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ENGINEERING DATA TRANSMITTAL

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**Document
Number:**

WHC-SD-WM-SWD-015 Rev. 0

**Document
Title:**

Liquid Effluent Monitoring Information System
(LEMIS) System Construction

**Release
Date:**

August 30, 1994

* * * * *

This document was reviewed following the
procedures described in WHC-CM-3-4 and
is:

APPROVED FOR PUBLIC RELEASE

* * * * *

**WHC Information Release Administration
Specialist:**

Christine Willingham

C. Willingham

(Signature)

August 30, 1994

(Date)

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SUPPORTING DOCUMENT

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2. Title

Liquid Effluent Monitoring Information System
(LEMIS) System Construction

3. Number

WHC-SD-WM-SWD-015

4. Rev No.

0

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6. Author

Name: R. T. Adams

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7. Abstract

The Liquid Effluent Monitoring Information System (LEMIS) is being developed as the organized information repository facility in support of the liquid effluent monitoring requirements of the Tri-Party Agreement. It is necessary to provide an automated repository into which the results from liquid effluent sampling will be placed. This repository must provide for effective retention, review, and retrieval of selected sample data by authorized persons and organizations.

This System Construction document is the aggregation of the DMR P+ methodology project management deliverables. Together they represent a description of the project and its plan through four Releases, corresponding to the definition and prioritization of requirements defined by the user.

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LIST OF TERMS

CASE	Computer Aided Systems Engineering
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FY	fiscal year
HEIS	Hanford Environmental Information System
LEMIS	Liquid Effluent Monitoring Information System
QAPP	Quality Assurance Project Plan
SAF	Sample Authorization Form
SAP	Sample and Analysis Plan
Tri-Party Agreement	Hanford Federal Facility Agreement and Consent Order (Ecology et al, 1989)

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LIQUID EFFLUENT MONITORING INFORMATION SYSTEM SYSTEM CONSTRUCTION

1.0 INTRODUCTION

The System Construction phase is the final development phase before implementation of the system. It follows the Functional Design phase and precedes the implementation phase.

2.0 PURPOSE

The purpose of the System Construction phase is to produce the software components and user guides for the system.

This document contains the deliverables that define the software, testing, training, and user documentation of the system.

3.0 SCOPE

The System Construction document contains the following deliverables, each designed to provide a specific portion of the data required for the purpose of this document. The DMR¹ P+ deliverable number is identified in parentheses.

1. Definition of Database and Files (510).
2. Definition of Data Elements (320).
3. Definition of Fuel Utility Runs (530).
4. Coding of Internal Views (620).
5. Training Package (710).
6. Unit Test Environment (730).
7. Functional Test Environment (740).
8. Description of Functional Test Groups (750).
9. Description of Functional Test Units (760).
10. Functional Test Report (770).

4.0 BACKGROUND

The May 21, 1991 proposed amendments to the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al, 1989), otherwise known as the Tri-Party Agreement, requires that a sampling and analysis plan (SAP) be prepared for each of 33 currently identified major Hanford liquid effluent streams that are actively discharged. The SAPs are required to be submitted to the regulators [the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology)] according to a defined schedule.

---

¹DMR Productivity Plus (P+) is a trademark of DMR Group, Inc.

The liquid effluent sampling program is part of the effort to minimize adverse environmental impact during the cleanup operation at the Hanford Site. Of the 33 Phase I and Phase II liquid effluents, all streams actively discharged to the soil column will be sampled. The specific sampling objective for each stream will be somewhat different.

It is necessary to provide an automated repository into which the sample results will be placed. This repository must provide for effective retention, review, and retrieval of the selected sample data by authorized persons and organizations.

Originally planned as an extension of the Hanford Environmental Information System (HEIS), the schedules and manpower/funding commitments for HEIS did not permit HEIS to support the Liquid Effluent Monitoring Information System (LEMIS) project schedule that was established by the regulators for the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement). HEIS simply was not an option during fiscal year (FY) 1992. It was recognized that being responsive to the Tri-Party Agreement milestones for the liquid effluent permitting and monitoring processes was the primary responsibility.

The future for relational, distributive databases is still tenuous for the distributive component. But by maintaining the Oracle¹ database, the Unix² operating system, and the client-server architecture, the U.S. Department of Energy (DOE) is positioned to support the best nearly-distributive capability in the interim. The future does not support a single large database. It supports the use of multiple, distributed relational databases.

LEMIS will be able to provide regulator access via modem using a partitioned system and/or a read-only computer security access for regulators.

---

¹Oracle is a trademark of Oracle Corporation.

²Unix is a trademark of UNIX Systems Laboratories, Inc.

5.0 DEFINITION OF TERMS

The glossary of terms for LEMIS can be found in WHC-SD-WM-TI-546.

6.0 REFERENCES

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Chapter: Building the Physical Data Model
Document: Definition of Databases and Files
Date: June 9, 1994

Chapter No: 1
DMR Number: 510
DMR REV: 0

APPENDIX A

DEFINITION OF DATABASES AND FILES (510)

Chapter: Building the Physical Data Model
Document: Definition of Databases and Files
Date: June 9, 1994

Chapter No: 1
DMR Number: 510
DMR REV: 0

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Chapter: Building the Physical Data Model
Document: Definition of Databases and Files
Date: June 9, 1994

Chapter No: 1
DMR Number: 510
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To guide the coding of database definitions and views

CONTENT:

- 2.0 DIRECTIONS FOR USE OF THE DATABASE.
- 3.0 LIST OF INDEXED COLUMNS IN THE DATABASE.

Custom DMR CASE*Dictionary Reports

Report : Definition of Database (DMR510)
File Name : DMR510.lis
Report Date : 29-OCT-93

PARAMETER VALUES	
System	: GENERIC
Version	: 1

Chapter: Building the Physical Data Model
Document: Definition of Databases and Files
Date: June 9, 1994

Chapter No: 1
DMR Number: 510
DMR REV: 0

2.0 DIRECTIONS FOR USE OF THE DATABASE

All queries and views should use the index paths whenever possible. The indexes using the ID fields should be used to link tables together in queries and views. Numerical indexes should be used rather than character indexes whenever possible.

Chapter: Building the Physical Data Model
 Document: Definition of Databases and Files
 Date: June 9, 1994

Chapter No: 1
 DMR Number: 510
 DMR REV: 0

3.0 LIST OF INDEXED COLUMNS IN THE DATABASE

The List of Indexed Columns may be extracted from the Computer Aided Systems Engineering (CASE) data dictionary as report DMR510. This report may be requested from the development Project Manager. Two representative pages of the report are attached to illustrate the information available.

Table: ADDRESS

Index	U Column	Datatype	Seq
ADDRESS_PK	Y ID_FUNC_UNIT	NUMBER	2
	TYPE_ADDR	CHAR	3

Table: APPLICATION

Index	U Column	Datatype	Seq
PK_APPL	Y IDENT_APPLICATION	CHAR	1

Table: BULLETIN

Index	U Column	Datatype	Seq
FK_BULLETIN	N IDENT_APPLICATION	CHAR	2
	NAME_TRANSACTION	CHAR	4

Table: BULLET_FUNC_UNIT_J

Index	U Column	Datatype	Seq
BULFUJ_UK	Y ID_BULLETIN	NUMBER	1
	ID_PERSON	NUMBER	2

Table: COMMENT_TEXT

Index	U Column	Datatype	Seq
COMTXT_UK	Y ID_ROW	NUMBER	1
	TYPE_TEXT	CHAR	2

Table: DATA_OWNER

Index	U Column	Datatype	Seq
DATOWN_UK	Y IDENT_APPLICATION	CHAR	1
	IDENT_OWNER	CHAR	2

Chapter: Building the Physical Data Model
 Document: Definition of Databases and Files
 Date: June 9, 1994

Chapter No: 1
 DMR Number: 510
 DMR REV: 0

Table: DOCUMENT_HDR

Index	U Column	Datatype	Seq
DOCHDR_PK	Y ID_DOC_HDR	NUMBER	2
DOCHDR_UK	IDENT_DOCUMENT	CHAR	1

Table: DOCUMENT_START

Index	U Column	Datatype	Seq
DOCSRT_PK	Y NAME TRANSACTION	CHAR	1
	BLOCK_NAME	CHAR	2

Table: FUNCTIONAL_UNIT

Index	U Column	Datatype	Seq
FUNCUNIT_PK	Y ID_FUNC_UNIT	NUMBER	2
FUNCUNIT_UK	Y IDENT_FUNCTIONAL_UNIT	CHAR	1

Table: FUNC_UNIT_NEST

Index	U Column	Datatype	Seq
FUNEST_PK	Y ID_FUNC_UNIT_PAR	NUMBER	1
	ID_FUNC_UNIT_CLD	NUMBER	2
	RELATIONSHIP	CHAR	3

Table: JOURNAL_CONTROL

Index	U Column	Datatype	Seq
JNCTRL_UK	Y NAME TABLE	CHAR	1
	IDENT_JOURNAL_FORMAT	CHAR	2

Table: JOURNAL_DISPLAY

Index	U Column	Datatype	Seq
JNDISP_KK	JND_ID PERSON	CHAR	2
	JND_DATE_ADDED	DATE	3

End of Report

Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

APPENDIX B

DEFINITION OF DATA ELEMENTS (320) SYSTEM MANAGEMENT

Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

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Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To establish the meaning of each data element describing an entity or relationship or circulating in the system.

CONTENT:

The contents of this deliverable may be extracted from the Computer Aided Systems Engineering (CASE) data dictionary as report DMR320, subsystem GENERIC. This report may be requested from the development Project Manager. Two representative pages of the report are attached to illustrate the information available.

Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

The following are excerpts from the CASE*Dictionary Reports,
therefore, the format will not follow the current document style.

Custom DMR CASE*Dictionary Reports

Report : Definition of Data Elements (DMR 320)
Filename : SC320.lis
Report date : 28-OCT-93

Parameter values:	
Application System	: GENERIC
Version	: 1

Application	Column Name	Type	Length	Null	Table Name	Description
GENERIC	ACCESS_ROLE	CHAR	12	Y	ACCESS_LOG	The role of the user who accessed the transaction at this time.
	ACTION	CHAR	8	Y	GEN_ERROR_LOG	
	ADDR_BLDG	CHAR	10	Y	ADDRESS	Building identifier associated with the address.
	ADDR_CITY	CHAR	20	Y	ADDRESS	This is the city associated with this address.
	ADDR_LINE_1	CHAR	30	Y	ADDRESS	Line 1 of the address.
	ADDR_LINE_2	CHAR	30	Y	ADDRESS	Line 2 of the Address.
	ADDR_LINE_3	CHAR	30	Y	ADDRESS	Line 3 of the address.
	ADDR_MS	CHAR	10	Y	ADDRESS	The Mail Stop associated with this address.
	ADDR_PHONE	CHAR	18	Y	ADDRESS	This is the phone number associated with this address.
	ADDR_ROOM	CHAR	10	Y	ADDRESS	This is the room identifier (if any) for this address.
	APPLICATION_ACRONYM	CHAR	10	N	APPLICATION	This is the acronym for the application name (i.e. LEMIS, GENERIC), maximum length: 10 characters.
	ASSIGNED TO	CHAR	12	Y	TRANSACTION_BULLET	The ID of the person this problem is assigned to.
	BLOCK_NAME	CHAR	20	N	SYSTEM_COMMENT	The block name of the block that this will be the starting document for. The combination of transaction and block name will determine which starting document will be used. If "ALL" is entered here this will define a starting document for ALL blocks within a transaction.
	CALL_TYPE	CHAR	1	N	DOCUMENT_START	This field contains the call type to be made. Valid values:

C = CALL. The transaction will be "called" and the control will be returned to the calling form.
 N = NEWFORM. The transaction will replace the calling transaction as the current transaction.
 Q = QUERY. The transaction will be called in query only mode.

 This data field:

B-5

<u>Application</u>	<u>Column Name</u>	Type	Length	Null	<u>Table Name</u>	Description
GENERIC	CALL_TYPE	CHAR	1	N	JUNCTION_LIST	- Provides a default value. To accept the default value, press the ENTER key or TAB key. - May contain any character combination. - Must contain a valid value. A blank is not allowed. - All input is converted to upper case.
	CHARGE_CODE	CHAR	10	Y	SYSTEM_COMMENT	A classification code.
	CLASSIFICATION	CHAR	15	Y	SYSTEM_COMMENT	The transaction access code consists of four Y/N flags that determine the access each role is allowed for each transaction. The four flags are in the following order: Q U A D Where Q = Query U = Update A = Add D = Delete
	CODE_ACCESS	CHAR	4	N	TRANSACTION_ACCESS	
						Example:
						User MAY (Y) query using this transaction. +---User MAY NOT (N) update using this transaction. ++--User MAY (Y) add using this transaction. +++-----User MAY NOT (N) delete using this transaction. NYNN
					TRANSACTION_MENU	
					ACCESS_LOG	
	CODE_DESCRIPTION	CHAR	4	Y	TYPE_DATA_VALID_CODE	The QUAD access the user had when they accessed this transaction.
		CHAR	45	N		This field contains a 1-30 character descriptive title of the data value. This field contains a 1-30 character descriptive title of the data value.

B-6

Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

DEFINITION OF DATA ELEMENTS (320)
LIBRARY MANAGEMENT

Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

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Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To establish the meaning of each data element describing an entity or relationship or circulating in the system.

CONTENT:

The contents of this deliverable may be extracted from the CASE data dictionary as report DMR320, subsystem LIBRARY. This report may be requested from the development Project Manager. Two representative pages of the report are attached to illustrate the information available.

Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

The following are excerpts from the CASE*Dictionary Reports,
therefore, the format will not follow the current document style.

Custom DMR CASE*Dictionary Reports

Report : Definition of Data Elements (DMR 320)
Filename : SC321.1is
Report date : 28-OCT-93

Parameter values

Application System : LIBRARY

Version : 1

Application	Column Name	Type	Length	Null	Table Name	Description
LIBRARY	CONTRACT_DETECT_LIM	NUMBER	18	Y	METHOD_CONSTITUENT	Enter the volume of the constituent that constitutes the minimum acceptable level that can be tested by the procedure. This field should be combined with unit of measure to fully identify the volume value. Where the value entered includes a decimal value, enter the value with the decimal point at the place required (1223.04).
						----- This data field: - Is optional and may be left empty. - Must contain a numeric value (0-9), a comma (,), plus (+), minus (-), or period (.).
	CONVERSION_MODIFIER	NUMBER	18	Y	TYPE_UNIT_MEASURE_CO	This field should contain the multiplier used in conjunction with the source unit of measure to arrive at the standard unit of measure. For example: If the source unit of measure was ML (milliliters), and the standard unit of measure was LITER (liters), the conversion modifier would be 1000.00. A default of 1 is used unless another value is entered.
						----- This data field: - Must contain a valid value. A blank is not allowed. - Must contain a numeric value. - A default value is specified.
	COST_METHOD	NUMBER	9	Y	LAB_METHOD	Enter the cost of the laboratory procedure as performed by the laboratory, in dollars and cents.
						----- This data field: - Is optional and may be left empty. - Must contain a numeric value (0-9), a comma (,), plus (+), minus (-), or period (.).
	COUNT_CHANGE	NUMBER	2	N	ANAL_CLASS	This field is system-updated. It contains the number of changes that have occurred to a specific data row in the

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Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

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Chapter No: 1
DMR Number: 320
DMR REV: 0

Application	Column Name	Type	Length	Null	Table Name	Description
LIBRARY	COUNT_CHANGE	NUMBER	2	N	ANAL_CLASS	database. If the field value is zero, no changes have occurred. The field may be displayed for reference by the user but may not be modified. Each occurrence of the data row over time will increment the count as changes are made to the database. This means that no two occurrences of a specific data row will have the same change count value.
					ANAL_CLASS_PLUS	This field is system-updated. It contains the number of changes that have occurred to a specific data row in the database. If the field value is zero, no changes have occurred. The field may be displayed for reference by the user but may not be modified. Each occurrence of the data row over time will increment the count as changes are made to the database. This means that no two occurrences of a specific data row will have the same change count value.
					CONSTITUENT	This field is found in all tables that implement historical change control. The value ranges from 0 through 99 (it being assumed that no individual row will have more than 99 changes to its data) with zero being the initial default value. As a row is updated, the count is stored with the now-history row, incremented and then stored with the new current row. The current row contains a count of the number of changes that have occurred.
					LABORATORY	This field is system-updated. It contains the number of changes that have occurred to a specific data row in the database. If the field value is zero, no changes have occurred. The field may be displayed for reference by the user but may not be modified. Each occurrence of the data row over time will increment the count as changes are made to the database. This means that no two occurrences of a specific data row will have the same change count value.
					LIBRARY_TEXT	This field is system-updated. It contains the number of

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 Date: June 9, 1994

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Chapter No: 1
 DMR Number: 320
 DMR REV: 0

Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

DEFINITION OF DATA ELEMENTS (320)
LEMIS MANAGEMENT

Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

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Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To establish the meaning of each data element describing an entity or relationship or circulating in the system.

CONTENT:

The contents of this deliverable may be extracted from the CASE data dictionary as report DMR320, subsystem LEMIS. This report may be requested from the development Project Manager. Two representative pages of the report are attached to illustrate the information available.

Chapter: Complete the Conceptual Data Model
Document: Definition of Data Elements
Date: June 9, 1994

Chapter No: 1
DMR Number: 320
DMR REV: 0

The following are excerpts from the CASE*Dictionary Reports,
therefore, the format will not follow the current document style.

Custom DMR CASE*Dictionary Reports

Report : Definition of Data Elements (DMR 320)
Filename : SC322.lis
Report date : 28-OCT-93

Parameter values

Application System : TLEMIS

Version : 1

Application	Column Name	Type	Length	Null	Table Name	Description
TLEMIS	ACTION_CODE	CHAR	1	Y	LDR_DET_CINORG LDR_DET_CORG LDR_DET_CRAD LDR_DET_CTIC LDR_DET_CWET EVENT_PERSON	
	ADDR_MS	CHAR	10	Y	EVENT_PERSON	this field contains the mail stop code for the person identified. The mail stop code should be entered as xx/xx.
						----- This data field: - Is optional and may be left empty. - May contain any character combination. - All input is converted to upper case.
	ADDR_PHONE	CHAR	18	Y	EVENT_PERSON	This field contains the telephone number of the person identified. Use the full seven-digit telephone number.
						----- This data field: - Is optional and may be left empty. - May contain any character combination. - All input is converted to upper case.
	ALTITUDE_MSL	NUMBER	5	Y	LEMIS_LOCATION	
	ANALYTE_SYMBOL	CHAR	2	Y	LDR_DET_01I	
	ARTIFACTS	CHAR	1	Y	LDR_DET_CINORG	
		CHAR	3	Y	INORG_RESULTS	
					LDR_HDR_01I	
	CASE_NO	CHAR	10	Y	LDR_HDR_CLAS	
		CHAR	5	Y	LDR_HDR_01I	
					LDR_HDR_010	
	CASE_NUM	CHAR	5	Y	RESULTS	
	CAS_NO	CHAR	10	N	LDR_DET_010 LDR_DET_CINORG LDR_DET_CORG	This field contains a number assigned by the laboratory to a group of samples collected over a given time period from a particular site.

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Document: Definition of Data Elements
Date: June 9, 1994

WMC-SD-MM-SWD-015 REV 0

Chapter No: 1
DMR Number: 320
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Chapter: Complete the Conceptual Data Model
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Definition of Data Elements (DMR320)

Page: 3

Application	Column Name	Type	Length	Null	Table Name	Description
TLEMIS	CAS_NO	CHAR	10	N	LDR_DET_CRAD LDR_DET_CTIC LDR_DET_CWET LDR_TIC_010 RESULT_TIC	
	CHARGE_CODE	CHAR	16	Y	SAMPLE_AUTHORIZATION	----- This data field: - Is optional and may be left empty. - May contain any character combination. - All input is converted to upper case.
	CLARITY_AFTER	CHAR	5	Y	EVENT	
		CHAR	6	Y	INORG_RESULTS LDR_DET_CINORG LDR_HDR_011	
	CLARITY_BEFORE	CHAR	6	Y	INORG_RESULTS LDR_DET_CINORG LDR_HDR_011	
	CODE_CONDITION	CHAR	1	Y	CUSTODY_CHEST	----- This data field: - Is optional and may be left empty. - May contain any character combination. - All input is converted to upper case. Supplied by United States Testing Company, Inc. When a sample is rerun because the initial result was high, this field contains a C+ if the rerun confirmed the initial high result or a C- if the rerun did not confirm the initial high result. Usually the field is blank. HEIS-definition.
	CODE_CONFIRM	CHAR	2	Y	RESULTS	
	COLOR_AFTER	CHAR	9	Y	INORG_RESULTS LDR_DET_CINORG LDR_HDR_011	
	COLOR_BEFORE	CHAR	9	Y	INORG_RESULTS LDR_DET_CINORG	

Chapter: Building the Physical Data Model
Document: Definition of File Utility Runs
Date: June 9, 1994

Chapter No: 1
DMR Number: 530
DMR REV: 0

APPENDIX C

DEFINITION OF FILE UTILITY RUNS (530)

Chapter: Building the Physical Data Model
Document: Definition of File Utility Runs
Date: June 9, 1994

Chapter No: 1
DMR Number: 530
DMR REV: 0

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Chapter: Building the Physical Data Model
Document: Definition of File Utility Runs
Date: June 9, 1994

Chapter No: 1
DMR Number: 530
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To define the runs required to support the databases and files of the system.

CONTENT:

- 2.0 DEFINITION OF BACKUP, RECOVERY AND REORGANIZATION PROCEDURES

Chapter: Building the Physical Data Model
Document: Definition of File Utility Runs
Date: June 9, 1994

Chapter No: 1
DMR Number: 530
DMR REV: 0

2.0 DEFINITION OF BACKUP, RECOVERY AND REORGANIZATION PROCEDURES

2.1 FULL BACKUP

A full backup will archive every file on the system using the Unix¹ dump format. This will be done every fourth Friday. Three months worth of full backups will be kept in storage.

2.2 WEEKLY BACKUP

A weekly backup will archive files using the tar format. Only user files and Oracle² data files will be backed up. This will be done every Friday. Four weeks worth of weekly backups will be kept in storage.

2.3 DAILY BACKUP

A daily backup will archive files using the tar format. Only user files and Oracle data files will be backed up. This will be done Monday through Thursday. Two weeks worth of daily backups will be kept in storage.

2.4 DATABASE RECOVERY

The data base can be recovered by restoring the database files from the most recent Incorrupt weekly backup and applying the archive logs from all of the weekly backups since that time.

2.5 SYSTEM RECOVERY

In case of a complete system loss, due to catastrophic disk failure or loss of whole system due to fire etc, the system can be recovered by restoring the system from the monthly full backup. The procedure for database recovery can then be used to get the database recovered correctly.

2.6 DATABASE DEFRAGMENTATION

In order to prevent database fragmentation, which will impact the performance of the system, the database needs to be defragmented periodically. This involves exporting the database into oracle export file(s), recreating

---

¹Unix is a trademark of UNIX Systems Laboratories, Inc.

²Oracle is a trademark for Oracle Corporation.

Chapter: Building the Physical Data Model
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the table spaces, and then importing the files into the recreated table spaces.

2.7 ADDING ADDITIONAL SPACE TO THE DATABASE

When the table spaces get close to being full, additional space will need to be added to the table spaces.

2.8 ARCHIVING JOURNAL DATA

It may become necessary to archive journal data to improve efficiency and reduce disk utilization.

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Document: Definition of File Utility Runs
Date: June 9, 1994

Chapter No: 1
DMR Number: 530
DMR REV: 0

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Chapter: Program the Physical Data Model
Document: Coding of Internal Views
Date: June 9, 1994

Chapter No: 3
DMR Number: 620
DMR REV: 0

APPENDIX D

CODING OF INTERNAL VIEWS (620)

Chapter: Program the Physical Data Model
Document: Coding of Internal Views
Date: June 9, 1994

Chapter No: 3
DMR Number: 620
DMR REV: 0

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Chapter: Program the Physical Data Model
Document: Coding of Internal Views
Date: June 9, 1994

Chapter No: 3
DMR Number: 620
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To detail the coding of the database views in machine-readable form.

CONTENT:

- Listing of statements

The contents of this deliverable may be extracted from the Computer Aided Systems Engineering (CASE) data dictionary as report DMR620. This report may be requested from the development Project Manager. Two representative pages of the report are attached to illustrate the information available.

Chapter: Program the Physical Data Model
 Document: Coding of Internal Views
 Date: June 9, 1994

Chapter No: 3
 DMR Number: 620
 DMR REV: 0

```
REM
REM This ORACLE V6 RDBMS command file was generated by CASE*Dictionary
REM          on 28-OCT-93
REM
REM For application system TLEMIS version 1
REM
SET SCAN OFF
```

REM Objects being generated in this file are:-

```
REM VIEW
REM     ORGANIZATION
REM     PERSON
REM     RESULTS_CURRENT
REM     RESULTS_SUMMARY
REM     SAF_METHODS
REM     SAF_SAMPLES
REM     SAF_SAMPLE_METHODS
REM     SAMPLE_SCHEDULE
```

```
REM
REM ORGANIZATION
REM
REM Organization view of FUNCTIONAL_UNIT
REM
PROMPT
PROMPT Creating View ORGANIZATION
CREATE VIEW organization
```

```
(
    id organ
    ,date updated
    ,level data_valid
    ,flag text
    ,count_change
    ,ident_owner
    ,ident_organ
    ,type_func_unit
    ,date_added
    ,title
)
AS SELECT
    id func_unit
    ,date updated
    ,level data_valid
    ,flag text
    ,count_change
    ,ident_owner
    ,ident_functional_unit
    ,type_func_unit
    ,date_added
    ,title_func_unit
```

Chapter: Program the Physical Data Model
 Document: Coding of Internal Views
 Date: June 9, 1994

Chapter No: 3
 DMR Number: 620
 DMR REV: 0

```
FROM
  functional_unit
  where type_func_unit = "0";

COMMENT ON TABLE organization
  IS "Organization view of FUNCTIONAL_UNIT";
```

```
REM
REM PERSON
REM
REM Person view of FUNCTIONAL_UNIT
REM
PROMPT
PROMPT Creating View PERSON
CREATE VIEW person
```

```
(
  id_person
  ,date_updated
  ,level_data_valid
  ,flag_text
  ,count_change
  ,ident_owner
  ,ident_person
  ,type_func_unit
  ,date_added
  ,date_expires
  ,title
  ,name_last
  ,name_first
  ,initials
  ,default_printer
)
AS SELECT
  id_func_unit
  ,date_updated
  ,level_data_valid
  ,flag_text
  ,count_change
  ,ident_owner
  ,ident_functional_unit
  ,type_func_unit
  ,date_added
  ,date_expires
  ,title_func_unit
  ,name_last
  ,name_first
  ,initials
  ,default_printer
FROM
  functional_unit
```

Chapter: Program the Physical Data Model
Document: Coding of Internal Views
Date: June 9, 1994

Chapter No: 3
DMR Number: 620
DMR REV: 0

where type_func_unit = "P"
;

COMMENT ON TABLE person
IS "Person view of FUNCTIONAL_UNIT";

Chapter: Prepare Installation
Document: Training Package
Date: June 9, 1994

Chapter No: 6
DMR Number: 710
DMR REV: 0

APPENDIX E
TRAINING PACKAGE (710)

Chapter: Prepare Installation
Document: Training Package
Date: June 9, 1994

Chapter No: 6
DMR Number: 710
DMR REV: 0

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Chapter: Prepare Installation
Document: Training Package
Date: June 9, 1994

Chapter No: 6
DMR Number: 710
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To teach the operation of the system to its users.
- To support acquisition of the knowledge, skills and attitudes that will favor a successful change process in the organization.

CONTENT:

- 2.0 TRAINING OUTLINE
- 3.0 TRAINING MATERIALS

Chapter: Prepare Installation
Document: Training Package
Date: June 9, 1994

Chapter No: 6
DMR Number: 710
DMR REV: 0

2.0 TRAINING OUTLINE

Training for the system will be performed on an as needed basis. The system is easy enough to learn that formal training classes are not required. As each user is identified they will be trained to perform their specific function by an experienced Liquid Effluent Monitoring Information Systems (LEMIS) user or by someone from the LEMIS development team. They will be given the appropriate user's guides for their specific function and shown how to use the online documentation and help facilities.

The following training will be done for each job function:

<u>Job Function</u>	<u>Required Training</u>
Program Administration	Enter requirements, Enter Quality Assurance Project Plan (QAPP), Enter Sample Analysis Plan (SAP), Schedule samples, Approve Sample Form (SAF), View results data, update approval level.
Sample Coordination	Enter SAFs, Load results Data, Enter results, Enter validation flags, View results data Update approval level.
Field Data Entry	Enter Field Data, Query SAP information.
Data Owner	View results data, Run results reports. Update approval level.
Regulator	View results data, Run results reports.

All job functions will be trained in the following:

LEMIS logon and logout procedures, Menu navigation, Access online documentation, Access online help, Using List-Of-Values, Querying data, Entering online problem reports, Running reports.

Chapter: Prepare Installation
Document: Training Package
Date: June 9, 1994

Chapter No: 6
DMR Number: 710
DMR REV: 0

3.0 TRAINING MATERIALS

The training materials for this system consist of the following:

3.1 LEMIS USER'S GUIDES AND OTHER CONTROLLED DOCUMENTS:

3.1.1 WHC-SD-WM-UM-015 User Guide

The User Guide contains general information about how to use the LEMIS system. It tells how to log on to the system, how to navigate the LEMIS menus, and how to use the general functions of the LEMIS screens. It is the starting point for anyone to learn how to access and use LEMIS.

3.1.2 WHC-SD-WM-UM-016 System Managers User Guide

The System Managers User Guide contains information about how to administer the LEMIS system.

3.1.3 WHC-SD-WM-UM-017 System Messages and Codes

This document contains a list of system messages and explanations or remedies for each of the messages.

3.1.4 WHC-SD-WM-UM-024 Specialized User Instructions

The Specialized User Instructions contains specific instructions about how to perform specific functions in LEMIS. There will be a section in this document for each specific task. The tasks that are to be included in this document are:

- 1.0 INTRODUCTION
- 2.0 DATA LOADER USERS GUIDE
- 3.0 DATA VALIDATION PROCEDURES
- 4.0 VERIFICATION PROCEDURES
- 5.0 FIELD DATA PROCEDURES
- 6.0 VIEW DATA PROCEDURES

3.2 LEMIS ONLINE DOCUMENTATION

LEMIS includes an online documentation facility that contains much of the information that is in the user's guides. This information is available to the users from any point in the system with just a keystroke.

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3.3 LEMIS ONLINE HELP FACILITY

LEMIS includes a context sensitive online help facility that contains much information about the system. This facility makes specific information about each data element, table, and transaction available to the users while they are using the system.

Chapter: Prepare Test Environment
Document: Unit Test Environment
Date: June 9, 1994

Chapter No: 7
DMR Number: 730
DMR REV: 0

APPENDIX F
UNIT TEST ENVIRONMENT (730)

Chapter: Prepare Test Environment
Document: Unit Test Environment
Date: June 9, 1994

Chapter No: 7
DMR Number: 730
DMR REV: 0

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Chapter: Prepare Test Environment
Document: Unit Test Environment
Date: June 9, 1994

Chapter No: 7
DMR Number: 730
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To describe the techniques and tools used in unit testing.

CONTENT:

A description of the unit testing techniques, environment and tools is detailed in the Liquid Effluent Monitoring Information Systems (LEMIS) Project Management document (WHC-SD-WM-PMP-007).

Chapter: Prepare Test Environment
Document: Unit Test Environment
Date: June 9, 1994

Chapter No: 7
DMR Number: 730
DMR REV: 0

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Chapter: Prepare Test Environment
Document: Functional Test Environment
Date: June 9, 1994

Chapter No: 7
DMR Number: 740
DMR REV: 0

APPENDIX G
FUNCTIONAL TEST ENVIRONMENT (740)

Chapter: Prepare Test Environment
Document: Functional Test Environment
Date: June 9, 1994

Chapter No: 7
DMR Number: 740
DMR REV: 0

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Chapter: Prepare Test Environment
Document: Functional Test Environment
Date: June 9, 1994

Chapter No: 7
DMR Number: 740
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To describe the techniques and tools used in functional testing.

CONTENT:

A description of the functional testing techniques, environment and tools is detailed in the Liquid Effluent Monitoring Information Systems (LEMIS) Project Management document (WHC-SD-WM-PMP-007).

Chapter: Prepare Test Environment
Document: Functional Test Environment
Date: June 9, 1994

Chapter No: 7
DMR Number: 740
DMR REV: 0

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Chapter: Conduct Functional Tests
Document: Description of Functional Test Groups
Date: June 9, 1994

Chapter No: 8
DMR Number: 750
DMR REV: 0

APPENDIX H
DESCRIPTION OF FUNCTIONAL TEST GROUPS (750)

Chapter: Conduct Functional Tests
Document: Description of Functional Test Groups
Date: June 9, 1994

Chapter No: 8
DMR Number: 750
DMR REV: 0

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Chapter: Conduct Functional Tests
Document: Description of Functional Test Groups
Date: June 9, 1994

Chapter No: 8
DMR Number: 750
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To document the partitioning of functional test groups into test units.

CONTENT:

- Definition of units in each test group. A test group consists of all of the test units in a release.
- Dependencies among test units. The dependencies for each module are listed after the module in parentheses.

The contents of this deliverable may be extracted from the Computer Aided Systems Engineering (CASE) data dictionary as report DMR750. This report may be requested from the development Project Manager. Two representative pages of the report are attached to illustrate the information available.

Chapter: Conduct Functional Tests
 Document: Description of Functional Test Groups
 Date: June 9, 1994

Chapter No: 8
 DMR Number: 750
 DMR REV: 0

Custom DMR CASE*Dictionary Reports

Report : Description of Functional Test Groups (750)
 File Name : DMR750.11s
 Report Date : 29-OCT-93

PARAMETER VALUES	
System	: GENERIC
Version	: 1

Chapter: Conduct Functional Tests
 Document: Description of Functional Test Groups
 Date: June 9, 1994

Chapter No: 8
 DMR Number: 750
 DMR REV: 0

2.0 DEFINITION OF TEST UNITS IN EACH TLEMIS RELEASE

Release	Module	Title	Type	Language
1.0	GE1410Q1	LEMIS Person Directory Last Name	SCREEN	SQL*FORMS
		(Enter persons with GE1110U1.		)
		(Called from GE2410U1.		)
	GE2130Q1	Main Menu	SCREEN	SQL*FORMS
	GE2130R1	MENU STRUCTURE REPORT	REPORT	SQL*REPORTWRITER
		(Enter Menu structure with GE2110U1.		)
	GE2320Q1	Select Role	SCREEN	SQL*FORMS
		(Enter roles with GE2210U1.		)
		(Assign multiple roles to test user with GE1110U1.		)
		(Called from application startup screen.		)
	GE2410U1	Assign People to a Role	SCREEN	SQL*FORMS
	GE2620U1	Assign People to Data Ownership	SCREEN	SQL*FORMS
	GE3120Q1	Function Key Help	SCREEN	SQL*FORMS
	GE3130Q1	Function Key Template	SCREEN	SQL*FORMS
	GE3210U1	Enter Comment/Bug	SCREEN	SQL*FORMS
	GE3250R1	Programmer's Bug Report	REPORT	SQL*REPORTWRITER
	GE3420Q1	Related Data	SCREEN	SQL*FORMS
	GE3520Q1	Application Startup	SCREEN	SQL*FORMS
	GE3721R1	Access Log Report	REPORT	SQL*REPORTWRITER
	GE3830R1	ERROR MESSAGES BY CODE	REPORT	SQL*REPORTWRITER
	GE4130G1	Pick List	SCREEN	SQL*FORMS
	GE6014Q1	On-Line Documentation	SCREEN	SQL*FORMS
	GETEXTU1	TEXTUAL DATA ENTRY	SCREEN	SQL*FORMS
1.1	GE1001U1	Maintain Address Type Codes	SCREEN	SQL*FORMS
	GE1002U1	Maintain Country Codes	SCREEN	SQL*FORMS
	GE1003U1	Maintain State Codes	SCREEN	SQL*FORMS
	GE1110U1	Maintain Person	SCREEN	SQL*FORMS
		(Printer definitions should be entered with GE3910U1		)
		(Applications, Roles, Ownerships should be entered.		)
	GE1210U1	Maintain Organization	SCREEN	SQL*FORMS
		(Enter address code info with: GE1001U1, GE1002U1, GE1003U1		)
	GE3002U1	Table Type Code Maintenance	SCREEN	SQL*FORMS
	GE3003U1	Maintain Text Types	SCREEN	SQL*FORMS
	GE3004U1	Maintain Valid Text types.	SCREEN	SQL*FORMS
	GE3005U1	Maintain Data Validation Codes	SCREEN	SQL*FORMS
	GE3007U1	MAINTAIN COMMENT STATUS CODES	SCREEN	SQL*FORMS

Chapter: Conduct Functional Tests
 Document: Description of Functional Test Groups
 Date: June 9, 1994

Chapter No: 8
 DMR Number: 750
 DMR REV: 0

Release	Module	Title	Type	Language
1.2	GE1310R1	People in the System (Enter persons with GE1110U1	REPORT	SQL*REPORTWRITER)
	GE1310U1	Associate Persons with Organization (Enter persons with GE1110U1. (Enter organizations with GE1210U1.	SCREEN	SQL*FORMS)
	GE1320R1	Organizations in the system. (Enter organizations with GE1210U1.	REPORT	SQL*REPORTWRITER)
	GE2110Q1	Transaction Picklist (Enter transaction with GE2110U1. (Called from GE2210U1.	SCREEN	SQL*FORMS)
	GE2110U1	Transaction Maintenance (Enter application with GE2120U1	SCREEN	SQL*FORMS)
	GE2120U1	Maintain Application Header	SCREEN	SQL*FORMS
	GE2210U1	Role Maintenance (Enter application with GE2120U1. (Enter transactions with GE2110U1.	SCREEN	SQL*FORMS)
	GE2510R1	Transaction List Report (Enter transactions with GE2110U1	REPORT	SQL*REPORTWRITER)
	GE2520R1	Role List Report (Enter roles with GE2210U1	REPORT	SQL*REPORTWRITER)
	GE2530R1	Transactions Authorized (Enter transactions for roles with GE2210U1	REPORT	SQL*REPORTWRITER)
	GE2540R1	Users for each Role	REPORT	SQL*REPORTWRITER
	GE2610U1	Maintain Data Ownership	SCREEN	SQL*FORMS
	GE3110U1	Function Key Help Maintenance	SCREEN	SQL*FORMS
	GE3220U1	System Comments	SCREEN	SQL*FORMS
	GE3240R1	Comment Report	REPORT	SQL*REPORTWRITER
	GE3310U1	Maintain Generic Codes	SCREEN	SQL*FORMS
	GE3722R1	DETAILED ACTIVITY REPORT	REPORT	SQL*REPORTWRITER
	GE3820R1	Messages Report	REPORT	SQL*REPORTWRITER
	GE3910U1	Printer List Maintenance	SCREEN	SQL*FORMS
	GE3920U1	Report Parameter Maintenance	SCREEN	SQL*FORMS
	GE3930Q1	Generate and print Report	SCREEN	SQL*FORMS
	GE3940U1	Maintain Report Output Files	SCREEN	SQL*FORMS
	GE6011R2	Document Headers Detail With Text	REPORT	SQL*REPORTWRITER
	GE6011U1	Maintain Online Documentation	SCREEN	SQL*FORMS
	GE6013U1	Maintain Document Types	SCREEN	SQL*FORMS
	GE6015U1	Maintain Document Start Point	SCREEN	SQL*FORMS

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Release	Module	Title	Type	Language
1.3	GE1120U1	Maintain Person (Enter address code info with: GE1001U1, GE1002U1, GE1003U1)	SCREEN	SQL*FORMS
	GE2111U1	Transaction Maintenance (Menu and non-menu transactions entered with GE2110U1.)	SCREEN	SQL*FORMS
	GE2220U1	Validation Levels for a Role (Enter roles with GE2210U1)	SCREEN	SQL*FORMS
	GE3001U1	Maintain Relationship Codes	SCREEN	SQL*FORMS
	GE3006U1	Maintain Unit of Measure Codes	SCREEN	SQL*FORMS
	GE3220R1	System Comment Context Report	REPORT	SQL*REPORTWRITER
	GE3410U1	Maintain Junction List	SCREEN	SQL*FORMS
	GE3430Q1	Fast Access	SCREEN	SQL*FORMS
	GE3510U1	Maintain Bulletins	SCREEN	SQL*FORMS
	GE3710U1	Maintain Transfer Setup	SCREEN	SQL*FORMS
	GE3721Q1	Start File Transfer	SCREEN	SQL*FORMS
	GE3810U1	Maintain Messages	SCREEN	SQL*FORMS
	GE4419P1	Popup Message	SCREEN	SQL*FORMS
	GE6014R1	Online Documentation Context Report	REPORT	SQL*REPORTWRITER
	GEHELPR1	Context Report for Generic Help	REPORT	SQL*REPORTWRITER
1.4	GE2220R1	Validation Levels for Roles (Enter validation levels for roles with GE2220U1)	REPORT	SQL*REPORTWRITER
	GE3221R1	Problem Resolution Report	REPORT	SQL*REPORTWRITER
	GE3260R1	Problem Disposition by Transaction	REPORT	SQL*REPORTWRITER
	GE3261R1	Problem/Comment Summary Report	REPORT	SQL*REPORTWRITER
	GE3440Q1	Journal information	SCREEN	SQL*FORMS
	GE3530Q1	Transaction Bulletin	SCREEN	SQL*FORMS
	GE6011R1	Document Module Hierarchy Summary	REPORT	SQL*REPORTWRITER
	GE6013R1	Valid Document Type Codes	REPORT	SQL*REPORTWRITER
	GESUSTRI	Sustaining Metrics Report	REPORT	SQL*REPORTWRITER
2.0	GE3241R1	Comment Status Report	REPORT	SQL*REPORTWRITER
	GE3242R1	Comment Disposition Summary Report	REPORT	SQL*REPORTWRITER
	GE3730Q0	Journal Records Setup	SCREEN	SQL*FORMS
	GE3730Q1	Journal Records	SCREEN	SQL*FORMS
	GE3730Q2	Journal Records	SCREEN	SQL*FORMS
	GE3730Q3	Journal Records	SCREEN	SQL*FORMS
	GE3731U1	Journal Control	SCREEN	SQL*FORMS

End of Report

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Document: Description of Functional Test Units
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APPENDIX I

DESCRIPTION OF FUNCTIONAL TEST UNITS (760)

Chapter: Conduct Functional Tests
Document: Description of Functional Test Units
Date: June 9, 1994

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DMR Number: 760
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Chapter: Conduct Functional Tests
Document: Description of Functional Test Units
Date: June 9, 1994

Chapter No: 8
DMR Number: 760
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To describe the conditions to be tested in each functional test unit.
- To serve as a reference for the verification of functional tests.

CONTENT:

- The description of test cases, input data, and expected results for each module is listed in the test plan for each module.
- The test plans for each module are included in the following documents:

WHC-SD-WM-TP-163	LEMIS Test Plans Release 1.0
WHC-SD-WM-TP-164	LEMIS Test Plans Release 1.1
WHC-SD-WM-TP-165	LEMIS Test Plans Release 1.2
WHC-SD-WM-TP-169	LEMIS Test Plans Release 2.0

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Chapter: Conduct Functional Tests
Document: Functional Test Report
Date: June 9, 1994

Chapter No: 8
DMR Number: 770
DMR REV: 0

APPENDIX J

DESCRIPTION OF FUNCTIONAL TEST UNITS (770)

Chapter: Conduct Functional Tests
Document: Functional Test Report
Date: June 9, 1994

Chapter No: 8
DMR Number: 770
DMR REV: 0

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Chapter: Conduct Functional Tests
Document: Functional Test Report
Date: June 9, 1994

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DMR Number: 770
DMR REV: 0

1.0 PURPOSE & CONTENT

PURPOSE:

- To describe the variances found in the functional test.
- To document the test results.

CONTENT:

- The variances, corrective measures, and test results for each module are listed in the completed test plan for each module.
- The test plans for each module are included in the following documents:

WHC-SD-WM-TP-163	LEMIS Test Plans Release 1.0
WHC-SD-WM-TP-164	LEMIS Test Plans Release 1.1
WHC-SD-WM-TP-165	LEMIS Test Plans Release 1.2
WHC-SD-WM-TP-169	LEMIS Test Plans Release 2.0

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