclature
	NSN	Text	NO	NO	Component National Stock Number
	PN	Text	NO	NO	Component Part Number
	SN	Text	NO	NO	Component Serial Number
	CAGE	Text	NO	NO	Contractor and Government Entity (CAGE) code
	PREVOH	Text	NO	NO	Component Number of Previous Overhauls
	TSLINST	Long Integer	NO	NO	Component Hours Last Installed
	TSNEW	Long Integer	NO	NO	Component Time Since New
	TSOH	Text	NO	NO	Component Time Since Overhaul
	FAIL	Text	NO	NO	Component Failure Code
	POSITION	Text	NO	NO	Component Position Code
	HSF	Long Integer	NO	NO	Hot Section Factor
	METER_HRS	Long Integer	NO	NO	See 341-01 for items that are tracked by Hour Meter.
	WUC	Text	NO	NO	Component Work Unit Code
	LCF1	Long Integer	NO	NO	Component LCF1 Reading at Removal
	LCF2	Long Integer	NO	NO	Component LCF2 Reading at Removal
	TTI	Long Integer	NO	NO	Component TTI Reading at Removal
	OPHRS	Long Integer	NO	NO	Component OPHRS Reading at Removal
	APU_SSN	Long Integer	NO	NO	APU Starts Since New
	APU_HRS	Long Integer	NO	NO	APU Total Hours
	APU_SSO	Long Integer	NO	NO	APU Starts Since Overhaul
	VERSION	Text	NO	NO	Software Version (If it was software that was removed.)
	NHA_NOMEN	Text	NO	NO	Nomen of Next Higher Assembly (NHA)
	NHA_NSN	Text	NO	NO	NSN of Next Higher Assembly (NHA)
	NHA_PN	Text	NO	NO	PN of Next Higher Assembly (NHA)
	NHA_SN	Text	NO	NO	SN of Next Higher Assembly (NHA)
	NHA_HOURS	Long Integer	NO	NO	Hours of Next Higher Assembly (NHA) at removal of component
	NHA_LCF1	Long Integer	NO	NO	NHA LCF1 Reading at Removal
	NHA_LCF2	Long Integer	NO	NO	NHA LCF2 Reading at Removal
	NHA_TTI	Long Integer	NO	NO	NHA TTI Reading at Removal
	NHA_OPHRS	Long Integer	NO	NO	NHA OPHRS Reading at Removal
	APU_HR_METER	Long Integer	NO	NO	For -16-1 APU's that have an Hour Meter (Reading at Time of Removal)
	APU_START_METER	Long Integer	NO	NO	For -16-1 APU's that have a Start Meter (Reading at Time of Removal)
	HIST_REC_SN	Text	NO	NO	History Recorder Serial Number of NHA
	HIST_LCF1	Long Integer	NO	NO	History Recorder LCF1 Reading at Removal
	HIST_LCF2	Long Integer	NO	NO	History Recorder LCF2 Reading at Removal
	HIST_TTI	Long Integer	NO	NO	History Recorder TTI Reading at Removal
	HIST_OPHRS	Long Integer	NO	NO	History Recorder OPHRS Reading at Removal
	MDS	Text	NO	NO	Model Aircraft component removed from
	SERNO	Text	NO	NO	Aircraft Serial Number component

					removed from
	MAINTLEV	Text	NO	NO	Maintenance Level that removed component
	REMOVAL_DATE	Date/Time	NO	NO	Date component was removed from major
	MAN_HOURS	Single	NO	NO	Man Hours to remove the component.
	PID	Text	NO	NO	PID of person removing component.
	PHONE	Text	NO	NO	Telephone Number of UIC
	MALFUNC_EFFECT	Text	NO	NO	Malfunction Effect Code
	WHEN_DISC	Text	NO	NO	When Discovered Code
	PRINT_FLAG_2410	Yes/No	NO	NO	Has the 2410 been Printed for this component or not
	REMARKS	Memo	NO	NO	Remarks entered at time of removal.
	SENT	Byte	NO	NO	Has 2410 been sent/Verified (0 = no, 1 = verified, 2 = sent)
	MACHINE_TAG	Text	NO	NO	Machine Tag
	RCODE	Text	NO	NO	Reason Code
	IACD_CD	Text	NO	NO	Inspection Action Code
	CONTRACT	Text	NO	NO	Contract Number
	ACT_FCODE	Text	NO	NO	Actual Failure code
	SRA	Text	NO	NO	Special Repair Authorization ('Y'/'N')
	NEW_NSN	Text	NO	NO	New National Stock Number
	NEW_PN	Text	NO	NO	New Part Number
	NEW_SN	Text	NO	NO	New Serial Number
	LOSS_TO	Text	NO	NO	Name of activity doing the Loss (DRMO)
	LOSS_DT	Text	NO	NO	UIC of activity doing the Loss
	LOSS_LOC	Text	NO	NO	Location of activity doing the Loss
	DATE_CHK_SHIP	Date/Time	NO	NO	Date component was Checked (Copy 2) or Shipped (Copy 3)
	UIC_ACTION	Text	NO	NO	Unit Identification Code for this Action (Copy 2)
	MAINTLEV_ACTION	Text	NO	NO	Maintenance Level for this Action (Copy 2)
	CORR_COPY	Yes/No	NO	NO	Is this a Corrected Copy 2410?
	FINALIZED	Yes/No	NO	NO	Is this 2410 finalized? (used for Copy 2)
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'REL_MAINT'

Entity name	REL_MAINT
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Aircraft Serial Number
PK	SYS_CODE	Text	YES	NO	System Code
PK	FAULT_DATE	Date/Time	YES	NO	Date of Fault
PK	FAULT_NO	Integer	YES	NO	Fault Number
PK	RM_SEQ_NO	Integer	YES	NO	Related Maintenance Sequence Number
	RM_STATUS	Text	NO	NO	Related Maintenance Status
	RM_DATE	Date/Time	NO	NO	Related Maintenance Date
	RM_TIME	Date/Time	NO	NO	Related Maintenance Time
	RM_FAULT	Memo	NO	NO	Related Maintenance Fault Narrative
	RM_ACTION	Memo	NO	NO	Related Maintenance Corrective Action
	WO_NO	Text	NO	NO	Work Order Number
	WUC	Text	NO	NO	WUC for 2408-13-2
	RM_TI_CODE	Text	NO	NO	Related Maintenance TI Action Code
	RM_TI_PID	Text	NO	NO	Technical Inspector PID
	RM_TI_LVL	Text	NO	NO	Level of Maintenance of TI
	RM_TI_MMH	Single	NO	NO	Technical Inspector Man-Hours
	RM_CLOSED	Yes/No	NO	NO	
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'REM_ENG_COMPNTS'

Entity name	REM_ENG_COMPNTS
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
PK	WUC	Text	YES	NO	Discovery Work Unit Code
PK	CONFIG_CODE	Byte	YES	NO	Code that Identifies Unique Configurations
PK	PN	Text	YES	NO	Part Number
PK	PART_SN	Text	YES	NO	Part Serial Number
PK	SEQ_NO	Byte	YES	NO	Sequence Number
	LOCATION	Text	NO	NO	Location of Part Serial Number
	NEXT_HIGH_WUC	Text	NO	NO	WUC of the Next Highest Level Component
	NEXT_HIGH_CONFIG	Byte	NO	NO	Configuration Code of the Next Highest Level Component
	NEXT_HIGH_PN	Text	NO	NO	Part Number of the Next Highest Level Component
	NEXT_HIGH_SN	Text	NO	NO	Serial Number of the Next Highest Level Component
	LCF1_LN1	Long Integer	NO	NO	LCF-1 Total Counts on Component at Installation
	LCF1_LN2	Long Integer	NO	NO	LCF-1 History Recorder Reading at Installation
	LCF1_LN3	Long Integer	NO	NO	LCF-1 History Recorder Reading at Removal
	LCF1_LN4	Long Integer	NO	NO	LCF-1 Time Since Install (Line 3 minus Line 2)
	LCF1_LN5	Long Integer	NO	NO	LCF-1 Total Counts on Component at Removal (Line 4 plus Line 1)
	LCF2_LN1	Long Integer	NO	NO	LCF-2 Total Counts on Component at Installation
	LCF2_LN2	Long Integer	NO	NO	LCF-2 History Recorder Reading at Installation
	LCF2_LN3	Long Integer	NO	NO	LCF-2 History Recorder Reading at Removal
	LCF2_LN4	Long Integer	NO	NO	LCF-2 Time Since Install (Line 3 minus Line 2)
	LCF2_LN5	Long Integer	NO	NO	LCF-2 Total Counts on Component at Removal (Line 4 plus Line 1)
	TTI_LN1	Long Integer	NO	NO	TTI Total Counts on Component at Installation
	TTI_LN2	Long Integer	NO	NO	TTI History Recorder Reading at Installation
	TTI_LN3	Long Integer	NO	NO	TTI History Recorder Reading at Removal
	TTI_LN4	Long Integer	NO	NO	TTI Time Since Install (Line 3 minus Line 2)
	TTI_LN5	Long Integer	NO	NO	TTI Total Counts on Component at Removal (Line 4 plus Line 1)
	OPH_LN1	Long Integer	NO	NO	OPHRS Total Counts on Component at Installation
	OPH_LN2	Long Integer	NO	NO	OPHRS History Recorder Reading at Installation
	OPH_LN3	Long Integer	NO	NO	OPHRS History Recorder Reading at Removal
	OPH_LN4	Long Integer	NO	NO	OPHRS Time Since Install (Line 3 minus Line 2)
	OPH_LN5	Long Integer	NO	NO	OPHRS Total Counts on Component at Removal (Line 4 plus Line 1)
	REV_NHA_LCF1_INST	Long Integer	NO	NO	Reverse Side NHA LCF1 Inst Component Counts
	REV_NHA_LCF2_INST	Long Integer	NO	NO	Reverse Side NHA LCF2 Inst Component Counts
	REV_NHA_TTI_INST	Long Integer	NO	NO	Reverse Side NHA TTI Inst Component Counts
	REV_NHA_OPHRS_INST	Long Integer	NO	NO	Reverse Side NHA OP Hrs Inst Component Counts

REV_NHA_LCF1_RM VL	Long Integer	NO	NO	Reverse Side NHA LCF1 Rmvl Component Counts
REV_NHA_LCF2_RM VL	Long Integer	NO	NO	Reverse Side NHA LCF2 Rmvl Component Counts
REV_NHA_TTI_RMVL	Long Integer	NO	NO	Reverse Side NHA TTI Rmvl Component Counts
REV_NHA_OPHRS_R MVL	Long Integer	NO	NO	Reverse Side NHA OP Hrs Rmvl Component Counts
REV_SUB_LCF1_INS T	Long Integer	NO	NO	Reverse Side SUB LCF1 Inst Component Counts
REV_SUB_LCF2_INS T	Long Integer	NO	NO	Reverse Side SUB LCF2 Inst Component Counts
REV_SUB_TTI_INST	Long Integer	NO	NO	Reverse Side SUB TTI Inst Component Counts
REV_SUB_OPHRS_I NST	Long Integer	NO	NO	Reverse Side SUB OP Hrs Inst Component Counts
REPLACE_DUE	Long Integer	NO	NO	Replacement Due Hours
RETIREMENT_DUE	Long Integer	NO	NO	Retirement Due Hours
HIST_RCDR_SN	Text	NO	NO	History Recorder Serial Number
REMARKS	Memo	NO	NO	Significant Historical Data on Part
INSTALL_STATUS	Text	NO	NO	Status of Part (Installed/Removed/Cannibalized)
PRINT_FLAG_2410	Yes/No	NO	NO	Has a 2410 been Printed?
DATE_INST	Date/Time	NO	NO	Date Part was Installed
DATE_RMVL	Date/Time	NO	NO	Date Part was Removed
AC_HRS_INST	Long Integer	NO	NO	Hours on AC at eng component install
AC_HRS_RMVL	Long Integer	NO	NO	Hours on AC at eng component removal
SERV_CODE	Text	NO	NO	Serviceability Code for 2410 Generation
FAIL_CODE	Text	NO	NO	Failure Code
AOAP	Yes/No	NO	NO	Is this part in the -20 Army Oil Analysis Program
CNTRL_NUM	Text	NO	NO	2410 Control Number
QDR_REPORT_CON TROL_NO	Text	NO	NO	RCN Generated by QDARS system
DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
PID_STAMP	Text	NO	NO	Last Transaction PID
DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'REM_MWO_COMPNT'

Entity name	REM_MWO_COMPNT
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	MDS of Aircraft
PK	SER_NO	Text	YES	NO	Serial Number of Aircraft having MWO Applied
PK	WUC	Text	YES	NO	Discovery Work Unit Code
PK	CONFIG_CODE	Byte	YES	NO	Code that Identifies Unique Configurations
PK	PN	Text	YES	NO	Part Number
PK	PART_SN	Text	YES	NO	Part Serial Number
PK	LOCATION	Text	YES	NO	Location of Part Serial Number
PK	MWO_NUMBER	Text	YES	NO	MWO Number
	ORG	Text	NO	NO	Organization
	PID	Text	NO	NO	PID
	DATE_APLD	Date/Time	NO	NO	Date MWO Applied
	MWO_MHRS	Single	NO	NO	Man-hours to Complete Requirement
	REMOVE_FLAG	Yes/No	NO	NO	Is the component removed
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'REMOVED_COMPONENTS'

Entity name	REMOVED_COMPONENTS
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
PK	WUC	Text	YES	NO	Discovery Work Unit Code
PK	CONFIG_CODE	Byte	YES	NO	Code that Identifies Unique Configurations
PK	PN	Text	YES	NO	Part Number
PK	PART_SN	Text	YES	NO	Part Serial Number
PK	LOCATION	Text	YES	NO	Location of Part Serial Number
PK	SEQ_NO	Byte	YES	NO	Unique sequence Number
	NEXT_HIGH_WUC	Text	NO	NO	WUC of the Next Highest Level Component
	NEXT_HIGH_CONFIG	Byte	NO	NO	Configuration Code of the Next Highest Level Component
	NEXT_HIGH_PN	Text	NO	NO	Part Number of the Next Highest Level Component
	NEXT_HIGH_SN	Text	NO	NO	Serial Number of the Next Highest Level Component
	NEXT_HIGH_LOC	Text	NO	NO	Location of the Next Highest Level Component
	NO_OVHLS	Text	NO	NO	Number of Overhauls
	N_INST_HRS	Long Integer	NO	NO	Hours on Nomenclature at Installation
	N_RMV_L_HRS	Long Integer	NO	NO	Hours on Nomenclature at Removal
	C_INST_HRS	Long Integer	NO	NO	Hours on Component at Installation
	C_RMV_L_HRS	Long Integer	NO	NO	Hours on Component at Removal
	TSOH	Text	NO	NO	Time Since Overhaul
	REPLACE_DUE	Long Integer	NO	NO	Replacement Due Hours
	RETIREMENT_DUE	Long Integer	NO	NO	Retirement Due Hours
	REMARKS	Memo	NO	NO	Significant Historical Data on Part
	INSTALL_STATUS	Text	NO	NO	Status of Part (Installed/Removed/Cannibalized)
	PRINT_FLAG_2410	Yes/No	NO	NO	Has a 2410 been Printed?
	DATE_INST	Date/Time	NO	NO	Date Part was Installed
	DATE_RMV_L	Date/Time	NO	NO	Date Part was Removed
	SERV_CODE	Text	NO	NO	Serviceability Code for 2410 Generation
	FAIL_CODE	Text	NO	NO	Failure Code
	AOAP	Yes/No	NO	NO	Is this part in the -20 Army Oil Analysis Program
	CNTRL_NUM	Text	NO	NO	2410 Control Number
	QDR_REPORT_CONTROL_NO	Text	NO	NO	Report Control Number for Quality Deficiency Report in QDARS system
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'RM_ACTIONS'

Entity name	RM_ACTIONS
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Aircraft Serial Number
PK	SYS_CODE	Text	YES	NO	System Code
PK	FAULT_DATE	Date/Time	YES	NO	Date of Fault
PK	FAULT_NO	Integer	YES	NO	Fault Number
PK	RM_SEQ_NO	Integer	YES	NO	Related Maintenance Sequence Number
PK	RM_ACT_NO	Integer	YES	NO	Related Maintenance Action Sequence Number
	RM_ACTION	Text	NO	NO	Related Maintenance Action Code
	RM_PID	Text	NO	NO	Related Maintenance Personal Identification
	RM_LVL_MAINT	Text	NO	NO	Related Maintenance Level of Maintenance
	RM_MAN_HOURS	Single	NO	NO	Related Maintenance Man Hours
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'SCH_INSP'

Entity name	SCH_INSP
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
PK	SYS_CODE	Text	YES	NO	System Code
PK	INSP_NO	Integer	YES	NO	Inspection Number
	INSP_DATE	Date/Time	NO	NO	Date of Last Inspection
	INSP_HOURS	Single	NO	NO	Aircraft Hours at Last Inspection
	INSP_RNDS	Long Integer	NO	NO	Number of Rounds at Last Inspection
	INSP_APU_HOURS	Single	NO	NO	Number of APU Hours at Last Inspection
	INSP_APU_STARTS	Long Integer	NO	NO	Number of APU Starts at Last Inspection
	INSP_CYCLES	Long Integer	NO	NO	Number of Landing Gear Cycles at Last Inspection
	INSP_LANDINGS	Long Integer	NO	NO	Number of Landings at Last Inspection
	INSP_ENG1_STARTS	Long Integer	NO	NO	Number of starts for engine 1
	INSP_ENG2_STARTS	Long Integer	NO	NO	Number of starts for engine 2
	INSP_HSF	Long Integer	NO	NO	Hot Section Factor count
	NEXT_DUE_DATE	Date/Time	NO	NO	Next Due Date
	NEXT_DUE_HRS	Single	NO	NO	Next Due Hours
	NEXT_DUE_VAL	Single	NO	NO	Next Due Value (rnds,starts)
	DAYS_BEFORE_DUE	Integer	NO	NO	Number of days before inspection is due
	HOURS_BEFORE_DUE	Single	NO	NO	Number of hours before inspection is due
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'SERV_CODE'

Entity name	SERV_CODE
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	SERVICE_CODE	Text	YES	NO	Service Code
	SERV_NARR	Text	NO	NO	Service Code Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'SERVICING'

Entity name	SERVICING
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	SER_NO	Text	YES	NO	Serial Number
PK	MSN_DATE	Date/Time	YES	NO	Mission Date
PK	FLIGHT_NO	Byte	YES	NO	Flight Number
PK	SRV_SEQ	Byte	YES	NO	Service Line Number
	FUEL_ADD_LAUX	Integer	NO	NO	Fuel Added to Left Aux Tank in Pounds
	FUEL_ADD_FWD	Integer	NO	NO	Fuel Added to Forward Tank in Pounds
	FUEL_ADD_CTR	Integer	NO	NO	Fuel Added to Center Tank in Pounds
	FUEL_ADD_AFT	Integer	NO	NO	Fuel Added to Aft Tank in Pounds
	FUEL_ADD_MAIN	Integer	NO	NO	Fuel Added to Main Tank in Pounds
	FUEL_ADD_RAUX	Integer	NO	NO	Fuel Added to Right Aux Tank in Pounds
	IN_TANK_LAUX	Integer	NO	NO	Total Fuel in Left Aux Tank in Pounds
	IN_TANK_FWD	Integer	NO	NO	Total Fuel in Forward Tank in Pounds
	IN_TANK_CTR	Integer	NO	NO	Total Fuel in Center Tank in Pounds
	IN_TANK_AFT	Integer	NO	NO	Total Fuel in Aft Tank in Pounds
	IN_TANK_MAIN	Integer	NO	NO	Total Fuel in Main Tank in Pounds
	IN_TANK_RAUX	Integer	NO	NO	Total Fuel in Right Aux Tank in Pounds
	GRADE_LAUX	Text	NO	NO	Grade of Fuel Added to Left Aux Tank
	GRADE_FWD	Text	NO	NO	Grade of Fuel Added to Forward Tank
	GRADE_CTR	Text	NO	NO	Grade of Fuel Added to Center Tank
	GRADE_AFT	Text	NO	NO	Grade of Fuel Added to Aft Tank
	GRADE_MAIN	Text	NO	NO	Grade of Fuel Added to Main Tank
	GRADE_RAUX	Text	NO	NO	Grade of Fuel Added to Right Aux Tank
	OIL1	Integer	NO	NO	Amount of Oil Added to Tank 1
	OIL_GRADE1	Text	NO	NO	Grade of Oil Added to Tank 1
	OIL2	Integer	NO	NO	Amount of Oil Added to Tank 2
	OIL_GRADE2	Text	NO	NO	Grade of Oil Added to Tank 2
	APU_OIL	Integer	NO	NO	Amount of Oil Added to APU
	APU_GRADE	Text	NO	NO	Grade of Oil Added to APU
	OXYGEN	Integer	NO	NO	Oxygen Added
	ANTI_ICE	Integer	NO	NO	Anti-Ice Added
	SERVICE_PID	Text	NO	NO	Aircraft Serviced By (Name or PID)
	SERV_LOC	Text	NO	NO	Service Location
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'STATUS'

Entity name	STATUS
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	STATUS	Text	YES	NO	Status Symbols
	NARRATIVE	Text	NO	NO	Status Narrative
	PRIORITY	Integer	NO	NO	Priority of Status
	TI_REQD	Yes/No	NO	NO	TI is required to sign off faults of this status (True/False)
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'T700_LCF'

Entity name	T700_LCF
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	EN_MODEL	Text	YES	NO	Engine Model
PK	FAT	Long Integer	YES	NO	Free Air Temperature
PK	PRESALT	Long Integer	YES	NO	Pressure Altitude
	TBLTGT	Long Integer	NO	NO	Table TGT Value

Entity 'TRANS_CODE'

Entity name	TRANS_CODE
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	TRANS_CODE	Text	YES	NO	Transaction Code
	TRANS_NARR	Text	NO	NO	Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'UNIT_LCF'

Entity name	UNIT_LCF
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	UIC	Text	YES	NO	
	UNIT_DESC	Text	NO	NO	
	ORG	Text	NO	NO	
	LOCATION	Text	NO	NO	
	PHONE_NO	Text	NO	NO	
	TBO_LIMIT	Integer	NO	NO	
	TBO_161_LIMIT	Integer	NO	NO	
	DAYS_LIMIT	Integer	NO	NO	
	HOURS_LIMIT	Long Integer	NO	NO	
	RNDS_LIMIT	Long Integer	NO	NO	
	ENG_STARTS_LIMIT	Integer	NO	NO	
	APU_START_LIMIT	Integer	NO	NO	
	APU_HRS_LIMIT	Integer	NO	NO	
	HSF_LIMIT	Long Integer	NO	NO	
	CYCLES_LIMIT	Integer	NO	NO	
	LNDGS_LIMIT	Integer	NO	NO	
	PPM_LIMIT	Integer	NO	NO	
	PHASE_LIMIT	Integer	NO	NO	
	LASTDSRDATE	Date/Time	NO	NO	
	LASTDSRTIME	Date/Time	NO	NO	
	PRE_OP_HOIST_NARRATIVE	Text	NO	NO	
	POST_OP_HOIST_NARRATIVE	Text	NO	NO	
	DATE_STAMP	Date/Time	NO	NO	
	TIME_STAMP	Date/Time	NO	NO	
	PID_STAMP	Text	NO	NO	
	DEL_FLAG	Yes/No	NO	NO	

Entity 'UTIL_LCF'

Entity name	UTIL_LCF
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	UTIL_CODE	Text	YES	NO	Utilization Code
	UTIL_NARR	Text	NO	NO	Utilization Code Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'WHEN_DISC'

Entity name	WHEN_DISC
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	WHEN_DISC	Text	YES	NO	When Discovered Code
	WHEN_DISC_NARR	Text	NO	NO	When Discovered Narrative
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'WORK_ORDERS'

Entity name	WORK_ORDERS
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	CNTRL_NO	Text	YES	NO	Control Number
	WO_NO	Text	NO	NO	Work Order Number
	SHOP_CODE	Text	NO	NO	Shop Code of Work Order
	EIC	Text	NO	NO	End Item Code
	PRIORITY	Byte	NO	NO	Priority
	PRI_PID	Text	NO	NO	Priority Authorization PID
	TYPE	Text	NO	NO	Type of 2407 (Request,MWO,Warranty)
	REQ_UIC	Text	NO	NO	Requesting Unit
	EQ_SER_NO	Text	NO	NO	Equipment Serial Number
	EQ_NOMEN	Text	NO	NO	Equipment Nomenclature
	MDS	Text	NO	NO	Model (Mission Design Series) of Aircraft
	SER_NO	Text	NO	NO	Serial Number of Aircraft
	LINE_NO	Text	NO	NO	Line Number
	EQ_NSN	Text	NO	NO	Equipment National Stock Number
	MNT_ACT	Text	NO	NO	Maintenance Activity
	MNT_LVL	Text	NO	NO	Maintenance Level (O,F,D)
	UTIL_CODE	Text	NO	NO	Utilization Code
	MSCR_ITEM	Yes/No	NO	NO	MSCR Item
	ERC	Text	NO	NO	Equipment Readiness Code
	PACING	Text	NO	NO	Pacing Item Code
	HOURS	Single	NO	NO	Operating Hours
	MILES	Integer	NO	NO	Miles
	ROUNDS	Long Integer	NO	NO	Rounds
	APU_STARTS	Long Integer	NO	NO	APU Starts
	WHEN_DISC	Text	NO	NO	When Discovered Code
	HOW_REC	Text	NO	NO	How Recognized Code
	DESCRIPTION	Memo	NO	NO	Description
	REMARKS	Memo	NO	NO	Remarks
	REP_UIC	Text	NO	NO	Repair Unit
	REP_ORG	Text	NO	NO	Repair Organization
	REP_LOC	Text	NO	NO	Repair Location
	ORG_TYPE	Text	NO	NO	Organization Type (1,2,3)
	AMS_CODE	Text	NO	NO	AMS Account Code
	TOT_MH_COST	Single	NO	NO	Total Man-hour Cost
	DELAY	Text	NO	NO	Delay Code (0-5)
	TRANSCRIBED	Yes/No	NO	NO	Data Transcribed
	SUB_BY	Text	NO	NO	Submitted by
	SUB_DT	Date/Time	NO	NO	Date Submitted
	REC_BY	Text	NO	NO	Received by
	REC_DT	Date/Time	NO	NO	Date Received
	WS_BY	Text	NO	NO	Work Started by
	WS_DT	Date/Time	NO	NO	Date Work Started
	INSP_BY	Text	NO	NO	Inspected by
	INSP_DT	Date/Time	NO	NO	Date Inspected
	ACPT_BY	Text	NO	NO	Accepted by
	ACPT_DT	Date/Time	NO	NO	Date Accepted
	DISP	Text	NO	NO	Disposition Code (A,B,C,D,E)
	MWO_NUMBER	Text	NO	NO	MWO Number
	SYS_CODE	Text	NO	NO	System Code -- for Fault reference
	FAULT_DATE	Date/Time	NO	NO	Date of Fault -- for Fault reference
	FAULT_NO	Integer	NO	NO	Fault Number -- for Fault reference
	RM_SEQ_NO	Integer	NO	NO	Related Maintenance Sequence

					Number -- for Fault reference
	WUC	Text	NO	NO	Component Work Unit Code -- for Component reference
	CONFIG_CODE	Byte	NO	NO	Component Config Code -- for Component reference
	PN	Text	NO	NO	Component Part Number -- for Component reference
	PART_SN	Text	NO	NO	Component Part Serial Number -- for Component reference
	LOCATION	Text	NO	NO	Component Location of Part Serial Number -- for Component reference
	CLOSED	Yes/No	NO	NO	Is Work Order Closed?
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

Entity 'WUC'

Entity name	WUC
Entity type	independent

User-defined variables

Name	Value
Linked table	No
Connect	
Source Table Name	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MDS	Text	YES	NO	Model (Mission Design Series)
PK	WUC	Text	YES	NO	Work Unit Code
	WUC_NOMEN	Text	NO	NO	Work Unit Code Nomenclature
	NEXT_HIGH_WUC	Text	NO	NO	Identifies Next Highest WUC for this Part
	FUNC_GROUP	Yes/No	NO	NO	Is this WUC a Functional Group ?
	DATE_STAMP	Date/Time	NO	NO	Last Transaction Date
	TIME_STAMP	Date/Time	NO	NO	Last Transaction Time
	PID_STAMP	Text	NO	NO	Last Transaction PID
	DEL_FLAG	Yes/No	NO	NO	Logical Delete Flag

UniRAM Data Dictionary

Report Date: 27-MAR-03
03086

Table Name: AUDIT_DELINS

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE		VARCHAR2	6		NOT NULL	TEST PHASE				
TABLE_NAME		VARCHAR2	30		NOT NULL	NAME OF TABLE TO AUDIT	alpha_num_check			
PRM_KEY		VARCHAR2	200		NOT NULL	PRIMARY KEY VALUE				
DML		VARCHAR2	6		NOT NULL	TYPE OF DML STATEMENT THAT CHANGED DATA	check const			
WHEN_DML		DATE			NOT NULL	DATE AND TIME OF THE DML STATEMENT THAT CHANGED THE DATA	in_the_past			
USERNAME		VARCHAR2	30		NULL	USERNAME THAT ISSUED DML STATEMENT THAT CHANGED THE DATA	alpha_num_check			

UniRAM Data Dictionary

Report Date: 27-MAR-03
03086

Table Name: AUDIT_STATUS

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE		VARCHAR2	6		NOT NULL	TEST PHASE				
MASTER_NAME		VARCHAR2	30		NOT NULL	MASTER TABLE NAME	check const			
PRM_KEY		VARCHAR2	200		NOT NULL	PRIMARY KEY VALUE				
AUDIT_BEG		DATE			NOT NULL	BEGIN DATE AND TIME OF AUDITING	in_the_past			
AUDIT_END		DATE			NULL	END DATE AND TIME OF AUDITING	in_the_past			
USERNAME_OFF		VARCHAR2	30		NULL	USERNAME THAT TURNED AUDITING OFF	alpha_num_check			
USERNAME_ON		VARCHAR2	30		NULL	USERNAME THAT TURNED AUDITING ON	alpha_num_check			

UniRAM Data Dictionary

Report Date: 27-MAR-03
03086

Table Name: AUDIT_UPD_CHAR

Col Name	FmTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE		VARCHAR2	6		NOT NULL	TEST PHASE				
TABLE_NAME		VARCHAR2	30		NOT NULL	NAME OF TABLE TO AUDIT	alpha_num_check			
PRM_KEY		VARCHAR2	200		NOT NULL	PRIMARY KEY VALUE				
COLUMN_NAME		VARCHAR2	15		NOT NULL	COLUMN NAME				
WHEN_DML		DATE			NOT NULL	DATE AND TIME OF THE DML STATEMENT THAT CHANGED THE DATA	in_the_past			
NEW_VALUE		VARCHAR2	4000		NULL	DATA VALUE POST-UPDATE				
OLD_VALUE		VARCHAR2	4000		NULL	DATA VALUE PRE-UPDATE				
USERNAME		VARCHAR2	30		NULL	USERNAME THAT ISSUED DML STATEMENT THAT CHANGED THE DATA	alpha_num_check			

UniRAM Data Dictionary

Report Date: 27-MAR-03
03086

Table Name: AUDIT_UPD_DATE

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE		VARCHAR2	6		NOT NULL	TEST PHASE				
TABLE_NAME		VARCHAR2	30		NOT NULL	NAME OF TABLE TO AUDIT	alpha_num_check			
PRM_KEY		VARCHAR2	200		NOT NULL	PRIMARY KEY VALUE				
COLUMN_NAME		VARCHAR2	15		NOT NULL	COLUMN NAME				
WHEN_DML		DATE			NOT NULL	DATE AND TIME OF THE DML STATEMENT THAT CHANGED THE DATA	in_the_past			
NEW_VALUE		DATE			NULL	DATA VALUE POST-UPDATE				
OLD_VALUE		DATE			NULL	DATA VALUE PRE-UPDATE				
USERNAME		VARCHAR2	30		NULL	USERNAME THAT ISSUED DML STATEMENT THAT CHANGED THE DATA	alpha_num_check			

UniRAM Data Dictionary

Report Date: 27-MAR-03
03086

Table Name: AUDIT_UPD_NUM

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE		VARCHAR2	6		NOT NULL	TEST PHASE				
TABLE_NAME		VARCHAR2	30		NOT NULL	NAME OF TABLE TO AUDIT	alpha_num_check			
PRM_KEY		VARCHAR2	200		NOT NULL	PRIMARY KEY VALUE				
COLUMN_NAME		VARCHAR2	15		NOT NULL	COLUMN NAME				
WHEN_DML		DATE			NOT NULL	DATE AND TIME OF THE DML STATEMENT THAT CHANGED THE DATA	in_the_past			
NEW_VALUE		NUMBER			NULL	DATA VALUE POST-UPDATE				
OLD_VALUE		NUMBER			NULL	DATA VALUE PRE-UPDATE				
USERNAME		VARCHAR2	30		NULL	USERNAME THAT ISSUED DML STATEMENT THAT CHANGED THE DATA	alpha_num_check			

UniRAM Data Dictionary

Report Date: 27-MAR-03
03086

Table Name: AVAIL

Col Name	FmTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	CNTLLOG	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL	CNTLLOG	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	CNTLLOG	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_AVL	CNTLLOG	VARCHAR2	12		NOT NULL	AVAILABILITY EVENT CONTROL NUMBER	validate_cn			
EI_SN	VARCHAR2	VARCHAR2	25		NULL	END ITEM SERIAL NUMBER	model_lookup	ENDITEM	EI_SN	
EI_TYP	VARCHAR2	VARCHAR2	3		NULL	TYPE OF END ITEM I.E. AIRCRAFT, SUPPORT EQUIPMENT	model_lookup	MODEL	EI_TYP	
UIC_OWN	VARCHAR2	VARCHAR2	6		NULL	OWNING UIC	model_lookup	EIDETL	UIC_OWN	

UniRAM Data Dictionary

Report Date: 27-MAR-03
03086

Table Name: AVLDETL

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	AVAIL	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	AVAIL	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	AVAIL	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_AVL	AVAIL	VARCHAR2	12		NOT NULL	AVAILABILITY EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
AVL_BEG		DATE	9		NULL	BEGIN DATE AND TIME OF THE AVAILABILITY EVENT	in_the_past			YYDDDDHH24MI
AVL_END		DATE	9		NULL	END DATE AND TIME OF THE AVAILABILITY EVENT	in_the_past			YYDDDDHH24MI
CN_REF		VARCHAR2	12		NULL	RELATED EVENT CONTROL NUMBER	validate_cn			
LOC		VARCHAR2	4		NULL	LOCATION OF EVENT ORIGINATION	lcf_lookup	LCFCODES	CODE	
RED_EI		VARCHAR2	1		NULL	END ITEM READINESS FOR THIS TIME PERIOD	lcf_lookup	LCFCODES	CODE	
STAT_EI		VARCHAR2	1		NULL	END ITEM STATUS FOR THIS TIME PERIOD	lcf_lookup	LCFCODES	CODE	
TEXT		VARCHAR2	2000		NULL	NARRATIVE TEXT				

Table Name: CNTILLOG

Col Name	FmtTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	ENDITEM	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL	ENDITEM	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	ENDITEM	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN		VARCHAR2	12		NOT NULL	EVENT CONTROL NUMBER	validate_cn			
AUDIT_EVNT		VARCHAR2	1		NULL	AUDITING TURNED ON	check const			
EI_BEG_AGE		NUMBER	6	1	NULL	END ITEM AGE WHEN EVENT STARTED				9990.9
EI_SN		VARCHAR2	25		NULL	END ITEM SERIAL NUMBER	model_lookup	ENDITEM	EI_SN	
EI_TYP		VARCHAR2	3		NULL	TYPE OF END ITEM I.E. AIRCRAFT, SUPPORT EQUIPMENT	model_lookup	MODEL	EI_TYP	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
EVNT_CLOSED		VARCHAR2	1		NULL	EVENT IS CLOSED	check const			
EVNT_COMPLETE		VARCHAR2	1		NULL	EVENT IS COMPLETELY ENTERED	check const			
EVNT_STAT01		VARCHAR2	1		NULL	STATUS 01 = LAST LEVEL 2 EDIT THAT WAS EXECUTED	check const			
EVNT_STAT02		VARCHAR2	1		NULL	STATUS 02 = SUCCESSFUL/UNSUCCESSFUL L2 EDIT	check const			
EVNT_STAT03		NUMBER	2	0	NULL	STATUS 03 = NUMBER OF LEVEL 2A EDIT CYCLES				90
EVNT_STAT04		VARCHAR2	1		NULL	STATUS 04 = PRINTED FOR SCORING CONFERENCE?	lcf_lookup	LCFCODES	CODE	
EVNT_STAT05		VARCHAR2	1		NULL	STATUS 05 = CURRENTLY UNUSED	lcf_lookup	LCFCODES	CODE	
EVNT_STAT06		VARCHAR2	1		NULL	STATUS 06 = CURRENTLY UNUSED	lcf_lookup	LCFCODES	CODE	
EVNT_STAT07		VARCHAR2	1		NULL	STATUS 07 = CURRENTLY UNUSED	lcf_lookup	LCFCODES	CODE	
EVNT_STAT08		VARCHAR2	1		NULL	STATUS 08 = CURRENTLY UNUSED	lcf_lookup	LCFCODES	CODE	
EVNT_STAT09		VARCHAR2	1		NULL	STATUS 09 = CURRENTLY UNUSED	lcf_lookup	LCFCODES	CODE	
EVNT_STAT10		VARCHAR2	1		NULL	STATUS 10 = CURRENTLY UNUSED	lcf_lookup	LCFCODES	CODE	
MODULE_A		NUMBER	2	0	NULL	NUMBER OF AVAILABILITY LINES THIS EVENT				90
MODULE_ED		NUMBER	2	0	NULL	NUMBER OF APU/ENGINE DETAIL RUNS USED THIS EVENT				90
MODULE_ES		NUMBER	1	0	NULL	NUMBER OF APU/ENGINE SUMMARY RUNS USED THIS EVENT				0
MODULE_MA		NUMBER	3	0	NULL	NUMBER OF ACTIONS USED THIS EVENT				990
MODULE_MM		NUMBER	1	0	NULL	NUMBER OF MONITORINGS USED THIS EVENT				0
MODULE_MT		NUMBER	3	0	NULL	NUMBER OF TASKS USED THIS EVENT				990
MODULE_OA		NUMBER	3	0	NULL	NUMBER OF ACTIVITIES USED THIS EVENT				990
MODULE_OC		NUMBER	2	0	NULL	NUMBER OF CONFIGURATIONS USED THIS EVENT				90

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Table Name: CNTLLOG

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
MODULE_OL		NUMBER	2	0	NULL	NUMBER OF LOADS USED THIS EVENT USED				90
MODULE_OW		NUMBER	2	0	NULL	NUMBER OF WEAPON/AMMOS USED THIS EVENT				90
MODULE_P		NUMBER	2	0	NULL	NUMBER OF PART UTILIZATIONS USED THIS EVENT				90
MODULE_Q		NUMBER	2	0	NULL	NUMBER OF EQUIPMENT/TOOLS USED THIS EVENT				90
MODULE_R		NUMBER	2	0	NULL	NUMBER OF READINGS USED THIS EVENT				90
MODULE_X		NUMBER	2	0	NULL	NUMBER OF EXPENDABLE/SERVICES USED THIS EVENT				90
TEXT1		VARCHAR2	4000		NULL	EVENT DESCRIPTION				
TEXT2		VARCHAR2	4000		NULL	FAULT CORRECTION				
UIC_OWN		VARCHAR2	6		NULL	OWNING UIC	model_lookup	EIDETL	UIC_OWN	

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Table Name: COLUSAGE

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	TEST	VARCHAR2	6		NOT NULL	TEST PHASE				
MODULE_SEQ		NUMBER			NOT NULL	MODULE SEQUENCE NUMBER				
MODULE_NAME		VARCHAR2	2		NOT NULL	TABLE/MODULE NAME				
COLUMN_NAME		VARCHAR2	15		NOT NULL	COLUMN/FIELD NAME				
CHANGED_ITM		VARCHAR2	1		NULL	FIELD HAS CHANGED PRIOR CUSTOMIZATION	check const			
CUSTOM_USAGE		VARCHAR2	4		NULL	HOW COLUMN/FIELD IS USED	sys_lookup	SYSCODES	CODE	
DEF_VALUE		VARCHAR2	20		NULL	DEFAULT VALUE FOR RANGE CHECK				
FLD_SEQ		NUMBER			NULL	FIELD SEQUENCE ORDER				
GENERIC_USAGE		VARCHAR2	4		NULL	FIELD USAGE IN GENERIC UNIRAM	sys_lookup	SYSCODES	CODE	
MAX_VALUE		VARCHAR2	20		NULL	MAXIMUM VALUE FOR RANGE CHECK				
MIN_VALUE		VARCHAR2	20		NULL	MINIMUM VALUE FOR RANGE CHECK				
MODULE_USAGE		VARCHAR2	4		NULL	FIELD USAGE AFTER USED MODULES SPECIFIED	sys_lookup	SYSCODES	CODE	
TABLE_NAME		VARCHAR2	30		NULL	TABLE NAME				

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Table Name: COMPUTATION

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
DT01		DATE			NULL	DATETIME COLUMN				
DT02		DATE			NULL	D DATETIME COLUMN				
DT03		DATE			NULL	D DATETIME COLUMN				
DT04		DATE			NULL	D DATETIME COLUMN				
DT05		DATE			NULL	D DATETIME COLUMN				
DT06		DATE			NULL	D DATETIME COLUMN				
DT07		DATE			NULL	D DATETIME COLUMN				
DT08		DATE			NULL	D DATETIME COLUMN				
DT09		DATE			NULL	D DATETIME COLUMN				
NUM01		NUMBER			NULL	D NUMERIC COLUMN				
NUM02		NUMBER			NULL	N NUMERIC COLUMN				
NUM03		NUMBER			NULL	N NUMERIC COLUMN				
NUM04		NUMBER			NULL	N NUMERIC COLUMN				
NUM05		NUMBER			NULL	N NUMERIC COLUMN				
NUM06		NUMBER			NULL	N NUMERIC COLUMN				
NUM07		NUMBER			NULL	N NUMERIC COLUMN				
NUM08		NUMBER			NULL	N NUMERIC COLUMN				
NUM09		NUMBER			NULL	N NUMERIC COLUMN				

Table Name: COMPUTATION

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
NUM10		NUMBER			NULL	NUMERIC COLUMN N				
NUM11		NUMBER			NULL	NUMERIC COLUMN N				
NUM12		NUMBER			NULL	NUMERIC COLUMN N				
NUM13		NUMBER			NULL	NUMERIC COLUMN N				
NUM14		NUMBER			NULL	NUMERIC COLUMN N				
NUM15		NUMBER			NULL	NUMERIC COLUMN N				
NUM16		NUMBER			NULL	NUMERIC COLUMN N				
NUM17		NUMBER			NULL	NUMERIC COLUMN N				
NUM18		NUMBER			NULL	NUMERIC COLUMN N				
NUM19		NUMBER			NULL	NUMERIC COLUMN N				
NUM20		NUMBER			NULL	NUMERIC COLUMN N				
USERNAME		VARCHAR2	30		NULL	ORACLE USER NAME N				
VC01		VARCHAR2	500		NULL	CHARACTER COLUMN U				
VC02		VARCHAR2	500		NULL	CHARACTER COLUMN V				
VC03		VARCHAR2	500		NULL	CHARACTER COLUMN V				
VC04		VARCHAR2	500		NULL	CHARACTER COLUMN V				
VC05		VARCHAR2	500		NULL	CHARACTER COLUMN V				

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Table Name: COMPUTATION

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
VC06		VARCHAR2	500		NULL	CHARACTER COLUMN	V			
VC07		VARCHAR2	500		NULL	CHARACTER COLUMN	V			
VC08		VARCHAR2	500		NULL	CHARACTER COLUMN	V			
VC09		VARCHAR2	500		NULL	CHARACTER COLUMN	V			
							V			

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Table Name: DATADICT

Col Name	FmTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TABLE_NAME		VARCHAR2	30		NOT NULL	TABLE NAME				
COLUMN_NAME		VARCHAR2	16		NOT NULL	COLUMN NAME				
COLUMN_FORMAT		VARCHAR2	20		NULL	COLUMN FORMAT				
COMMENTS		VARCHAR2	2000		NULL	COLUMN COMMENTS				
DATA_TYPE		VARCHAR2	9		NULL	COLUMN DATATYPE				
DECIMAL_WIDTH		NUMBER	1		NULL	DECIMAL WIDTH				0
FRNKEY_TABLE		VARCHAR2	12		NULL	FOREIGN KEY TABLE				
LOOKUP		VARCHAR2	16		NULL	LEVEL 1 LOOKUP VALIDATION				
REF_COLUMN		VARCHAR2	15		NULL	REFERENCE COLUMN FOR LEVEL 1				
REF_TABLE		VARCHAR2	8		NULL	LOOKUP				
SECTION		VARCHAR2	18		NULL	REFERENCE TABLE FOR LEVEL 1 LOOKUP				
TOTAL_WIDTH		NUMBER	4		NULL	SECTION WITHIN THE FORM/SCREEN				9990
ITEMID		NUMBER	4		NULL	TOTAL DISPLAY WIDTH				
						Itemid number for custom FLD_SEQ in Colusage				

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Table Name: EDITLIST

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	CNTLLOG	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	CNTLLOG	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	CNTLLOG	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN	CNTLLOG	VARCHAR2	12		NOT NULL	EVENT CONTROL NUMBER	validate_cn			
USERNAME		VARCHAR2	30		NOT NULL	ORACLE USER NAME	alpha_num_check			
EVNT_STAT01		VARCHAR2	1		NULL	STATUS 01 = LAST LEVEL 2 EDIT THAT WAS EXECUTED	lcf_lookup	LCFCODES	CODE	
EVNT_STAT02		VARCHAR2	1		NULL	STATUS 02 = SUCCESSFUL/UNSUCCESSFUL L2 EDIT	lcf_lookup	LCFCODES	CODE	

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Table Name: EICONFIG

Col Name	FmTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	ENDITEM	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	ENDITEM	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	ENDITEM	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_INS		VARCHAR2	12		NOT NULL	ITEM INSTALLATION CONTROL NUMBER				
TASK_NO_INS		NUMBER	3	0	NOT NULL	INSTALLATION TASK NUMBER				990
SEQ_NO_INS		NUMBER	4	1	NOT NULL	INSTALLATION SEQUENCE NUMBER				90.9
AGE_NEW_INS		NUMBER	6	0	NULL	ITEM AGE SINCE NEW AT INSTALLATION				999990
AGE_NEW_REM		NUMBER	6	0	NULL	ITEM AGE SINCE NEW AT REMOVAL				999990
AGE_OVH_INS		NUMBER	6	0	NULL	ITEM AGE SINCE LAST OVERHAUL AT INSTALLATION				999990
AGE_OVH_REM		NUMBER	6	0	NULL	ITEM AGE SINCE LAST OVERHAUL AT REMOVAL				999990
CN_REM		VARCHAR2	12		NULL	ITEM REMOVAL CONTROL NUMBER				
DISP		VARCHAR2	2		NULL	ACTUAL DISPOSITION OF THE PART AT REMOVAL				
EI_AGE_AS_OF		DATE			NULL	LAST TIME EICONFIG WAS REGENED (ONLY INSTALLED PARTS)				
EI_AGE_INS		NUMBER	6	1	NULL	AGE ON END ITEM WHEN ITEM IS INSTALLED				9990.9
EI_AGE_LATEST		NUMBER	6	1	NULL	END ITEM AGE WHEN EICONFIG LAST REGENED (ONLY INSTALLED PARTS)				9990.9
EI_AGE_REM		NUMBER	6	1	NULL	AGE ON END ITEM WHEN ITEM IS REMOVED				9990.9
EI_SN		VARCHAR2	25		NULL	END ITEM SERIAL NUMBER				
EI_TYP		VARCHAR2	3		NULL	TYPE OF END ITEM I.E. AIRCRAFT, SUPPORT EQUIPMENT				
N2410_OVH		NUMBER	2	0	NULL	NUMBER OF 2410 OVERHAULS				90
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE PART				
PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE PART				
PATCH		VARCHAR2	2		NULL	SOFTWARE PATCH				
POS		VARCHAR2	2		NULL	POSITION OF THE PART				
SEQ_NO_REM		NUMBER	4	1	NULL	REMOVAL SEQUENCE NUMBER				90.9
SFTW_VER_NO		VARCHAR2	20		NULL	SOFTWARE VERSION NUMBER				
TASK_NO_REM		NUMBER	3	0	NULL	REMOVAL TASK NUMBER				990
WHEN_INS		DATE			NULL	DATE AND TIME THE ITEM IS INSTALLED ON END ITEM				
WHEN_REM		DATE			NULL	DATE AND TIME THE ITEM IS REMOVED ON END ITEM				
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE PART				

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Table Name: EIDETL

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	ENDITEM	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	ENDITEM	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800	lcf_lookup	LCFCODES	CODE	
EI_ID	ENDITEM	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
TEST_BEG		DATE	9		NOT NULL	DATE AND TIME END ITEM IS INITIATED IN TEST PHASE				YYDDDDHH24MI
EI_BEG_AGE		NUMBER	6	1	NULL	END ITEM AGE WHEN INITIATED INTO TEST PHASE				9990.9
EI_END_AGE		NUMBER	6	1	NULL	END ITEM AGE WHEN LEFT TEST PHASE				9990.9
EI_MODE		VARCHAR2	1		NULL	NORMAL, FTX, PHASE MAINTENANCE	lcf_lookup	LCFCODES	CODE	
LOC		VARCHAR2	4		NULL	HOME LOCATION OF THE END ITEM	lcf_lookup	LCFCODES	CODE	
PHASE_NO		NUMBER	2	0	NULL	PHASE NUMBER FOR PHASE MAINTENANCE				90
TEST_END		DATE	9		NULL	DATE AND TIME END ITEM LEFT TEST PHASE	in_the_past			YYDDDDHH24MI
UTC_OWNI		VARCHAR2	6		NULL	OWNING UIC	unit_lookup	UNIT	UIC	

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Table Name: ENDTITEM

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MODEL	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MODEL	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID		VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER	alpha_num_check			
CONTRACT		VARCHAR2	22		NULL	CONTRACT FOR END ITEM PURCHASE				
EI_SN		VARCHAR2	25		NULL	END ITEM SERIAL NUMBER	alpha_num_check			

Table Name: EQUIP

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	TEST	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL		VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800	lcf_lookup	LCFCODES	CODE	
EQP_CAT		VARCHAR2	1		NOT NULL	EQUIPMENT CATEGORY	lcf_lookup	LCFCODES	CODE	
EQP_ID		VARCHAR2	3		NOT NULL	EQUIPMENT ID	alpha_num_check			99999990.99
CURR_COST		NUMBER	11	2	NULL	COST TO ACQUIRE EQUIPMENT WITH CURRENT NSN				
FIA1		VARCHAR2	1		NULL	MATERIEL CATEGORY OF THE EQUIPMENT	lcf_lookup	LCFCODES	CODE	
FIA2		VARCHAR2	1		NULL	APPROPRIATION AND BUDGET ACTIVITY ACCOUNT FOR THE EQUIPMENT	lcf_lookup	LCFCODES	CODE	
FIA3		VARCHAR2	1		NULL	MANAGEMENT INVENTORY SEGMENT FOR THE EQUIPMENT	lcf_lookup	LCFCODES	CODE	
FIA45		VARCHAR2	2		NULL	SPECIFIC GROUP/GENERIC GROUP FOR THE EQUIPMENT	lcf_lookup	LCFCODES	CODE	
FSCM		VARCHAR2	5		NULL	FEDERAL SUPPLY CODE FOR MANUFACTURERS	lcf_lookup	LCFCODES	CODE	
NOMEN		VARCHAR2	30		NULL	NOMENCLATURE OF THE EQUIPMENT				
NSN		VARCHAR2	13		NULL	NSN OF THE EQUIPMENT	alpha_num_check			
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE EQUIPMENT				
SMR12		VARCHAR2	2		NULL	SOURCE CODE FOR THE EQUIPMENT	lcf_lookup	LCFCODES	CODE	
SMR3		VARCHAR2	1		NULL	LOWEST MAINT LEVEL FOR REMOVE, REPLACE, USE OF THE EQUIPMENT	lcf_lookup	LCFCODES	CODE	
SMR4		VARCHAR2	1		NULL	LOWEST MAINT LEVEL FOR COMPLETE REPAIR OF THE EQUIPMENT	lcf_lookup	LCFCODES	CODE	
SMR5		VARCHAR2	1		NULL	RECOVERABILITY CODE FOR THE EQUIPMENT	lcf_lookup	LCFCODES	CODE	
SRC_SUPPLY		VARCHAR2	3		NULL	SOURCE OF SUPPLY FOR THE EQUIPMENT	lcf_lookup	LCFCODES	CODE	

Table Name: ERRORS

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	CNTLLOG	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	CNTLLOG	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	CNTLLOG	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN	CNTLLOG	VARCHAR2	12		NOT NULL	EVENT CONTROL NUMBER				
TABLES		VARCHAR2	40		NOT NULL	TABLE NAMES CONTAINING ERRORS				
TASK_NO		NUMBER	3	0	NOT NULL	TASK NUMBER OF EVENTS WITH ERRORS				990
SEQ_NO		NUMBER	5	1	NOT NULL	SEQUENCE NUMBER				990.9
EDIT_LEVEL		VARCHAR2	2		NOT NULL	EDIT LEVEL				
L2_ERROR		VARCHAR2	7		NOT NULL	LEVEL 2 ERROR				
ORDER_ERRORS		NUMBER	3	0	NOT NULL	ORDER OF ERRORS IN PRINTOUT				990
USERNAME		VARCHAR2	30		NOT NULL	ORACLE USER NAME	alpha_num_check			
TEXT		VARCHAR2	200		NULL	ERROR TEXT				

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Table Name: EVENTS

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	CNTLLOG	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL	CNTLLOG	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	CNTLLOG	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN	CNTLLOG	VARCHAR2	12		NOT NULL	EVENT CONTROL NUMBER	validate_cn			
USERNAME		VARCHAR2	30		NOT NULL	ORACLE USER NAME	alpha_num_check			

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Table Name: EXPDETL

Col Name	FrmTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	EXPND	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	EXPND	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EXP_CAT	EXPND	VARCHAR2	1		NOT NULL	EXPENDABLE CATEGORY				
EXP_ID	EXPND	VARCHAR2	3		NOT NULL	EXPENDABLE ID				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
CURR_COST		NUMBER	11	2	NULL	COST TO ACQUIRE EXPENDABLE WITH CURRENT NSN				99999990.99
UOI		VARCHAR2	2		NULL	SMALLEST QTY OF EXPENDABLE THAT CAN BE REQUISITIONED/ISSUED	lcf_lookup	LCFCODES	CODE	
UOM		VARCHAR2	2		NULL	UNIT OF MEASURE FOR THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	

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Table Name: EXPND

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	TEST	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL		VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, TS00	lcf_lookup	LCFCODES	CODE	
EXP_CAT		VARCHAR2	1		NOT NULL	EXPENDABLE CATEGORY	lcf_lookup	LCFCODES	CODE	
EXP_ID		VARCHAR2	3		NOT NULL	EXPENDABLE ID	alpha_num_check			
CURR_NSN		VARCHAR2	13		NULL	CURRENT NSN FOR THE EXPENDABLE	alpha_num_check			
FIA1		VARCHAR2	1		NULL	MATERIEL CATEGORY OF THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	
FIA2		VARCHAR2	1		NULL	APPROPRIATION AND BUDGET ACTIVITY ACCOUNT FOR THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	
FIA3		VARCHAR2	1		NULL	MANAGEMENT INVENTORY SEGMENT FOR THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	
FIA45		VARCHAR2	2		NULL	SPECIFIC GROUP/GENERIC GROUP FOR THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	
FSCM		VARCHAR2	5		NULL	FEDERAL SUPPLY CODE FOR MANUFACTURERS	lcf_lookup	LCFCODES	CODE	
NOMEN		VARCHAR2	30		NULL	NOMENCLATURE OF THE EXPENDABLE				
NSN		VARCHAR2	13		NULL	NSN OF THE EXPENDABLE	alpha_num_check			
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE EXPENDABLE				
SMR12		VARCHAR2	2		NULL	SOURCE CODE FOR THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	
SMR3		VARCHAR2	1		NULL	LOWEST MAINT LEVEL FOR REMOVE, REPLACE, USE OF THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	
SMR4		VARCHAR2	1		NULL	LOWEST MAINT LEVEL FOR COMPLETE REPAIR OF THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	
SMR5		VARCHAR2	1		NULL	RECOVERABILITY CODE FOR THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	
SRC_SUPPLY		VARCHAR2	3		NULL	SOURCE OF SUPPLY FOR THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	

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Table Name: GDVALUES

Col Name	FmTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
USERNAME		VARCHAR2	30		NOT NULL	ORACLE USER NAME				
ANAL_BEG		DATE	9		NULL	BEGIN DATE AND TIME OF THE ANALYSIS				YYDDDDHH24MI
ANAL_END		DATE	9		NULL	END DATE AND TIME OF THE ANALYSIS				YYDDDDHH24MI
EI_ID		VARCHAR2	3		NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
EI_MODEL		VARCHAR2	6		NULL	END ITEM MODEL I.E. AH64A, T800				
LAST_UPDATE		DATE	9		NULL	LAST DATE AND TIME USER RAN GETDATA REPORT				YYDDDDHH24MI
TEST_PHASE		VARCHAR2	6		NULL	TEST PHASE				
WHERE_A		VARCHAR2	2000		NULL	WHERE PHRASE FOR AVAILABILITY				
WHERE_C		VARCHAR2	2000		NULL	WHERE PHRASE FOR CONTROL LOG				
WHERE_M		VARCHAR2	2000		NULL	WHERE PHRASE FOR MAINTENANCE				
WHERE_O		VARCHAR2	2000		NULL	WHERE PHRASE FOR OPERATIONS				
WHERE_R		VARCHAR2	2000		NULL	WHERE PHRASE FOR READINGS				

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Table Name: IMAGES

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	CNTLLOG	VARCHAR2	6		NOT NULL	TEST PHASE		TEST	TEST_PHASE	
EI_MODEL	CNTLLOG	VARCHAR2	6		NOT NULL	END ITEM MODEL		MODEL	EI_MODEL	
EI_ID	CNTLLOG	VARCHAR2	3		NOT NULL	END ITEM ID		ENDITEM	EI_ID	
CN	CNTLLOG	VARCHAR2	12		NOT NULL	CONTROL NUMBER		CNTLLOG	CN	
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER PER EVENT				99.9
TEXT		VARCHAR2	100		NULL	TEXT DESCRIPTION OF IMAGE				
FILENAME		VARCHAR2	20		NULL	FILENAME OF IMAGE				
IMAGE		BLOB			NULL	IMAGE BINARY DATA				

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Table Name: LCFCODES

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	TEST	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
CODE_TYP		VARCHAR2	15		NOT NULL	CODE TYPE	uniram_dd_lookup			
CODE		VARCHAR2	15		NOT NULL	CODE VALUE	alpha_num_check			
CODE_SRC		VARCHAR2	1		NULL	CODE SOURCE	sys_lookup	SYSCODES	CODE	
MEANING		VARCHAR2	60		NULL	CODE MEANING				
TEXT		VARCHAR2	2000		NULL	CODE TEXT				

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Table Name: MNTACTN

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
TASK_NO		NUMBER	3	0	NOT NULL	MAINTENANCE TASK NUMBER				990
SEQ_NO		NUMBER	5	1	NOT NULL	SEQUENCE NUMBER				990.9
ACTN_BEG		DATE	9		NULL	BEGIN DATE AND TIME OF THE MAINTENANCE ACTION	in_the_past			YYDDDDHH24MI
ACTN_END		DATE	9		NULL	END DATE AND TIME OF THE MAINTENANCE ACTION	in_the_past			YYDDDDHH24MI
ACTN_MH		NUMBER	5	1	NULL	ACTION MANHOOURS				990.9
ACTN_MOS		VARCHAR2	5		NULL	MOS FOR THIS ACTION	lcf_lookup	LCFCODES	CODE	
ACTN_RED		VARCHAR2	1		NULL	REDINESS DUE TO THIS ACTION	lcf_lookup	LCFCODES	CODE	
ACTN_STAT		VARCHAR2	1		NULL	STATUS DUE TO THIS ACTION	lcf_lookup	LCFCODES	CODE	
DELAY_TYP_MNT		VARCHAR2	1		NULL	REASON FOR MAINTENANCE DELAY	lcf_lookup	LCFCODES	CODE	
DIR_IND		VARCHAR2	1		NULL	DIRECT OR INDIRECT MAINTENANCE	check const			
EVAL_GEAR		VARCHAR2	1		NULL	EVALUATION OF GEAR	lcf_lookup	LCFCODES	CODE	
EVAL_LEVEL		VARCHAR2	1		NULL	EVALUATION OF MAINTENANCE LEVEL	lcf_lookup	LCFCODES	CODE	
EVAL_MANL		VARCHAR2	1		NULL	EVALUATION OF MANUALS	lcf_lookup	LCFCODES	CODE	
EVAL_MOS		VARCHAR2	1		NULL	EVALUATION OF MOS	lcf_lookup	LCFCODES	CODE	
EVAL_TRNG		VARCHAR2	1		NULL	EVALUATION OF TRAINING	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
GEAR_USED		VARCHAR2	1		NULL	PERSONNEL GEAR USED	lcf_lookup	LCFCODES	CODE	
MNT_ACTN_CODE		VARCHAR2	2		NULL	MAINTENANCE ACTION PERFORMED	lcf_lookup	LCFCODES	CODE	
MNT_ACTN_LEVEL		VARCHAR2	1		NULL	MAINTENANCE LEVEL FOR THIS ACTION	lcf_lookup	LCFCODES	CODE	
PID		VARCHAR2	6		NULL	PERSONNEL IDENTIFIER CODE	unit_lookup	PEOPLE	PID	
TEXT		VARCHAR2	2000		NULL	NARRATIVE TEXT				

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Table Name: MNTEQUIP

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
TASK_NO		NUMBER	3	0	NOT NULL	MAINTENANCE TASK NUMBER				990
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
EQP_CAT		VARCHAR2	1		NULL	EQUIPMENT CATEGORY	lcf_lookup	LCFCODES	CODE	
EQP_ID		VARCHAR2	3		NULL	EQUIPMENT ID	equip_lookup	EQUIP	EQP_ID	
EQP_SN		VARCHAR2	10		NULL	SERIAL NUMBER OF THE EQUIPMENT	alpha_num_check			
EVAL_EQP		VARCHAR2	1		NULL	EVALUATION OF EQUIPMENT	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			

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Table Name: MNTEVENT

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	CNTLLOG	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL	CNTLLOG	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	CNTLLOG	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	CNTLLOG	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER	validate_cn			
ALDT		NUMBER	7	1	NULL	ADMINISTRATIVE AND LOGISTICS				99990.9
CN_REF		VARCHAR2	12		NULL	RELATED EVENT CONTROL NUMBER	validate_cn			
DELAY_TYP_MNT		VARCHAR2	1		NULL	REASON FOR INITIAL MAINTENANCE DELAY	lcf_lookup	LCFCODES	CODE	
DIRECTIVE		VARCHAR2	20		NULL	DIRECTIVE NUMBER				
EI_BEG_AGE		NUMBER	6	1	NULL	END ITEM AGE WHEN THE EVENT BEGINS				9990.9
EI_END_AGE		NUMBER	6	1	NULL	END ITEM AGE WHEN THE EVENT ENDS				9990.9
EI_OP		VARCHAR2	1		NULL	END ITEM OPERABILITY	lcf_lookup	LCFCODES	CODE	
EI_SN		VARCHAR2	25		NULL	END ITEM SERIAL NUMBER	model_lookup	ENDITEM	EI_SN	
EI_TYP		VARCHAR2	3		NULL	TYPE OF END ITEM I.E. AIRCRAFT, SUPPORT EQUIPMENT	model_lookup	MODEL	EI_TYP	
EVNT_BEG		DATE	9		NULL	BEGIN DATE AND TIME OF PERFORMANCE OF THE MAINTENANCE EVENT	in_the_past			YYDDDDHH24MI
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
EVNT_END		DATE	9		NULL	END DATE AND TIME OF PERFORMANCE OF THE MAINTENANCE EVENT	in_the_past			YYDDDDHH24MI
FAIL_CODE		VARCHAR2	3		NULL	EVENT FAILURE CODE	lcf_lookup	LCFCODES	CODE	
HOW_REC		VARCHAR2	1		NULL	HOW FAULT WAS RECOGNIZED	lcf_lookup	LCFCODES	CODE	
HRS_ACM		NUMBER	7	1	NULL	EVENT ACTIVE CLOCK MAINTENANCE HOURS DIRECT & INDIRECT				99990.9
LEVEL_MNT		VARCHAR2	1		NULL	ACTUAL LEVEL OF MAINTENANCE PERFORMED FOR THIS EVENT	lcf_lookup	LCFCODES	CODE	
LEVEL_PRSC		VARCHAR2	1		NULL	PRESCRIBED LEVEL OF MAINTENANCE IN MAC	lcf_lookup	LCFCODES	CODE	
LEVEL_REC		VARCHAR2	1		NULL	RECOMMENDED LEVEL OF MAINTENANCE PER MAINT PERSON	lcf_lookup	LCFCODES	CODE	
LOC		VARCHAR2	4		NULL	LOCATION OF EVENT ORIGINATION	lcf_lookup	LCFCODES	CODE	
MAL_EFF_MSN		VARCHAR2	1		NULL	EFFECT OF MALFUNCTION ON THE MISSION	lcf_lookup	LCFCODES	CODE	
MAL_EFF_OPN		VARCHAR2	1		NULL	EFFECT OF MALFUNCTION ON THE OPERATION	lcf_lookup	LCFCODES	CODE	
MAL_EFF_SYS		VARCHAR2	1		NULL	EFFECT OF MALFUNCTION ON THE SYSTEM	lcf_lookup	LCFCODES	CODE	
MDC_PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE MAJOR DYNAMIC COMPONENT	workunit_lookup	PART	PART_NO	

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Table Name: MNTSEVENT

Col Name	FmTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
MDC_PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE MAJOR DYNAMIC COMPONENT	alpha_num_check			
MDC_POS		VARCHAR2	2		NULL	POSITION OF THE MAJOR DYNAMIC COMPONENT	workunit_lookup	POSITION	POS	
MDC_WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE MAJOR DYNAMIC COMPONENT	workunit_lookup	WORKUNIT	WUC	
MFSCORE1		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 1	lcf_lookup	LCFCODES	CODE	
MFSCORE10		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 10	lcf_lookup	LCFCODES	CODE	
MFSCORE11		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 11	lcf_lookup	LCFCODES	CODE	
MFSCORE2		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 2	lcf_lookup	LCFCODES	CODE	
MFSCORE3		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 3	lcf_lookup	LCFCODES	CODE	
MFSCORE4		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 4	lcf_lookup	LCFCODES	CODE	
MFSCORE5		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 5	lcf_lookup	LCFCODES	CODE	
MFSCORE6		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 6	lcf_lookup	LCFCODES	CODE	
MFSCORE7		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 7	lcf_lookup	LCFCODES	CODE	
MFSCORE8		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 8	lcf_lookup	LCFCODES	CODE	
MFSCORE9		VARCHAR2	1		NULL	MAINT FINAL SCORE BLOCK 9	lcf_lookup	LCFCODES	CODE	
MNT_FUNC		VARCHAR2	2		NULL	MAINTENANCE EVENT FUNCTION PERFORMED	lcf_lookup	LCFCODES	CODE	
MNT_INTRVL		VARCHAR2	1		NULL	TYPE OF MAINTENANCE INTERVAL	lcf_lookup	LCFCODES	CODE	
MNT_MH_DRCT		NUMBER	5	1	NULL	I.E. 10 DAYS, 6 MONTHS				990.9
MNT_MH_IDRCT		NUMBER	5	1	NULL	EVENT MAINTENANCE MANHOURS DIRECT				990.9
MPSCORE1		VARCHAR2	1		NULL	EVENT MAINTENANCE MANHOURS INDIRECT				
MPSCORE10		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 1	lcf_lookup	LCFCODES	CODE	
MPSCORE11		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 10	lcf_lookup	LCFCODES	CODE	
MPSCORE2		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 11	lcf_lookup	LCFCODES	CODE	
MPSCORE3		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 2	lcf_lookup	LCFCODES	CODE	
MPSCORE4		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 3	lcf_lookup	LCFCODES	CODE	
MPSCORE5		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 4	lcf_lookup	LCFCODES	CODE	
MPSCORE6		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 5	lcf_lookup	LCFCODES	CODE	
MPSCORE7		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 6	lcf_lookup	LCFCODES	CODE	
MPSCORE8		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 7	lcf_lookup	LCFCODES	CODE	
MPSCORE9		VARCHAR2	1		NULL	MAINT PRELIM SCORE BLOCK 8	lcf_lookup	LCFCODES	CODE	
PART_NO		VARCHAR2	20		NULL	MAINT PRELIM SCORE BLOCK 9	lcf_lookup	LCFCODES	CODE	
						PART NUMBER OF THE MAINTENANCE SUBJECT COMPONENT	workunit_lookup	PART	PART_NO	
PART_SN		VARCHAR2	20		NULL	MAINTENANCE SUBJECT SERIAL NUMBER OF THE MAINTENANCE SUBJECT COMPONENT	alpha_num_check			

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Table Name: MNTVEVENT

Col Name	FmtTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
POS		VARCHAR2	2		NULL	POSITION OF THE MAINTENANCE SUBJECT COMPONENT	workunit_lookup	POSITION	POS	
SC_NO		NUMBER	1	0	NULL	SCORING CONFERENCE NUMBER THAT ASSIGNED FINAL SCORES				0
SC_RESULT		VARCHAR2	1		NULL	SCORING CONFERENCE RESULT	lcf_lookup	LCFCODES	CODE	
STAT_ARM_MNT		VARCHAR2	1		NULL	ARMAMENT SYSTEM STATUS AT EVENT START	lcf_lookup	LCFCODES	CODE	
STAT_EI_MNT		VARCHAR2	1		NULL	END ITEM STATUS AT EVENT START	lcf_lookup	LCFCODES	CODE	
STAT_ELEC_MNT		VARCHAR2	1		NULL	ELECTRICAL SYSTEM STATUS AT EVENT START	lcf_lookup	LCFCODES	CODE	
STAT_OTHER_MNT		VARCHAR2	1		NULL	OTHER SYSTEMS STATUS AT EVENT START	lcf_lookup	LCFCODES	CODE	
UIC_MNT		VARCHAR2	6		NULL	PREDOMINANT MAINTENANCE UNIT IDENTIFIER CODE	unit_lookup	UNIT	UIC	
UIC_OWN		VARCHAR2	6		NULL	OWNING UIC	model_lookup	EIDETL	UIC_OWN	
WHEN_DISC		VARCHAR2	2		NULL	WHEN THE FAULT WAS DISCOVERED	lcf_lookup	LCFCODES	CODE	
WHEN_OCC		VARCHAR2	2		NULL	WHEN THE FAULT OCCURRED	lcf_lookup	LCFCODES	CODE	
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE MAINTENANCE SUBJECT COMPONENT	workunit_lookup	WORKUNIT	WUC	
HRS_ACM_DIR		NUMBER	7	1	NULL	EVENT ACTIVE CLOCK				99990.9
SPEC_NO		NUMBER	6	0	NULL	MAINTENANCE HOURS DIRECT				999990
SPEC_SC1		VARCHAR2	2	2	NULL	SPECIAL NUMBER				0.99
SPEC_SC2		VARCHAR2	2	2	NULL	SPECIAL SCORE 1				0.99
MNT_MH_DRCT_ECT		NUMBER	6	1	NULL	SPECIAL SCORE 2				9990.9
HRS_ACM_ECT		NUMBER	6	1	NULL	EVENT MAINTENANCE MANHOURS DIRECT EXCLUDING CURE TIME				9990.9
HRS_ACM_DIR_ECT		NUMBER	6	1	NULL	EVENT ACTIVE CLOCK MAINTENANCE HOURS DIRECT & INDIRECT EXCLUDING CURE TIME				9990.9

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Table Name: MNTEXPND

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
TASK_NO		NUMBER	3	0	NOT NULL	MAINTENANCE TASK NUMBER				990
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
CONSUME_TYP		VARCHAR2	1		NULL	EXPENDABLE VS. SERVICE TYPE	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
EXP_CAT		VARCHAR2	1		NULL	EXPENDABLE CATEGORY	lcf_lookup	LCFCODES	CODE	
EXP_ID		VARCHAR2	3		NULL	EXPENDABLE ID	expnd_lookup	EXPND	EXP_ID	
LOT_DATE		DATE	4		NULL	MONTH AND YEAR LOT WAS MANUFACTURED	in_the_past			MMYY
LOT_NO		VARCHAR2	30		NULL	LOT NUMBER				
METHOD		VARCHAR2	1		NULL	METHOD USED TO ACCOMPLISH PURPOSE	lcf_lookup	LCFCODES	CODE	
PURPOSE		VARCHAR2	1		NULL	PURPOSE FOR	lcf_lookup	LCFCODES	CODE	
QTY		NUMBER	4	0	NULL	EXPENDABLE/SERVICE ACTION QUANTITY OF EXPENDABLE				9990
UOM		VARCHAR2	2		NULL	UNIT OF MEASURE FOR THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	

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Table Name: MNTHONTR

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
BITE_A		VARCHAR2	1		NULL	BITE BLOCK A = USAGE	lcf_lookup	LCFCODES	CODE	
BITE_B		VARCHAR2	1		NULL	BITE BLOCK B = MONITORED	lcf_lookup	LCFCODES	CODE	
BITE_C		VARCHAR2	1		NULL	BITE BLOCK C = DETECTABLE	lcf_lookup	LCFCODES	CODE	
BITE_D		VARCHAR2	1		NULL	BITE BLOCK D = DETECTION	lcf_lookup	LCFCODES	CODE	
BITE_E		VARCHAR2	1		NULL	BITE BLOCK E = ISOLATION	lcf_lookup	LCFCODES	CODE	
BITE_F		VARCHAR2	1		NULL	BITE BLOCK F = CONFIRMED	lcf_lookup	LCFCODES	CODE	
BITE_G		VARCHAR2	1		NULL	BITE BLOCK G = FAULT CONFIRMED	lcf_lookup	LCFCODES	CODE	
BITE_H		VARCHAR2	1		NULL	BITE BLOCK H	lcf_lookup	LCFCODES	CODE	
BITE_I		VARCHAR2	1		NULL	BITE BLOCK I	lcf_lookup	LCFCODES	CODE	
BITE_J		VARCHAR2	1		NULL	BITE BLOCK J	lcf_lookup	LCFCODES	CODE	
BITE_K		VARCHAR2	1		NULL	BITE BLOCK K	lcf_lookup	LCFCODES	CODE	
BITE_L		VARCHAR2	1		NULL	BITE BLOCK L = TECH MANUAL	lcf_lookup	LCFCODES	CODE	
BITE_M		VARCHAR2	1		NULL	BITE BLOCK M = CONTRACTOR ASSIST	lcf_lookup	LCFCODES	CODE	
BITE_N		VARCHAR2	1		NULL	BITE BLOCK N = TMDE	lcf_lookup	LCFCODES	CODE	
BITE_WUC		VARCHAR2	15		NULL	BITE WORK UNIT CODE	workunit_lookup	WORKUNIT	WUC	
FDIS_A		VARCHAR2	1		NULL	FDIS BLOCK A = USAGE	lcf_lookup	LCFCODES	CODE	
FDIS_B		VARCHAR2	1		NULL	FDIS BLOCK B = MONITORED	lcf_lookup	LCFCODES	CODE	
FDIS_C		VARCHAR2	1		NULL	FDIS BLOCK C = DETECTABLE	lcf_lookup	LCFCODES	CODE	
FDIS_D		VARCHAR2	1		NULL	FDIS BLOCK D = DETECTION	lcf_lookup	LCFCODES	CODE	
FDIS_E		VARCHAR2	1		NULL	FDIS BLOCK E = ISOLATION	lcf_lookup	LCFCODES	CODE	
FDIS_F		VARCHAR2	1		NULL	FDIS BLOCK F = CONFIRMED	lcf_lookup	LCFCODES	CODE	
FDIS_G		VARCHAR2	1		NULL	FDIS BLOCK G = FAULT CONFIRMED	lcf_lookup	LCFCODES	CODE	
FDIS_H		VARCHAR2	1		NULL	FDIS BLOCK H	lcf_lookup	LCFCODES	CODE	
FDIS_I		VARCHAR2	1		NULL	FDIS BLOCK I	lcf_lookup	LCFCODES	CODE	
FDIS_J		VARCHAR2	1		NULL	FDIS BLOCK J	lcf_lookup	LCFCODES	CODE	
FDIS_K		VARCHAR2	1		NULL	FDIS BLOCK K	lcf_lookup	LCFCODES	CODE	
FDIS_L		VARCHAR2	1		NULL	FDIS BLOCK L = TECH MANUAL	lcf_lookup	LCFCODES	CODE	
FDIS_M		VARCHAR2	1		NULL	FDIS BLOCK M = CONTRACTOR ASSIST	lcf_lookup	LCFCODES	CODE	
FDIS_N		VARCHAR2	1		NULL	FDIS BLOCK N = TMDE	lcf_lookup	LCFCODES	CODE	
FDIS_WUC		VARCHAR2	15		NULL	FDIS WORK UNIT CODE	workunit_lookup	WORKUNIT	WUC	

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Table Name: MNTMONTR

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEXT		VARCHAR2	2000		NULL	NARRATIVE TEXT				

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Table Name: MNTPART

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
TASK_NO		NUMBER	3	0	NOT NULL	MAINTENANCE TASK NUMBER				990
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
AGE_INS		NUMBER	6	0	NULL	AGE SINCE INSTALLED				999990
AGE_NEW		NUMBER	6	0	NULL	AGE SINCE NEW				999990
AGE_OVH		NUMBER	6	0	NULL	AGE SINCE OVERHAUL				999990
DISP		VARCHAR2	1		NULL	ACTUAL DISPOSITION OF THE PART	lcf_lookup		LCFCODES CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
FAIL_CODE		VARCHAR2	3		NULL	PART FAILURE CODE	lcf_lookup		LCFCODES CODE	
N2410_OVH		NUMBER	2	0	NULL	NUMBER OF 2410 OVERHAULS				90
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE PART	workunit_lookup	PART	PART_NO	
PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE PART	alpha_num_check			
PART_SOURCE		VARCHAR2	1		NULL	PART SOURCE FOR INSTALLED PART	lcf_lookup		LCFCODES CODE	
PATCH		VARCHAR2	2		NULL	SOFTWARE PATCH	workunit_lookup	PATCH	PATCH	
POS		VARCHAR2	2		NULL	POSITION OF THE PART	workunit_lookup	POSITION	POS	
QTY		NUMBER	4	0	NULL	QUANTITY OF PARTS				9990
SFTW_VER_NO		VARCHAR2	20		NULL	SOFTWARE VERSION NUMBER	workunit_lookup	SOFTWARE	SFTW_VER_NO	
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE PART	workunit_lookup	WORKUNIT	WUC	
PART_EI_HRS		NUMBER	6	1	NULL					99999.9

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Table Name: MNTREAD

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	RELATED EVENT CONTROL NUMBER				
TASK_NO		NUMBER	3	0	NOT NULL	MAINTENANCE TASK NUMBER				990
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
COMP_HRS		NUMBER	8	1	NULL	COMPONENT HOURS AT TIME OF METER READING				999990.9
DATA_SOURCE		VARCHAR2	2		NULL	DATA SOURCE FOR THE METER READING	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE PART/METER	workunit_lookup	PART	PART_NO	
PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE PART/METER	alpha_num_check			
POS		VARCHAR2	2		NULL	POSITION OF THE PART/METER	workunit_lookup	POSITION	POS	
READOUT		NUMBER	9	1	NULL	READOUT/INDICATION				9999990.9
READ_UOM		VARCHAR2	2		NULL	READING UNIT OF MEASURE	lcf_lookup	LCFCODES	CODE	
TYPE_INDIC_MNT		VARCHAR2	1		NULL	TYPE OF INDICATION	lcf_lookup	LCFCODES	CODE	
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE PART/METER	workunit_lookup	WORKUNIT	WUC	

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Table Name: MNTRUN

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
TASK_NO		NUMBER	3	0	NOT NULL	MAINTENANCE TASK NUMBER				990
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
APU_PURP1		VARCHAR2	1		NULL	APU USED FOR AIR POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP2		VARCHAR2	1		NULL	APU USED FOR ELECTRICAL POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP3		VARCHAR2	1		NULL	APU USED FOR HYDRAULIC POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP4		VARCHAR2	1		NULL	APU USED FOR ENVIRONMENTAL POWER	lcf_lookup	LCFCODES	CODE	
ENG_NUM		NUMBER	1	0	NULL	ENGINE NUMBER				0
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
RUN_BEG		DATE	9		NULL	BEGIN DATE AND TIME FOR MAINTENANCE RUN	in_the_past			YYDDDDHH24MI
RUN_END		DATE	9		NULL	END DATE AND TIME FOR MAINTENANCE RUN	in_the_past			YYDDDDHH24MI
RUN_TYP		VARCHAR2	2		NULL	TYPE OF MAINTENANCE RUN				
RUN_USG		NUMBER	4	1	NULL	TOTAL RUN USAGE	lcf_lookup	LCFCODES	CODE	90.9

Table Name: MNTRUNSM

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
APU_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES THE APU WAS STARTED IN THE AIR				90
APU_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES THE APU WAS STARTED ON THE GROUND				90
APU_PURP1		VARCHAR2	1		NULL	APU USED FOR AIR POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP2		VARCHAR2	1		NULL	APU USED FOR ELECTRICAL POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP3		VARCHAR2	1		NULL	APU USED FOR HYDRAULIC POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP4		VARCHAR2	1		NULL	APU USED FOR ENVIRONMENTAL POWER	lcf_lookup	LCFCODES	CODE	
APU_USG		NUMBER	4	1	NULL	TOTAL APU USAGE				90.9
ENG1_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 1 WAS STARTED IN THE AIR				90
ENG1_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 1 WAS STARTED ON THE GROUND				90
ENG1_USG		NUMBER	4	1	NULL	TOTAL ENGINE 1 USAGE				90.9
ENG2_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 2 WAS STARTED IN THE AIR				90
ENG2_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 2 WAS STARTED ON THE GROUND				90
ENG2_USG		NUMBER	4	1	NULL	TOTAL ENGINE 2 USAGE				90.9
ENG3_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 3 WAS STARTED IN THE AIR				90
ENG3_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 3 WAS STARTED ON THE GROUND				90
ENG3_USG		NUMBER	4	1	NULL	TOTAL ENGINE 3 USAGE				90.9
ENG4_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 4 WAS STARTED IN THE AIR				90
ENG4_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 4 WAS STARTED ON THE GROUND				90
ENG4_USG		NUMBER	4	1	NULL	TOTAL ENGINE 4 USAGE				90.9
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			

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Table Name: MNTTASK

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
TASK_NO		NUMBER	3	0	NOT NULL	MAINTENANCE TASK NUMBER				990
HRS_ACM		NUMBER	7	1	NULL	TASK ACTIVE CLOCK MAINTENANCE HOURS DIRECT & INDIRECT				99990.9
MNT_MH_DRCT		NUMBER	5	1	NULL	TASK MAINTENANCE MANHOURS DIRECT				990.9
MNT_MH_IDRCT		NUMBER	5	1	NULL	TASK MAINTENANCE MANHOURS INDIRECT				990.9
MNT_TASK_FUNC		VARCHAR2	2		NULL	MAINTENANCE TASK FUNCTION	lcf_lookup		LCFCODES CODE	
OFF_EI		VARCHAR2	1		NULL	WAS REPAIR DONE ON OR OFF THE END ITEM?	check const			
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE PART	workunit_lookup	PART	PART_NO	
PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE PART	alpha_num_check			
POS		VARCHAR2	2		NULL	POSITION OF THE PART	workunit_lookup	POSITION	POS	
TASK_BEG		DATE	9		NULL	BEGIN DATE AND TIME OF THE MAINTENANCE TASK	in_the_past			YYDDDDHH24MI
TASK_END		DATE	9		NULL	END DATE AND TIME OF THE MAINTENANCE TASK	in_the_past			YYDDDDHH24MI
UIC_MNT		VARCHAR2	6		NULL	PREDOMINANT MAINTENANCE UNIT IDENTIFIER CODE	unit_lookup	UNIT	UIC	
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE PART	workunit_lookup	WORKUNIT	WUC	
HRS_ACM_DIR		NUMBER	7	1	NULL	TASK ACTIVE CLOCK MAINTENANCE HOURS DIRECT				99990.9
MNT_MH_DRCT_ECT		NUMBER	5	1	NULL	TASK MAINTENANCE MANHOURS DIRECT EXCLUDING CURE TIME				990.9
HRS_ACM_ECT		NUMBER	6	1	NULL	TASK ACTIVE CLOCK MAINTENANCE HOURS DIRECT & INDIRECT EXCLUDING CURE TIME				9990.9
HRS_ACM_DIR_ECT		NUMBER	6	1	NULL	TASK ACTIVE CLOCK MAINTENANCE HOURS DIRECT EXCLUDING CURE TIME				9990.9

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Table Name: MNTTEXT

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	MNTEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	MNTEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	MNTEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_MNT	MNTEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
TEXT_TYP		VARCHAR2	1		NOT NULL	TYPE OF TEXT	lcf_lookup	LCFCODES	CODE	
TEXT		VARCHAR2	4000		NULL	NARRATIVE TEXT				

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Table Name: MODEL

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	TEST	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL		VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800	lcf_lookup	LCFCODES	CODE	
BASIC_WT		NUMBER	6	0	NULL	WEIGHT OF END ITEM W/ NORMAL CREW				999990
DIFF_EI_ID		VARCHAR2	1		NULL	ALLOW DIFFERENCE EI_ID FOR CN_REF	check const			
EI_TYP		VARCHAR2	3		NULL	TYPE OF END ITEM I.E. AIRCRAFT, SUPPORT EQUIPMENT	lcf_lookup	LCFCODES	CODE	
FSCM		VARCHAR2	5		NULL	FEDERAL SUPPLY CODE FOR MANUFACTURERS	lcf_lookup	LCFCODES	CODE	
NOMEN		VARCHAR2	30		NULL	NOMENCLATURE OF THE END ITEM				
N_ENG		NUMBER	1	0	NULL	NUMBER OF ENGINES ON THE ENDITEM				0
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE END ITEM	workunit_lookup	PART	PART_NO	
SEAT_ARRANGE		VARCHAR2	1		NULL	SEAT ARRANGEMENT	lcf_lookup	LCFCODES	CODE	
UOM		VARCHAR2	2		NULL	UNIT OF MEASURE FOR END ITEM USAGE	lcf_lookup	LCFCODES	CODE	

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Table Name: OPACTVTY

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	5	1	NOT NULL	SEQUENCE NUMBER				990.9
ACTV_BEG		DATE	9		NULL	BEGIN DATE AND TIME OF THE OPERATIONS ACTIVITY	in_the_past			YYDDDDHH24MI
ACTV_CODE		VARCHAR2	1		NULL	ACTIVITY CODE	lcf_lookup	LCFCODES	CODE	
ACTV_END		DATE	9		NULL	END DATE AND TIME OF THE OPERATIONS ACTIVITY	in_the_past			YYDDDDHH24MI
ACTV_MH		NUMBER	5	1	NULL	ACTIVITY MANHOURS				990.9
DELAY_TYP_OPN		VARCHAR2	1		NULL	REASON FOR OPERATIONS DELAY	lcf_lookup	LCFCODES	CODE	
DUTY_POS		VARCHAR2	2		NULL	DUTY POSITION FOR THIS ACTIVITY	lcf_lookup	LCFCODES	CODE	
EVAL_GEAR		VARCHAR2	1		NULL	EVALUATION OF GEAR	lcf_lookup	LCFCODES	CODE	
EVAL_MANL		VARCHAR2	1		NULL	EVALUATION OF MANUALS	lcf_lookup	LCFCODES	CODE	
EVAL_MOS		VARCHAR2	1		NULL	EVALUATION OF MOS	lcf_lookup	LCFCODES	CODE	
EVAL_TRNG		VARCHAR2	1		NULL	EVALUATION OF TRAINING	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
GEAR_USED		VARCHAR2	1		NULL	PERSONNEL GEAR USED	lcf_lookup	LCFCODES	CODE	
PID		VARCHAR2	6		NULL	PERSONNEL IDENTIFIER CODE	unit_lookup	PEOPLE	PID	
SEAT_POS		VARCHAR2	1		NULL	SEAT POSITION	lcf_lookup	LCFCODES	CODE	
TEXT		VARCHAR2	2000		NULL	NARRATIVE TEXT				
TRN_NO		NUMBER	2	0	NULL	TURNAROUND NUMBER				90

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Table Name: OPAMMO

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, TS00				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
AMMO_TYP		VARCHAR2	3		NULL	TYPE OF AMMUNITION	lcf_lookup	LCFCODES	CODE	
DOWNLOAD		NUMBER	4	0	NULL	AMOUNT OF AMMO DOWNLOADED				9990
FIRE		NUMBER	4	0	NULL	AMOUNT OF AMMO FIRED				9990
LOT_DATE		DATE	4		NULL	MONTH AND YEAR LOT WAS MANUFACTURED	in_the_past			MMYY
LOT_NO		VARCHAR2	15		NULL	LOT NUMBER OF THE AMMO				
MSL_RESULT		VARCHAR2	1		NULL	RESULT OF FIRING THE MISSLE	lcf_lookup	LCFCODES	CODE	
MSL_SN		VARCHAR2	15		NULL	SERIAL NUMBER OF THE MISSLE	alpha_num_check			
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE WEAPON	workunit_lookup	PART	PART_NO	
PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE WEAPON	alpha_num_check			
POS	POSITION	VARCHAR2	2		NULL	POSITION OF THE WEAPON	workunit_lookup	POSITION	POS	
UPLOAD		NUMBER	4	0	NULL	AMOUNT OF AMMO UPLOADED				9990
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE WEAPON	workunit_lookup	WORKUNIT	WUC	

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Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
ASE_CFG_A		VARCHAR2	1		NULL	ASE CONFIG BLOCK A	lcf_lookup	LCFCODES	CODE	
ASE_CFG_B		VARCHAR2	1		NULL	ASE CONFIG BLOCK B	lcf_lookup	LCFCODES	CODE	
ASE_CFG_C		VARCHAR2	1		NULL	ASE CONFIG BLOCK C	lcf_lookup	LCFCODES	CODE	
ASE_CFG_D		VARCHAR2	1		NULL	ASE CONFIG BLOCK D	lcf_lookup	LCFCODES	CODE	
ASE_CFG_E		VARCHAR2	1		NULL	ASE CONFIG BLOCK E	lcf_lookup	LCFCODES	CODE	
ASE_CFG_F		VARCHAR2	1		NULL	ASE CONFIG BLOCK F	lcf_lookup	LCFCODES	CODE	
ASE_CFG_G		VARCHAR2	1		NULL	ASE CONFIG BLOCK G	lcf_lookup	LCFCODES	CODE	
ASE_CFG_H		VARCHAR2	1		NULL	ASE CONFIG BLOCK H	lcf_lookup	LCFCODES	CODE	
ASE_CFG_I		VARCHAR2	1		NULL	ASE CONFIG BLOCK I	lcf_lookup	LCFCODES	CODE	
ASE_CFG_J		VARCHAR2	1		NULL	ASE CONFIG BLOCK J	lcf_lookup	LCFCODES	CODE	
ASE_CFG_K		VARCHAR2	1		NULL	ASE CONFIG BLOCK K	lcf_lookup	LCFCODES	CODE	
ASE_CFG_L		VARCHAR2	1		NULL	ASE CONFIG BLOCK L	lcf_lookup	LCFCODES	CODE	
ASE_CFG_M		VARCHAR2	1		NULL	ASE CONFIG BLOCK M	lcf_lookup	LCFCODES	CODE	
ASE_CFG_N		VARCHAR2	1		NULL	ASE CONFIG BLOCK N	lcf_lookup	LCFCODES	CODE	
ASE_CFG_O		VARCHAR2	1		NULL	ASE CONFIG BLOCK O	lcf_lookup	LCFCODES	CODE	
AVN_CFG_A		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK A	lcf_lookup	LCFCODES	CODE	
AVN_CFG_B		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK B	lcf_lookup	LCFCODES	CODE	
AVN_CFG_C		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK C	lcf_lookup	LCFCODES	CODE	
AVN_CFG_D		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK D	lcf_lookup	LCFCODES	CODE	
AVN_CFG_E		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK E	lcf_lookup	LCFCODES	CODE	
AVN_CFG_F		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK F	lcf_lookup	LCFCODES	CODE	
AVN_CFG_G		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK G	lcf_lookup	LCFCODES	CODE	
AVN_CFG_H		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK H	lcf_lookup	LCFCODES	CODE	
AVN_CFG_I		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK I	lcf_lookup	LCFCODES	CODE	
AVN_CFG_J		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK J	lcf_lookup	LCFCODES	CODE	
AVN_CFG_K		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK K	lcf_lookup	LCFCODES	CODE	
AVN_CFG_L		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK L	lcf_lookup	LCFCODES	CODE	
AVN_CFG_M		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK M	lcf_lookup	LCFCODES	CODE	
AVN_CFG_N		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK N	lcf_lookup	LCFCODES	CODE	
AVN_CFG_O		VARCHAR2	1		NULL	AVIONICS CONFIG BLOCK O	lcf_lookup	LCFCODES	CODE	

Table Name: OPCONFIG

Col Name	FmtTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
EIT_CFG_A		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK A	lcf_lookup	LCFCODES	CODE	
EIT_CFG_B		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK B	lcf_lookup	LCFCODES	CODE	
EIT_CFG_C		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK C	lcf_lookup	LCFCODES	CODE	
EIT_CFG_D		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK D	lcf_lookup	LCFCODES	CODE	
EIT_CFG_E		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK E	lcf_lookup	LCFCODES	CODE	
EIT_CFG_F		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK F	lcf_lookup	LCFCODES	CODE	
EIT_CFG_G		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK G	lcf_lookup	LCFCODES	CODE	
EIT_CFG_H		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK H	lcf_lookup	LCFCODES	CODE	
EIT_CFG_I		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK I	lcf_lookup	LCFCODES	CODE	
EIT_CFG_J		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK J	lcf_lookup	LCFCODES	CODE	
EIT_CFG_K		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK K	lcf_lookup	LCFCODES	CODE	
EIT_CFG_L		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK L	lcf_lookup	LCFCODES	CODE	
EIT_CFG_M		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK M	lcf_lookup	LCFCODES	CODE	
EIT_CFG_N		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK N	lcf_lookup	LCFCODES	CODE	
EIT_CFG_O		VARCHAR2	1		NULL	END ITEM CONFIG BLOCK O	lcf_lookup	LCFCODES	CODE	
MEP_CFG_A		VARCHAR2	1		NULL	MEP CONFIG BLOCK A	lcf_lookup	LCFCODES	CODE	
MEP_CFG_B		VARCHAR2	1		NULL	MEP CONFIG BLOCK B	lcf_lookup	LCFCODES	CODE	
MEP_CFG_C		VARCHAR2	1		NULL	MEP CONFIG BLOCK C	lcf_lookup	LCFCODES	CODE	
MEP_CFG_D		VARCHAR2	1		NULL	MEP CONFIG BLOCK D	lcf_lookup	LCFCODES	CODE	
MEP_CFG_E		VARCHAR2	1		NULL	MEP CONFIG BLOCK E	lcf_lookup	LCFCODES	CODE	
MEP_CFG_F		VARCHAR2	1		NULL	MEP CONFIG BLOCK F	lcf_lookup	LCFCODES	CODE	
MEP_CFG_G		VARCHAR2	1		NULL	MEP CONFIG BLOCK G	lcf_lookup	LCFCODES	CODE	
MEP_CFG_H		VARCHAR2	1		NULL	MEP CONFIG BLOCK H	lcf_lookup	LCFCODES	CODE	
MEP_CFG_I		VARCHAR2	1		NULL	MEP CONFIG BLOCK I	lcf_lookup	LCFCODES	CODE	
MEP_CFG_J		VARCHAR2	1		NULL	MEP CONFIG BLOCK J	lcf_lookup	LCFCODES	CODE	
MEP_CFG_K		VARCHAR2	1		NULL	MEP CONFIG BLOCK K	lcf_lookup	LCFCODES	CODE	
MEP_CFG_L		VARCHAR2	1		NULL	MEP CONFIG BLOCK L	lcf_lookup	LCFCODES	CODE	
MEP_CFG_M		VARCHAR2	1		NULL	MEP CONFIG BLOCK M	lcf_lookup	LCFCODES	CODE	
MEP_CFG_N		VARCHAR2	1		NULL	MEP CONFIG BLOCK N	lcf_lookup	LCFCODES	CODE	
MEP_CFG_O		VARCHAR2	1		NULL	MEP CONFIG BLOCK O	lcf_lookup	LCFCODES	CODE	
NAV_CFG_A		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK A	lcf_lookup	LCFCODES	CODE	
NAV_CFG_B		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK B	lcf_lookup	LCFCODES	CODE	
NAV_CFG_C		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK C	lcf_lookup	LCFCODES	CODE	
NAV_CFG_D		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK D	lcf_lookup	LCFCODES	CODE	
NAV_CFG_E		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK E	lcf_lookup	LCFCODES	CODE	
NAV_CFG_F		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK F	lcf_lookup	LCFCODES	CODE	
NAV_CFG_G		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK G	lcf_lookup	LCFCODES	CODE	

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Col Name	FmtTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
NAV_CFG_H		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK H	lcf_lookup	LCFCODES	CODE	
NAV_CFG_I		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK I	lcf_lookup	LCFCODES	CODE	
NAV_CFG_J		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK J	lcf_lookup	LCFCODES	CODE	
NAV_CFG_K		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK K	lcf_lookup	LCFCODES	CODE	
NAV_CFG_L		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK L	lcf_lookup	LCFCODES	CODE	
NAV_CFG_M		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK M	lcf_lookup	LCFCODES	CODE	
NAV_CFG_N		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK N	lcf_lookup	LCFCODES	CODE	
NAV_CFG_O		VARCHAR2	1		NULL	NAVIGATIONAL CONFIG BLOCK O	lcf_lookup	LCFCODES	CODE	
VSN_CFG_A		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK A	lcf_lookup	LCFCODES	CODE	
VSN_CFG_B		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK B	lcf_lookup	LCFCODES	CODE	
VSN_CFG_C		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK C	lcf_lookup	LCFCODES	CODE	
VSN_CFG_D		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK D	lcf_lookup	LCFCODES	CODE	
VSN_CFG_E		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK E	lcf_lookup	LCFCODES	CODE	
VSN_CFG_F		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK F	lcf_lookup	LCFCODES	CODE	
VSN_CFG_G		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK G	lcf_lookup	LCFCODES	CODE	
VSN_CFG_H		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK H	lcf_lookup	LCFCODES	CODE	
VSN_CFG_I		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK I	lcf_lookup	LCFCODES	CODE	
VSN_CFG_J		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK J	lcf_lookup	LCFCODES	CODE	
VSN_CFG_K		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK K	lcf_lookup	LCFCODES	CODE	
VSN_CFG_L		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK L	lcf_lookup	LCFCODES	CODE	
VSN_CFG_M		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK M	lcf_lookup	LCFCODES	CODE	
VSN_CFG_N		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK N	lcf_lookup	LCFCODES	CODE	
VSN_CFG_O		VARCHAR2	1		NULL	VISIONICS CONFIG BLOCK O	lcf_lookup	LCFCODES	CODE	
WPN_CFG_A		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK A	lcf_lookup	LCFCODES	CODE	
WPN_CFG_B		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK B	lcf_lookup	LCFCODES	CODE	
WPN_CFG_C		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK C	lcf_lookup	LCFCODES	CODE	
WPN_CFG_D		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK D	lcf_lookup	LCFCODES	CODE	
WPN_CFG_E		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK E	lcf_lookup	LCFCODES	CODE	
WPN_CFG_F		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK F	lcf_lookup	LCFCODES	CODE	
WPN_CFG_G		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK G	lcf_lookup	LCFCODES	CODE	
WPN_CFG_H		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK H	lcf_lookup	LCFCODES	CODE	
WPN_CFG_I		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK I	lcf_lookup	LCFCODES	CODE	
WPN_CFG_J		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK J	lcf_lookup	LCFCODES	CODE	
WPN_CFG_K		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK K	lcf_lookup	LCFCODES	CODE	
WPN_CFG_L		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK L	lcf_lookup	LCFCODES	CODE	
WPN_CFG_M		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK M	lcf_lookup	LCFCODES	CODE	
WPN_CFG_N		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK N	lcf_lookup	LCFCODES	CODE	

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Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
WPN_CFG_O		VARCHAR2	1		NULL	WEAPONS CONFIG BLOCK 0	lcf_lookup	LCFCODES	CODE	

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Table Name: OPEQUIP

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, TS00				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
EQP_CAT		VARCHAR2	1		NULL	EQUIPMENT CATEGORY	lcf_lookup	LCFCODES	CODE	
EQP_ID		VARCHAR2	3		NULL	EQUIPMENT ID	equip_lookup	EQUIP	EQP_ID	
EQP_SN		VARCHAR2	10		NULL	SERIAL NUMBER OF THE EQUIPMENT	alpha_num_check			
EVAL_EQP		VARCHAR2	1		NULL	EVALUATION OF EQUIPMENT	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			

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Table Name: OPEVENT

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	CNTLLOG	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL	CNTLLOG	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	CNTLLOG	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	CNTLLOG	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER	validate_cn			
CN_REF		VARCHAR2	12		NULL	RELATED EVENT CONTROL NUMBER	validate_cn			
EI_BEG_AGE		NUMBER	6	1	NULL	END ITEM AGE WHEN THE EVENT BEGINS				9990.9
EI_END_AGE		NUMBER	6	1	NULL	END ITEM AGE WHEN THE EVENT ENDS				9990.9
EI_SN		VARCHAR2	25		NULL	END ITEM SERIAL NUMBER	model_lookup	ENDITEM	EI_SN	
EI_TYP		VARCHAR2	3		NULL	TYPE OF END ITEM I.E. AIRCRAFT, SUPPORT EQUIPMENT	model_lookup	MODEL	EI_TYP	
ENG1_HIT_CHK		VARCHAR2	14		NULL	ENGINE 1 HIT CHECK RESULTS				
ENG2_HIT_CHK		VARCHAR2	14		NULL	ENGINE 2 HIT CHECK RESULTS				
ENG3_HIT_CHK		VARCHAR2	14		NULL	ENGINE 3 HIT CHECK RESULTS				
ENG4_HIT_CHK		VARCHAR2	14		NULL	ENGINE 4 HIT CHECK RESULTS				
EVNT_BEG		DATE	9		NULL	BEGIN DATE AND TIME OF THE OPERATIONS EVENT	in_the_past			YYDDDDHH24MI
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
EVNT_END		DATE	9		NULL	END DATE AND TIME OF THE OPERATIONS EVENT	in_the_past			YYDDDDHH24MI
LAND_NON_STD		NUMBER	2	0	NULL	NUMBER OF NON-STANDARD LANDINGS				90
LAND_STD		NUMBER	2	0	NULL	NUMBER OF STANDARD LANDINGS				90
LOC		VARCHAR2	4		NULL	LOCATION OF EVENT ORIGINATION	lcf_lookup	LCFCODES	CODE	
OP_EVNT_TYP		VARCHAR2	1		NULL	TYPE OF OPERATIONAL EVENT	lcf_lookup	LCFCODES	CODE	
OSCORE1		VARCHAR2	1		NULL	OP SCORE BLOCK 1	lcf_lookup	LCFCODES	CODE	
OSCORE2		VARCHAR2	1		NULL	OP SCORE BLOCK 2	lcf_lookup	LCFCODES	CODE	
PRESSURE		NUMBER	5	2	NULL	BAROMETRIC PRESSURE AT TAKEOFF				90.99
PROFILE1		VARCHAR2	1		NULL	MISSION	lcf_lookup	LCFCODES	CODE	
PROFILE2		VARCHAR2	2		NULL	CONDITIONS	lcf_lookup	LCFCODES	CODE	
PROFILE3		VARCHAR2	1		NULL	THEATER OF OPERATIONS	lcf_lookup	LCFCODES	CODE	
PROFILE4		VARCHAR2	1		NULL	TERRAIN	lcf_lookup	LCFCODES	CODE	
PROFILE5		VARCHAR2	1		NULL	GROSS WEIGHT	lcf_lookup	LCFCODES	CODE	
RESULT1		VARCHAR2	1		NULL	OPERATION	lcf_lookup	LCFCODES	CODE	
RESULT2		VARCHAR2	1		NULL	MISSION	lcf_lookup	LCFCODES	CODE	
ROTOR_BRKS		NUMBER	2	0	NULL	NUMBER OF ROTOR BRAKE APPLICATIONS				90

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Table Name: OPEVENT

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
STAT_ARM_OPN		VARCHAR2	1		NULL	ARMAMENT SYSTEM STATUS AT EVENT START	lcf_lookup	LCFCODES	CODE	
STAT_EI_OPN		VARCHAR2	1		NULL	END ITEM STATUS AT EVENT START	lcf_lookup	LCFCODES	CODE	
STAT_ELEC_OPN		VARCHAR2	1		NULL	ELECTRICAL SYSTEM STATUS AT EVENT START	lcf_lookup	LCFCODES	CODE	
STAT_OTHER_OPN		VARCHAR2	1		NULL	OTHER SYSTEMS STATUS AT EVENT START	lcf_lookup	LCFCODES	CODE	
TEMPERATURE		NUMBER	3	0	NULL	TEMPERATURE AT TAKEOFF				990
TO_ACTUAL		DATE	9		NULL	ACTUAL DATE AND TIME FOR TAKEOFF	in_the_past			YYDDDDHH24MI
TO_SCHED		DATE	9		NULL	SCHEDULED DATE AND TIME FOR TAKEOFF	in_the_past			YYDDDDHH24MI
TO_WT		NUMBER	7	0	NULL	TOTAL GROSS WEIGHT AT TAKEOFF				9999990
UIC_OWEN		VARCHAR2	6		NULL	OWNING UIC	model_lookup	EIDETL	UIC_OWEN	
USG_ACTUAL		NUMBER	4	1	NULL	ACTUAL EVENT OPERATING USAGE				90.9
USG_SCHED		NUMBER	4	1	NULL	SCHEDULED EVENT OPERATING USAGE				90.9
WEATHER		VARCHAR2	2		NULL	PREDOMINANT WEATHER CONDITIONS	lcf_lookup	LCFCODES	CODE	

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Table Name: OPEXPEND

Col Name	FnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
CONSUME_TYP		VARCHAR2	1		NULL	EXPENDABLE VS. SERVICE TYPE	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
EXP_CAT		VARCHAR2	1		NULL	EXPENDABLE CATEGORY	lcf_lookup	LCFCODES	CODE	
EXP_ID		VARCHAR2	3		NULL	EXPENDABLE ID	expnd_lookup	EXPND	EXP_ID	
LOT_DATE		DATE	4		NULL	MONTH AND YEAR LOT WAS MANUFACTURED	in_the_past			MMYY
LOT_NO		VARCHAR2	30		NULL	LOT NUMBER				
METHOD		VARCHAR2	1		NULL	METHOD USED TO ACCOMPLISH PURPOSE	lcf_lookup	LCFCODES	CODE	
PURPOSE		VARCHAR2	1		NULL	PURPOSE FOR EXPENDABLE/SERVICE ACTION	lcf_lookup	LCFCODES	CODE	
QTY		NUMBER	4	0	NULL	QUANTITY OF EXPENDABLE				9990
UOM		VARCHAR2	2		NULL	UNIT OF MEASURE FOR THE EXPENDABLE	lcf_lookup	LCFCODES	CODE	

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Table Name: OPLOAD

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
EXT_WT		NUMBER	6	0	NULL	EXTERNAL WEIGHT				999990
INT_WT		NUMBER	6	0	NULL	INTERNAL WEIGHT				999990
LOAD_BEG		DATE	9		NULL	LOAD BEGIN DATE AND TIME	in_the_past			YYDDDDHH24MI
LOAD_END		DATE	9		NULL	LOAD END DATE AND TIME	in_the_past			YYDDDDHH24MI
LOAD_GROSS_WT		NUMBER	7	0	NULL	TOTAL LOAD GROSS WEIGHT				9999990
LOAD_TIME		NUMBER	4	1	NULL	LOAD TIME IN HOURS				90.9
LOAD_TYP		VARCHAR2	1		NULL	TYPE OF LOAD CARRIED	lcf_lookup	LCFCODES	CODE	
PAX		NUMBER	3	0	NULL	TOTAL NUMBER OF PASSENGERS				990

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Table Name: OPMEPWEAP

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	MAINTENANCE EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
DISP		VARCHAR2	1		NULL	ACTUAL DISPOSITION OF THE MEP/WEAPON	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE MEP/WEAPON	workunit_lookup	PART	PART_NO	
PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE MEP/WEAPON	alpha_num_check			
PART_SOURCE		VARCHAR2	1		NULL	PART SOURCE FOR INSTALLED MEP/WEAPON	lcf_lookup	LCFCODES	CODE	
POS		VARCHAR2	2		NULL	POSITION OF THE MEP/WEAPON	workunit_lookup	POSITION	POS	
QTY		NUMBER	4	0	NULL	QUANTITY OF MEP/WEAPON				9990
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE MEP/WEAPON	workunit_lookup	WORKUNIT	WUC	
PART_EI_HRS		NUMBER	6	1	NULL					99999.9

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Table Name: OPREAD

Col Name	FnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
COMP_HRS		NUMBER	8	1	NULL	COMPONENT HOURS AT TIME OF METER READING				999990.9
DATA_SOURCE		VARCHAR2	2		NULL	DATA SOURCE FOR THE METER READING	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE PART/METER	workunit_lookup	PART	PART_NO	
PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE PART/METER	alpha_num_check			
POS		VARCHAR2	2		NULL	POSITION OF THE PART/METER	workunit_lookup	POSITION	POS	
READOUT		NUMBER	9	1	NULL	READOUT/INDICATION				9999990.9
READ_UOM		VARCHAR2	2		NULL	READING UNIT OF MEASURE	lcf_lookup	LCFCODES	CODE	
TYPE_INDIC_OPN		VARCHAR2	1		NULL	TYPE OF INDICATION	lcf_lookup	LCFCODES	CODE	
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE PART/METER	workunit_lookup	WORKUNIT	WUC	

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Table Name: OPRUN

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
APU_PURP1		VARCHAR2	1		NULL	APU USED FOR AIR POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP2		VARCHAR2	1		NULL	APU USED FOR ELECTRICAL POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP3		VARCHAR2	1		NULL	APU USED FOR HYDRAULIC POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP4		VARCHAR2	1		NULL	APU USED FOR ENVIRONMENTAL POWER	lcf_lookup	LCFCODES	CODE	
ENG_NUM		NUMBER	1	0	NULL	ENGINE NUMBER				0
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
RUN_BEG		DATE	9		NULL	BEGIN DATE AND TIME FOR OPERATIONAL RUN	in_the_past			YYDDDDHH24MI
RUN_END		DATE	9		NULL	END DATE AND TIME FOR OPERATIONAL RUN	in_the_past			YYDDDDHH24MI
RUN_TYP		VARCHAR2	2		NULL	TYPE OF OPERATIONAL RUN				
RUN_USG		NUMBER	4	1	NULL	TOTAL RUN USAGE	lcf_lookup	LCFCODES	CODE	90.9

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Table Name: OPRUNSM

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
APU_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES THE APU WAS STARTED IN THE AIR				90
APU_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES THE APU WAS STARTED ON THE GROUND				90
APU_PURP1		VARCHAR2	1		NULL	APU USED FOR AIR POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP2		VARCHAR2	1		NULL	APU USED PRO ELECTRICAL POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP3		VARCHAR2	1		NULL	APU USED FOR HYDRAULIC POWER	lcf_lookup	LCFCODES	CODE	
APU_PURP4		VARCHAR2	1		NULL	APU USED FOR ENVIRONMENTAL POWER	lcf_lookup	LCFCODES	CODE	
APU_USG		NUMBER	4	1	NULL	TOTAL APU USAGE				90.9
ENG1_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 1 WAS STARTED IN THE AIR				90
ENG1_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 1 WAS STARTED ON THE GROUND				90
ENG1_USG		NUMBER	4	1	NULL	TOTAL ENGINE 1 USAGE				90.9
ENG2_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 2 WAS STARTED IN THE AIR				90
ENG2_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 2 WAS STARTED ON THE GROUND				90
ENG2_USG		NUMBER	4	1	NULL	TOTAL ENGINE 2 USAGE				90.9
ENG3_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 3 WAS STARTED IN THE AIR				90
ENG3_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 3 WAS STARTED ON THE GROUND				90
ENG3_USG		NUMBER	4	1	NULL	TOTAL ENGINE 3 USAGE				90.9
ENG4_AIR_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 4 WAS STARTED IN THE AIR				90
ENG4_GND_START		NUMBER	2	0	NULL	NUMBER OF TIMES ENGINE 4 WAS STARTED ON THE GROUND				90
ENG4_USG		NUMBER	4	1	NULL	TOTAL ENGINE 4 USAGE				90.9
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			

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Table Name: OPTTEXT

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	OPEVENT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	OPEVENT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	OPEVENT	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_OPN	OPEVENT	VARCHAR2	12		NOT NULL	OPERATIONAL EVENT CONTROL NUMBER				
TEXT_TYP		VARCHAR2	1		NOT NULL	TYPE OF TEXT	lcf_lookup	LCFCODES	CODE	
TEXT		VARCHAR2	4000		NULL	NARRATIVE TEXT				

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Table Name: PART

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	WORKUNIT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	WORKUNIT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
WUC	WORKUNIT	VARCHAR2	15		NOT NULL	WORK UNIT CODE OF THE PART				
PART_NO		VARCHAR2	20		NOT NULL	PART NUMBER OF THE PART				
CURR_COST		NUMBER	11	2	NULL	COST TO ACQUIRE PART WITH CURRENT NSN				999999990.99
CURR_NSN		VARCHAR2	13		NULL	CURRENT NSN OF THE PART	alpha_num_check			
DASH16_ITM		VARCHAR2	1		NULL	INDICATES 2408-16/2410 PART	check const			
EICONFIG_ITM		VARCHAR2	1		NULL	INDICATES PART IS TRACKED IN EICONFIG TABLE	check const			
ESS_CURR_NSN		VARCHAR2	1		NULL	ESSENTIALITY OF CURRENT NSN	lcf_lookup	LCFCODES	CODE	
ESS_PRIME_NSN		VARCHAR2	1		NULL	ESSENTIALITY OF PRIME NSN	lcf_lookup	LCFCODES	CODE	
FIA1		VARCHAR2	1		NULL	MATERIEL CATEGORY OF THE PART	lcf_lookup	LCFCODES	CODE	
FIA2		VARCHAR2	1		NULL	APPROPRIATION AND BUDGET ACTIVITY ACCOUNT OF THE PART	lcf_lookup	LCFCODES	CODE	
FIA3		VARCHAR2	1		NULL	MANAGEMENT INVENTORY SEGMENT OF THE PART	lcf_lookup	LCFCODES	CODE	
FIA45		VARCHAR2	2		NULL	SPECIFIC GROUP/GENERIC GROUP OF THE PART	lcf_lookup	LCFCODES	CODE	
FLT_SFTY_ITM		VARCHAR2	1		NULL	INDICATES FLIGHT SAFETY PART	check const			
FSCM		VARCHAR2	5		NULL	FEDERAL SUPPLY CODE FOR MANUFACTURERS	lcf_lookup	LCFCODES	CODE	
FURNISHED		VARCHAR2	1		NULL	INDICATES WHO FURNISHES THE PART	lcf_lookup	LCFCODES	CODE	
LRM_ITM		VARCHAR2	1		NULL	INDICATES LINE REPLACEABLE MODULE	check const			
LRU_ITM		VARCHAR2	1		NULL	INDICATES LINE REPLACEABLE UNIT	check const			
NOMEN		VARCHAR2	30		NULL	NOMENCLATURE OF THE PART				
NSN		VARCHAR2	13		NULL	NSN OF THE PART	alpha_num_check			999999990.99
PRIME_COST		NUMBER	11	2	NULL	COST TO ACQUIRE PART WITH PRIME NSN				
PRIME_NSN		VARCHAR2	13		NULL	PRIME NSN OF THE PART	alpha_num_check			990
QTY_EI		NUMBER	3	0	NULL	PART QUANTITY PER ENDITEM				
RPSTL_ITM		VARCHAR2	1		NULL	INDICATES PART IS ON REPAIR PARTS AND SPECIAL TOOLS LIST	check const			
SERIAL_ITM		VARCHAR2	1		NULL	INDICATES PART IS A SERIALIZED ITEM	check const			
SMR12		VARCHAR2	2		NULL	SOURCE CODE OF THE PART	lcf_lookup	LCFCODES	CODE	
SMR3		VARCHAR2	1		NULL	LOWEST MAINT LEVEL FOR REMOVE, REPLACE, USE OF THE PART	lcf_lookup	LCFCODES	CODE	
SMR4		VARCHAR2	1		NULL	LOWEST MAINT LEVEL FOR COMPLETE REPAIR OF THE PART	lcf_lookup	LCFCODES	CODE	

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Table Name: PART

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
SMR5		VARCHAR2	1		NULL	RECOVERABILITY CODE OF THE PART	lcf_lookup	LCFCODES	CODE	
SRC_SUPPLY		VARCHAR2	3		NULL	SOURCE OF SUPPLY OF THE PART	lcf_lookup	LCFCODES	CODE	
SRU_ITM		VARCHAR2	1		NULL	INDICATES SUPPORT REPLACEABLE UNIT	check const			
TASNA_ITM		VARCHAR2	1		NULL	INDICATES TASNA (AIMIX) PART	check const			
UOI		VARCHAR2	2		NULL	SMALLEST QTY OF PART THAT CAN BE REQUISITIONED AND ISSUED	lcf_lookup	LCFCODES	CODE	
UOM		VARCHAR2	2		NULL	UNIT OF MEASURE OF THE PART	lcf_lookup	LCFCODES	CODE	
WARR_ITM		VARCHAR2	1		NULL	INDICATES PART UNDER WARRANTY	check const			

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Table Name: PATCH

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	SOFTWARE	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	SOFTWARE	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
WUC	SOFTWARE	VARCHAR2	15		NOT NULL	WORK UNIT CODE FOR THE HW THAT SF IS INSTALLED ON OR OWN				
PART_NO	SOFTWARE	VARCHAR2	20		NOT NULL	PART NUMBER FOR THE HW THAT THE SOFTWARE IS INSTALLED ON OR OWN				
SFTW_VER_NO	SOFTWARE	VARCHAR2	20		NOT NULL	SOFTWARE VERSION NUMBER				
PATCH		VARCHAR2	2		NOT NULL	SOFTWARE PATCH				
WHEN_RELEASE		DATE	5		NULL	DATE OF PATCH RELEASE	in_the_past			YYDDD

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Table Name: PEODETL

Col Name	FnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	PEOPLE	VARCHAR2	6		NOT NULL	TEST PHASE				
UIC	PEOPLE	VARCHAR2	6		NOT NULL	UNIT IDENTIFIER CODE				
PID	PEOPLE	VARCHAR2	6		NOT NULL	PERSONNEL IDENTIFIER CODE				
PID_BEG		DATE	9		NOT NULL	PIC BEGIN DATE AND TIME				YYDDDDHH24MI
GRADE		VARCHAR2	4		NULL	GRADE OF THE INDIVIDUAL IDENTIFIED	lcf_lookup	LCFCODES	CODE	
MOS1		VARCHAR2	5		NULL	PRIMARY MILITARY OCCUPATIONAL SPECIALITY	lcf_lookup	LCFCODES	CODE	
MOS1_TRAINING		VARCHAR2	1		NULL	TRAINING METHOD FOR PRIMARY MOS	lcf_lookup	LCFCODES	CODE	
MOS2		VARCHAR2	5		NULL	SECONDARY MILITARY OCCUPATIONAL SPECIALITY	lcf_lookup	LCFCODES	CODE	
MOS2_TRAINING		VARCHAR2	1		NULL	TRAINING METHOD FOR SECONDARY MOS	lcf_lookup	LCFCODES	CODE	
MOS3		VARCHAR2	5		NULL	DUTY MILITARY OCCUPATIONAL SPECIALITY	lcf_lookup	LCFCODES	CODE	
MOS3_TRAINING		VARCHAR2	1		NULL	TRAINING METHOD FOR DUTY MOS	lcf_lookup	LCFCODES	CODE	
PID_END		DATE	9		NULL	PIC END DATE AND TIME	in_the_past			YYDDDDHH24MI
WHEN_GRADE		DATE	5		NULL	DATE GRADE WAS ACQUIRED	in_the_past			YYDDD
WHEN_MOS1		DATE	5		NULL	DATE PRIMARY MOS WAS ACQUIRED	in_the_past			YYDDD
WHEN_MOS2		DATE	5		NULL	DATE SECONDARY MOS WAS ACQUIRED	in_the_past			YYDDD
WHEN_MOS3		DATE	5		NULL	DATE DUTY MOS WAS ACQUIRED	in_the_past			YYDDD

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Table Name: PEOPLE

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	UNIT	VARCHAR2	6		NOT NULL	TEST PHASE				
UIC	UNIT	VARCHAR2	6		NOT NULL	UNIT IDENTIFIER CODE				
PID		VARCHAR2	6		NOT NULL	PERSONNEL IDENTIFIER CODE				
FIRST_NAME		VARCHAR2	30		NULL	FIRST NAME OF THE INDIVIDUAL IDENTIFIED				
LAST_NAME		VARCHAR2	30		NULL	LAST NAME OF THE INDIVIDUAL IDENTIFIED				
MID_INIT		VARCHAR2	1		NULL	MIDDLE INITIAL OF THE INDIVIDUAL IDENTIFIED				

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Table Name: POSITION

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	WORKUNIT	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	WORKUNIT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, TS00				
WUC	WORKUNIT	VARCHAR2	15		NOT NULL	WORK UNIT CODE OF THE PART				
POS		VARCHAR2	2		NOT NULL	POSITION OF THE PART ON ITS PARENT	lcf_lookup	LCFCODES	CODE	

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Table Name: READETL

Col Name	FinTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	READING	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	READING	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	READING	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_RED	READING	VARCHAR2	12		NOT NULL	READING EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
COMP_HRS		NUMBER	8	1	NULL	COMPONENT HOURS AT TIME OF METER READING				999990.9
DATA_SOURCE		VARCHAR2	2		NULL	DATA SOURCE FOR THE METER READING	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE PART/METER	workunit_lookup	PART	PART_NO	
PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE PART/METER	alpha_num_check			
POS		VARCHAR2	2		NULL	POSITION OF THE PART/METER	workunit_lookup	POSITION	POS	
READOUT		NUMBER	9	1	NULL	READOUT/INDICATION				9999990.9
READ_UOM		VARCHAR2	2		NULL	READING UNIT OF MEASURE	lcf_lookup	LCFCODES	CODE	
TYPE_INDIC		VARCHAR2	1		NULL	TYPE OF INDICATION	lcf_lookup	LCFCODES	CODE	
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE PART/METER	workunit_lookup	WORKUNIT	WUC	

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Table Name: POSITION

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	WORKUNIT	VARCHAR2	6		NOT NULL	TEST PHASE				
EL_MODEL	WORKUNIT	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
WUC	WORKUNIT	VARCHAR2	15		NOT NULL	WORK UNIT CODE OF THE PART				
POS		VARCHAR2	2		NOT NULL	POSITION OF THE PART ON ITS PARENT	lcf_lookup	LCFCODES	CODE	

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Table Name: READETL

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	READING	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	READING	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	READING	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_RED	READING	VARCHAR2	12		NOT NULL	READING EVENT CONTROL NUMBER				
SEQ_NO		NUMBER	4	1	NOT NULL	SEQUENCE NUMBER				90.9
COMP_HRS		NUMBER	8	1	NULL	COMPONENT HOURS AT TIME OF METER READING				999990.9
DATA_SOURCE		VARCHAR2	2		NULL	DATA SOURCE FOR THE METER READING	lcf_lookup	LCFCODES	CODE	
EVNT_CLASS		VARCHAR2	1		NULL	EVENT CLASS FOR COMMON VIEWS	check const			
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE PART/METER	workunit_lookup	PART	PART_NO	
PART_SN		VARCHAR2	20		NULL	SERIAL NUMBER OF THE PART/METER	alpha_num_check			
POS		VARCHAR2	2		NULL	POSITION OF THE PART/METER	workunit_lookup	POSITION	POS	
READOUT		NUMBER	9	1	NULL	READOUT/INDICATION				9999990.9
READ_UOM		VARCHAR2	2		NULL	READING UNIT OF MEASURE	lcf_lookup	LCFCODES	CODE	
TYPE_INDIC		VARCHAR2	1		NULL	TYPE OF INDICATION	lcf_lookup	LCFCODES	CODE	
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE PART/METER	workunit_lookup	WORKUNIT	WUC	

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Table Name: READING

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	CNTLLOG	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL	CNTLLOG	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	CNTLLOG	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_RED	CNTLLOG	VARCHAR2	12		NOT NULL	READING EVENT CONTROL NUMBER	validate_cn			
EI_SN		VARCHAR2	25		NULL	END ITEM SERIAL NUMBER	model_lookup	ENDITEM	EI_SN	
EI_TYP		VARCHAR2	3		NULL	TYPE OF END ITEM I.E. AIRCRAFT, SUPPORT EQUIPMENT	model_lookup	MODEL	EI_TYP	
UIC_OWN		VARCHAR2	6		NULL	OWNING UIC	model_lookup	EIDETL	UIC_OWN	

Table Name: SKIPEDIT

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	TEST	VARCHAR2	6		NOT NULL	TEST PHASE				
MODULE		VARCHAR2	5		NOT NULL	MODULE/TABLE NAME	sys_lookup	SYSCODES	CODE	
EDIT_LEVEL		VARCHAR2	2		NOT NULL	EDIT LEVEL	sys_lookup	SYSCODES	CODE	
EDIT001		VARCHAR2	1		NULL	EDIT 001 OR 1	sys_lookup	SYSCODES	CODE	
EDIT002		VARCHAR2	1		NULL	EDIT 002 OR 2	sys_lookup	SYSCODES	CODE	
EDIT003		VARCHAR2	1		NULL	EDIT 003 OR 3	sys_lookup	SYSCODES	CODE	
EDIT004		VARCHAR2	1		NULL	EDIT 004 OR 4	sys_lookup	SYSCODES	CODE	
EDIT005		VARCHAR2	1		NULL	EDIT 005 OR 5	sys_lookup	SYSCODES	CODE	
EDIT006		VARCHAR2	1		NULL	EDIT 006 OR 6	sys_lookup	SYSCODES	CODE	
EDIT007		VARCHAR2	1		NULL	EDIT 007 OR 7	sys_lookup	SYSCODES	CODE	
EDIT008		VARCHAR2	1		NULL	EDIT 008 OR 8	sys_lookup	SYSCODES	CODE	
EDIT009		VARCHAR2	1		NULL	EDIT 009 OR 9	sys_lookup	SYSCODES	CODE	
EDIT010		VARCHAR2	1		NULL	EDIT 010 OR 10	sys_lookup	SYSCODES	CODE	
EDIT011		VARCHAR2	1		NULL	EDIT 011 OR 11	sys_lookup	SYSCODES	CODE	
EDIT012		VARCHAR2	1		NULL	EDIT 012 OR 12	sys_lookup	SYSCODES	CODE	
EDIT013		VARCHAR2	1		NULL	EDIT 013 OR 13	sys_lookup	SYSCODES	CODE	
EDIT014		VARCHAR2	1		NULL	EDIT 014 OR 14	sys_lookup	SYSCODES	CODE	
EDIT015		VARCHAR2	1		NULL	EDIT 015 OR 15	sys_lookup	SYSCODES	CODE	
EDIT016		VARCHAR2	1		NULL	EDIT 016 OR 16	sys_lookup	SYSCODES	CODE	
EDIT017		VARCHAR2	1		NULL	EDIT 017 OR 17	sys_lookup	SYSCODES	CODE	
EDIT018		VARCHAR2	1		NULL	EDIT 018 OR 18	sys_lookup	SYSCODES	CODE	
EDIT019		VARCHAR2	1		NULL	EDIT 019 OR 19	sys_lookup	SYSCODES	CODE	
EDIT020		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT021		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT022		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT023		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT024		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT025		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT026		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT027		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT028		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT029		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT030		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT031		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT032		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT033		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	
EDIT034		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	

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Table Name: SKIPEdit

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
EDIT035		VARCHAR2	1		NULL	EDIT 020 OR 20	sys_lookup	SYSCODES	CODE	

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Table Name: SOFTWARE

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	PART	VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL	PART	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
WUC	PART	VARCHAR2	15		NOT NULL	WORK UNIT CODE FOR THE HW THAT SF IS INSTALLED ON OR OWN				
PART_NO	PART	VARCHAR2	20		NOT NULL	PART NUMBER FOR THE HW THAT SF IS INSTALLED ON OR OWN				
SFTW_VER_NO		VARCHAR2	20		NOT NULL	SOFTWARE VERSION NUMBER				
FSCM		VARCHAR2	5		NULL	FEDERAL SUPPLY CODE FOR MANUFACTURERS	lcf_lookup	LCFCODES	CODE	
WARR_ITM		VARCHAR2	1		NULL	INDICATES SOFTWARE UNDER WARRANTY	check const			
WHEN_RELEASE		DATE	5		NULL	DATE OF SOFTWARE RELEASE	in_the_past			YYDDD

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Table Name: SUPPLY

Col Name	FnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	ENDITEM	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL	ENDITEM	VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID	ENDITEM	VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN_REF		VARCHAR2	12		NOT NULL	RELATED EVENT CONTROL NUMBER	validate_cn			
DR_NUM		VARCHAR2	14		NOT NULL	SUPPLY SYSTEM DOCUMENT REGISTER NUMBER				
EI_SN		VARCHAR2	25		NULL	END ITEM SERIAL NUMBER	model_lookup	ENDITEM	EI_SN	
EI_TYP		VARCHAR2	3		NULL	TYPE OF END ITEM I.E. AIRCRAFT, SUPPORT EQUIPMENT	model_lookup	MODEL	EI_TYP	
NSN		VARCHAR2	13		NULL	NSN OF THE PART	alpha_num_check			
ORDERED_FROM		VARCHAR2	6		NULL	DODAAC/UIC/FSCM ORDERED FROM				
PART_NO		VARCHAR2	20		NULL	PART NUMBER OF THE PART				
PRIORITY		VARCHAR2	2		NULL	PRIORITY OF THE SUPPLY ACTION	lcf_lookup	LCFCODES	CODE	
QTY		NUMBER	3	0	NULL	QUANTITY OF PARTS				990
RECEIVED_FROM		VARCHAR2	6		NULL	DODAAC/UIC/FSCM RECEIVED FROM				
REQ_TYP		VARCHAR2	3		NULL	REQUEST TYPE	lcf_lookup	LCFCODES	CODE	
TASK_NO_REF		NUMBER	3	0	NULL	RELATED TASK NUMBER				990
TEXT		VARCHAR2	2000		NULL	NARRATIVE TEXT				
UIC_OWEN		VARCHAR2	6		NULL	OWNING UIC	model_lookup	EIDETL	UIC_OWEN	
WHEN_REC		DATE	9		NULL	DATE AND TIME OF THE RECEIPT	in_the_past			YYDDDDHH24MI
WHEN_REQ		DATE	9		NULL	DATE AND TIME OF THE REQUEST	in_the_past			YYDDDDHH24MI
WHY_ORDERED		VARCHAR2	2		NULL	REASON FOR THE ORDER I.E. PLL, ASL, TAIL NUMBER	lcf_lookup	LCFCODES	CODE	
WUC		VARCHAR2	15		NULL	WORK UNIT CODE OF THE PART	workunit_lookup	WORKUNIT	WUC	

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Table Name: SYSCODES

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
CODE_TYP		VARCHAR2	15		NOT NULL	CODE NAME				
CODE		VARCHAR2	15		NOT NULL	CODE VALUE				
MEANING		VARCHAR2	60		NULL	CODE MEANING				

Table Name: TEST

Col Name	FnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE		VARCHAR2	6		NOT NULL	TEST PHASE	alpha_num_check			
AGENCY		VARCHAR2	2000		NULL	TEST AGENCY				
AUDIT_AVL		VARCHAR2	1		NULL	AUDITING TURNED ON FOR AVAILABILITY EVENTS	check const			
AUDIT_MNT		VARCHAR2	1		NULL	AUDITING TURNED ON FOR MAINTENANCE EVENTS	check const			
AUDIT_OPN		VARCHAR2	1		NULL	AUDITING TURNED ON FOR OPERATIONAL EVENTS	check const			
AUDIT_RED		VARCHAR2	1		NULL	AUDITING TURNED ON FOR READING EVENTS	check const			
AUDIT_REF		VARCHAR2	1		NULL	AUDITING TURNED ON FOR REFERENCE TABLES	check const			
MODULE_A		VARCHAR2	1		NULL	AVAILABILITY MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_ED		VARCHAR2	1		NULL	APU/ENGINE DETAIL RUN MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_ES		VARCHAR2	1		NULL	APU/ENGINE SUMMARY RUN MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_MA		VARCHAR2	1		NULL	ACTION MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_ME		VARCHAR2	1		NULL	MAINTENANCE EVENT SUMMARY MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_MM		VARCHAR2	1		NULL	MONITORING MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_MT		VARCHAR2	1		NULL	TASK MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_N		VARCHAR2	1		NULL	NARRATIVE/TEXT MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_OA		VARCHAR2	1		NULL	ACTIVITY MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_OC		VARCHAR2	1		NULL	CONFIGURATION MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_OE		VARCHAR2	1		NULL	OPERATIONAL EVENT SUMMARY MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_OL		VARCHAR2	1		NULL	LOAD MODULE USED USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_OW		VARCHAR2	1		NULL	WEAPON/AMMO MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_P		VARCHAR2	1		NULL	PART UTILIZATION MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_Q		VARCHAR2	1		NULL	EQUIPMENT/TOOL MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_R		VARCHAR2	1		NULL	READING MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_S		VARCHAR2	1		NULL	SUPPLY MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
MODULE_X		VARCHAR2	1		NULL	EXPENDABLE/SERVICE MODULE USED THIS TEST	sys_lookup		SYSCODES	CODE
NOMEN		VARCHAR2	30		NULL	NOMENCLATURE OF THE TEST PHASE				
PROJECT_NUM		VARCHAR2	16		NULL	TEST PROJECT NUMBER				
SPONSOR		VARCHAR2	2000		NULL	TEST SPONSOR				

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Table Name: TEST

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_BEG		DATE	9		NULL	TEST PHASE BEGIN DATE AND TIME				YYDDDDHH24MI
TEST_END		DATE	9		NULL	TEST PHASE END DATE AND TIME	in_the_past			YYDDDDHH24MI
TEXT		VARCHAR2	2000		NULL	NARRATIVE TEXT				

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Table Name: TIMESLICE

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE		VARCHAR2	6		NOT NULL	TEST PHASE				
EI_MODEL		VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800				
EI_ID		VARCHAR2	3		NOT NULL	ABBREVIATED FORM OF END ITEM SERIAL NUMBER				
CN		VARCHAR2	12		NOT NULL	EVENT CONTROL NUMBER				
TASK_NO		NUMBER	3	0	NOT NULL	MAINTENANCE TASK NUMBER				990
SLICE_BEG		DATE			NOT NULL	BEGIN DATE AND TIME FOR THIS SLICE OF TIME				
USERNAME		VARCHAR2	30		NOT NULL	ORACLE USER NAME	alpha_num_check			
DELAY_TYP		VARCHAR2	1		NULL	REASON FOR DELAY				
SLICE_END		DATE			NULL	END DATE AND TIME FOR THIS SLICE OF TIME				
SLICE_HRS		NUMBER	7	1	NULL	HOURS FOR THIS SLICE OF TIME				99990.9

Table Name: TIRACTN

Col Name	FnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRDATA	VARCHAR2	20		NOT NULL	Block 3: Test Project Number		TIRTEST	TEST_PROJ#	
TIRPRFX	TIRDATA	VARCHAR2	5		NOT NULL	FIRST FIVE CHARACTER OF TIR#		TIRTEST	TIRPRFX	
TIR#	TIRDATA	VARCHAR2	10		NOT NULL	Block 4: TIR Number		TIRLOG	TIR#	
TIR_REV	TIRDATA	VARCHAR2	2		NOT NULL	Block 1-2: TIR Revision Number		TIRLOG	TIR_REV	
CA_STATUS		VARCHAR2	10		NULL	Block 100: STATUS OF CORRECTIVE ACTION OF TIR.		TIRCODES	CODE_TYPE	
ASGD_RESP		VARCHAR2	18		NULL	Block 101: ASSIGNED RESPONSIBILITY ORGNAZITION FOR CORRECTIVE ACTION.		TIRCODES	CODE_TYPE	
CA_DATE		DATE	11		NULL	Block 102: DATE OF CORRECTIVE ACTION OF TIR				DD MON YYYY
CA_ANALYSIS		VARCHAR2	2000		NULL	Block 120: DEVELOPER'S ANALYSIS OF PROBLEM				
CA_DESC		VARCHAR2	2000		NULL	Block 121: DESCRIPTION OF CORRECTIVE ACTION OF TIR.				
CA_RESULT		VARCHAR2	2000		NULL	Block 122: TEST RESULT ON CORRECTIVE ACTION.				
CA_IMPL		VARCHAR2	2000		NULL	Block 123: PLANNED PRODUCTION IMPLEMENTATION.				

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Table Name: TIRCODES

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRTEST	VARCHAR2	20		NOT NULL	TIR TEST PROJECT NUMBER		TIRTEST	TEST_PROJ#	
TIRPRFX	TIRTEST	VARCHAR2	5		NOT NULL	TIR NUMBER PREFIX		TIRTEST	TEST_PROJ#	
CODE_VALUE		VARCHAR2	50		NOT NULL	TIR SPECIFIC CODE VALUE FROM DA 73-1				
CODE_TYPE		VARCHAR2	30		NOT NULL	TIR CODE TYPE FROM DA 73-1				
BLOCK_ID		NUMBER	3		NULL	BLOCK NAME TIR Block Number				

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Table Name: TIRDATA

Col Name	FnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRLOG	VARCHAR2	20		NOT NULL	Block 3: TEST PROJECT NUMBER		TIRTEST	TEST_PROJ#	
TIRPRFX	TIRLOG	VARCHAR2	5		NOT NULL	FIRST FIVE CHARACTER OF TIR#		TIRTEST	TIRPRFX	
TIR#	TIRLOG	VARCHAR2	10		NOT NULL	Block 4: TIR NUMBER FOR EACH TEST INCIDENT REPORT		TIRLOG	TIR#	
TIR_REV	TIRLOG	VARCHAR2	2		NOT NULL	Block 1-2: TIR REVISION		TIRLOG	TIR_REV	
CATGRY_1	VARCHAR2	VARCHAR2	14		NULL	Block 46-1: Category 1 or Test Issues		TIRCODES	CODE_TYPE	
CATGRY_2	VARCHAR2	VARCHAR2	14		NULL	Block 46-2: Category 2 or Test Issues		TIRCODES	CODE_TYPE	
CATGRY_3	VARCHAR2	VARCHAR2	14		NULL	Block 46-3: Category 3 or Test Issues		TIRCODES	CODE_TYPE	
CATGRY_4	VARCHAR2	VARCHAR2	14		NULL	Block 46-4: Category 4 or Test Issues		TIRCODES	CODE_TYPE	
CHARGEABILITY	VARCHAR2	VARCHAR2	18		NULL	Block 43: FD/SC chargeability of TIR		TIRCODES	CODE_TYPE	
COMDR_NAME	VARCHAR2	VARCHAR2	34		NULL	Block 99-1: Commander's Name		TIRSIGN	COMDR_NAME	
COMDR_PHONE	VARCHAR2	VARCHAR2	34		NULL	Block 99-3: Commander's Phone		TIRSIGN	COMDR_PHONE	
COMDR_TITLE	VARCHAR2	VARCHAR2	34		NULL	Block 99-2: Commander's Title		TIRSIGN	COMDR_TITLE	
CONTRACT#	VARCHAR2	VARCHAR2	22		NULL	Block 14: Major Item Contract Number		TIREI	CONTRACT#	
CORR_ACTION#	NUMBER	NUMBER	34		NULL	Block 45: Corrective Action Number (reserved for ATIR)				
DG_CLKHRS	VARCHAR2	VARCHAR2	7		NULL	Block 70: Diagnostic Clockhour				
DG_MANHRS	VARCHAR2	VARCHAR2	7		NULL	Block 71: Diagnostic Man Hours				
DISPOSITION	VARCHAR2	VARCHAR2	59		NULL	Block 49: Disp of Failed or defective Material of TIR		TIRCODES	CODE_TYPE	
FD_SC_CLASS	VARCHAR2	VARCHAR2	20		NULL	Block 42: Scoring Class of TIR		TIRCODES	CODE_TYPE	
FD_SC_STEP#	VARCHAR2	VARCHAR2	20		NULL	Block 41: Scoring Step Number of TIR		TIRCODES	CODE_TYPE	
FSN_NSN	VARCHAR2	VARCHAR2	24		NULL	Block 52: Federal/National Stock Number		TIRPN	FSN_NSN	
INC_ACTION	VARCHAR2	VARCHAR2	25		NULL	Block 34: Incident Action		TIRCODES	CODE_TYPE	
INC_CLASS	VARCHAR2	VARCHAR2	12		NULL	Block 32: Incident Class		TIRCODES	CODE_TYPE	
INC_DATE	DATE	DATE	16		NULL	Block 40-1&2: Incident Date and Time				DD MON YYYY
INC_STATUS	VARCHAR2	VARCHAR2	12		NULL	Block 44: Incident Status i.e. PRELIMINARY, SCORED OR ASSESSED		TIRCODES	CODE_TYPE	HH24MI
INC_TMZONE	VARCHAR2	VARCHAR2	3		NULL	Block 40-3: Incident Time Zone		TIRCODES	CODE_TYPE	
ISD_ACTION	VARCHAR2	VARCHAR2	25		NULL	Block 57: Incident Subject Action or Part Action (Required if Sect III Used)		TIRCODES	CODE_TYPE	
ISD_DRWG#	VARCHAR2	VARCHAR2	23		NULL	Block 55: ISD Drawing Number				

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Col Name	FnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
ISD_FGC		VARCHAR2	28		NULL	Block 60: Functional Group Code		TIRWUC	WUC	
ISD_LSA		VARCHAR2	27		NULL	Block 61: LSA Control Number for Incident Subject		TIRPN	LSA_NUM	
ISD_MFR_NAME		VARCHAR2	28		NULL	Block 53: Manufacturer Name		TIRPN	MFR_NAME	
ISD_MFR_PART#		VARCHAR2	22		NULL	Block 54: Manufacturer Part Number		TIRPN	MFR_PART_NO	
ISD_NAME		VARCHAR2	27		NULL	Block 50: Incident Subject Name		TIRPN	NOMEN	
ISD_QTY		NUMBER	10		NULL	Block 56: Quantity of Incident Subject or Part				
ISD_SERIAL#		VARCHAR2	24		NULL	Block 51: Serial No of Incident Subject or Part				
ITEM_NUM		VARCHAR2	26		NULL	Block 15: Code assigned to End Item		TIRMODEL	ITEM_NUM	
KEYWORD_1		VARCHAR2	14		NULL	Block 47-1: Primary Keywords describing TIR		TIRCODES	CODE_TYPE	
KEYWORD_2		VARCHAR2	14		NULL	Block 47-2: Primary Keywords describing TIR		TIRCODES	CODE_TYPE	
KEYWORD_3		VARCHAR2	14		NULL	Block 47-3: Primary Keywords describing TIR		TIRCODES	CODE_TYPE	
KEYWORD_4		VARCHAR2	14		NULL	Block 47-4: Primary Keywords describing TIR		TIRCODES	CODE_TYPE	
MFR_NAME		VARCHAR2	28		NULL	Block 13: End Item Manufacturer Name		TIRMODEL	MFR_NAME	
MNT_LVL_USED		VARCHAR2	21		NULL	Block 81: TIR Maintenance Level Used		TIRCODES	CODE_TYPE	
MNT_LVL_PRSC		VARCHAR2	21		NULL	Block 82: TIR Maintenance Level Prescribed		TIRCODES	CODE_TYPE	
MNT_LVL_RECMD		VARCHAR2	21		NULL	Block 83: TIR Maintenance Level Recommended		TIRCODES	CODE_TYPE	
MNT_TYPE		VARCHAR2	27		NULL	Block 80: TIR Maintenance Type		TIRCODES	CODE_TYPE	
MODEL_EI		VARCHAR2	26		NULL	Block 10: End Item Model Name		TIRMODEL	MODEL_EI	
NXT_ASM		VARCHAR2	22		NULL	Block 65: Next Higher Assembly of Incident Subject		TIRWUC	WUC	
NXT_ASM_SRL#		VARCHAR2	24		NULL	Block 66: Next Higher Assembly Serial Number of ISD Part				
OBSVD_DUR		VARCHAR2	16		NULL	Block 33: TIR Incident Observed during.		TIRCODES	CODE_TYPE	
ORIG_REL_DATE		DATE	6		NULL	Block 8: Original TIR Release Date				YYMMDD
PART_LIFE1		VARCHAR2	10		NULL	Block 62-1: Part Item Life Span				
PART_LIFE2		VARCHAR2	10		NULL	Block 63-1: Part Item Life Span				
PART_LIFE3		VARCHAR2	10		NULL	Block 64-1: Part Item Life Span				
PART_UNIT#		VARCHAR2	15		NULL	Block 62-2: PART UNIT FOR		TIRCODES	CODE_TYPE	

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Table Name: TIRDATA

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
PART_UNIT2		VARCHAR2	15		NULL	RESPECTIVE LIFE Block 63-2: PART UNIT FOR RESPECTIVE LIFE		TIRCODES	CODE_TYPE	
PART_UNIT3		VARCHAR2	15		NULL	Block 64-2: PART UNIT FOR RESPECTIVE LIFE		TIRCODES	CODE_TYPE	
PREP_NAME		VARCHAR2	34		NULL	Block 98-1: TIR Preparer Name		TIRSIGN	PREP_NAME	
PREP_PHONE		VARCHAR2	34		NULL	Block 98-3: TIR Preparer Phone		TIRSIGN	PREP_PHONE	
PREP_TITLE		VARCHAR2	34		NULL	Block 98-2: TIR Preparer Title		TIRSIGN	PREP_TITLE	
REL_DATE		DATE	11		NULL	Block 1: TIR Release Date (20 char including REV# 99)				DD MON YYYY
SERIAL#		VARCHAR2	24		NULL	Block 11: TIR End Item Serial Number				
SOFTWARE_VER#		VARCHAR2	14		NULL	Block 67: Software version of Incident Subject.				
SUBSYSTEM		VARCHAR2	22		NULL	Block 31: TIR Incident Subsystem Name				
TEST_COND1N		VARCHAR2	16		NULL	Block 48-3: Test Environment Condition		TIRCODES	CODE_TYPE	
TEST_ENVMT		VARCHAR2	32		NULL	Block 48-1: Test Environment at Incident Time.		TIRCODES	CODE_TYPE	
TEST_LIFE1		VARCHAR2	10		NULL	Block 21-1: MAJOR ITEM LIFE SPAN				
TEST_LIFE2		VARCHAR2	10		NULL	Block 22-1: MAJOR ITEM LIFE SPAN				
TEST_LIFE3		VARCHAR2	10		NULL	Block 23-1: MAJOR ITEM LIFE SPAN				
TEST_LIFE4		VARCHAR2	10		NULL	Block 24-1: MAJOR ITEM LIFE SPAN				
TEST_LIFE5		VARCHAR2	10		NULL	Block 25-1: TEST LIFE OF END ITEM				
TEST_TYPE		VARCHAR2	22		NULL	Block 48-2: TIR Test Environment Type		TIRCODES	CODE_TYPE	
TEST_UNIT1		VARCHAR2	15		NULL	Block 21-2: MAJOR ITEM UNIT FOR RESPECTIVE LIFE		TIRCODES	CODE_TYPE	
TEST_UNIT2		VARCHAR2	15		NULL	Block 22-2: MAJOR ITEM UNIT FOR RESPECTIVE LIFE		TIRCODES	CODE_TYPE	
TEST_UNIT3		VARCHAR2	15		NULL	Block 23-2: MAJOR ITEM UNIT FOR RESPECTIVE LIFE		TIRCODES	CODE_TYPE	
TEST_UNIT4		VARCHAR2	15		NULL	Block 24-2: MAJOR ITEM UNIT FOR RESPECTIVE LIFE		TIRCODES	CODE_TYPE	
TEST_UNIT5		VARCHAR2	15		NULL	Block 25-2: UNIT FOR TEST LIFE5 OF END ITEM		TIRCODES	CODE_TYPE	
TIR_MESSAGE		VARCHAR2	72		NULL	TIR MESSAGE				
TIR_TITLE	TIRLOG	VARCHAR2	26		NULL	Block 30: TIR Title		TIRLOG	TIR_TITLE	
TTL_MNT_CLKHRS		VARCHAR2	7		NULL	Block 90: Total Maintenance Clockhours				
TTL_MNT_MANHRS		VARCHAR2	7		NULL	Block 90: Total Maintenance				

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Table Name: TIRDATA

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
USA#		VARCHAR2	27		NULL	Man hours Block 12: End Item USA Registration Number.		TIREI	USA#	

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Table Name: TIRDSRPT

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRTEST	VARCHAR2	20		NOT NULL	TEST PROJECT NUMBER		TIRTEST	TEST_PROJ#	
TIRPRFX	TIRTEST	VARCHAR2	5		NOT NULL	TIR PREFIX		TIRTEST	TIRPRFX	
TIR#	TIRLOG	VARCHAR2	10		NOT NULL	TIR NUMBER		TIRLOG	TIR#	
TIR_REV	TIRLOG	VARCHAR2	2		NOT NULL	TIR REVISION		TIRLOG	TIR_REV	
DATA_ITEM		NUMBER			NULL	ATIRS DATA STREAM HEADER DATA ITEM				
MARKINGS		NUMBER			NULL	ATIRS DATA STREAM HEADER CLASSIFICATION MARKINGS				
VERSION#		NUMBER			NULL	ATIRS DATA STREAM HEADER VERSION NUMBER				
SENDER_DATE		DATE			NULL	DATE WHEN TIR IS GENERATED FOR SENDING				
SENDER_NAME	TIRSIGN	VARCHAR2	20		NULL	TIR SENDERS NAME		TIRSIGN	SIGNNAME	
SENDER_PHONE		VARCHAR2	20		NULL	TIR SENDERS PHONE NUMBER				
SENDER_EMAIL		VARCHAR2	78		NULL	TIR SENDERS EMAIL ADDRESS				

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Table Name: TIREI

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRMODEL	VARCHAR2	20		NOT NULL	TEST PROJECT NUMBER FOR END ITEM		TIRMODEL	TIRMODEL	
TIRPREFIX	TIRMODEL	VARCHAR2	5		NOT NULL	TIR PREFIX		TIRMODEL	TIRPREFIX	
MODEL_EI	TIRMODEL	VARCHAR2	26		NOT NULL	END ITEM MODEL		TIRMODEL	MODEL_EI	
SERIAL#		VARCHAR2	24		NOT NULL	END ITEM SERIAL NUMBER				
CONTRACT#		VARCHAR2	22		NULL	END ITEM CONTRACT NUMBER				
ITEM_NUM		VARCHAR2	26		NULL	END ITEM ITEM NUMBER				
USA#		VARCHAR2	27		NULL	END ITEM USA NUMBER				
REMARKS		VARCHAR2	2000		NULL	END ITEM REMARKS				

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Table Name: TIRGENUS

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRTEST	VARCHAR2	20		NOT NULL	TEST PROJECT NUMBER		TIRTEST	TEST_PROJ#	
TIRPRFX	TIRTEST	VARCHAR2	5		NOT NULL	TIR PREFIX		TIRTEST	TIRPRFX	
TABLE_NAME		VARCHAR2	15		NOT NULL	TABLE NAME TO GENERATE VALUES FOR				
COLUMN_NAME		VARCHAR2	30		NOT NULL	COLUMN NAME TO GENERATE VALUES FOR				
BLOCK_ID		NUMBER	3		NULL	TIR BLOCK ID NUMBER				
GENERIC_USAGE		VARCHAR2	4		NULL	GENERIC USAGE VALUES				

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Table Name: TIRLOG

Col Name	FnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRTEST	VARCHAR2	20		NOT NULL	Test Project Number		TIRTEST	TEST_PROJ#	
TIRPRFX	TIRTEST	VARCHAR2	5		NOT NULL	FIRST FIVE CHARACTER OF TIR#		TIRTEST	TIRPRFX	
TIR#		VARCHAR2	10		NOT NULL	TIR Number				
TIR_REV		VARCHAR2	2		NOT NULL	TIR Revision Number				
CN		VARCHAR2	12		NULL	Control Number from Uniram for each Test Incident				
MARK_COMP		CHAR	1		NULL	TIR Marked Complete?				
EI_MODEL		VARCHAR2	6		NULL	Uniram End Item Model				
EI_ID		VARCHAR2	3		NULL	Uniram End Item ID (End Item Identifier)				
ORIGIN_DATE		DATE	7		NULL	Original TIR Date from Revision 0				
REL_DATE		DATE	7		NULL	Release Date of TIR				
REL_NAME		VARCHAR2	30		NULL	User Name Who Released the Completed TIR				
RPT_DATE		DATE	7		NULL	Test Incident Report Generation Date (When Xmitted to ATIRS)				
TEST_PHASE		VARCHAR2	6		NULL	Uniram Test Phase				
TIR_MESSAGE		VARCHAR2	72		NULL	TIR MESSAGE				
TIRTITLE		VARCHAR2	26		NULL	Block 2: TIR Title				

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Table Name: TIRMODEL

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRTEST	VARCHAR2	20		NOT NULL	TEST PROJECT NUMBER		TIRTEST	TEST_PROJ#	
TIRPREFIX	TIRTEST	VARCHAR2	5		NOT NULL	TIR PREFIX		TIRTEST	TIRPREFIX	
MODEL_EI		VARCHAR2	26		NOT NULL	END ITEM MODEL				
MFR_NAME		VARCHAR2	28		NULL	MODEL MANUFACTURERS NAME				
REMARKS		VARCHAR2	2000		NULL	REMARKS PERTAINING TO THE MODEL				

UniRAM Data Dictionary

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Table Name: TIRMTB

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRDATA	VARCHAR2	20		NOT NULL	Block 3: Test Project Number for each TIR		TIRTEST	TEST_PROJ#	
TIR#	TIRDATA	VARCHAR2	10		NOT NULL	Block 4: TIR Number		TIRLOG	TIR#	
TIR_REV	TIRDATA	VARCHAR2	2		NOT NULL	Block 1-2: TIR Revision Number		TIRLOG	TIR_REV	
MNT_SEQ		NUMBER	3	1	NOT NULL	Block 90: Maintenance Sequence Number for each TIR				99.9
APPL		CHAR	1		NULL	Block 90: Applicable or Not Applicable	Y,N	TIRCODES	CODE_TYPE	YYMMDD
DATE_END		DATE	6		NULL	Block 90: Date maintenance ended for defective or failed part				YYMMDD
DATE_START		DATE	6		NULL	Block 90: Date Maintenance Started for each part				YYMMDD
DELAY_HRS		VARCHAR2	6		NULL	Block 90: Administrative and Logistic Delay Hours				HHH:MM
DG_CLKHS		VARCHAR2	6		NULL	Block 90: Diagnostic Clock Hours of part				HHH:MM
DG_MHS		VARCHAR2	6		NULL	Block 90: Diagnostic Man-hours for part				HHH:MM
LEVEL_90		VARCHAR2	5		NULL	Block 90: Maintenance Level		TIRCODES	CODE_TYPE	
MNT_TYPE_90		VARCHAR2	4		NULL	Block 90: Maintenance Type		TIRCODES	CODE_TYPE	
TIME_END		VARCHAR2	4		NULL	Block 90: Maintenance Time Ended				9999
TIME_START		VARCHAR2	4		NULL	Block 90: Maintenance Time Started				9999
TTL_MNT_CLKHS		VARCHAR2	6		NULL	Block 90: Total Maintenance Clock Hours				HHH:MM
TTL_MNT_MHS		VARCHAR2	6		NULL	Block 90: Total Maintenance Man hours				HHH:MM

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Table Name: TIRPART

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRDATA	VARCHAR2	20		NOT NULL	Block 3: Test Project Number		TIRTEST	TEST_PROJ#	
TIRPREFIX	TIRDATA	VARCHAR2	5		NOT NULL	FIRST FIVE CHARACTER OF TIR#		TIRTEST	TIRPREFIX	
TIR#	TIRDATA	VARCHAR2	10		NOT NULL	Block 4: TIR Number		TIRLOG	TIR#	
TIR_REV	TIRDATA	VARCHAR2	2		NOT NULL	Block 1-2: TIR Revision Number		TIRLOG	TIR_REV	
PART_SEQ		NUMBER	3	1	NOT NULL	Administrative Part Sequence Number for Block 90				99.9
ACTION		VARCHAR2	7		NULL	Block 90: Part Action		TIRCODES	CODE_TYPE	
FGC		VARCHAR2	4		NULL	Block 90: Part Functional Group Code		TIRWUC	WUC	
FSN_NSN		VARCHAR2	24		NULL	Block 90: Part FSN/NSN		TIRPN	PART_NO	
LEVEL_PART		VARCHAR2	4		NULL	Block 90: Part Maintenance Level		TIRCODES	CODE_TYPE	
MFR_PART#		VARCHAR2	22		NULL	Block 90: Part Manufacturer's Part Number		TIRPN	PART_NO	
NOMEN		VARCHAR2	19		NULL	Block 90: Part Nomenclature				
PART_LIFE		VARCHAR2	7		NULL	Block 90: Part Life				
QTY		NUMBER	4		NULL	Block 90: Part Quantity				9999
SERIAL#		VARCHAR2	24		NULL	Block 90: Part Serial Number				

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Table Name: TIRSCODE

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRTEST	VARCHAR2	20		NOT NULL	GENERIC TEST PROJECT NUMBER		TIRTEST	TEST_PROJ#	
TIRPRFX	TIRTEST	VARCHAR2	5		NOT NULL	GENERIC TIR PREFIX		TIRTEST	TIRPRFX	
CODE_VALUE		VARCHAR2	50		NOT NULL	GENERIC TIR CODE VALUES				
CODE_TYPE		VARCHAR2	30		NOT NULL	GENERIC TIR CODE TYPES				
BLOCK_ID		NUMBER	3		NULL	GENERIC TIR BLOCK ID NUMBER				

UniRAM Data Dictionary

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Table Name: TIRSIGN

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRTEST	VARCHAR2	20		NOT NULL	TEST PROJECT NUMBER		TIRTEST	TEST_PROJ#	
TIRPRFX	TIRTEST	VARCHAR2	5		NOT NULL	TIR PREFIX		TIRTEST	TIRPRFX	
DBUSERNAME		VARCHAR2	20		NOT NULL	DATABASE USER NAME				
TITLE_TYPE		CHAR	1		NOT NULL	USER TITLE TYPE				
PHONE		VARCHAR2	34		NULL	PHONE OF PREPARER OR COMMANDER				
SIGNNAME		VARCHAR2	34		NULL	SIGNATURE/NAME OF PREPARER OR COMMANDER				
TITLE		VARCHAR2	34		NULL	TITLE OF PREPARER OR COMMANDER				

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Table Name: TIRTEST

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#		VARCHAR2	20		NOT NULL	Block 3: TIR Project number				
TIRPRFX		VARCHAR2	5		NOT NULL	Block 4: TIR Number First 4-5 Characters				
REMARKS		VARCHAR2	2000		NULL	TIR TEST REMARKS				
SYSTEM		VARCHAR2	14		NULL	Block 7: Major Item System Name				
TEST_AGENCY		VARCHAR2	20		NULL	Block 5: Test Agency Name				
TEST_SPONSOR		VARCHAR2	20		NULL	Block 6: Program Sponsor of TIR				
TEST_TITLE		VARCHAR2	34		NULL	Block 2: Test Project Title				
MISC_CODE		VARCHAR2	8		NULL	TIR MESSAGE CODE				
RPT_TYP		VARCHAR2	1		NULL	TIR REPORT TYPE				

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Table Name: TIRTEXT

Col Name	FmTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRDATA	VARCHAR2	20		NOT NULL	Block 3: Test Project Number		TIRTEST	TEST_PROJ#	
TIRPRFX	TIRDATA	VARCHAR2	5		NOT NULL	FIRST FIVE CHARACTER OF TIR#		TIRTEST	TIRPRFX	
TIR#	TIRDATA	VARCHAR2	10		NOT NULL	Block 4: TIR Number		TIRLOG	TIR#	
TIR_REV	TIRDATA	VARCHAR2	2		NOT NULL	Block 1-2: TIR Revision Number		TIRLOG	TIR_REV	
INC_TITLE		VARCHAR2	72		NULL	Block 90 First Line, Incident Title, same as Block 30				
TEXT		LONG			NULL	Block 90: Description of the incident				

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Table Name: TIRUSAGE

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PROJ#	TIRTEST	VARCHAR2	20		NOT NULL	TEST PROJECT NUMBER		TIRTEST	TEST_PROJ#	
TIRPREFIX	TIRTEST	VARCHAR2	5		NOT NULL	TIR PREFIX		TIRTEST	TIRPRFX	
TABLE_NAME		VARCHAR2	15		NOT NULL	TABLE NAME				
COLUMN_NAME		VARCHAR2	30		NOT NULL	COLUMN NAME				
BLOCK_ID		NUMBER	3		NULL	TIR BLOCK ID NUMBER				
CUSTOM_USAGE		VARCHAR2	4		NULL	COLUMN CUSTOM USAGE				
DEF_VALUE		VARCHAR2	20		NULL	DEFAULT VALUE FOR COLUMN				
FLD_SEQ		NUMBER			NULL	FIELD SEQUENCE				
GENERIC_USAGE		VARCHAR2	4		NULL	GENERIC COLUMN USAGE				
MAX_VALUE		VARCHAR2	20		NULL	MAXIMUM VALUE				
MIN_VALUE		VARCHAR2	20		NULL	MINIMUM VALUE				

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Table Name: UNIT

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	TEST	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
UIC		VARCHAR2	6		NOT NULL	UNIT IDENTIFIER CODE	alpha_num_check			
COMPONENT		VARCHAR2	3		NULL	MILITARY COMPONENT I.E. USAR	lcf_lookup	LCFCODES	CODE	
DODAAC		VARCHAR2	6		NULL	DEPARTMENT OF DEFENSE ACTIVITY ADDRESS CODE	alpha_num_check			
SRVC		VARCHAR2	4		NULL	MILITARY SERVICE	lcf_lookup	LCFCODES	CODE	
SRVC_BRNCH		VARCHAR2	2		NULL	MILITARY SERVICE BRANCH	lcf_lookup	LCFCODES	CODE	
UNIT_NAME		VARCHAR2	20		NULL	UNIT NAME				
UNIT_TYP		VARCHAR2	1		NULL	TYPE OF UNIT	lcf_lookup	LCFCODES	CODE	

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Table Name: UNITDETL

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	UNIT	VARCHAR2	6		NOT NULL	TEST PHASE				
UIC	UNIT	VARCHAR2	6		NOT NULL	UNIT IDENTIFIER CODE				
UNIT_LEVEL		VARCHAR2	1		NOT NULL	LEVEL OF UNIT	lcf_lookup	LCFCODES	CODE	
UNIT_BEG		DATE	9		NOT NULL	BEGIN DATE AND TIME AT THIS LOCATION				YYDDDDHH24MI
LOC		VARCHAR2	4		NULL	LOCATION OF UNIT				
UNIT_END		DATE	9		NULL	END DATE AND TIME AT THIS LOCATION	lcf_lookup in_the_past	LCFCODES	CODE	YYDDDDHH24MI

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Table Name: WHERE_PHRASE

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
SEQ_NO		NUMBER	5	1	NOT NULL	SEQUENCE NUMBER				
TEXT		VARCHAR2	2000		NULL	SAMPLE WHERE PHRASES				990.9

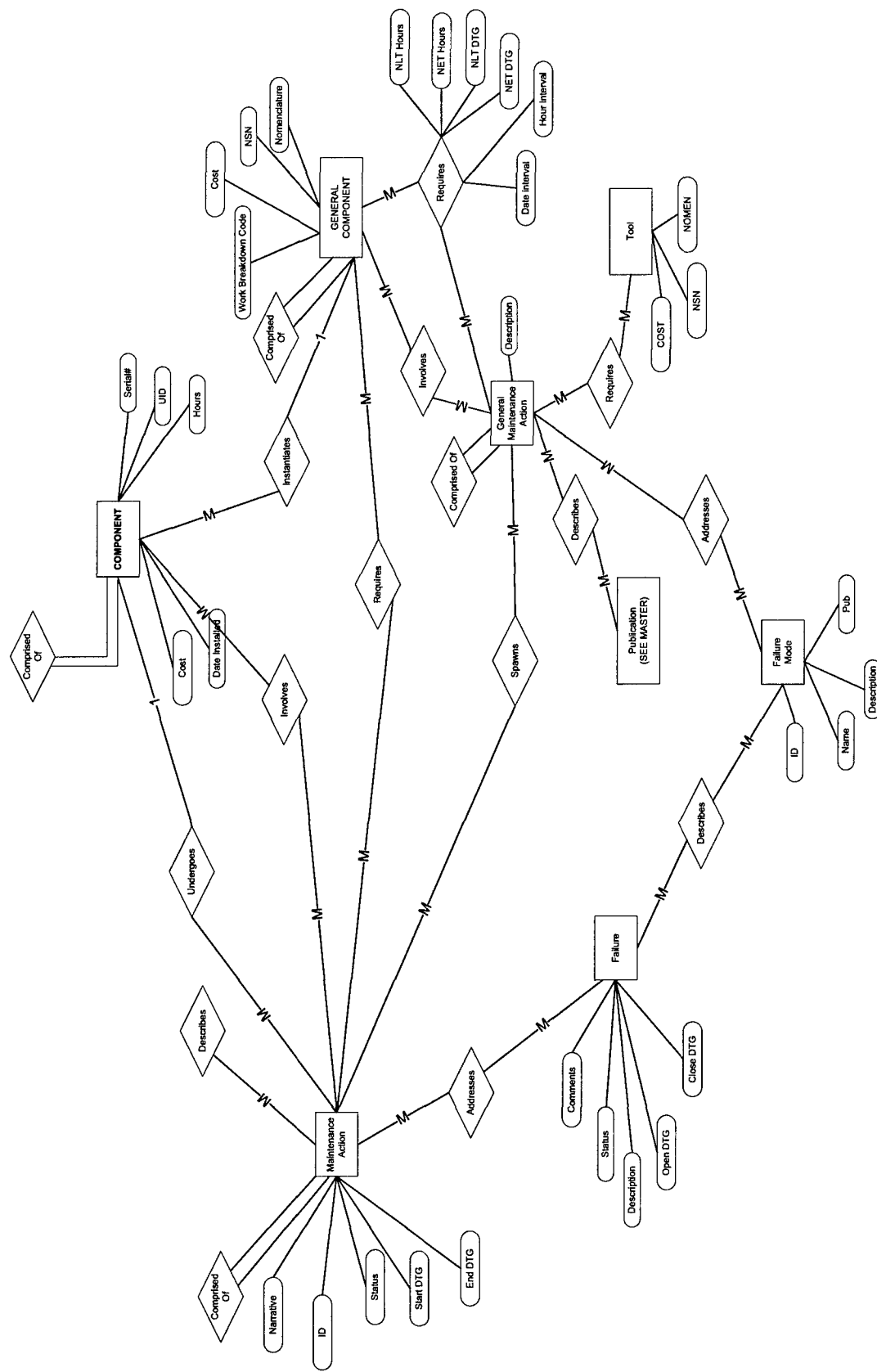
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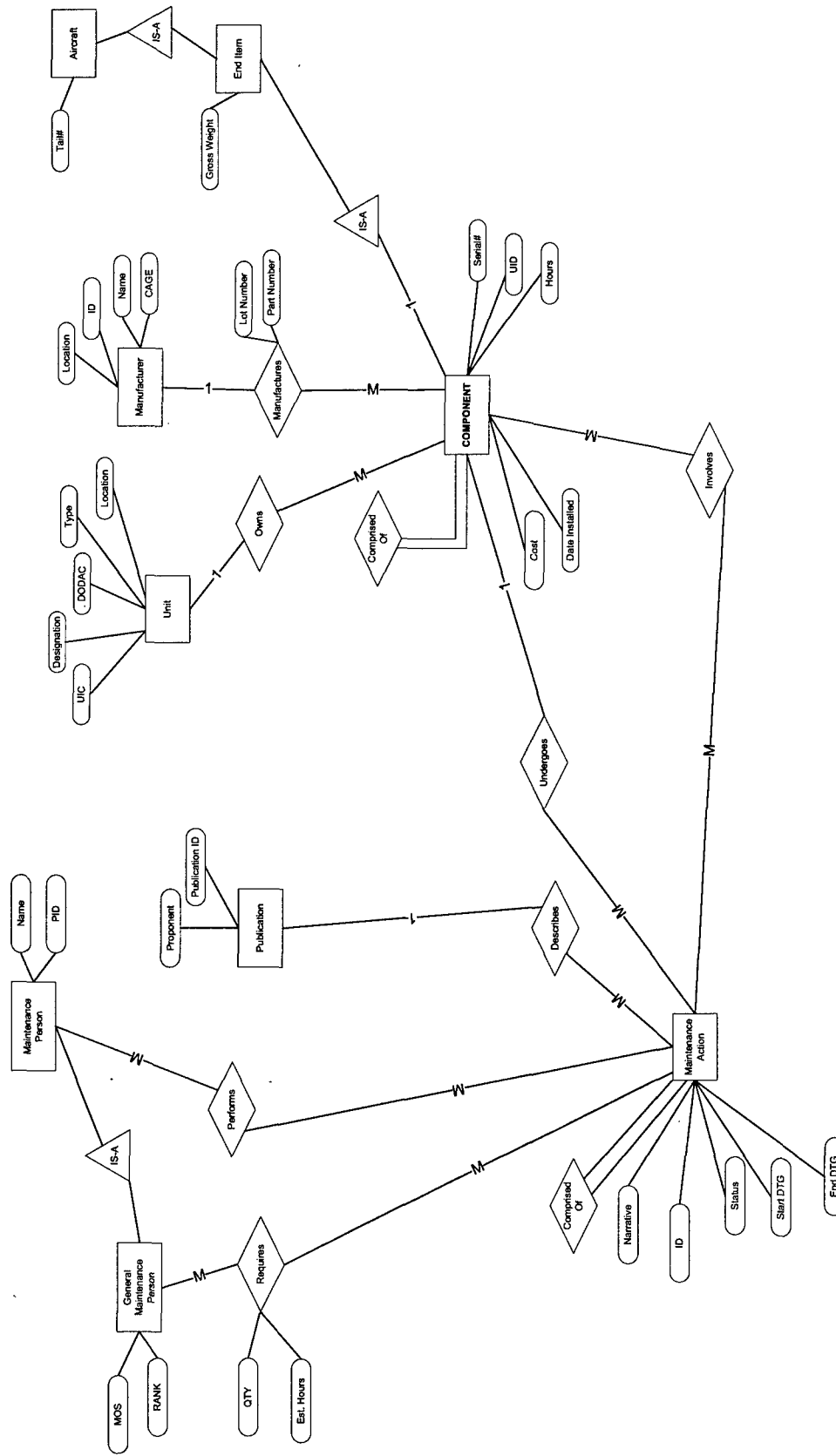
Table Name: WORKUNIT

Col Name	FrnTable	Type	Width	Dec	Null/Not	Comment	Validation	Ref Table	Ref Column	Column Format
TEST_PHASE	TEST	VARCHAR2	6		NOT NULL	TEST PHASE	test_lookup	TEST	TEST_PHASE	
EI_MODEL		VARCHAR2	6		NOT NULL	END ITEM MODEL I.E. AH64A, T800	lcf_lookup	LCFCODES	CODE	
WUC		VARCHAR2	15		NOT NULL	WORK UNIT CODE OF THE PART	alpha_num_check			
LSA_NUM		VARCHAR2	27		NULL	LOGISTICS SUPPORT ANALYSIS NUMBER				
NOMEN		VARCHAR2	30		NULL	NOMENCLATURE OF THE WORK UNIT CODE				
WUC_Is_MDC		VARCHAR2	1		NULL	WORK UNIT CODE IS VALID FOR MAJOR DYNAMIC COMPONENT	check const			

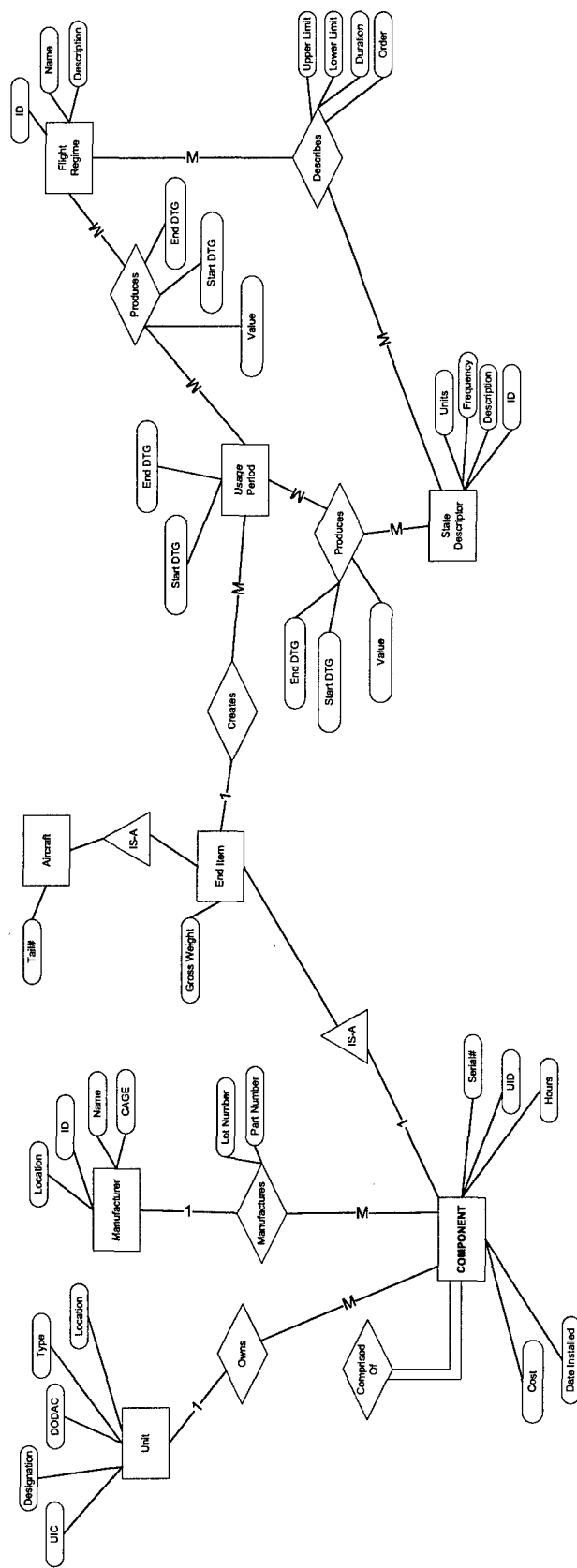
Appendix G – CBMUDM Entity Relationship Diagram



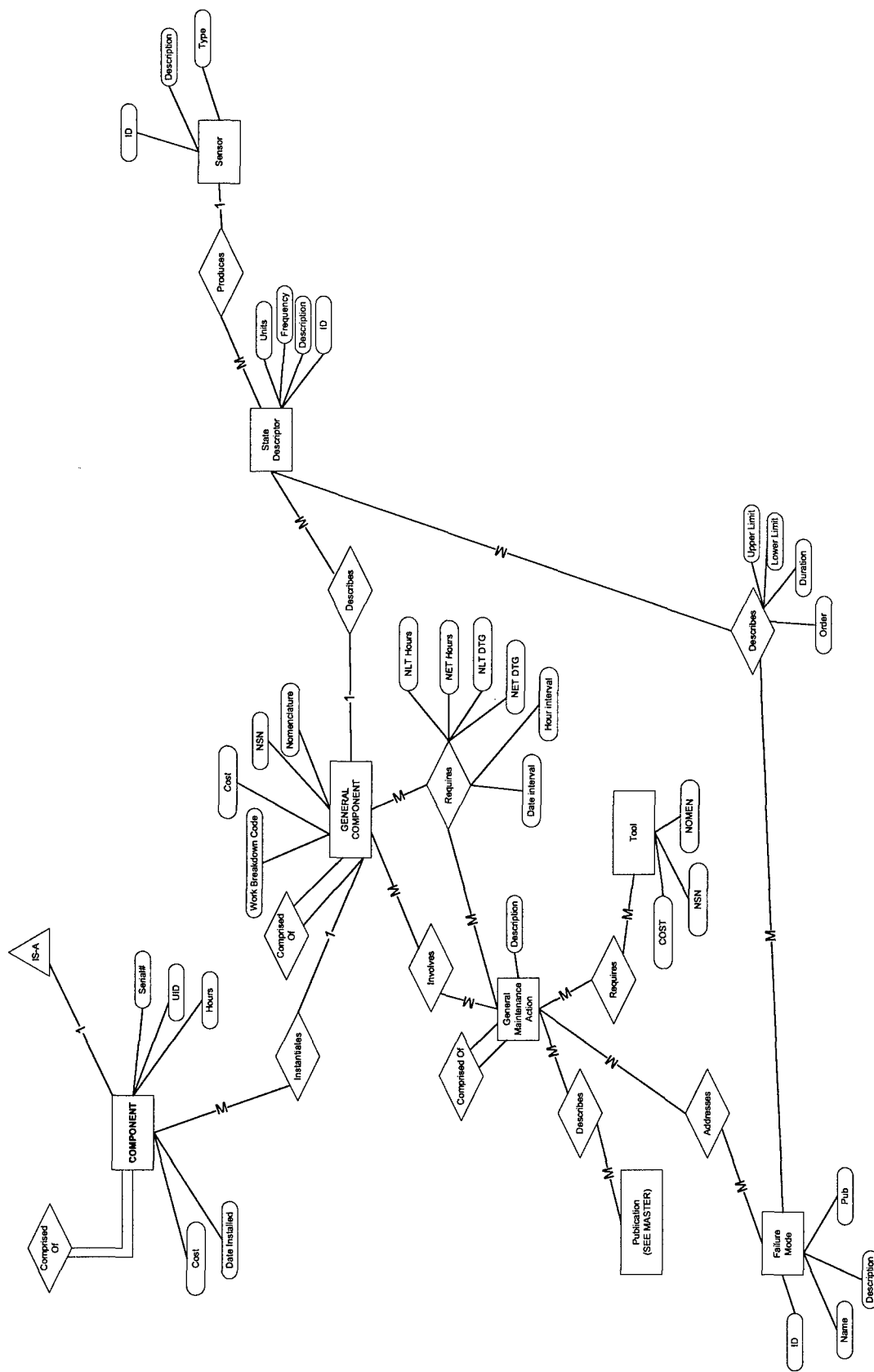
Appendix G – CBMUDM Entity Relationship Diagram



Appendix G – CBMUDM Entity Relationship Diagram



Appendix G – CBMUDM Entity Relationship Diagram



Appendix H – MDR and VMEP Low-Level Stage Physical Design

```

/*****
*   MDR LOW LEVEL SCHEMA
*
*   Created      3/9/2005
*   Modified     4/7/2005
*   Project      CBM
*   Model        Low level table create script
*   Author       Henderson
*   Editor       Henderson Last Update: 7 APR 2005
*   Database     Oracle 10g - MDR Schema
*****/
--drop user MDR cascade;

Drop table "MDR"."MDR_PARAM";

Drop table "MDR"."MDR_DATA";

Drop table "MDR"."MDR_MISSION";

Drop public synonym "MDR_DATA";

Drop public synonym "MDR_PARAM";

Drop public synonym "MDR_MISSION";

Drop sequence "MDR"."NEXT_MISSION_ID";

--create user mdr
create user mdr identified by w35tar
default tablespace mdrdata temporary tablespace temp;

grant connect, dba to mdr;

-- Create Types section

-- Create Tables section
--MDR PARAMETER TABLE
CREATE TABLE "MDR"."MDR_PARAM" (
  "PARAMETER_ID" NUMBER ,
  "DESCRIPTION" VARCHAR2(40) ,
  "BITSIZE" NUMBER ,
  "MIN_VAL" NUMBER(12,4) ,
  "FULL_SCALE" NUMBER(12,4) ,
  "UNITS" VARCHAR2(60) ,
  "RESOLUTION" NUMBER(14,12) ,
  "ENUM" VARCHAR2(5) ,
  "CBMUDM_STATE_DESCRIPTOR_ID" NUMBER(8),
  CONSTRAINT "MDR_PARAM$PK" PRIMARY KEY ("PARAMETER_ID") VALIDATE )
  ORGANIZATION INDEX TABLESPACE "MDRDATA";

ALTER TABLE MDR.MDR_PARAM ADD (
  CONSTRAINT MDR_PARAM$PARAMETER_ID$NN CHECK ("PARAMETER_ID" IS NOT NULL));

```

Appendix H – MDR and VMEP Low-Level Stage Physical Design

```
CREATE INDEX "MDR"."MDR_PARAMS$DESCRIPTION$IDX" ON "MDR"."MDR_PARAM" ("DESCRIPTION")
TABLESPACE "MDRINDX" COMPUTE STATISTICS ;

Create public synonym "MDR_PARAM" for "MDR"."MDR_PARAM";

--MDR DATA TABLE
Create table "MDR"."MDR_DATA" (
    PARAMETER_TIME Timestamp ,
    PARAMETER_ID Number ,
    VALUE Number(20,10) ,
    MISSION_ID Number(12),
    CONSTRAINT "MDR_DATA$PK" PRIMARY KEY ("PARAMETER_TIME","PARAMETER_ID","MISSION_ID") VALIDATE )
ORGANIZATION INDEX TABLESPACE "MDRDATA";

ALTER TABLE MDR.MDR_DATA ADD (
    CONSTRAINT MDR_DATA$PARAMETER_TIME$NN CHECK ("PARAMETER_TIME" IS NOT NULL));

ALTER TABLE MDR.MDR_DATA ADD (
    CONSTRAINT MDR_DATA$PARAMETER_ID$NN CHECK ("PARAMETER_ID" IS NOT NULL));

ALTER TABLE MDR.MDR_DATA ADD (
    CONSTRAINT MDR_DATA$EI_MODEL$NN CHECK ("MISSION_ID" IS NOT NULL));

Create public synonym "MDR_DATA" for "MDR"."MDR_DATA";

--MDR MISSION TABLE
CREATE TABLE "MDR"."MDR_MISSION" (
    "MISSION_ID" NUMBER ,
    "START_DTG" TIMESTAMP ,
    "END_DTG" TIMESTAMP ,
    "EI_SN" VARCHAR2(12) ,
    "EI_MODEL" VARCHAR2(12) ,
    "FILE_NAME" VARCHAR2(255),
    "STATUS" Number,
    CONSTRAINT "MDR_MISSION$PK" PRIMARY KEY ("MISSION_ID") VALIDATE )
ORGANIZATION INDEX TABLESPACE "MDRDATA";

ORGANIZATION INDEX TABLESPACE "MDRDATA";

ALTER TABLE MDR.MDR_MISSION ADD (
    CONSTRAINT MDR_MISSION$MISSION_ID$NN CHECK ("MISSION_ID" IS NOT NULL));

ALTER TABLE MDR.MDR_MISSION ADD (
    CONSTRAINT MDR_MISSION$START_DTG$NN CHECK ("START_DTG" IS NOT NULL));

ALTER TABLE MDR.MDR_MISSION ADD (
    CONSTRAINT MDR_MISSION$END_DTG$NN CHECK ("END_DTG" IS NOT NULL));

Create public synonym "MDR_MISSION" for "MDR"."MDR_MISSION";
```

Appendix H – MDR and VMEP Low-Level Stage Physical Design

```
--Create Sequence for MDR Mission ID
CREATE SEQUENCE "MDR"."NEXT_MISSION_ID" NOCYCLE NOORDER CACHE 20 NOMAXVALUE MINVALUE 1 INCREMENT
BY 1 START WITH 1;

-- Create Table comments section

Comment on table "MDR_PARAM" is 'The MDR_PARAM table is a list of all possible MDR parameters and
their respective characteristics.'

Comment on table "MDR_DATA" is 'The MDR_DATA table is used to store actual MDR parameter values
from flights.';

Comment on table "MDR_MISSION" is 'The MDR_MISSION table is used to store information about the
aircraft and start & end of missions. Missions correspond to individual MDR files from
LINSYGAS.';

-- Create Attribute comments section

Comment on column "MDR_PARAM"."PARAMETER_ID" is 'A unique integer identifier for each MDR
parameter.' ;

Comment on column "MDR_PARAM"."DESCRIPTION" is 'A text description of the MDR parameter.' ;

Comment on column "MDR_PARAM"."BITSIZE" is 'The size of the MDR parameter data, in bits.' ;

Comment on column "MDR_PARAM"."MIN_VAL" is 'The minimum value of the MDR parameter.' ;

Comment on column "MDR_PARAM"."FULL_SCALE" is 'The upper limit of the MDR parameter.';

Comment on column "MDR_PARAM"."UNITS" is 'The units (meters, seconds, etc) corresponding to the
MDR parameter.';

Comment on column "MDR_PARAM"."RESOLUTION" is 'The resolution (?) of the MDR parameter.';

Comment on column "MDR_DATA"."PARAMETER_TIME" is 'The date time group (DTG) corresponding to the
MDR measurement, Measured in GMT time.';

Comment on column "MDR_DATA"."VALUE" is 'The recorded value for the MDR parameter during the said
time.' ;

Comment on column "MDR_DATA"."PARAMETER_ID" is 'Foreign key linking the MDR measurement to the
associate MDR parameter.';

Comment on column "MDR_DATA"."MISSION_ID" is 'Foreign key linking the MDR measurement to the
associate MDR MISSION (aircraft info).';

Comment on column "MDR_MISSION"."MISSION_ID" is 'The mission number when MDR_DATA was recorded.';

Comment on column "MDR_MISSION"."START_DTG" is 'The start date time group of the mission. First
entry in data file.';

Comment on column "MDR_MISSION"."END_DTG" is 'The end date time group of the mission. First
entry in data file.';

Comment on column "MDR_MISSION"."EI_MODEL" is 'The model of the aircraft producing MDR
measurements.';

Comment on column "MDR_MISSION"."EI_SN" is 'The serial number of the aircraft producing MDR
measurements.';

Comment on column "MDR_MISSION"."FILE_NAME" is 'The file name of the source data file for the
mission.';

Comment on column "MDR_MISSION"."STATUS" is 'The status of the source file. 0=non processed,
1=processed with success, 2=processed with errors (bad data), 3=unprocessed unreadable file,
4=mark for reload';
```

Appendix H -- MDR and VMEP Low-Level Stage Physical Design

```

/*****
*   VMEP LOW LEVEL SCHEMA
*
*   Reference:   IAC ExportToText ICD
*
*   Created      3;11;2005
*   Modified     4;9;2005
*   Project      CBM
*   Model        Low level table create script
*   Author       Henderson
*   Database     Oracle 10g - VMEP Schema
*****/
spool /home/oracle/sql/buildvmep.txt;

Drop table "VMEP"."VMEP_DATA";

Drop table "VMEP"."VMEP_MISSION";

Drop table "VMEP"."VMEP_PARAM";

--create user vmep
create user vmep identified by w35tar
default tablespace vmep temporary tablespace temp;

-- Create Tables section

Create table "VMEP"."VMEP_DATA" (
    "VMEP_SEQ" Number NOT NULL,
    "CI_ID" Varchar2(255) NOT NULL ,
    "CI_TIME" Timestamp NOT NULL,
    "CI_VECTOR" Number(9,6) NOT NULL,
    "MISSION_ID" Number NOT NULL,
    CONSTRAINT "VMEP_DATA$VMEP_SEQ$PK" PRIMARY KEY ("VMEP_SEQ")
)
TABLESPACE "VMEPDATA";

DROP PUBLIC SYNONYM "VMEP_DATA";

CREATE PUBLIC SYNONYM "VMEP_DATA" for "VMEP"."VMEP_DATA";

CREATE table "VMEP"."VMEP_MISSION" (
    "MISSION_ID" NUMBER,
    "VMEP_MODE" VARCHAR2(20),
    "AIRCRAFT_TYPE" VARCHAR2(20),
    "AIRCRAFT_SERIAL" VARCHAR2(20),
    "START_DTG" Timestamp,
    "END_DTG" Timestamp,
    "VMEP_STATE" VARCHAR2(10),
    "STATUS" NUMBER,
    "HOUSING_DIR_NAME" VARCHAR2(255),
    CONSTRAINT "VMEP_MISSION$MISSION_ID$PK" PRIMARY KEY ("MISSION_ID")
)
TABLESPACE "VMEPDATA";

DROP PUBLIC SYNONYM "VMEP_MISSION";

CREATE PUBLIC SYNONYM "VMEP_MISSION" for "VMEP"."VMEP_MISSION";

DROP SEQUENCE "VMEP"."NEXT_MISSION_ID";

CREATE SEQUENCE "VMEP"."NEXT_MISSION_ID" NOCYCLE NOORDER CACHE 20 NOMAXVALUE MINVALUE 1 INCREMENT
BY 1 START WITH 1 ;

DROP SEQUENCE "VMEP"."NEXT_VMEP_SEQ";

CREATE SEQUENCE "VMEP"."NEXT_VMEP_SEQ" NOCYCLE NOORDER CACHE 20 NOMAXVALUE MINVALUE 1 INCREMENT
BY 1 START WITH 1 ;

CREATE table "VMEP"."VMEP_PARAM" (
    "CI_ID" Varchar2(255) NOT NULL ,

```

Appendix H – MDR and VMEP Low-Level Stage Physical Design

```
"DESCRIPTION" Varchar2(255),
"MIN_VALUE"    Number,
"MAX_VALUE"    Number,
"UNITS"        Varchar2(25) ,
"CBMUDM_STATE_DESCRIPTOR_ID"  NUMBER(8),
CONSTRAINT "VMEP_PARAM$CI_ID$PK" PRIMARY KEY ("CI_ID")
)
TABLESPACE "VMEPDATA";

DROP PUBLIC SYNONYM "VMEP_PARAM";

CREATE PUBLIC SYNONYM "VMEP_PARAM" for "VMEP"."VMEP_PARAM";

-- Create Table comments section

Comment on table "VMEP_DATA" is 'The VMEP_DATA table is used to store actual VMEP parameter
values during flight.';

Comment on table "VMEP_MISSION" is 'The VMEP_MISSION table is used to store information about a
particular VMEP recording. A VMEP recording has many VMEP_DATA entries';

Comment on table "VMEP_PARAM" is 'The VMEP_PARAM table is used to store information about a the
VMEP CI Parameters (desription ranges, etc)';

-- Create Attribute comments section

Comment on column "VMEP_DATA"."CI_ID" is 'A unique integer identifier for the CI sensor.';

Comment on column "VMEP_DATA"."CI_TIME" is 'The DTG the CI was recorded - YYMMDD_HHMMSS';

Comment on column "VMEP_DATA"."CI_VECTOR" is 'The value of the CI.';

Comment on column "VMEP_DATA"."MISSION_ID" is 'The foreign key of the corresponding vmep mission
(set of measurements)';

Comment on column "VMEP_MISSION"."MISSION_ID" is 'A unique integer for the VMEP recording or
mission.';

Comment on column "VMEP_MISSION"."VMEP_MODE" is 'The mode the VDU was in when the measurements
was made.';

Comment on column "VMEP_MISSION"."AIRCRAFT_TYPE" is 'The type of aircraft making the
measurement.';

Comment on column "VMEP_MISSION"."AIRCRAFT_SERIAL" is 'The serial number of aircraft making the
measurement.';

Comment on column "VMEP_MISSION"."START_DTG" is 'The start date time group of the VMEP mission.';

Comment on column "VMEP_MISSION"."END_DTG" is 'The end date time group of the VMEP mission.';

Comment on column "VMEP_MISSION"."VMEP_STATE" is 'The state of the VMEP system when parameters
where recorded (MONITOR, BIT, etc)';

Comment on column "VMEP_MISSION"."STATUS" is 'The status of the source file. 0=non processed,
1=processed with success, 2=processed with errors (bad data), 3=unprocessed unreadable file,
4=mark for reload';

Comment on column "VMEP_MISSION"."HOUSING_DIR_NAME" is 'the source directory housing the
All_CI.txt (source) file.';

Comment on column "VMEP_PARAM"."CI_ID" is 'A unique integer identifier for the CI sensor.';

Comment on column "VMEP_PARAM"."DESCRIPTION" is 'A description of the CI.';

Comment on column "VMEP_PARAM"."MIN_VALUE" is 'The minimum acceptable value for the CI.';

Comment on column "VMEP_PARAM"."MAX_VALUE" is 'The maximum acceptable value for the CI.';

Comment on column "VMEP_PARAM"."UNITS" is 'The units that the CI is measured in.';
```

Appendix H – MDR and VMEP Low-Level Stage Physical Design

Comment on column "VMEP_PARAM"."CBMUDM_STATE_DESCRIPTOR_ID" is 'Foriegn key linking the VMEP CI to the state descriptor table in the CBMUDM.';

Entity report

Entity name	Entity type	Primary key	# attributes
AIRCRAFT	independent	AIRCRAFT_ID	7
COMPONENT	independent	COMPONENT_ID	7
COMPONENT_INSTALLATION_RECORD	independent	COMPONENT_ID, SUPER_PART_ID	4
END ITEM	independent	END_ITEM_ID	3
FAILURE	dependent	FAILURE_ID, COMPONENT_ID	10
FAILURE_MODE	independent	FAILURE_MODE_ID	11
FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION	dependent	GENERAL_MAINTENANCE_ACTION_ID, FAILURE_MODE_ID	2
GEN_COMP__REQ_GEN_MAINT	dependent	COMPONENT_ID, GENERAL_MAINTENANCE_ACTION_ID	5
GEN_COMPONENT_REQ_GEN_MAINT	dependent	GENERAL_COMPONENT_ID, GENERAL_MAINTENANCE_ACTION_ID	5
GEN_COMPONENT_STATE_DESCRIPTOR	dependent	GENERAL_COMPONENT_ID, STATE_DESCRIPTOR_ID	2
GEN_MAINT_ACTION_REQ_GEN_PERSON	dependent	MAINTENANCE_ACTION_ID, MAINTENANCE_PERSON_ID, GENERAL_MAINTENANCE_ACTION_ID, GEN_MAINTENANCE_PERSON_ID	7
GEN_MAINT_REQ_PUBLICATION	dependent	GENERAL_MAINTENANCE_ACTION_ID, PUBLICATION_ID	2
GEN_MAINT_REQ_TOOL	dependent	TOOL_ID, GENERAL_MAINTENANCE_ACTION_ID	3
GENERAL_COMPONENT	independent	GENERAL_COMPONENT_ID	35
GENERAL_MAINTENANCE_ACTION	independent	GENERAL_MAINTENANCE_ACTION_ID	7
GENERAL_MAINTENANCE_PERSON	independent	GEN_MAINTENANCE_PERSON_ID	7
MAINT_ACTION_INVOLVES_COMP	dependent	MAINTENANCE_ACTION_ID, COMPONENT_ID	2
MAINT_ACTION_INVOLVES_PERSON	dependent	MAINTENANCE_PERSON_ID, MAINTENANCE_ACTION_ID, GEN_MAINTENANCE_PERSON_ID	6
MAINT_ACTION_REQ_GEN_COMPONENT	dependent	GENERAL_MAINTENANCE_ACTION_ID, GENERAL_COMPONENT_ID	3
MAINTENANCE_ACTION	independent	MAINTENANCE_ACTION_ID	12
MAINTENANCE_ACTION_ADDRESSES_FAILURE	dependent	FAILURE_ID, MAINTENANCE_ACTION_ID, COMPONENT_ID	3
MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	dependent	MAINTENANCE_ACTION_ID, GENERAL_COMPONENT_ID	4
MAINTENANCE_PERSON	dependent	MAINTENANCE_PERSON_ID, GEN_MAINTENANCE_PERSON_ID	5
MANUFACTURER	independent	CAGE	5
PUBLICATION	independent	PUBLICATION_ID	3
REGIME	independent	REGIME_ID	4
STATE_DESCRIPTOR	independent	STATE_DESCRIPTOR_ID	7
TOOL	independent	TOOL_ID	4
UNIT	independent	UIC	13
USAGE_PERIOD	independent	USAGE_PERIOD_ID	4
USAGE_PERIOD_REGIME	dependent	REGIME_ID, USAGE_PERIOD_ID	5

USAGE_PERIOD_STATE_ DESCRIPTOR	dependent	USAGE_PERIOD_ID, STATE_DESCRIPTOR_ID	5

Entity 'AIRCRAFT'

Entity name	AIRCRAFT
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	AIRCRAFT_ID	Varchar2	YES	NO	A unique identifier (CBMUDM specific) for each aircraft.
FK	END_ITEM_ID	Number	YES	NO	Foreign key link to the corresponding END_ITEM entity for the AIRCRAFT.
	AIRCRAFT_TAIL_NUMBER	Varchar2	NO	NO	Tail number (Last 3) of aircraft.
	STATUS_AIRCRAFT	Varchar2	NO	NO	The DA738-751 status of the aircraft.
	STATUS_ELECTRICAL	Varchar2	NO	NO	The DA738-751 status of the aircraft's electrical system.
	STATUS_ARMAMENT	Varchar2	NO	NO	The DA738-751 status of the aircraft's armament system.
	CURRENT_HOURS	Number	NO	NO	The cumulative number of hours flown by the aircraft.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship115	Non-identifying	END_ITEM	AIRCRAFT	1:N

Description

AIRCRAFT - An aircraft is a specific type of END_ITEM.

Entity 'COMPONENT'

Entity name	COMPONENT
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	COMPONENT_ID	Number	YES	NO	Unique (CBM_UDM specific) identifier for COMPONENT entities
FK	GENERAL_COMPONENT_ID/GENERAL_COMPONENT_ID	Integer	NO	NO	Foreign key link to corresponding GENERAL_COMPONENT
	SERIAL_NUMBER	Varchar2	NO	NO	The serial number of the part. Used to uniquely identify the component from peers.
	LOT_NUMBER	Varchar2	NO	NO	Lot Number
	OWNING_UIC	Varchar2	NO	NO	Foreign key link to the UNIT that "owns" or controls the part.
FK	UIC	Varchar2	NO	NO	
	WEIGHT	Number(x,y)	NO	NO	Weight of the component in pounds.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
COMPONENTCOMPONENT_INSTALLATION_RECORD	Informative	COMPONENT	COMPONENT_INSTALLATION_RECORD	1:N
COMPONENTCOMPONENT_INSTALLATION_RECORD1	Informative	COMPONENT	COMPONENT_INSTALLATION_RECORD	1:N
Relationship65	Non-identifying	COMPONENT	END_ITEM	1:1
Relationship66	Identifying	COMPONENT	MAINT_ACTION_INVOLVES_COMP	1:N
ABSTRACT_COMPONENTCOMPONENT	Non-identifying	GENERAL_COMPONENT	COMPONENT	1:N
Relationship67	Informative	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	COMPONENT	1:N
Relationship64	Non-identifying	UNIT	COMPONENT	1:N
Relationship84	Identifying	COMPONENT	FAILURE	1:N
Relationship90	Identifying	COMPONENT	GEN_COMP_REQ_GEN_MAINT	1:N

Description

The central entity of the CBMUDM. A physical component, part, assembly, or aircraft that is installed on or existing in reality. Not to be confused with a GENERAL_COMONENT. Example - Apache 87-0446 is a physical AH-64A

Entity 'COMPONENT_INSTALLATION_RECORD'

Entity name	COMPONENT_INSTALLATION_RECORD
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	COMPONENT_ID/SUB_PART_ID	Number	YES	NO	Foreign key of sub-component
PK	SUPER_PART_ID	Number	YES	NO	Foreign key of super-component
	DATE_INSTALLED_DT	Timestamp	NO	NO	Date component defined by SUB_COMPONENT_ID was installed on component defined by SUPER_COMPONENT_ID. NULL for removal actions
	DATE_REMOVED_DT	Timestamp	NO	NO	Date component defined by SUB_COMPONENT_ID was removed from component defined by SUPER_COMPONENT_ID. NULL for installation actions.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
COMPONENTCOMPONENT_INSTALLATION_RECORD	Informative	COMPONENT	COMPONENT_INSTALLATION_RECORD	1:N
COMPONENTCOMPONENT_INSTALLATION_RECORD1	Informative	COMPONENT	COMPONENT_INSTALLATION_RECORD	1:N

Description

This entity is used to track what components were replaced by other components, and when.

Entity 'END_ITEM'

Entity name	END_ITEM
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	END_ITEM_ID	Number	YES	NO	Unique identifier (CDM_UDM specific) for END_ITEM entities
FK	COMPONENT_ID	Number	YES	NO	Foreign key link to COMPONENT that is the generalization of the END_ITEM. For example, a TRUCK is a special kind of COMPONENT (made up of other components) that is tracked as an END_ITEM.
	STATUS	Varchar2	NO	NO	The operational status of the end item.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship73	Non-identifying	END_ITEM	USAGE_PERIOD	1:N
Relationship65	Non-identifying	COMPONENT	END_ITEM	1:1
Relationship115	Non-identifying	END_ITEM	AIRCRAFT	1:N

Description

END_ITEM - An end item is the top level component in the part/component hierarchy. It is tracked separately to allow for capturing of attributes that are common to the end item.

Entity 'FAILURE'

Entity name	FAILURE
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	FAILURE_ID	Integer	YES	NO	A unique identifier (CBM_UDM Specific) for the failure entity
	HOW_RECOGNIZED_CODE	Varchar2	NO	NO	DA PAM 738-751 Code for how the failure or degradation was recognized
	WHEN_DISCOVERED_CODE	Varchar2	NO	NO	DA PAM 738-751 Code for when the failure or degradation was recognized
	MALFUNCTION_EFFECT_CODE	Varchar2	NO	NO	DA PAM 738-751 Code detailing the effect of the malfunction
	STATE_DESCRIPTOR_ID	Integer	NO	NO	Foreign key of the STATE_DESCRIPTOR describing the failure (if applicable)
	STATE_DESCRIPTOR_VALUE	Integer	NO	NO	Value of the STATE_DESCRIPTOR (id applicable)
	REMARKS	Long	NO	NO	Remarks describing the failure
	STATUS	Varchar2	NO	NO	DA PAM 738-751 Status Code of Failure (X, Circle-X, Diagonal)
FK	FAILURE_MODE_ID	Integer	NO	NO	Foreign key to the describing FAILURE_MODE (if applicable)
PFK	COMPONENT_ID	Number	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship23	Identifying	FAILURE	MAINTENANCE_ACTION_ADDRESSES_FAILURE	1:N
Relationship71	Non-identifying	FAILURE_MODE	FAILURE	1:N
Relationship84	Identifying	COMPONENT	FAILURE	1:N

Entity 'FAILURE_MODE'

Entity name	FAILURE_MODE
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	FAILURE_MODE_ID	Integer	YES	NO	Unique (CBM_UDM) identifier for the FAILURE_MODE entity
FK	GENERAL_COMPONENT_ID	Integer	YES	NO	
	FAILURE_MODE_DESCRIPTION	Varchar2	NO	NO	Description of the failure mode
	FAILURE_MODE_PUBLICATION_ID	Long	NO	NO	Foreign key of PUBLICATION describing or prescribing the FAILURE_MODE
	FAILURE_MODE_PUBLICATION_SECTION	Varchar2	NO	NO	Section and page information for the PUBLICATION describing the failure mode.
	FAILURE_MODE_TITLE	Varchar2	NO	NO	A short description of the failure mode. Example - "Hydraulic Pump Overheating"
	FAILURE_CODE	Varchar2	NO	NO	DA PAM 738-751 Failure Code
	STATE_DESCRIPTOR_ID	Integer	NO	NO	Foreign key of describing STATE_DESCRIPTOR (if applicable)
	STATE_DESCRIPTOR_MIN_VALUE	Double precision	NO	NO	Minimum acceptable value of STATE_DESCRIPTOR (if applicable)
	STATE_DESCRIPTOR_MAX_VALUE	Double precision	NO	NO	Maximum acceptable value of STATE_DESCRIPTOR (if applicable)
	STATE_DESCRIPTOR_DURATION	Double precision	NO	NO	Duration (in seconds) of exceedance of STATE_DESCRIPTOR (if applicable)

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship70	Identifying	FAILURE_MODE	FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION	1:N
Relationship71	Non-identifying	FAILURE_MODE	FAILURE	1:N
Relationship78	Non-identifying	GENERAL_COMPONENT	FAILURE_MODE	1:N

Description

A failure mode describes a condition when a component is considered "failed" or degraded. For example, if a hydraulic hose springs a leak, then the hose is experiencing a failure mode known as "leaking."

Entity 'FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION'

Entity name	FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	GENERAL_MAINTENANCE_ACTION_ID	Integer	YES	NO	
PFK	FAILURE_MODE_ID	Integer	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship70	Identifying	FAILURE_MODE	FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION	1:N
Relationship69	Identifying	GENERAL_MAINTENANCE_ACTION	FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION	1:N

Entity 'GEN_COMP_REQ_GEN_MAINT'

Entity name	GEN_COMP_REQ_GEN_MAINT
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	COMPONENT_ID	Number	YES	NO	
PFK	GENERAL_MAINTENANCE_ACTION_ID	Integer	YES	NO	
	INTERVAL_HOURS	Integer	NO	NO	The interval of the required maintenance action (in operating hours) - if applicable.
	INTERVAL_DAYS	Integer	NO	NO	The interval of the required maintenance action (in operating calendar days) - if applicable.
	INTERVAL_EACH_USE	Binary_Double	NO	NO	A flag indicating that the maintenance action is required for each use of the component.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship90	Identifying	COMPONENT	GEN_COMP_REQ_GEN_MAINT	1:N
Relationship91	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_COMP_REQ_GEN_MAINT	1:N

Description

This entity specifies which PARTS are required for a GENERAL_MAINTENANCE_ACTION. Used to help forecast what parts may/are required for future failures.

Entity 'GEN_COMPONENT_REQ_GEN_MAINT'

Entity name	GEN_COMPONENT_REQ_GEN_MAINT
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	GENERAL_COMPONENT_ID	Integer	YES	NO	
PFK	GENERAL_MAINTENANCE_ACTION_ID	Integer	YES	NO	
	INTERVAL_HOURS	Integer	NO	NO	The interval of the required maintenance action (in operating hours) - if applicable.
	INTERVAL_DAYS	Integer	NO	NO	The interval of the required maintenance action (in operating calendar days) - if applicable.
	INTERVAL_EACH_USE	Binary_Double	NO	NO	A flag indicating that the maintenance action is required for each use of the component.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship92	Identifying	GENERAL_COMPONENT	GEN_COMPONENT_REQ_GEN_MAINT	1:N
Relationship94	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_COMPONENT_REQ_GEN_MAINT	1:N

Description

This entity specifies which GENERAL_COMPONENTS are required for a GENERAL_MAINTENANCE_ACTION. Used to help forecast what parts may/are required for future failures.

Entity 'GEN_COMPONENT_STATE_DESCRIPTOR'

Entity name	GEN_COMPONENT_STATE_DESCRIPTOR
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	GENERAL_COMPONENT_ID	Integer	YES	NO	
PFK	STATE_DESCRIPTOR_ID	Integer	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship106	Identifying	GENERAL_COMPONENT	GEN_COMPONENT_STATE_DESCRIPTOR	1:N
Relationship107	Identifying	STATE_DESCRIPTOR	GEN_COMPONENT_STATE_DESCRIPTOR	1:N

Description

A table used to track which GENERAL_COMPONENTS are tracked by which STATE_DESCRIPTORs. A STATE_DESCRIPTOR can describe more than one component. As a rule, state descriptors are tracked only for the highest level component group. All subordinate components inherit the state descriptors of higher components. For example, VERTICAL_AIRSPEED is tracked for the aircraft, and all components that are part of the aircraft share this state. State descriptors must be recorded separately for components that aren't within the same work unit code. For example, state descriptor TAIL_ROTOR_RPM would be assigned to the TAIL_ROTOR HEAD assembly (hypothetical Group 05) as well as the TAIL_ROTOR_BLADE assembly (hypothetical group 07). However, the TAIL_ROTOR_RPM state descriptor would not be assigned to any subordinate components in these groups -i.e. TAIL_ROTOR_RPM for the TAIL_ROTOR_PITCH_LINKS (hypothetical group 07A) would not be recorded.

Entity 'GEN_MAINT_ACTION_REQ_GEN_PERSON'

Entity name	GEN_MAINT_ACTION_REQ_GEN_PERSON
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MAINTENANCE_ACTION_ID	Integer	YES	NO	Foreign key of maintenance action requiring personnel
PK	MAINTENANCE_PERSON_ID	Integer	YES	NO	Foreign key of maintenance person performing maintenance action
	QUANTITY_REQUIRED	Integer	NO	NO	Number of maintenance personnel required
	ESTIMATED_MAN_HOURS	Integer	NO	NO	Estimated number of total man hours for this category of personnel
	ADDITIONAL_SKILLS_REQUIRED	Varchar2	NO	NO	Additional skills (local in nature - i.e. unit specific licensing, time in unit, specific team, etc)
PFK	GENERAL_MAINTENANCE_ACTION_ID	Integer	YES	NO	
PFK	GEN_MAINTENANCE_PERSON_ID	Integer	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship86	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_MAINT_ACTION_REQ_GEN_PERSON	1:N
Relationship117	Identifying	GENERAL_MAINTENANCE_PERSON	GEN_MAINT_ACTION_REQ_GEN_PERSON	1:N

Description

Used to specify what standard/predetermined personnel are needed to complete a certain maintenance activity. This information is used to help plan and predict what components are required for certain maintenance tasks.

Entity 'GEN_MAINT_REQ_PUBLICATION'

Entity name	GEN_MAINT_REQ_PUBLICATION
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	GENERAL_MAINTENANCE_ACTION_ID	Integer	YES	NO	
PK	PUBLICATION_ID	Integer	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship119	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_MAINT_REQ_PUBLICATION	1:N
Relationship120	Identifying	PUBLICATION	GEN_MAINT_REQ_PUBLICATION	1:N

Description

Used to specify what standard/predetermined tools and supplies are needed to complete a certain maintenance activity. This information is used to help plan and predict what is needed for certain maintenance tasks.

Entity 'GEN_MAINT_REQ_TOOL'

Entity name	GEN_MAINT_REQ_TOOL
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	TOOL_ID	Integer	YES	NO	Foreign key of tool performing maintenance action
PFK	GENERAL_MAINTENANCE_ACTION_ID	Integer	YES	NO	
	QUANTITY_REQUIRED	Integer	NO	NO	Number of tools required

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
TOOLMAINTENANCE_ACTION_REQUIRES_TOOL	Identifying	TOOL	GEN_MAINT_REQ_TOOL	1:N
Relationship85	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_MAINT_REQ_TOOL	1:N

Description

Used to specify what standard/predetermined tools and supplies are needed to complete a certain maintenance activity. This information is used to help plan and predict what is needed for certain maintenance tasks.

Entity 'GENERAL_COMPONENT'

Entity name	GENERAL_COMPONENT
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	GENERAL_COMPONENT_ID	Integer	YES	NO	Unique identifier (CBM_UDM specific) for the GENERAL_COMPONENT entity.
	HIGHER_GENERAL_COMPONENT_ID	Integer	NO	NO	The GENERAL_COMPONENT_ID of the next higher assembly.
	QTY_PER_HIGHER	Integer	NO	NO	The quantity of GENERAL_COMPONENTS per the next higher GENERAL_COMPONENT.
FK	CAGE	Varchar2	YES	NO	COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE - The Commercial and Government Entity (CAGE) Code is a five-character code assigned by the Defense Logistics Information Service (DLIS) to the design control activity or actual manufacturer of an item.
	LCN	Varchar2	NO	NO	LOGISTIC SUPPORT ANALYSIS CONTROL NUMBER (LCN) - A code that represents a functional or hardware generation breakdown/disassembly sequence of system/equipment hardware including SE, training equipment, and installation (connecting) hardware.
	ALT_LCN	Varchar2	NO	NO	ALTERNATE LOGISTIC SUPPORT ANALYSIS CONTROL NUMBER CODE - A code used to allow documentation of multiple models of a system/ equipment, or alternate design considerations of an item, using the same Logistic Support Analysis Control Number (LCN) breakdown.
	WUC	Varchar2	YES	NO	WORK UNIT CODE. A code describing what major assembly a component belongs to. Defines a physical slot on the end item where a component is placed. Can be populated by multiple part numbers.
	PART_NUMBER	Varchar2	YES	NO	Unique identifier for a component type. This field may contain a 13-digit FSC/NIIN, ACVC, Manufacturer's Control Number, or a part number of variable length. This is the part number for the repair part used.
	WUC_NOUN	Varchar2	NO	NO	Nomenclature or description of work unit code.
	POSITION_CODE	Integer	NO	NO	Position code for the component.
	NOMENCLATURE	Varchar2	NO	NO	NOMENCLATURE - The descriptive name of an item, usually identifying some characteristics of the item.
	FEDERAL_SUPPLY_CLASSIFICATION	Varchar2	NO	NO	FEDERAL SUPPLY CLASSIFICATION - First four digits of the NATIONAL STOCK NUMBER (NSN)
	NIIN	Varchar2	NO	NO	NATIONAL ITEM IDENTIFICATION NUMBER - Nine-digit number sequentially assigned to each approved item identification number under the federal cataloging program.
	SERIAL_ITEM	Varchar2	NO	NO	Indicates ABSTRACT_COMPONENT is a "serial numbered" item
	UNIT_OF_ISSUE	Varchar2	NO	NO	UNIT OF ISSUE CODE - A two-position, alphabetic code that represents the definite amount or

					quantity of an item that will be issued.
	LOCATION_X	Double precision	NO	NO	Lateral location of the component reference the aircraft datum.
	LOCATION_Y	Double precision	NO	NO	Longitudinal location of the component relative to the aircraft datum.
	LOCATION_Z	Double precision	NO	NO	Vertical position of the component relative to the aircraft datum.
	CD_CONFIG	Number	NO	NO	ULLS-A Configuration Code
	CD_CHANGE_TYPE	Number	NO	NO	ULLS-A - TYPE= TC TBO, RC FINITE LIFE, CC CONDIT
	FLIGHT_SAFETY_COMPONENT	Char	NO	NO	Component is a flight critical component (Y=Yes; N=No)
	MAX_OPERATING_TIME	Number	NO	NO	Maximum allowable operating time of the component (in hours).
	UNIT_PRICE	Number	NO	NO	Current price of unit.
	REMARKS	Varchar2	NO	NO	Additional remarks about the component.
	RESET_COMPONENT	Varchar2	NO	NO	Component is part of the AED Reset Program (Y=yes; N=no)
	SBO	Varchar2	NO	NO	ULLS-A
	SOURCE_OF_SUPPLY	Varchar2	NO	NO	SOURCE OF SUPPLY (SOS) CODE - Identifies a specific supply and distribution organization by its military service / governmental ownership and geographical location. The Source of Supply (SOS) code is used to identify the activity that is to receive requisitions for a given item of supply. The activity can be an Army wholesale supply organization or another federal agency.
	SYS_CATEGORY	Varchar2	NO	NO	MCDS30 Directory for this part.
	UNDER_WARRANTY	Varchar2	NO	NO	ULLS-A Warranty Indicator.
	WARRANTY_DAYS	Number	NO	NO	ULLS-A Warranty period in days.
	ASSEMBLY_LEVEL	Number	NO	NO	Assembly level based on WUC.
	CMB_CERTIFIED	Varchar2	NO	NO	Component is contact memory button verified.
	DA2410_ITEM	Varchar2	NO	NO	Component is required to be tracked by DA FORM 2410.
	LOCAL_TRACKED	Varchar2	NO	NO	Component's locally tracked value pulled from DA FORM 2410 (Y=L on 2410, N= No L on 2410).
	SN_VISUALLY_VERIFIED	Varchar2	NO	NO	Serial number of the component can be visually verified, (Y=yes; N=No).

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
ABSTRACT_COMPONENTCOMPONENT	Non-identifying	GENERAL_COMPONENT	COMPONENT	1:N
ABSTRACT_COMPONENTMAINTENANCE_ACTION_REQUIRES_COMPONENT	Identifying	GENERAL_COMPONENT	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	1:N
Relationship52	Identifying	GENERAL_COMPONENT	MAINT_ACTION_REQ_GEN_COMPONENT	1:N
Relationship78	Non-identifying	GENERAL_COMPONENT	FAILURE_MODE	1:N
Relationship92	Identifying	GENERAL_COMPONENT	GEN_COMPONENT_REQ_GEN_MAINT	1:N
Relationship97	Non-identifying	MANUFACTURER	GENERAL_COMPONENT	1:N
Relationship106	Identifying	GENERAL_COMPONENT	GEN_COMPONENT_STATE_DESCRIPTOR	1:N

Description

A hypothetical component or part that is included in the design of the aircraft. This entity is used to specify all possible components in the maintenance system. Example- "HELICOPTER: AH64 ATTACK" is a general component without an aircraft serial #.

Entity 'GENERAL_MAINTENANCE_ACTION'

Entity name	GENERAL_MAINTENANCE_ACTION
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	GENERAL_MAINTENANCE_ACTION_ID	Integer	YES	NO	Unique identifier (CBM_UDM specific) for GENERAL_MAINTENANCE_ACTION entities
	NARRATIVE	Long	NO	NO	Narrative of the general maintenance action - e.g. "Aircraft Wash"
	MAINTENANCE_ACTION_TYPE	Varchar2	NO	NO	Type of maintenance action (Rebuild, replacement, modification, inspection, repair, installation)
	ESTIMATED_HOURS	Integer	NO	NO	Estimated length of action - in hours
	STATUS	Varchar2	NO	NO	DA PAM 738-751 status of maintenance action (if it becomes a real maintenance action)
	PUBLICATION_ID	Integer	NO	NO	Foreign key link to PUBLICATION governing maintenance action
	PARENT_MAINTENANCE_ACTION_ID	Integer	NO	NO	Foreign key to parent MAINTENANCE_ACTION

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship51	Identifying	GENERAL_MAINTENANCE_ACTION	MAINT_ACTION_REQ_GEN_COMPONENT	1:N
Relationship69	Identifying	GENERAL_MAINTENANCE_ACTION	FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION	1:N
Relationship85	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_MAINT_REQ_TOOL	1:N
Relationship86	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_MAINT_ACTION_REQ_GEN_PERSON	1:N
Relationship91	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_COMP_REQ_GEN_MAINT	1:N
Relationship94	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_COMPONENT_REQ_GEN_MAINT	1:N
Relationship119	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_MAINT_REQ_PUBLICATION	1:N

Description

A general maintenance action or event that a component might experience. Includes inspections, repairs, rebuilds, replacements, etc. Used for planning and prediction purposes.

Entity 'GENERAL_MAINTENANCE_PERSON'

Entity name	GENERAL_MAINTENANCE_PERSON
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	GEN_MAINTENANCE_PERSON_ID	Integer	YES	NO	Unique identifier (CBM_UDM specific)
	MTOE_PARAGRAPH	Varchar2	NO	NO	MTO&E Paragraph of maintenance person (if applicable)
	MTOE_LINE	Varchar2	NO	NO	MTO&E Line of maintenance person (if applicable)
	MOS	Varchar2	NO	NO	Mission Occupational Specialty of person
	RANK	Varchar2	NO	NO	Rank of maintenance person
	ADDITIONAL_SKILLS_COMMENTS	Varchar2	NO	NO	Information regarding additional skills required.
	FLIGHT_STATUS	Varchar2	NO	NO	Flight status of maintenance person

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship116	Identifying	GENERAL_MAINTENANCE_PERSON	MAINTENANCE_PERSON	1:N
Relationship117	Identifying	GENERAL_MAINTENANCE_PERSON	GEN_MAINT_ACTION_REQ_GEN_PERSON	1:N

Description

A position or abstract person involved with maintenance. Examples - Maintainer, Inspector, Test Pilot, Technician, etc.

Entity 'MAINT_ACTION_INVOLVES_COMP'

Entity name	MAINT_ACTION_INVOLVES_COMP
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	MAINTENANCE_ACTION_ID	Integer	YES	NO	
PFK	COMPONENT_ID	Number	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship66	Identifying	COMPONENT	MAINT_ACTION_INVOLVES_COMP	1:N
Relationship26	Identifying	MAINTENANCE_ACTION	MAINT_ACTION_INVOLVES_COMP	1:N

Description

This entity tracks what actual components were involved with a particular maintenance action. For example a particular hose might have been used (replaced) during a hydraulic pump replacement.

Entity 'MAINT_ACTION_INVOLVES_PERSON'

Entity name	MAINT_ACTION_INVOLVES_PERSON
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	MAINTENANCE_PERSON_ID	Integer	YES	NO	Foreign key of maintenance person performing maintenance action
PFK	MAINTENANCE_ACTION_ID	Integer	YES	NO	Foreign key of maintenance action requiring personnel
	QUANTITY_REQUIRED	Integer	NO	NO	Number of maintenance personnel required
	MAN_HOURS	Integer	NO	NO	Number of total man hours for this category of personnel actually expended.
	ADDITIONAL_SKILLS_REQUIRED	Varchar2	NO	NO	Additional skills (local in nature - i.e. unit specific licensing, time in unit, specific team, etc)
PFK	GEN_MAINTENANCE_PERSON_ID	Integer	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship28	Identifying	MAINTENANCE_ACTION	MAINT_ACTION_INVOLVES_PERSON	1:N
Relationship40	Identifying	MAINTENANCE_PERSON	MAINT_ACTION_INVOLVES_PERSON	1:N

Description

This entity tracks what actual personnel were involved with a particular maintenance action. For example a particular crew chief (SGT Rock) might have conducted a hydraulic pump repair.

Entity 'MAINT_ACTION_REQ_GEN_COMPONENT'

Entity name	MAINT_ACTION_REQ_GEN_COMPONENT
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	GENERAL_MAINTENANCE_ACTION_ID	Integer	YES	NO	
PFK	GENERAL_COMPONENT_ID	Integer	YES	NO	
	QUANTITY	Integer	NO	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship52	Identifying	GENERAL_COMPONENT	MAINT_ACTION_REQ_GEN_COMPONENT	1:N
Relationship51	Identifying	GENERAL_MAINTENANCE_ACTION	MAINT_ACTION_REQ_GEN_COMPONENT	1:N

Description

This entity specifies which GENERAL_COMPONENTS are required for a GENERAL_MAINTENANCE_ACTION. Used to help forecast what parts may/are required for future failures.

Entity 'MAINTENANCE_ACTION'

Entity name	MAINTENANCE_ACTION
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MAINTENANCE_ACTION_ID	Integer	YES	NO	Unique identifier (CBM_UDM specific) for MAINTENANCE_ACTION entities
	PARENT_MAINTENANCE_ACTION_ID	Integer	YES	NO	A foreign key linking the MAINTENANCE_ACTION to a parent MAINTENANCE_ACTION. For example, an engine replacement might involve replacing connecting sub components.
	NARRATIVE	Long	YES	NO	Narrative of the maintenance action
	MAINTENANCE_ACTION_TYPE	Varchar2	YES	NO	Type of maintenance action (Rebuild, replacement, modification, inspection, repair, installation)
	START_DTG	Date	YES	NO	Start DTG of maintenance action
	END_DTG	Date	NO	NO	End DTG of maintenance action
	STATUS	Varchar2	YES	NO	Status of maintenance action IAW DA PAM 738-751
	PUBLICATION_ID	Integer	NO	NO	Foreign key link to PUBLICATION governing maintenance action
	NLT_DTG	Date	NO	NO	No later than (NLT) Date Time Group of when the maintenance action must be accomplished
	NLT_AIRCRAFT_HOURS	Integer	NO	NO	No later than (NLT) Aircraft Hours when maintenance action must be accomplished
	NET_DTG	Date	NO	NO	No earlier than (NET) Date Time Group of when the maintenance action must be accomplished
	NET_AIRCRAFT_HOURS	Float	NO	NO	No earlier than (NET) Aircraft Hours when maintenance action must be accomplished

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
MAINTENANCE_ACTIONMAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	Identifying	MAINTENANCE_ACTION	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	1:N
Relationship24	Identifying	MAINTENANCE_ACTION	MAINTENANCE_ACTION_ADDRESSES_FAILURE	1:N
Relationship26	Identifying	MAINTENANCE_ACTION	MAINT_ACTION_INVOLVES_COMP	1:N
Relationship28	Identifying	MAINTENANCE_ACTION	MAINT_ACTION_INVOLVES_PERSON	1:N

Description

A specific maintenance action or event that involves one or more components. Includes inspections, repairs, rebuilds, replacements, etc. Can be a past, present, or future (scheduled) activity.

Entity 'MAINTENANCE_ACTION_ADDRESSES_FAILURE'

Entity name	MAINTENANCE_ACTION_ADDRESSES_FAILURE
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	FAILURE_ID	Integer	YES	NO	
PFK	MAINTENANCE_ACTION_ID	Integer	YES	NO	
PFK	COMPONENT_ID	Number	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship23	Identifying	FAILURE	MAINTENANCE_ACTION_ADDRESSES_FAILURE	1:N
Relationship24	Identifying	MAINTENANCE_ACTION	MAINTENANCE_ACTION_ADDRESSES_FAILURE	1:N

Description

Used to link what MAINTENANCE_ACTIONS were conducted in response to failures. This is important to link maintenance with failure and usage, as not all MAINTENANCE_ACTIONS are in response to failures.

Entity 'MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT'

Entity name	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	MAINTENANCE_ACTION_ID	Integer	YES	NO	Foreign key of maintenance action requiring the abstract component
PFK	GENERAL_COMPONENT_ID	Integer	YES	NO	Foreign key of abstract component addressing maintenance action
	REPLACED_PART_ID	Integer	NO	NO	Foreign key of component replaced
	SATISFYING_PART_ID	Integer	NO	NO	Foreign key of satisfying component ID

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
ABSTRACT_COMPONENTMAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	Identifying	GENERAL_COMPONENT	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	1:N
MAINTENANCE_ACTIONMAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	Identifying	MAINTENANCE_ACTION	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	1:N
Relationship67	Informative	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	COMPONENT	1:N

Description

Used to specify what standard/predetermined general components are needed to complete a certain maintenance activity. This information is used to help plan and predict what components are required for certain maintenance activities.

Entity 'MAINTENANCE_PERSON'

Entity name	MAINTENANCE_PERSON
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	MAINTENANCE_PERSON_ID	Integer	YES	NO	Unique identifier (CBM_UDM specific)
	LAST_NAME	Varchar2	NO	NO	
	FIRST_NAME	Varchar2	NO	NO	
	PID	Varchar2	NO	NO	
PFK	GEN_MAINTENANCE_PERSON_ID	Integer	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship40	Identifying	MAINTENANCE_PERSON	MAINT_ACTION_INVOLVES_PERSON	1:N
Relationship116	Identifying	GENERAL_MAINTENANCE_PERSON	MAINTENANCE_PERSON	1:N

Description

A position or abstract person involved with maintenance. Examples - Maintainer, Inspector, Test Pilot, Technician, etc.

Entity 'MANUFACTURER'

Entity name	MANUFACTURER
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	CAGE	Varchar2	YES	NO	COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE - The Commercial and Government Entity (CAGE) Code is a five-character code assigned by the Defense Logistics Information Service (DLIS) to the design control activity or actual manufacturer of an item.
	MANUFACTURER_NAME	Varchar2	NO	NO	Name of manufacturer
	MANUFACTURER_LOCATION	Varchar2	NO	NO	Location of manufacturer
	MANUFACTURER_POC_INFO	Varchar2	NO	NO	POC information for manufacture
	CONTRACT_NUMBER	Varchar2	NO	NO	CONTRACT NUMBER - If the ninth position of the contract number is a D or G, then a delivery order number is required, and the contract number will be 17 characters; otherwise, the contract number will be 13 characters.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship97	Non-identifying	MANUFACTURER	GENERAL_COMPONENT	1:N

Description

A particular manufacturer of a component. For example - New Hampshire bearing corporation is a manufacturer for many helicopter bearings.

Entity 'PUBLICATION'

Entity name	PUBLICATION
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	PUBLICATION_ID	Integer	YES	NO	Unique identifier for publication
	PUBLICATION_TITLE	Varchar2	NO	NO	The title of the publications.
	PUBLICATION_PAMS_NUMBER	Varchar2	NO	NO	NSN for publication

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship120	Identifying	PUBLICATION	GEN_MAINT_REQ_PUBLICATION	1:N

Description

Any maintenance publication. Technical Manuals, Field manuals, SOPs, etc.

Entity 'REGIME'

Entity name	REGIME
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	REGIME_ID	Number	YES	NO	Unique identifier (CBM_UDM specific) for each FLIGHT REGIME entity
	REGIME_DESCRIPTOR	Varchar2	NO	NO	Full description of the REGIME
	REGIME_TITLE	Varchar2	NO	NO	Title or short description of REGIME
	REFERENCE_PUBLICATION_ID	Number	NO	NO	Foreign key of PUBLICATION describing REGIME

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship82	Identifying	REGIME	USAGE_PERIOD_REGIME	1:N

Description

A particular profile or maneuver an end item might experience. In the future, will be described by one or more state descriptor trajectories.

Entity 'STATE_DESCRIPTOR'

Entity name	STATE_DESCRIPTOR
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	STATE_DESCRIPTOR_ID	Integer	YES	NO	Unique (CBMUDM specific) identifier for state descriptor
	SOURCE_SYSTEM	Varchar2	NO	NO	The data source for the state descriptor (MDR, VMEP, HUMS).
	DESCRIPTION	Varchar2	NO	NO	A meaningful description of the state descriptor
	UNITS	Varchar2	NO	NO	Units state descriptor is measured in
	REFERENCE	Varchar2	NO	NO	Governing reference or publication of state descriptor
	MIN_VALUE	Number	NO	NO	The minimum value for the state descriptor.
	MAX_VALUE	Number	NO	NO	The maximum value for the state descriptor.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship107	Identifying	STATE_DESCRIPTOR	GEN_COMPONENT_STATE_DESCRIPTOR	1:N
Relationship113	Identifying	STATE_DESCRIPTOR	USAGE_PERIOD_STATE_DESCRIPTOR	1:N

Description

An entity used to describe the physical state of an abstract component. For example Temperature and Pressure are state descriptors that describe the state of a NOSE GEAR BOX on an AH64. A state descriptor might describe more than one component. As a rule, state descriptors are tracked only for the highest level component group. All subordinate components inherit the state descriptors of higher components. For example, VERTICAL AIRSPEED is tracked for the aircraft, and all components that are part of the aircraft share this state.

Entity 'TOOL'

Entity name	TOOL
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	TOOL_ID	Integer	YES	NO	Unique identifier (CBM_UDM specific) for the tool
	TOOL_NOMENCLATURE	Varchar2	YES	NO	Description of the tool
	NSN	Varchar2	YES	YES	NSN of tool
	COST	Integer	YES	NO	Cost of tool

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
TOOLMAINTENANCE_ACTION_REQUIRES_TOOL	Identifying	TOOL	GEN_MAINT_REQ_TOOL	1:N

Description

A tool that might be needed or involved with a particular maintenance task.

Entity 'UNIT'

Entity name	UNIT
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	UIC	Varchar2	YES	NO	UNIT IDENTIFICATION CODE - The Unit Identification Code (UIC) is a six-position, alphanumeric code that uniquely identifies a Department of Defense (DOD) organization as a "unit." The UIC is issued by the HQDA DCSOPS.
	DESIGNATION	Varchar2	NO	NO	Designation of unit (e.g. 101st AVN BDE)
	PRESENT_LOCATION	Varchar2	NO	NO	A description of the Present Geographic Code (PRGEO).
	DODAAC	Varchar2	NO	NO	DEPARTMENT OF DEFENSE ACTIVITY ADDRESS CODE - A six-position, alphanumeric code that identifies a specific unit or activity authorized to requisition, receive supplies, or receive billing.
	UNIT_DESCRIPTION	Varchar2	NO	NO	UNIT IDENTIFICATION CODE DESCRIPTION - A description of the Unit Identification Code (UIC).
	DODAAC_POC_NAME	Varchar2	NO	NO	DEPARTMENT OF DEFENSE ACTIVITY ADDRESS CODE POINT OF CONTACT NAME - The registered person to be contacted regarding the Department of Defense Activity Address Code (DODAAC).
	DODAAC_POC_PHONE	Varchar2	NO	NO	DEPARTMENT OF DEFENSE ACTIVITY ADDRESS CODE POINT OF CONTACT PHONE NUMBER - The phone number of the registered person to be contacted regarding the Department of Defense Activity Address Code (DODAAC).
	DSS_ALOC	Varchar2	NO	NO	DIRECT SUPPORT SYSTEM/AIR LINE OF COMMUNICATION (DSS/ALOC) - A one-character, numeric code that indicates if a unit is DSS/ALOC or non-DSS/ALOC, and identifies the CCP that serves the unit.
	COMPONENT_CODE	Varchar2	NO	NO	COMPONENT CODE - ASORTS uses the following codes: 1 (Active Army), 3 (USAR), 2 (ARNG), and 6 (AWRP). The component does not change if the unit is called to active duty from the Reserve or National Guard.
	MACOM_CODE	Varchar2	NO	NO	MAJOR ARMY COMMAND CODE (MACOM) - Identifies the Major Command or Department of the Army Staff Agency.
	PRESENT_GEO_CODE	Varchar2	NO	NO	PRESENT GEOGRAPHIC CODE - A four-position code that indicates the present geographic location.
	STATION_NAME	Varchar2	NO	NO	SHORT STATION NAME - A description of the Station Code.
	STATION_CODE	Varchar2	NO	NO	Code indicating home station of unit.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship64	Non-identifying	UNIT	COMPONENT	1:N

Description

The "owning" unit, organization, or activity for a particular physical component. This could be the operational battalion where an aircraft is stationed, or a warehouse where a replacement transmission is stored.

Entity 'USAGE_PERIOD'

Entity name	USAGE_PERIOD
Entity type	independent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PK	USAGE_PERIOD_ID	Number	YES	NO	A unique (CBM_UDM specific) identifier for the USAGE_PERIOD (Flight or run-up).
FK	END_ITEM_ID	Number	YES	NO	Foreign key link to END_ITEM entity.
	START_DTG	Timestamp	YES	NO	Date Time Group (DTG) in Greenwich Mean Time of start of usage period.
	END_DTG	Timestamp	YES	NO	Date Time Group (DTG) in Greenwich Mean Time of completion of usage period.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship73	Non-identifying	END_ITEM	USAGE_PERIOD	1:N
Relationship87	Identifying	USAGE_PERIOD	USAGE_PERIOD_R EGIME	1:N
Relationship112	Identifying	USAGE_PERIOD	USAGE_PERIOD_S TATE_DESCRIPTOR	1:N

Description

A USAGE_PERIOD is a specific use of the aircraft. It can be a flight, run-up, etc.

Entity 'USAGE_PERIOD_REGIME'

Entity name	USAGE_PERIOD_REGIME
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PFK	REGIME_ID	Number	YES	NO	A unique identifier for the FLIGHT_REGIME of interest
	REGIME_VALUE	Number(x,y)	NO	NO	The REGIME value during the measured time period.
	START_DTG	Timestamp	NO	NO	Start Date Time Group (DTG) of the REGIME measurement.
	END_DTG	Timestamp	NO	NO	End Date Time Group (DTG) of the REGIME measurement.
PFK	USAGE_PERIOD_ID	Number	YES	NO	

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship82	Identifying	REGIME	USAGE_PERIOD_REGIME	1:N
Relationship87	Identifying	USAGE_PERIOD	USAGE_PERIOD_REGIME	1:N

Description

USAGE_PERIOD_REGIME is used to capture specific regime values recorded for the END_ITEM during the USAGE_PERIOD.

Entity 'USAGE_PERIOD_STATE_DESCRIPTOR'

Entity name	USAGE_PERIOD_STATE_DESCRIPTOR
Entity type	dependent

User-defined variables

Name	Value
Owner	
Tablespace for Primary key	
Primary Key Deferrable	No
Primary Key Initially Deferred	No
Tablespace for Table	
Name of Using Index for Primary key	

Attributes

Key	Attribute/role name	Data type	Not null	Unique	Description
PKF	USAGE_PERIOD_ID	Number	YES	NO	
PKF	STATE_DESCRIPTOR_ID	Integer	YES	NO	FK linking to state descriptor that created the value.
	STATE_DESCRIPTOR_VALUE	Number	NO	NO	The value the state descriptor generated in the specified time window.
	START_DTG	Timestamp	NO	NO	The start time of the state descriptor recording.
	END_DTG	Timestamp	NO	NO	The end time of the state descriptor recording.

Relationships

Relationship name	Type	Parent entity	Child entity	Card.
Relationship112	Identifying	USAGE_PERIOD	USAGE_PERIOD_STATE_DESCRIPTOR	1:N
Relationship113	Identifying	STATE_DESCRIPTOR	USAGE_PERIOD_STATE_DESCRIPTOR	1:N

Description

This entity tracks specific state descriptor recordings for a specific usage period (or mission).

Relationship report

Relationship name	Relationship type	Parent entity	Child entity	Card.
ABSTRACT_COMPONENTCOMPONENT	Non-identifying	GENERAL_COMPONENT	COMPONENT	1:N
ABSTRACT_COMPONENTMAINTENANCE_ACTION_REQUIRES_COMPONENT	Identifying	GENERAL_COMPONENT	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	1:N
COMPONENTCOMPONENT_INSTALLATION_RECORD	Informative	COMPONENT	COMPONENT_INSTALLATION_RECORD	1:N
COMPONENTCOMPONENT_INSTALLATION_RECORD1	Informative	COMPONENT	COMPONENT_INSTALLATION_RECORD	1:N
MAINTENANCE_ACTIONMAINTENANCE_ACTION_REQUIRES_COMPONENT	Identifying	MAINTENANCE_ACTION	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	1:N
Relationship106	Identifying	GENERAL_COMPONENT	GEN_COMPONENT_STATE_DESCRIPTOR	1:N
Relationship107	Identifying	STATE_DESCRIPTOR	GEN_COMPONENT_STATE_DESCRIPTOR	1:N
Relationship112	Identifying	USAGE_PERIOD	USAGE_PERIOD_STATE_DESCRIPTOR	1:N
Relationship113	Identifying	STATE_DESCRIPTOR	USAGE_PERIOD_STATE_DESCRIPTOR	1:N
Relationship115	Non-identifying	END_ITEM	AIRCRAFT	1:N
Relationship116	Identifying	GENERAL_MAINTENANCE_PERSON	MAINTENANCE_PERSON	1:N
Relationship117	Identifying	GENERAL_MAINTENANCE_PERSON	GEN_MAINT_ACTION_REQ_GEN_PERSON	1:N
Relationship119	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_MAINT_REQ_PUBLICATION	1:N
Relationship120	Identifying	PUBLICATION	GEN_MAINT_REQ_PUBLICATION	1:N
Relationship23	Identifying	FAILURE	MAINTENANCE_ACTION_ADDRESSES_FAILURE	1:N
Relationship24	Identifying	MAINTENANCE_ACTION	MAINTENANCE_ACTION_ADDRESSES_FAILURE	1:N
Relationship26	Identifying	MAINTENANCE_ACTION	MAINT_ACTION_INVOLVES_COMP	1:N
Relationship28	Identifying	MAINTENANCE_ACTION	MAINT_ACTION_INVOLVES_PERSON	1:N
Relationship40	Identifying	MAINTENANCE_PERSON	MAINT_ACTION_INVOLVES_PERSON	1:N
Relationship51	Identifying	GENERAL_MAINTENANCE_ACTION	MAINT_ACTION_REQ_GEN_COMPONENT	1:N
Relationship52	Identifying	GENERAL_COMPONENT	MAINT_ACTION_REQ_GEN_COMPONENT	1:N
Relationship64	Non-identifying	UNIT	COMPONENT	1:N

Relationship65	Non-identifying	COMPONENT	END_ITEM	1:1
Relationship66	Identifying	COMPONENT	MAINT_ACTION_INVOLVES_COMP	1:N
Relationship67	Informative	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT	COMPONENT	1:N
Relationship69	Identifying	GENERAL_MAINTENANCE_ACTION	FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION	1:N
Relationship70	Identifying	FAILURE_MODE	FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION	1:N
Relationship71	Non-identifying	FAILURE_MODE	FAILURE	1:N
Relationship73	Non-identifying	END_ITEM	USAGE_PERIOD	1:N
Relationship78	Non-identifying	GENERAL_COMPONENT	FAILURE_MODE	1:N
Relationship82	Identifying	REGIME	USAGE_PERIOD_REGIME	1:N
Relationship84	Identifying	COMPONENT	FAILURE	1:N
Relationship85	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_MAINT_REQ_TOOL	1:N
Relationship86	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_MAINT_ACTION_REQ_GEN_PERSON	1:N
Relationship87	Identifying	USAGE_PERIOD	USAGE_PERIOD_REGIME	1:N
Relationship90	Identifying	COMPONENT	GEN_COMP_REQ_GEN_MAINT	1:N
Relationship91	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_COMP_REQ_GEN_MAINT	1:N
Relationship92	Identifying	GENERAL_COMPONENT	GEN_COMPONENT_REQ_GEN_MAINT	1:N
Relationship94	Identifying	GENERAL_MAINTENANCE_ACTION	GEN_COMPONENT_REQ_GEN_MAINT	1:N
Relationship97	Non-identifying	MANUFACTURER	GENERAL_COMPONENT	1:N
TOOLMAINTENANCE_ACTION_REQUIRES_TOOL	Identifying	TOOL	GEN_MAINT_REQ_TOOL	1:N

Relationship 'ABSTRACT_COMPONENTCOMPONENT'

Relationship name	ABSTRACT_COMPONENTCOMPONENT		
Relationship type	non-identifying	Cardinality	1:N
Parent entity	GENERAL_COMPONENT		
Child entity	COMPONENT		

Partiality

Parent	mandatory
Child	optional

Referential integrity

	Insert	Update	Delete
Parent	----	CASCADE	CASCADE
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_COM PONENT_ID	GENERAL_COM PONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship
'ABSTRACT_COMPONENTMAINTENANCE_ACTION_REQUIRES_COMPONENT'

Relationship name	ABSTRACT_COMPONENTMAINTENANCE_ACTION_REQUIRES_CO MPONENT		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_COMPONENT		
Child entity	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT		

Partiality

Parent	mandatory
Child	optional

Referential integrity

	Insert	Update	Delete
Parent	----	CASCADE	CASCADE
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_COM PONENT_ID	GENERAL_COM PONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'COMPONENTCOMPONENT_INSTALLATION_RECORD'

Relationship name	COMPONENTCOMPONENT_INSTALLATION_RECORD		
Relationship type	informative	Cardinality	1:N
Parent entity	COMPONENT		
Child entity	COMPONENT_INSTALLATION_RECORD		

Partiality

Parent	mandatory
Child	optional

Referential integrity

	Insert	Update	Delete
Parent	----	CASCADE	CASCADE
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	COMPONENT_I D	???	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'COMPONENTCOMPONENT_INSTALLATION_RECORD1'

Relationship name	COMPONENTCOMPONENT_INSTALLATION_RECORD1		
Relationship type	informative	Cardinality	1:N
Parent entity	COMPONENT		
Child entity	COMPONENT_INSTALLATION_RECORD		

Partiality

Parent	mandatory
Child	optional

Referential integrity

	Insert	Update	Delete
Parent	----	CASCADE	CASCADE
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	COMPONENT_I D	???	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship

'MAINTENANCE_ACTIONMAINTENANCE_ACTION_REQUIRES_COMPONENT'

Relationship name	MAINTENANCE_ACTIONMAINTENANCE_ACTION_REQUIRES_COMPONENT		
Relationship type	identifying	Cardinality	1:N
Parent entity	MAINTENANCE_ACTION		
Child entity	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT		

Partiality

Parent	mandatory
Child	optional

Referential integrity

	Insert	Update	Delete
Parent	----	CASCADE	CASCADE
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	MAINTENANCE_ACTION_ID	MAINTENANCE_ACTION_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship106'

Relationship name	Relationship106		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_COMPONENT		
Child entity	GEN_COMPONENT_STATE_DESCRIPTOR		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_COMPONENT_ID	GENERAL_COMPONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship107'

Relationship name	Relationship107		
Relationship type	identifying	Cardinality	1:N
Parent entity	STATE_DESCRIPTOR		
Child entity	GEN_COMPONENT_STATE_DESCRIPTOR		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	STATE_DESCRIPTOR_ID	STATE_DESCRIPTOR_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship112'

Relationship name	Relationship112		
Relationship type	identifying	Cardinality	1:N
Parent entity	USAGE_PERIOD		
Child entity	USAGE_PERIOD_STATE_DESCRIPTOR		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	USAGE_PERIOD_ID	USAGE_PERIOD_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship113'

Relationship name	Relationship113		
Relationship type	identifying	Cardinality	1:N
Parent entity	STATE_DESCRIPTOR		
Child entity	USAGE_PERIOD_STATE_DESCRIPTOR		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	STATE_DESCRIPTOR_ID	STATE_DESCRIPTOR_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship115'

Relationship name	Relationship115		
Relationship type	non-identifying	Cardinality	1:N
Parent entity	END_ITEM		
Child entity	AIRCRAFT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	END_ITEM_ID	END_ITEM_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship116'

Relationship name	Relationship116		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_MAINTENANCE_PERSON		
Child entity	MAINTENANCE_PERSON		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GEN_MAINTENANCE_PERSON_ID	GEN_MAINTENANCE_PERSON_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship117'

Relationship name	Relationship117		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_MAINTENANCE_PERSON		
Child entity	GEN_MAINT_ACTION_REQ GEN PERSON		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GEN_MAINTENANCE_PERSON_ID	GEN_MAINTENANCE_PERSON_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship119'

Relationship name	Relationship119		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_MAINTENANCE_ACTION		
Child entity	GEN_MAINT_REQ_PUBLICATION		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_MAIN TENANCE_ACTI ON_ID	GENERAL_MAIN TENANCE_ACTI ON_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship120'

Relationship name	Relationship120		
Relationship type	identifying	Cardinality	1:N
Parent entity	PUBLICATION		
Child entity	GEN_MAINT_REQ_PUBLICATION		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	PUBLICATION_I D	PUBLICATION_I D	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship23'

Relationship name	Relationship23		
Relationship type	identifying	Cardinality	1:N
Parent entity	FAILURE		
Child entity	MAINTENANCE_ACTION_ADDRESSES_FAILURE		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	FAILURE_ID	FAILURE_ID	----
	COMPONENT_ID	COMPONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship24'

Relationship name	Relationship24		
Relationship type	identifying	Cardinality	1:N
Parent entity	MAINTENANCE_ACTION		
Child entity	MAINTENANCE_ACTION_ADDRESSES_FAILURE		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	MAINTENANCE_ACTION_ID	MAINTENANCE_ACTION_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship26'

Relationship name	Relationship26		
Relationship type	identifying	Cardinality	1:N
Parent entity	MAINTENANCE_ACTION		
Child entity	MAINT_ACTION_INVOLVES_COMP		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	MAINTENANCE_ ACTION_ID	MAINTENANCE_ ACTION_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship28'

Relationship name	Relationship28		
Relationship type	identifying	Cardinality	1:N
Parent entity	MAINTENANCE_ACTION		
Child entity	MAINT_ACTION_INVOLVES_PERSON		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	MAINTENANCE_ ACTION_ID	MAINTENANCE_ ACTION_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship40'

Relationship name	Relationship40		
Relationship type	identifying	Cardinality	1:N
Parent entity	MAINTENANCE_PERSON		
Child entity	MAINT_ACTION_INVOLVES_PERSON		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	MAINTENANCE_PERSON_ID	MAINTENANCE_PERSON_ID	----
	GEN_MAINTENANCE_PERSON_ID	GEN_MAINTENANCE_PERSON_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship51'

Relationship name	Relationship51		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_MAINTENANCE_ACTION		
Child entity	MAINT_ACTION_REQ_GEN_COMPONENT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_MAINTENANCE_ACTION_ID	GENERAL_MAINTENANCE_ACTION_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship52'

Relationship name	Relationship52		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_COMPONENT		
Child entity	MAINT_ACTION_REQ_GEN_COMPONENT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_COM PONENT_ID	GENERAL_COM PONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship64'

Relationship name	Relationship64		
Relationship type	non-identifying	Cardinality	1:N
Parent entity	UNIT		
Child entity	COMPONENT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	UIC	UIC	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship65'

Relationship name	Relationship65		
Relationship type	non-identifying	Cardinality	1:1
Parent entity	COMPONENT		
Child entity	END_ITEM		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	COMPONENT_ID	COMPONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship66'

Relationship name	Relationship66		
Relationship type	identifying	Cardinality	1:N
Parent entity	COMPONENT		
Child entity	MAINT_ACTION_INVOLVES_COMP		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	COMPONENT_ID	COMPONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship67'

Relationship name	Relationship67		
Relationship type	informative	Cardinality	1:N
Parent entity	MAINTENANCE_ACTION_REQUIRES_GENERAL_COMPONENT		
Child entity	COMPONENT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	MAINTENANCE_ACTION_ID	???	----
	GENERAL_COMPONENT_ID	???	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship69'

Relationship name	Relationship69		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_MAINTENANCE_ACTION		
Child entity	FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_MAINTENANCE_ACTION_ID	GENERAL_MAINTENANCE_ACTION_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship70'

Relationship name	Relationship70		
Relationship type	identifying	Cardinality	1:N
Parent entity	FAILURE_MODE		
Child entity	FAILURE_MODE_REQUIRES_GENERAL_MAINT_ACTION		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	FAILURE_MODE_ID	FAILURE_MODE_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship71'

Relationship name	Relationship71		
Relationship type	non-identifying	Cardinality	1:N
Parent entity	FAILURE_MODE		
Child entity	FAILURE		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	FAILURE_MODE_ID	FAILURE_MODE_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship73'

Relationship name	Relationship73		
Relationship type	non-identifying	Cardinality	1:N
Parent entity	END_ITEM		
Child entity	USAGE_PERIOD		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	END_ITEM_ID	END_ITEM_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship78'

Relationship name	Relationship78		
Relationship type	non-identifying	Cardinality	1:N
Parent entity	GENERAL_COMPONENT		
Child entity	FAILURE_MODE		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_COMPONENT_ID	GENERAL_COMPONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship82'

Relationship name	Relationship82		
Relationship type	identifying	Cardinality	1:N
Parent entity	REGIME		
Child entity	USAGE_PERIOD_REGIME		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	REGIME_ID	REGIME_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship84'

Relationship name	Relationship84		
Relationship type	identifying	Cardinality	1:N
Parent entity	COMPONENT		
Child entity	FAILURE		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	COMPONENT_ID	COMPONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship85'

Relationship name	Relationship85		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_MAINTENANCE_ACTION		
Child entity	GEN_MAINT_REQ_TOOL		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_MAIN TENANCE_ACTI ON_ID	GENERAL_MAIN TENANCE_ACTI ON_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship86'

Relationship name	Relationship86		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_MAINTENANCE_ACTION		
Child entity	GEN_MAINT_ACTION_REQ GEN PERSON		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_MAIN TENANCE_ACTI ON_ID	GENERAL_MAIN TENANCE_ACTI ON_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship87'

Relationship name	Relationship87		
Relationship type	identifying	Cardinality	1:N
Parent entity	USAGE_PERIOD		
Child entity	USAGE_PERIOD_REGIME		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	USAGE_PERIOD_ID	USAGE_PERIOD_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship90'

Relationship name	Relationship90		
Relationship type	identifying	Cardinality	1:N
Parent entity	COMPONENT		
Child entity	GEN_COMP_REQ GEN_MAINT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	COMPONENT_ID	COMPONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship91'

Relationship name	Relationship91		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_MAINTENANCE_ACTION		
Child entity	GEN_COMP_REQ_GEN_MAINT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_MAIN TENANCE_ACTI ON_ID	GENERAL_MAIN TENANCE_ACTI ON_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship92'

Relationship name	Relationship92		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_COMPONENT		
Child entity	GEN_COMPONENT_REQ_GEN_MAINT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_COM PONENT_ID	GENERAL_COM PONENT_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship94'

Relationship name	Relationship94		
Relationship type	identifying	Cardinality	1:N
Parent entity	GENERAL_MAINTENANCE_ACTION		
Child entity	GEN_COMPONENT_REQ_GEN_MAINT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	GENERAL_MAIN TENANCE_ACTI ON_ID	GENERAL_MAIN TENANCE_ACTI ON_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'Relationship97'

Relationship name	Relationship97		
Relationship type	non-identifying	Cardinality	1:N
Parent entity	MANUFACTURER		
Child entity	GENERAL_COMPONENT		

Partiality

Parent	mandatory
Child	mandatory

Referential integrity

	Insert	Update	Delete
Parent	----	RESTRICT	RESTRICT
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	CAGE	CAGE	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

Relationship 'TOOLMAINTENANCE_ACTION_REQUIRES_TOOL'

Relationship name	TOOLMAINTENANCE_ACTION_REQUIRES_TOOL		
Relationship type	identifying	Cardinality	1:N
Parent entity	TOOL		
Child entity	GEN_MAINT_REQ_TOOL		

Partiality

Parent	mandatory
Child	optional

Referential integrity

	Insert	Update	Delete
Parent	----	CASCADE	CASCADE
Child	NONE	NONE	----

Keys

Key type	Parent key	Child key	Role name
Primary key	TOOL_ID	TOOL_ID	----

User-defined variables

Name	Value
Referential Integrity Deferrable	No
Referential Integrity Initially Deferred	No

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14. ABSTRACT The United States Army's legacy maintenance strategy for its helicopter fleet is centered on replacing and repairing components based on aircraft hours flown. This strategy overlooks how variations in environmental conditions, component stresses, and other exogenous factors effect the lifetime of specific components across the entire fleet of Army Aviation Aircraft. This report describes the design and implementation of a data warehouse that subsumes many disparate databases currently housing information about these factors. This data warehouse supports a common synchronized "maintenance picture" that includes state, health, usage, and logistics data for any component on any helicopter in the fleet. This view enables researchers and planners to individually manage component maintenance according to a "condition based" policy. This report discusses a systems engineering approach to creating a data warehouse including logical and physical designs, data management strategies, and an implementation plan. Discussion is also included detailing how the warehouse might be adopted for conditioned-based maintenance of all Army systems.					
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