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ENGINEERING DATA TRANSMITTAL

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	3. Information			3. Disapproved w/comment	6. Receipt acknowledged

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1	/	Design Authority GP Janicek	<i>[Signature]</i>	2/24/98	57-12	1	/	TE Rainey	<i>[Signature]</i>	H6-12	2/24/98
1	/	Design Agent GA Barnes	<i>[Signature]</i>	2/24/98	B4-51						
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1	/	Cog. Mgr. JS Schofield	<i>[Signature]</i>	2/24/98	S7-12	57-12					
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18. GA Barnes <i>[Signature]</i> 2-24-98 Signature of EDT Originator Date		19. TE Rainey <i>[Signature]</i> 2/26/98 Authorized Representative Date for Receiving Organization		20. GP Janicek <i>[Signature]</i> 2/26/98 Design Authority/Cognizant Manager Date		21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments	
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# LIGHT DUTY UTILITY ARM STARTUP PLAN

G. A. Barnes, SGM Eurisys Services Corp. for  
Lockheed Martin Hanford Corporation, Richland, WA 99352  
U.S. Department of Energy Contract DE-AC06-96RL13200

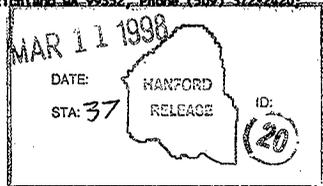
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Abstract: This Startup Plan encompasses activities necessary to perform startup and operation of the LDUA in Facility Group 3 tanks and complete turnover to CPO. The activities discussed in this plan will occur prior to, and following the U.S. Department Energy, Richland Operations Office Operational Readiness Review. This startup plan does not authorize or direct any specific field activities or authorize a change of configuration. As such, this startup plan need not be Unresolved Safety Question (USQ) screened.

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*James Cardal* 3-11-98  
Release Approval Date

Release Stamp

Approved for Public Release

**LIGHT DUTY UTILITY ARM  
STARTUP PLAN**

**HNF-2300  
Rev. 0**

**G. A. Barnes  
SGN Eurisys Services Corporation**

**February, 1998**

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## LIGHT DUTY UTILITY ARM STARTUP PLAN

### 1.0 PURPOSE

This plan details the methods and procedures necessary to ensure a safe transition in the operation of the Light Duty Utility Arm (LDUA) System. The steps identified below outline the work scope and identify responsibilities to complete startup, and turnover of the LDUA to Characterization Project Operations (CPO).

### 2.0 SCOPE

This Startup Plan encompasses activities necessary to perform startup and operation of the LDUA in Facility Group 3 tanks and complete turnover to CPO. The activities discussed in this plan will occur prior to, and following the U.S. Department of Energy, Richland Operations Office (RL) Operational Readiness Review (ORR). Contained in Appendix A is the baseline schedule that lists system startup and turnover activities.

This startup plan does not authorize or direct any specific field activities or authorize a change of configuration. As such, this startup plan need not be Unresolved Safety Question (USQ) screened.

### 3.0 BACKGROUND

#### 3.1 SYSTEM DESCRIPTION

The LDUA is a mobile, multi-axis positioning system capable of accessing tanks through existing 12-inch diameter and larger tank dome risers. This system provides a flexible robotic platform designed to exercise tools called end effectors for accomplishing activities such as in situ inspection, waste assessment, equipment deployment, and sampling. The end effectors are mounted on the end of the LDUA by attachment to a tool interface plate (TIP) with mating service connectors.

The various end effectors are deployed into tanks to facilitate requirements such as surveillance, inspection, waste characterization, and movement of in-tank equipment. The end effectors may be locally waste disturbing near the waste surface (up to 12 inches deep) by probing, scraping, grabbing or sampling tank waste at various locations within the tank. In addition, the end effectors may be used to place monitoring equipment onto or into tank waste.

Major components of the LDUA system are as follows:

- **End Effectors:** end effectors are the tools that perform the specific in-tank tasks of the LDUA system;

- **Light Duty Utility Arm:** the light duty utility arm is a robotic manipulator (having seven degrees of freedom) that provides dexterity to reach around obstructions in the tank while orienting and positioning end effectors to any surface within its operating envelope;
- **Tank Riser Interface and Confinement (TRIC) System:** the TRIC system provides an interface between the LDUA system and the waste tank riser, and is used for change-out of end effectors, minor maintenance tasks, and containment of the tank atmosphere;
- **Vertical Positioning Mast:** the vertical positioning mast provides the gross vertical positioning of the LDUA above the waste;
- **Mobile Deployment System:** the mobile deployment system is used to transport the LDUA between and within tank farms;
- **Operations Control System:** the operations control system includes most of the control and data acquisition equipment for the LDUA system, consisting of the operations control trailer, the at-tank instrument enclosure, the supervisory control and data acquisition system, and the control network;
- **Operations Control Trailer:** the operations control trailer is a standard semi-trailer that is towed to the tank farm and parked outside the perimeter fence. It provides two separate work areas - the operating area, containing the control panels and workstations which control the LDUA system; and the visitor area, containing desks, shelves, data access workstations, and other staff amenities;
- **Utilities:** electrical systems, compressed gas systems, and decontamination wash water supply system.

#### 4.0 RESPONSIBILITIES

The LDUA Startup Team has been formed with key personnel from the Hanford Tanks Initiative (HTI) and Characterization Project. Cognizant Engineering and Design Authority support is provided by Characterization Equipment Engineering. The LDUA Startup Team and the individual responsibilities for each activity are provided in Appendix A.

CPO will specifically train a selected group who will work with the LDUA Startup Team to provide operations support for startup of the LDUA. This selected group consists of two Persons In Charge (PIC), seven Nuclear Process Operators (NPO) and various other maintenance and radiological control personnel. The Operations Shift Manager will release work activities in this startup sequence and direct the startup team to proceed. When appropriate, a senior supervisory watch will observe the activity.

## 5.0 START-UP OF THE LDUA

### 5.1 OVERVIEW OF STARTUP SEQUENCE

Startup of the LDUA (deployment in tank AX-104) will consist of the following activities:

- **Install Utilities** – This activity will provide appropriate utilities to AX-farm to power the LDUA system. It is anticipated that this activity will be completed prior to the completion of the RL ORR.
- **Move LDUA to AX-farm** – This activity will consist of moving the LDUA equipment from the Cold Test Facility (CTF) in the 400 area to AX-Farm.
- **Setup equipment at AX-farm** – The LDUA system will be setup for deployment into AX-104, as depicted in Figure 1.

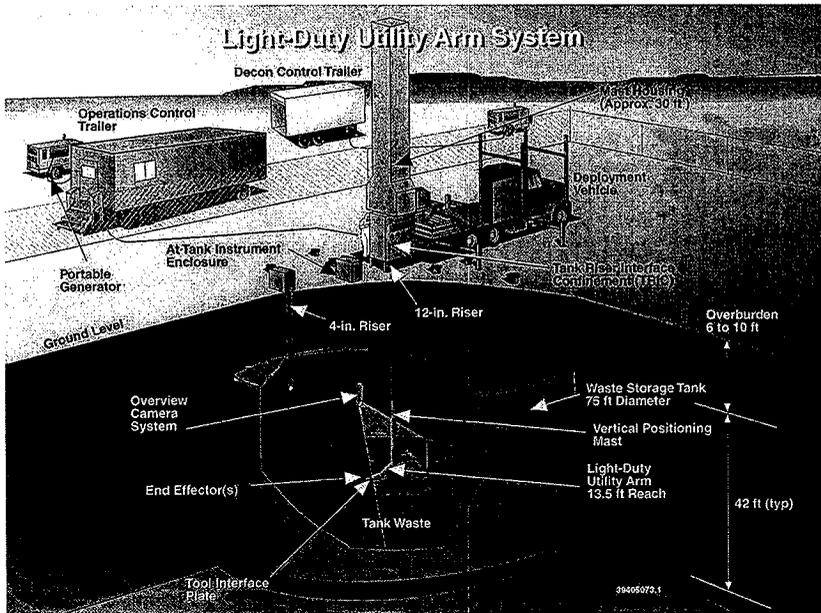


Figure 1

- **Deploy LDUA in AX-104/Complete Campaign** – The LDUA system will be deployed into tank AX-104 and sampling will be conducted with the Extended Reach End Effector (EREE). Approximately 15 samples will be retrieved from the bottom, side-walls and dome (Tank 241-AX-104 Light Duty Utility Arm Sampling and Analysis Plan, HNF-2071). Video inspection of the interior of AX-104 will also be conducted during deployment with the High Resolution Stereo Video System (HRSVS) end effector.
- **Ship Samples to 222S** – The samples obtained during the LDUA deployment will be shipped to the 222S laboratory for analysis.
- **Remove Equipment** – At the completion of the deployment, the LDUA will be removed from the tank and all associated equipment will be placed in storage.
- **Remove Boot** – During this activity, the LDUA will be moved to TX farm where it will be deployed into an empty caisson. As the LDUA is lowered into the TX farm caisson, the protective rubber boots will be removed. The LDUA will also be decontaminated at this time, if required.

- **Transport to Storage** – Upon successful decontamination of the LDUA, the LDUA system and all subsystems will be transported to storage.

## 5.2 STARTUP PREREQUISITES

Prior to commencing the Startup activities, it must be confirmed that the Department of Energy, Richland Operations Office (RL), Operational Readiness Review (ORR) has been completed and RL has issued authorization to startup.

Prior to the RL ORR, the following items must be completed:

- RL must release the hold on LDUA field activities. The hold on LDUA field activities occurred in February of 1997 and it will not be lifted until RL is satisfied that there is adequate authorization basis for the LDUA system.
- All ORR prerequisites are completed. The following is a list of ORR prerequisites:
  - **Preparation and approval of LDUA system Preventive Maintenance (PM) and calibration procedures.** The basis for the scope of the PM procedures is detailed in PNNL document, PNNL-LDUA-PMR-97211701, (VI # 22803). The scope of the calibration program is based on the LDUA safety equipment list (HNF-2147) and the Flammable Gas Equipment Advisory Board (FGEAB) letter (FGEAB-97-019, Rev 2, September 9, 1997.) A total of 6 PM and calibration procedures are required.
  - **Revision and approval of the LDUA Plant Operating Procedures (POP).** The LDUA POPs were first prepared in FY-96 for the initial deployment of the LDUA in tank T-106 and must be revised to include controls from the BIO, TSRs and FGEAB requirements. A total of 7 POPs are required.
  - **Reconcile POPs to the Authorization Basis.** Preparation of the POPs was largely performed prior to finalization of the AB. CPO personnel will verify that the POPs have incorporated all controls from the authorization basis documents.
  - **Prepare and approve work package.** The work package is the first line work authorization document. It includes instructions, permits, dome load calculations and other documentation required for the operating crew to safely deploy the LDUA. This activity cannot be completed until the POPs are approved.
  - **Setup operator training program.** This task will include preparation of all operator training documentation. The training documentation will be adequate to qualify the operations personnel to operate the LDUA. The documentation will include training handouts, OJT cards, examinations and training plan.

- **Operator Training.** Operator training will occur in the Cold Test Facility (CTF) in the 400 area. Operator training will begin before the training program is complete, however the operators will not be qualified until they attend the classes and pass the exam. In addition, the POPs will be validated during the initial phase of operator training.
- **Setup maintenance training program.** The CPO maintenance personnel will be maintaining the LDUA after the system is turned over. This activity will prepare the training program for CPO maintenance personnel. The maintenance training program will focus on orientations to the LDUA systems and LDUA PM and calibration procedures, rather than component-specific training.
- **Maintenance training.** Maintenance training of CPO personnel will occur after the maintenance training program is setup. Maintenance training cannot occur until after the PM and calibration procedures are completed.
- **Safety documentation for the Extended Reach End Effector (EREE).** Safety documentation for the EREE must be completed. The safety documentation for the EREE includes preparation of a Hazards Identification and Evaluation (HIE) and preparation of a USQ screening/determination. The information in the HIE will feed into the POPs and other documentation, as required.
- **Review procedures for conduct of operations.** The scope of this activity is to review the operations procedures to verify that all aspects of the conduct of operations program are considered.
- **Review calibration, testing and PMs.** A separate review of the PM and calibration procedures will be conducted to verify adequacy.
- **Place PMs and calibrations on recall.** This activity will place all PM and calibration items identified during the preparation of the PM and calibration procedures in the CPO preventive maintenance and calibration recall system. This task will also review the current status of the LDUA PMs and calibrations.
- **Calibrate LDUA instruments and perform PMs.** This activity will consist of preparation of the work packages and performing the calibrations and maintenance on the LDUA system. This activity cannot start until the calibration and PM procedures are approved and maintenance personnel are adequately trained.
- **Review HATS and DTS.** This activity will review the various tracking systems associated with CPO and TWRS to verify there are no issues that could affect the LDUA deployment

- **Identify changes to S/RIDS.** The scope of this activity is to review the current S/RIDS program to verify that the startup of the LDUA does not change any of the requirements within the S/RIDS.
- **Prepare SEL.** A LDUA system Safety Equipment List (SEL) will be prepared. The SEL will provide requirements for calibration and dedication of Commercial Grade Items (CGI)
- **Prepare CGI.** CGI data sheets will be prepared during this activity. The CGI data sheets will be based on the SEL. Completion of the CGI forms will document the dedication of commercial grade items to the appropriate Safety Class, Safety Significant or GS-DID level.
- **Prepare essential drawings.** Essential drawings will be prepared and released that identifies the safety equipment identified in the SEL.
- **Prepare storage plan.** A storage plan will be prepared that identifies the storage location for the LDUA after deployment in AX-104. The selected storage location must allow storage of radioactive material and must provide adequate electrical utilities for operating the HVAC systems and maintaining climate control of the various LDUA systems
- **Complete ABU Punchlist.** In addition to the previously listed activities, the following tasks must be finished to complete the Acceptance for Beneficial Use (ABU) punchlist:
  - ◊ **Issue Documents to CVI.** Prior to turnover of the LDUA system to Operations, all design and vendor documentation will be transmitted to the Vendor Information (VI) file.
  - ◊ **Issue ATP.** The LDUA Phase 2 qualification test report (HNF-SD-WM-ATR-196) must be issued. Phase 2 qualification testing verified that the LDUA met the flammable gas control imposed by the FGEAB (FGEAB-97-019, Rev 2, September 9, 1997)
  - ◊ **Issue Test Report.** The vendor, (PNNL), will issue the EREE test report. The EREE test report will then be transmitted to the VI file.
  - ◊ **Issue O&M Manuals.** The Operations and Maintenance manuals that were prepared by the vendors of the LDUA system will be issued.
  - ◊ **Complete Spare Parts Inventory.** This task will include preparation of the recommended spare parts list by the vendor (PNNL) and verification that recommended spare parts are available for LDUA startup.
  - ◊ **Release vendor drawings to CVI.** This task will update all LDUA vendor drawings to include red line changes identified after delivery of the system. The updated vendor drawings will be released by the vendor

(PNNL) with vendor QA review. The updated vendor drawings will then be transmitted to the VI file.

- ◊ **Issue ABU.** Once the above tasks are completed, a final ABU checklist will be issued. Issuance of the ABU will be tied to completion of the management self-assessment.
- **Review Environmental Permits.** A review of environmental permits associated with the LDUA system will be performed to verify that all environmental permits associated with LDUA startup are current and approved.
- **Prepare drill Scenarios.** Various drill scenarios will be prepared to verify that the operations team is adequately trained for typical emergency responses.
- **Management observe drills.** Once the drill scenarios are prepared, management will observe and evaluate the team's performance while conducting these drills.
- **Develop design compliance matrix.** The design compliance matrix will identify all design criteria that was used to develop the LDUA system and it will also detail how the design criteria has been met.

## 6.0 SYSTEM TESTING

### 6.1 OPERATIONAL TESTING

Operational testing of the LDUA has been completed. The scope of the operational testing is detailed in WHC-SD-WM-OTP-213, Rev. 0. The results of the operational testing are detailed in HNF-SD-WM-OTR-213, Rev. 0. **No additional operational testing is anticipated at this time.**

### 6.2 ACCEPTANCE TESTING

Acceptance testing was performed in two parts: Phase 1 qualification (acceptance) testing was performed in fiscal year, 1996, per ATP-WHC-SD-TD-ATP-005 and the results are detailed in WHC-SD-TD-ATR-005. Phase 2 qualification (acceptance) testing was performed in fiscal year 1997 per WHC-SD-WM-ATP-196 and the results are detailed in WHC-SD-WM-ATR-196. **No additional acceptance testing is anticipated at this time.**

## 7.0 REFERENCES

1. FGEAB-97-019, Rev 2, "*Flammable Gas Equipment Advisory Board Interpretation/ Recommendation Report*," dated September 9, 1997.
2. HNF-2071, Rev. 0, "*Tank 241-AX-104 Light Duty Utility Arm Sampling and Analysis Plan*", dated February, 1998.
3. HNF-2147, Rev 0, "*Safety Equipment List for the Light Duty Utility Arm System*," dated February, 1998.
4. HNF-SD-WM-ATP-196, Rev 0, "*Light Duty Utility Arm Equipment Qualification Test Procedure*", 1997.
5. HNF-SD-WM-ATR-196, Rev 0, "*Light Duty Utility Arm Equipment Qualification Test Report*", 1997.
6. HNF-SD-TD-ER-005, Rev. 1, "*Light Duty Utility Arm Baseline System Description*", dated December, 16, 1996.
7. HNF-SD-WM-OTR-213, REV 0, "*Light Duty Utility Arm (LDUA) Operability Test Report*, dated October, 1996.
8. Letter, J.K. McClusky, RL to H.J. Hatch, FDH, "*contract Number DE-AC06-96RL13200, Directed Hold on Tank Intrusive Activities With the Light Duty Utility Arm (LDUA) and Push Mode Sampling*," 9751787, dated February 27, 1997.
9. PNNL-LDUA-PMR-97211701, (contained inf VI file # 22803), "*Integrated LDUA System Preventive Maintenance Requirements*, dated December 30, 1997.
10. WHC-SD-WM-OTP-213, Rev 0, "*Operability Test Procedure for the Light Duty Utility Arm in Tank T-106*", dated 1996
11. WHC-SD-WM-TD-004, Rev 0, "*Light Duty Utility Arm Qualification Test Procedure*," 1996.
12. WHC-SD-WM-TD-004, Rev 0, "*Light Duty Utility Arm Qualification Test Report*," 1996.
13. LMHC-97-61734, "*Light Duty Utility Arm Plan of Action*" , dated December 18, 1998.
14. LMHC, Draft "*Light Duty Utility Arm Plant Readiness Plan*", Dated February, 1998

APPENDIX A

DSI, Bill Root to D. Shuford et al, "FY-98 LDUA Schedule/Cost Estimate" Dated December 29, 1997, 9 pages (including cover).

DON'T SAY IT --- Write It!

DATE: 12/29/97

TO: D.H. Shuford	S7-01
R.S. Popielarczyk	S7-01
J. G. Burton	S7-21
R.M. Boger	S7-12
D.O. Dobson	R2-50
J.D. McDonald	R2-50
C.A. Esvelt	S7-12
W.J. Kennedy	S7-03
T.C. Bender	R2-83
J.M. Mooris	R2-87
T.E. Rainey	H6-12
G.A. Barnes	B4-51

FROM: Bill Root

Telephone: 373-1828

*Bill Root 12/29/97*

SUBJECT: FY-98 LDUA SCHEDULE/COST ESTIMATE

Attached, please find a copy of the approved schedule/cost estimate and statements of work for the FY-98 LDUA deployment and sampling activities. If you have any questions, please contact either Geoff Barnes at 376-2241 or Tom Rainey at 373-3531.

HTI FY-98 Scope Statements  
Task: 1D2CL50K02 - LDUA Deployment

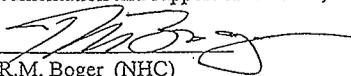
**CHARACTERIZATION OPERATIONS**

Scope Statement: Provide Operations personnel to support the LDUA deployment in tank 241-AX-104 as identified in the attached schedule/cost estimate. This support shall include LDUA operator and maintenance training, Plant readiness preparation for the Operational Readiness Review (ORR), transport of the LDUA equipment to AX-farm, setup of LDUA equipment at AX-farm, operation/sampling with the LDUA in tank 241-AX-104, removal and decontamination of the LDUA equipment when the deployment is completed and transport of the LDUA equipment to storage.

Approvals:   
R.S. Popielarczyk (LMHC)

**CHARACTERIZATION ENGINEERING**

Scope Statement: Provide cognizant engineering and Design Authority support for the deployment of the LDUA in tank 241-AX-104 as identified in the attached schedule/cost estimate. This support shall include preparation of all operations and calibration/maintenance procedures for the LDUA, all USQ documentation that is required to deploy the LDUA, design authority review and approval of all design baseline documentation, cognizant engineering review and approval of all field work packages, coordination of all appropriate reviews and approvals of operating and maintenance/calibration procedures, field work packages and other required documentation and support of the ORR, as required.

Approvals:   
R.M. Boger (NHC)

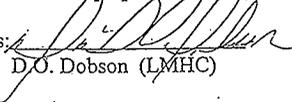
**TESTING AND SYSTEM READINESS**

Scope Statement: Provide personnel (site and/or contractor personnel, as required) to perform the LDUA ORR per the attached schedule/cost estimate. This task shall include preparation/approval of the ORR Implementation Plan, ORR team selection and training, performance of the Management Self Assessment (MSA), performance of the Independent contractor ORR and preparation and approval of the ORR final report.

PREPARE FOR AND

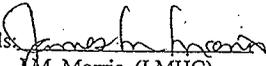
REVIEWER VALIDATION OF AFFIDAVITS

PROVIDE CONTRACTOR ORR TEAM LEADER,

Approvals:   
D.O. Dobson (LMHC)

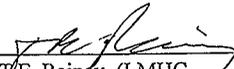
**TANK FARMS OPERATIONS TRAINING**

Scope Statement: Prepare LDUA operations training program and LDUA maintenance training programs per the attached schedule/cost estimate. Provide training for Operations and Maintenance personnel per the attached schedule/cost estimate.

Approvals:  12/22/07  
J.M. Morris (LMHC)

**HTI LDUA DEPLOYMENT**

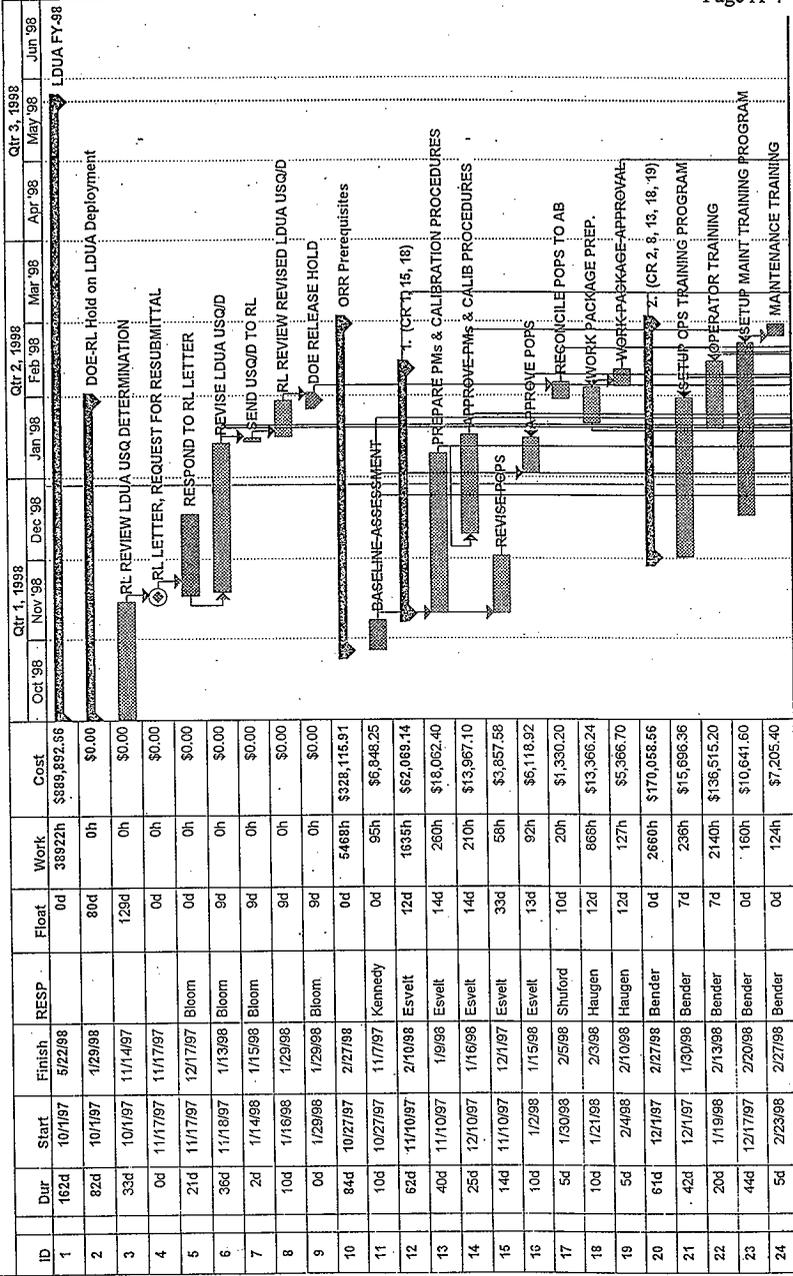
**Scope Statement:** Manage the tasks identified in the attached schedule/cost estimate. Perform tasks identified as RESP in the attached schedule/cost estimate.

Approvals:   
T.E. Rainey (LMHC)

  
G.A. Barnes (SESC)

# Approved Schedule

## LDUA DEPLOYMENT FY-98



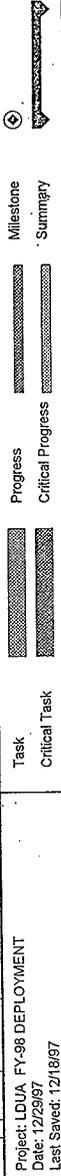
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3	33d	10/1/97	11/14/97		129d	0h	\$0.00
4	0d	11/17/97	11/17/97		0d	0h	\$0.00
5	21d	11/17/97	12/17/97	Bloom	0d	0h	\$0.00
6	36d	11/18/97	1/13/98	Bloom	9d	0h	\$0.00
7	2d	1/14/98	1/15/98	Bloom	9d	0h	\$0.00
8	10d	1/16/98	1/29/98	Bloom	9d	0h	\$0.00
9	0d	1/29/98	1/29/98	Bloom	9d	0h	\$0.00
10	84d	10/27/97	2/27/98		0d	5468h	\$328,115.91
11	10d	10/27/97	11/7/97	Kennedy	0d	95h	\$6,848.25
12	62d	11/10/97	2/10/98	Esvelt	12d	1835h	\$62,069.14
13	40d	11/10/97	1/9/98	Esvelt	14d	260h	\$18,062.40
14	25d	12/10/97	1/16/98	Esvelt	14d	210h	\$13,967.10
15	14d	11/10/97	12/18/97	Esvelt	33d	58h	\$3,857.58
16	10d	1/2/98	1/15/98	Esvelt	13d	92h	\$6,118.92
17	5d	1/30/98	2/5/98	Shuford	10d	20h	\$1,330.20
18	10d	1/21/98	2/3/98	Haugen	12d	868h	\$13,366.24
19	5d	2/4/98	2/10/98	Haugen	12d	127h	\$5,366.70
20	61d	12/1/97	2/27/98	Bender	0d	2660h	\$170,058.56
21	42d	12/1/97	1/30/98	Bender	7d	238h	\$15,696.36
22	20d	1/19/98	2/13/98	Bender	7d	2140h	\$136,515.20
23	44d	12/17/97	2/20/98	Bender	0d	160h	\$10,641.60
24	5d	2/23/98	2/27/98	Bender	0d	124h	\$7,205.40

Project: LDUA FY-98 DEPLOYMENT  
 Date: 12/29/97  
 Last Saved: 12/18/97

# Approved Schedule

## LDUA DEPLOYMENT FY-98

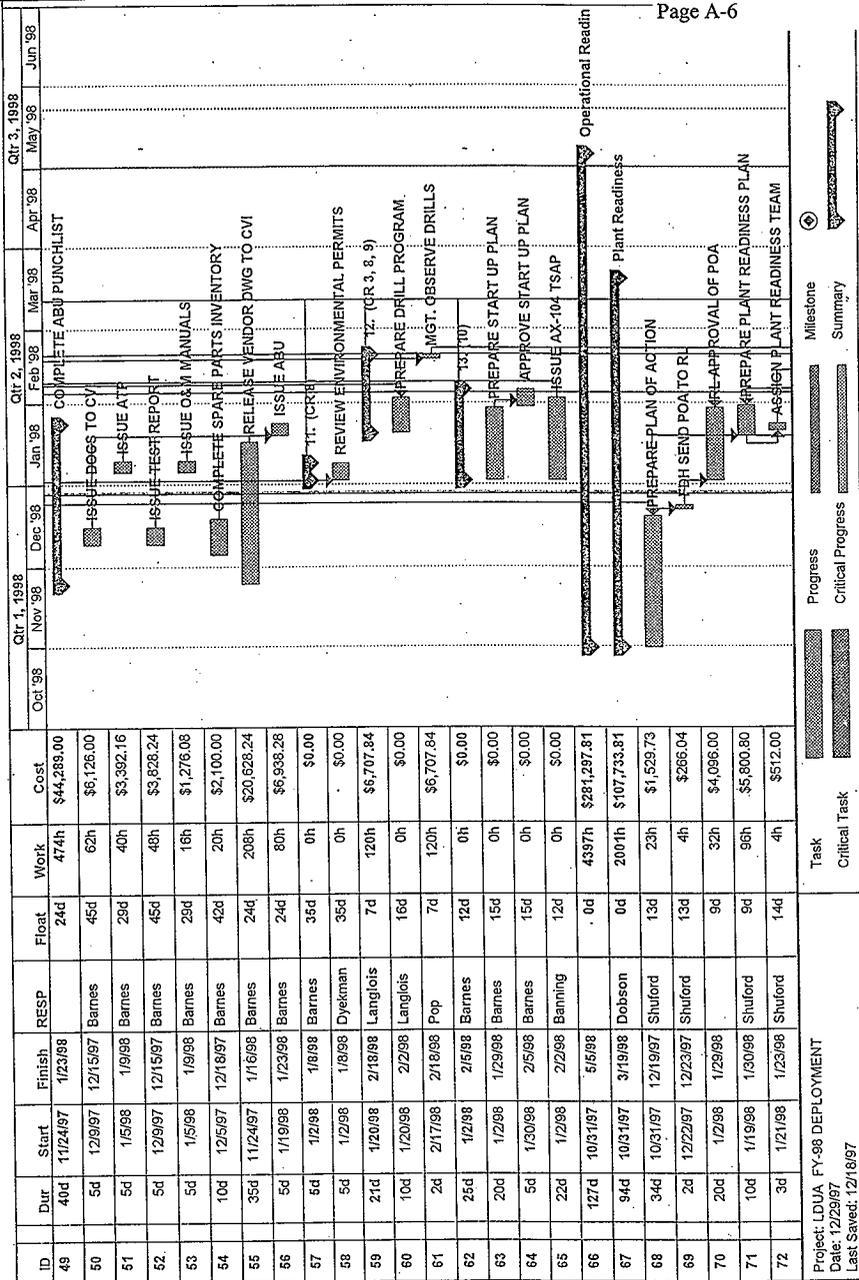
ID	Dur	Start	Finish	RESP	Float	Work	Cost	Qtr 1, 1998			Qtr 2, 1998			Qtr 3, 1998			
								Oct '98	Nov '98	Dec '98	Jan '98	Feb '98	Mar '98	Apr '98	May '98	Jun '98	
25	6d	2/6/98	2/13/98	Kennedy	9d	92h	\$5,388.72										
26	1d	2/6/98	2/6/98	Bender	9d	0h	\$0.00										
27	5d	2/9/98	2/13/98	Kennedy	9d	92h	\$5,388.72										
28	42d	12/1/97	1/30/98	Bloom	20d	0h	\$0.00										
29	12d	12/1/97	12/16/97	Bloom	20d	0h	\$0.00										
30	5d	12/17/97	12/23/97	Bloom	21d	0h	\$0.00										
31	10d	12/17/97	1/2/98	Bloom	20d	0h	\$0.00										
32	10d	1/5/98	1/16/98	Bloom	89d	0h	\$0.00										
33	1d	1/30/98	1/30/98	Bloom	19d	0h	\$0.00										
34	5d	1/2/98	1/8/98	Langlois	35d	60h	\$3,990.60										
35	5d	1/2/98	1/8/98	Langlois	35d	60h	\$3,990.60										
36	5d	1/12/98	1/16/98	Langlois	29d	80h	\$5,320.80										
37	5d	1/12/98	1/16/98	Langlois	29d	80h	\$5,320.80										
38	5d	1/19/98	1/19/98	Langlois	28d	8h	\$532.08										
39	5d	1/19/98	1/19/98	Langlois	28d	8h	\$532.08										
40	3d	1/23/98	1/27/98	Langlois	22d	20h	\$1,330.20										
41	3d	1/23/98	1/27/98	Langlois	22d	20h	\$1,330.20										
42	34d	1/28/97	1/28/98	Barnes	21d	224h	\$21,580.72										
43	10d	1/2/98	1/15/98	Barnes/L	30d	0h	\$0.00										
44	1d	12/9/97	12/9/97	Tedeschi	31d	0h	\$0.00										
45	20d	12/15/97	1/14/98	Barnes	21d	112h	\$8,932.56										
46	10d	1/15/98	1/28/98	Barnes	21d	112h	\$12,648.16										
47	40d	1/12/97	1/23/98		24d	474h	\$44,289.00										
48	30d	12/9/97	1/22/98	Rainey	25d	0h	\$0.00										



Project: LDUA FY-98 DEPLOYMENT  
 Date: 12/29/97  
 Last Saved: 12/18/97

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 Date: 12/29/97  
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Task  
 Critical Task

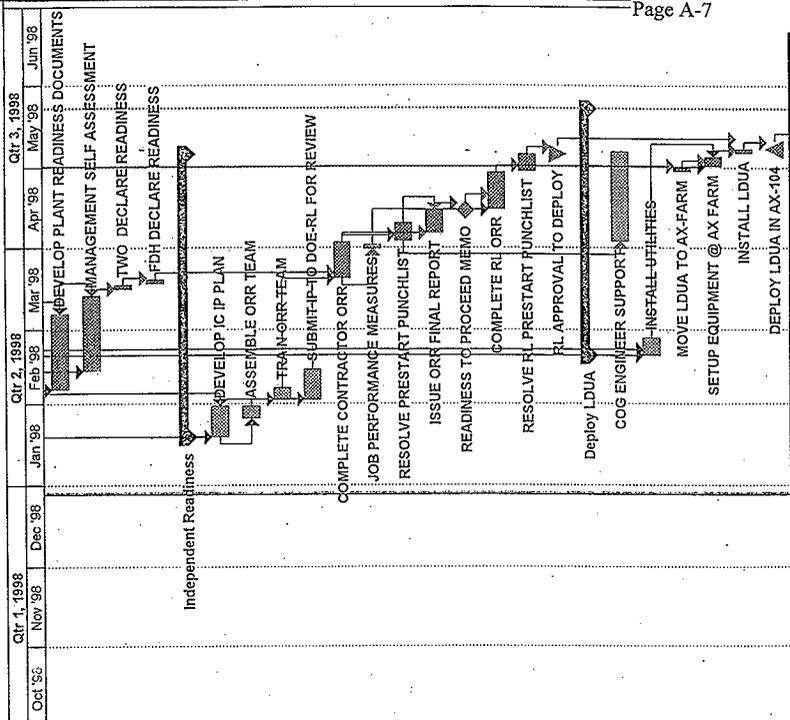
Progress  
 Critical Progress

Milestone  
 Summary

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## LDUA DEPLOYMENT FY-98

ID	Dur	Start	Finish	RESP	Float	Work	Cost
73	20d	2/6/98	3/6/98	Shuford	0d	450h	\$19,195.58
74	20d	2/13/98	3/13/98	Dobson	0d	1356h	\$72,709.52
75	2d	3/16/98	3/17/98	Ross	0d	20h	\$1,576.16
76	2d	3/19/98	3/19/98		0d	16h	\$2,048.00
77	76d	1/19/98	5/6/98	Rozaek	0d	2396h	\$173,564.00
78	10d	1/19/98	1/30/98	Rozaek	23d	112h	\$11,876.40
79	5d	1/26/98	1/30/98	Rozaek	28d	8h	\$744.00
80	5d	2/2/98	2/6/98	Rozaek	28d	80h	\$5,320.80
81	10d	2/2/98	2/13/98	Rozaek	23d	56h	\$4,708.40
82	10d	3/20/98	4/2/98	Rozaek	0d	1328h	\$93,545.44
83	2d	3/31/98	4/1/98	Kennedy	11d	178h	\$9,506.32
84	5d	4/3/98	4/9/98		0d	0h	\$0.00
85	7d	4/6/98	4/14/98	Rozaek	0d	140h	\$11,540.40
86	0d	4/14/98	4/14/98	Rozaek	0d	0h	\$0.00
87	10d	4/15/98	4/28/98		0d	466h	\$36,322.24
88	5d	4/29/98	5/5/98		0d	0h	\$0.00
89	0d	5/5/98	5/5/98		0d	0h	\$0.00
90	67d	2/19/98	5/22/98	Kennedy	0d	2017h	\$128,906.94
91	24d	4/3/98	5/6/98	Esvell	12d	180h	\$11,971.80
92	5d	2/19/98	2/25/98	Barnes	49d	160h	\$7,922.40
93	2d	4/29/98	4/30/98	Kennedy	1d	168h	\$12,034.72
94	2d	5/1/98	5/4/98	Kennedy	1d	288h	\$18,032.16
95	2d	5/6/98	5/7/98	Kennedy	0d	416h	\$27,330.08
96	0d	5/7/98	5/7/98	Kennedy	0d	0h	\$0.00



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Legend:  
 Progress (hatched)  
 Critical Progress (dotted)  
 Milestone (circle)  
 Summary (arrow)

