APR 05 1999

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 623361

2. To: (Receiving Organization) LMHC Characterization Engineering	3. From: (Originating Organization) Characterization Engineering	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Characterization Project	6. Design Authority/Design Agent/Cog. Engr.: GP Janicek/RN Dale	7. Purchase Order No.: N/A
8. Originator Remarks: ETN-98-0006 This ETP is the task management document for the design, fabrication, and installation of the replacement bellows.		9. Equip./Component No.: N/A
11. Receiver Remarks:		10. System/Bldg./Facility: 200G
11A. Design Baseline Document? ☐ Yes ☒ No		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: N/A

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	HNF 3567	N/A	0	Engineering Task Plan for The Development, Fabrication, and Installation of Rotary Mode Core Sample Truck Bellows	Q	1	1	

16. KEY			
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)	
F, S, Q, D or N/A (see WHC-CM-3-5, Sec. 12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment	4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION
(See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	Design Authority GP Janicek	<i>GP Janicek</i>	3/30/99	S7-12						
1	1	Design Agent GW Wilson	<i>GW Wilson</i>	3/29/99	S7-12						
1	1	Cog. Eng. RN Dale	<i>RN Dale</i>	3/29/99	S7-12						
1	1	Cog. Mgr. JS Schofield	<i>JS Schofield</i>	3/30/99	S7-12						
1	1	QA DB Board	<i>QA DB Board</i>	3-30-99	S7-07						
		Safety									
		Env.									
1	1	Proj. Mgr. J.L. Smalley	<i>J.L. Smalley</i>	3/29/99	S7-12						

18. <i>GW Wilson</i> GW Wilson Signature of EDT Originator	19. <i>JS Schofield</i> JS Schofield Authorized Representative For Receiving Organization	20. <i>JS Schofield</i> JS Schofield Design Authority/ Cognizant Manager	21. DOE APPROVAL (if required) Ctrl No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
---	--	---	--

ENGINEERING TASK PLAN FOR THE DEVELOPMENT, FABRICATION AND
INSTALLATION OF ROTARY MODE CORE SAMPLE TRUCK BELLOWS

S

RM Boger

Prepared for Lockheed Martin Hanford, Inc.

Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 623361

UC: 2070

Org Code: 74900

Charge Code: 102248/BO00

B&R Code: EW3120074

Total Pages: 16

Key Words: Waste Sampling, RMCST, Bellows Assembly,

Abstract: This Engineering Task Plan (ETP) is the management plan document for accomplishing the design, fabrication, and installation of a replacement bellows assembly for the Rotary Mode Core Sampling Trucks 3 & 4 (RMCST).

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: Document Control Services, P.O. Box 950, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

Release Approval

Date

Approved for Public Release

ENGINEERING TASK PLAN FOR THE DEVELOPMENT,
FABRICATION AND INSTALLATION OF
ROTARY MODE CORE SAMPLE TRUCK BELLOWS

Prepared for Characterization Engineering
Tank Waste Remediation System
Lockheed Martin Hanford Corporation

By

G. W. Wilson
COGEMA Engineering Corp.
Richland, WA

January 1999

TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 SCOPE.....	1
3.0 DESCRIPTION	1
3.1 PHYSICAL DESCRIPTION	1
3.2 ENGINEERING TASKS.....	2
3.3 VERIFICATION AND TECHNICAL REVIEWS AND MODIFICATION MANAGEMENT.....	2
3.4 SOFTWARE DEVELOPMENT TASKS.....	3
3.5 PROCUREMENT TASKS	3
3.6 INSTALLATION TASKS	3
3.7 PRE-OPERATIONAL AND OPERATIONAL TESTS	3
3.8 ACCEPTANCE FOR BENEFICIAL USE	4
3.9 RISK ASSESMENT.....	4
4.0 ORGANIZATION	4
5.0 SCHEDULE	6
6.0 COST ESTIMATE	6
7.0 DEVELOPMENTAL CONTROL REQUIREMENTS	7
8.0 CONFIGURATION MANAGEMENT	7
9.0 QUALITY ASSURANCE	7
10.0 SAFETY AND AUTHORIZATION BASIS	8
11.0 RADIATION CONTROL.....	8
12.0 SYSTEM ENGINEERING.....	8
13.0 CLOSEOUT COSTS.....	8
14.0 REFERENCES	9
APPENDIX A.....	10

1.0 INTRODUCTION

The Rotary Mode Core Sampling Trucks (RMSCTs) currently use a multi-sectioned bellows between the grapple box and the quill rod to compensate for drill head motion and to provide a path for purge gas. The current bellows, which is detailed on drawing H-2-690059, is expensive to procure, has a lengthy procurement cycle, and is prone to failure. Therefore, a task has been identified to design, fabricate, and install a replacement bellows.

This Engineering Task Plan (ETP) is the management plan document for accomplishing the identified tasks. Any changes in scope of the ETP shall require formal direction by the Characterization Engineering manager.

This document shall also be considered the work planning document for developmental control per Development Control Requirements (HNF 1999a)

2.0 SCOPE

The scope of the ETP is to design, generate drawings, fabricate, and install replacement bellows for RMCST 3 & 4 (see Lockheed Martin Hanford Corporation, LMHC, Contract 519, release 10). Deliverables will include generating fabrication drawings, fabrication of one bellows assembly, updating fabrication drawings as required, and installation of replacement bellows on either RMCST 3 or 4. The installation ECN(s) will not be incorporated as part of this task. The installation of the bellows assembly will be done when an existing bellows fails and therefore can not be scheduled at this time. After successful testing, installation, and use by operations, a second replacement bellows assembly will be fabricated and installed on the remaining RMCST truck.

3.0 DESCRIPTION

3.1 PHYSICAL DESCRIPTION

The end result of this task will be a replacement bellows installed on either RMCST 3 or 4. This replacement bellows will provide a more reliable alternative for the current multi-sectioned bellows.

The replacement bellows assembly will meet the following design criteria:

- The bellows assembly will provide a leak-tight connection between the grapple box and the quill rod during full drill head movement (24 inch stroke).

- The bellows assembly will be rated for 110 PSIG purge gas pressure.
- The bellows assembly will meet all applicable requirements in the Baseline Design Compliance Matrix (DCM) for the Rotary Mode Core Sampling System (HNF 1998a). The requirements added by this ETP will be included in the annual update of the DCM.

3.2 ENGINEERING TASKS

Engineering services and deliverables provided by Characterization Engineering will include the following.

- Provide overall task management and schedule
- Provide day-to-day guidance of design services during generation of fabrication drawings
- Conduct design review as directed by Design Authority
- Provide engineering support during fabrication
- Generate Engineering Change Notices (ECNs) as required
- Generate test plan and test report.
- Conduct pre-operational testing
- Generate drawings/ECN as required for installation
- Provide engineering support for installation work package preparation
- Provide engineering support during installation
- Update preventive maintenance procedures as required
- Update operating procedures as required
- Update Essential Drawing List (1998b) as required
- Update Drawing Evaluation Report (1998c) as required

All drawings shall be prepared, approved, and released per Engineering Drawing requirements (HNF 1999b). Any subsequent changes shall be done per Engineering Document Change Control Requirements (HNF 1997a). All subsequent design media and engineering documentation generated in support of this task shall reference Engineering Task Number ETN-98-0006.

3.3 VERIFICATION AND TECHNICAL REVIEWS AND MODIFICATION MANAGEMENT

The design media requiring verification and review will include new fabrication and installation drawings for the replacement bellows and any subsequent design changes identified during either fabrication or installation. Design verification requirements for the new drawings and any Engineering Change Notices (ECN's) will be determined on a case-by-case basis per Design Verification Requirements (HNF 1997b). The design verification method will be reviewed and approved by the Characterization Engineering Design Authority.

Technical review of documents will be completed per Review and Approval of Documents (HNF 1997c)

Modifications during fabrication will be done using the development control process per Development Control Requirements (HNF 1999a). All design changes will be documented by redlining the pre-released drawings. After completion of fabrication and testing all redlines will be incorporated into the drawings and the drawings will be released.

3.4 SOFTWARE DEVELOPMENT TASKS

There are no software development tasks associated with this task.

3.5 PROCUREMENT TASKS

This bellows will be fabricated onsite by Dyncorp Tri-Cities Services, Inc. All procurement associated with fabrication will be subcontracted to Dyncorp Tri-Cities Services, Inc. The procurement for miscellaneous items required for installation will be procured through LMHC Characterization Procurement.

3.6 INSTALLATION TASKS

Installation of the replacement bellows will be done by Characterization Maintenance per a work package generated by Characterization Production Control. The installation of the replacement bellows assembly will be done when an existing bellows fails and therefore can not be scheduled at this time. Bellows installation duration would be approximately three weeks. One week would be required for work package preparation and two weeks would be allowed for bellow installation. The lengthy two-week installation time allows for any problems that may develop during a new installation.

3.7 PRE-OPERATIONAL AND OPERATIONAL TESTS

Pre-operational testing will consist of a cycling the bellows a minimum of 200 full stroke cycles at approximately 2 inches per minute with between 30 and 90 PSIG air pressure using a mockup

installation. The seals will be checked for leakage before and after testing. Pre-operational testing will be conducted at either the Engineering Testing Laboratory or the Dynacorp Fabrication Shops to an approved test plan and results will be documented in a test report per Testing Requirements (HNF 1999c).

Operational testing will consist of leak testing after installation and verifying alignment and clearances by cycling the bellows through a minimum of one cycle. All operational testing will be conducted by Characterization Maintenance per instructions in the installation work package.

3.8 ACCEPTANCE FOR BENEFICIAL USE

A formal Acceptance for Beneficial Use (ABU) process and form will be used for this task per TWRS Administration (1998d). This Engineering Task Plan will be revised to incorporate a partial ABU for the installation on the first RMCST and the final ABU will be completed after the installation on the second sample truck. See Appendix A for an ABU form that delineates the anticipated requirements.

3.9 RISK ASSESMENT

The two main risks envisioned with this task are that the replacement bellows and/or the rotary union seals will not pass pre-operational testing. Appropriate engineering rigor will be used to minimize these risks.

4.0 ORGANIZATION

Responsibilities are assigned to various organizations as identified below:

COGEMA Engineering Corporation will provide task management, engineering support, and design services support.

Responsible Manager:	J. L. Smalley
Responsible Engineer:	G. W. Wilson

Lockheed Martin Hanford Corporation (LMHC) will provide funding and overall task management:

Responsible Manager:	R. M. Boger
----------------------	-------------

Lockheed Martin Hanford Corporation (LMHC) will also provide Cognizant Engineer support for document review and Un-reviewed Safety Question (USQ) screening preparation.

Responsible Manager: J. S. Schofield
Responsible Cog. Eng. R. N. Dale

Lockheed Martin Hanford Corporation (LMHC) will also provide Design Authority support.

Characterization Project System Design Authority: G. P. Janicek

Fluor Daniel Northwest, Inc. (FDNW) will provide designers to assist in design and generating design documentation as requested.

Responsible Lead: R. L. Romine
Responsible Designer R. L. Miller

Dyncorp Tri-Cities Services, Inc. will be responsible for fabrication and inspections of the replacement bellows assembly.

Responsible Manager: M. A. Butterworth

Numatec Hanford Corp., Engineering Testing Laboratories will be responsible for pre-operational testing and generation of test plans and test reports.

Responsible Manager: M. J. Schliebe
Responsible Engineer: K. S. Witwer

Characterization Production Control will be responsible for generation of installation work packages.

Responsible Manager: R. E. Falon

Characterization Maintenance will be responsible for provide craft support for installation and operational testing.

Responsible Manager: B. J. Shoemaker

5.0 SCHEDULE

The schedule for this task is shown in the table below:

SUBTASK	START DATE	FINISH DATE
Design/Generate Fab. Drawings	11/15/98	2/30/99
Generate Installation Drawings	2/15/99	3/15/99
Fabrication	3/30/99	5/15/99
Issue Test Procedure	3/30/99	5/15/99
Pre-operation Testing	5/15/99	5/30/99
Issue Test Report	5/30/99	6/15/99
Install	6/15/99	Unknown*
Closeout (Includes ABU, Essential drawing list, etc.)	6/15/99	Unknown*

* The installation of the replacement bellows assembly will be done when an existing bellows fails and therefore can not be scheduled at this time.

6.0 COST ESTIMATE

Cost estimates associated with this task are denoted in the table below:

SUBTASK	COGEMA	LMHC	LMSI	FDNW	DNYC.	NHC
Issue ETP	40	10				
Fabrication Drawings	100	20	16	180		
Installation Drawings	210*	10	24	50		
Fabrication	20	20			20 k	
Testing	100	20				200
Installation	60	120**				
TOTAL	530 (hrs)	200 (hrs)	40 (hrs)	230 (hrs)	\$20 k	200 (hrs)

* Includes 160 hours drafting support

** Craft Support for installation for installation of first bellows assembly

Costs for installation of second bellows and life cycle cost are not included in this cost estimate since they are funded by Characterization Project Operations.

7.0 DEVELOPMENTAL CONTROL REQUIREMENTS

Below is a list of requirements that must be identified in the work plan for any Facility-Use item per HNF 1999a. After each item is a description of where the information can be found.

- Description of the work to be performed. Pre-released Version of Drawings H-2-690029, H-2-690047, and HNF-3567, Section 3.0
- Any restrictions and/or special conditions. None
- Inspection/fabrication criteria. On the Fabrication Request (J-10) and HNF-3567, Section 9.0
- Work order number. On the Fabrication Request (J-10) and HNF-3567, Section 12.0
- Material requirements. Preliminary Revision of Drawing H-2-690029 And H-2-690047
- Special testing requirements. HNF-3567, Section 3.7
- Safety Class. On the Fabrication Request (J-10) and HNF-3567, Section 10.0
- Approval designator. On the Fabrication Request (J-10) and HNF-3567, Section 9.0 and 10.0
- Shipping and handling instructions. On the Fabrication Request (J-10) and HNF-3567, Section 3.7
- Delivery Date. HNF-3567, Section 5.0

Only Characterization Engineering personnel shall have signature authority on any redline changes.

8.0 CONFIGURATION MANAGEMENT

Configuration management will comply with requirements in Engineering Drawing Requirements (HNF 1999b) and Engineering Document Change Control Requirements (1997a).

9.0 QUALITY ASSURANCE

Quality Assurance review will be determined on a task-by-task basis per Review and Approval of Documents (HNF 1997c). The cognizant engineer will assign approval designators for all documentation with concurrence from the cognizant manager. All documents assigned an approval designator "Q" will be reviewed and approved by Quality Assurance.

Dyncorp, Tri-Cities Services, Inc. Quality Control shall inspect all fabricated items.

10.0 SAFETY AND AUTHORIZATION BASIS

Safety review of tasks will be determined on a task-by-task basis per Review and Approval of Documents (HNF 1997c). The cognizant engineer will assign approval designators for all documentation with concurrence from the cognizant manager. All documents assigned an approval designator "S" will be reviewed and approved by Safety.

Since the bellows assembly is currently classified in the SEL as a GS no authorization basis or permitting documentation changes are anticipated. However, an Unreviewed Safety Question Screening/Determination will be completed for initial release of drawings and for any ECNs that are generated.

11.0 RADIATION CONTROL

Radiation Control (RadCon) will be responsible for review and approval of the installation work package.

12.0 SYSTEM ENGINEERING

This task plan defines the work required to design, fabricate and install replacement bellows for RMCST 3 & 4. This subtask is currently covered under the Work Breakdown Structure (WBS) 1.1.1.1.1.3.1.7 with a Cost Account Charge Number (CACN) of 102248 and a Code Of Account (COA) of B000. Any major changes will be made to the WBS through the change request process (CR-TWRS-98-024).

13.0 CLOSEOUT COSTS

Closeout costs may vary depending on when closeout occurred but would be limited to less than 100 hrs. The closeout costs may include time to ensure that partially completed datasets, ECNs, work packages, and/or replacement bellows assemblies would be placed in a retrievable condition.

14.0 REFERENCES

- HNF, 1997a, HNF-PRO-440, Rev. 1, *Project Hanford Policy and Procedure System, Engineering Document Change Control Requirements*, Fluor Daniel Hanford, Inc., Richland, Washington
- HNF, 1997b, HNF-PRO-245, Rev. 1, *Project Hanford Policy and Procedure System, Design Verification Requirements*, Fluor Daniel Hanford, Inc., Richland, Washington
- HNF, 1997c, HNF-PRO-233, Rev. 1, *Project Hanford Policy and Procedure System, Review and Approval of Documents*, Fluor Daniel Hanford, Inc., Richland, Washington
- HNF, 1998a, HNF-SD-WM-CR-062, Rev. 1, *Baseline Design Compliance Matrix For The Rotary Mode Core Sampling System*, Lockheed Martin Hanford Corporation, Richland, Washington
- HNF, 1998b, HNF-3240, Rev 2, *Characterization Equipment Essential/Support Drawing Plan*, Lockheed Martin Hanford Corporation, Richland, WA
- HNF, 1998c, HNF-2305, Rev 0, *Drawing Evaluation Report for Sampling Equipment Drawings*, Lockheed Martin Hanford Corporation, Richland, WA
- HNF, 1998d, HNF-IP-0842, Vol. IV, *TWRS Administration*, Sec 3.12, *Acceptance of Structures, Systems and Components for Beneficial Use*, Lockheed Martin Hanford Corporation, Richland, WA
- HNF, 1999a, HNF-IP-0842, Vol. IV, *TWRS Administration*, Sec 4.27, *Development Control Requirements*, Lockheed Martin Hanford Corporation, Richland, Washington
- HNF, 1999b, HNF-IP-0842, Vol. IV, *TWRS Administration*, Sec 4.25, *Engineering Drawings*, Lockheed Martin Hanford Corporation, Richland, Washington
- HNF, 1999c, HNF-IP-0842, Vol. IV, *TWRS Administration*, Sec 4.28, *Testing Practices Requirements*, Lockheed Martin Hanford Corporation, Richland, Washington

APPENDIX A

ACCEPTANCE FOR BENEFICIAL USE

APPENDIX A- ACCEPTANCE FOR BENEFICIAL USE

ACCEPTANCE FOR BENEFICIAL USE (ABU)					
3. Document No. HNF-3567	4. Project No. N/A	5. SSC Designator N/A	6. System / Building / Facility 200 General	7. Equipment / Component No. RMCST 3 & 4	8. ECN/EDT No. TBD
9. Final ABU () Partial ABU ()			10. ATP Rerun Required () Yes (X) No		
11. Description of Work Modify Rotary Mode Core Sampling (RMCS) Trucks 3 & 4 by installing replacement bellows assembly to provide a reliability improvement					
12. Description of Work to be Completed Replacement Bellows Assembly		13. Scheduled Completion Date TBD	14. Responsibility for Completion GW Wilson	15. Impact on Operations/Safety Reliability improvement	
16. Documents or Other Items/Tasks to be Updated		17. Funding Source	18. Document Number	19. Responsibility for Completion	20. Required prior to final ABU (Yes/No)
<u>TRAINING:</u>					
• Training manuals ()					
• Training to Operating Crews (X)				D. Shuford	Yes
• Training to Maintenance Crews ()					
<u>ENGINEERING:</u>					
• Engineering Procedure ()					
• Final Safety Analysis Report (FSAR) ()					
• Safety Assessment (SA) ()					
• Functional Design Criteria (FDC) ()					
• Design Review Report ()					
• Conceptual Design Report (CDR) ()					
• Supplemental Design Requirements Document (SDRD) ()					
• System Design Description (SDD) ()					
• Test Procedures/Specifications Test Report ()				GW Wilson	Yes
• Safety Equipment List ()					
• Environmental Report ()					
• Environmental Permits ()					

16. Documents or Other Items/Tasks to be Updated	17. Funding Source	18. Document Number	19. Responsibility for Completion	20. Required prior to final ABU (Yes/No)
• Stress/Seismic Analysis ()				
• Stress/Design Report ()				
• Equipment Specification ()				
• Procurement Specification ()				
• Construction Specification ()				
• Essential Material Specification ()				
• Technical Specification ()				
• As-built Drawing (X)			GW Wilson	Yes
• Interface Control Drawing ()				
• Computer Software ()				
• Essential/Support Dwg. List (X)			GW Wilson	Yes
<u>OPERATIONS:</u>				
• Operating and Maintenance Manuals()				
• Operating Procedures ()				
• Operation Instructions ()				
• Calibration Procedures ()				
• Preventative Maintenance Procedures(X)		TBD	TBD	TBD
• Operations Safety Requirements ()				
<u>QUALITY ASSURANCE:</u>				
• Inspection Plan ()				
• QAPP ()				
• QAP JP ()				
• NEC Inspection ()				
<u>PROCUREMENT ACTIVITIES:</u>				
• Vendor Information ()				
• Material List ()				
• Spare Parts (X)			AB Cockrell	Yes
• Purchase Requisition ()				
• ALARA Management Worksheet ()				
• Other Commercial Grade Item forms ()				

PROJECTS: CHARACTERIZATION OPERATIONS AND ENGINEERING**Signature****Date**Cog/Field Engineer **RN Dale**Cog/Field Mgr. **JS Schofield**QA **ML McElroy**Safety **JA Ranschau**Modification Projects **RM Boger**

Characterization Ops

Design Authority **GP Janicek**

Design Authority

Design Engineer **GW Wilson**