AUG 03 1999

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 623417

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-99-0005 This ETP is the task management document for the design, and fabrication of a replacement footclamp.				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-4434	N/A	0	Engineering Task Plan for The Development of Footclamp	SQ	1	1	

16. KEY		
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, 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
1	1	Design Authority GP Janicek	<i>[Signature]</i>	8/2/99	S7-12	1	1	CE Mgr. RM Boger	<i>[Signature]</i>
1	1	Design Agent HF Shumake Jr.	<i>[Signature]</i>	7/29/99	S7-12	1	1	Proj. Mgr. JL Smalley	<i>[Signature]</i>
1	1	Cog. Eng. RN Dale	<i>[Signature]</i>	7/29/99	S7-12				
1	1	Cog. Mgr. JS Schofield	<i>[Signature]</i>	7/29/99	S7-12				
1	1	QA JS Sparks	<i>[Signature]</i>	7-29-99	S7-09				
1	1	Safety JA Ranshau	<i>[Signature]</i>	8/2/99	S7-07				
		Env.							

18. <i>[Signature]</i> 7/29/99 HF Shumake Jr. Signature of EDT Originator		19. <i>[Signature]</i> 8/4/99 RM Boger Authorized Representative For Receiving Organization		20. <i>[Signature]</i> 7/29/99 JS Schofield Design Authority/ Cognizant Manager		21. DOE APPROVAL (if required) Ctrl No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
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Engineering Task Plan for the Development of Footclamp

RM Boger

Prepared by Lockheed Martin Hanford, Inc.

Richland, WA 99352

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

EDT/ECN: ⁶²³⁴¹⁷~~623388~~ ⁸²⁶⁷

UC: 2070

Org Code: 74900

Charge Code: 102250/EI00

B&R Code: EW3120074

Total Pages: 17

Key Words: Waste Sampling, PMCS, RMCS, RMCST, Footclamp, Riser
Equipment

Abstract: This Engineering Task Plan (ETP) is the management plan document for accomplishing the design, fabrication, and testing of a replacement footclamp assembly for the Push Mode Core Sampling Truck #1 (PMCS) and the Rotary Mode Core Sampling Trucks 3 & 4 (RMCST).

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Release Approval Date

Release Stamp

Approved for Public Release

A-6400-073 (01/97) GEF321

ENGINEERING TASK PLAN FOR THE DEVELOPMENT OF FOOTCLAMP

Prepared for
Lockheed Martin Hanford Corporation
Characterization Engineering

by
H. F. Shumake Jr.
COGEMA Engineering Corporation

July 1999

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1.0 INTRODUCTION

The Rotary Mode Core Sampling Trucks (RMCSTs) currently use a footclamp that utilizes a wedge design to secure the drill string. On June 18, 1998, a problem occurred while core sampling operations were being conducted. Approximately 28 ft. of drill string was inadvertently dropped into tank 241-SX-102. The root cause of this occurrence was determined to be inadequate or defective design of the footclamp being used. The footclamp in use during this occurrence relied on a wedge-type design that gripped the drill string tighter as the weight of the drill string was increased. The MAXIDRILL Model 3030 Footclamp does not rely on a wedge effect to hold the drill string; it uses spring force to engage the jaws with the drill string. The use of the MAXIDRILL Model 3030 Footclamp should eliminate any further problems of this nature and allow corrective action 2 in section 26 of the related occurrence report (RL—PHMC-TANKFARM-1998-0064) to be completed.

Modifications of the base of the MAXIDRILL Model 3030 Footclamp are necessary to decrease the possibility of an injury due to the exposed jaws. Also, the plan for sampling tank 241-Z-361 calls for a footclamp that will allow for total containment when the footclamp is connected to a tank riser. The need for a footclamp with total containment capabilities, and the design of a safer base for the MAXIDRILL Model 3030 Footclamp can be satisfied in the same task. The re-design of the base of the footclamp will allow for total containment while still being suitable for "normal" RMCS operations and improving the safety of the footclamp.

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 development control per Development Control Requirements (HNF 1999a).

2.0 SCOPE

2.1 OBJECTIVES

The objectives of this task are to re-design the MAXIDRILL Model 3030 Footclamp, prepare fabrication and installation drawings, fabricate, assemble and perform acceptance testing for a footclamp assembly that has the desired safety characteristics for use by operations personnel during Rotary Mode Core Sampling (RMCS).

2.2 DELIVERABLES

This ETP will provide a footclamp that is fully documented, fabricated and tested, for acceptable use in accordance with applicable procedures. Deliverables will include, but

not be limited to, fabrication drawings, fabrication and assembly of four footclamps, development test plan and development test report, and Acceptance for Beneficial Use.

NOTE: A total of four footclamps are to be built under this ETP, three of them will be fabricated for, and funded by, the 241-Z-361 sampling project. The fourth will be fabricated for, and funded by, Characterization Project Operations.

3.0 DESCRIPTION

3.1 PHYSICAL DESCRIPTION/REQUIREMENTS

The end result of this task will be an approved replacement footclamp assembly acceptable for use in core sampling operations. This replacement footclamp will provide a more reliable alternative than the current wedge-type footclamp for engaging and supporting the core sampling drill string. The re-designed MAXIDRILL Model 3030 Footclamp will allow for enhanced operator safety.

The footclamp assembly shall meet the following design criteria:

- The footclamp assembly shall meet all applicable requirements in the Baseline Design Compliance Matrix (DCM) for the Rotary Mode Core Sampling System (HNF 1998a).
- The footclamp shall support a minimum of 1000 pounds of vertical force applied to a piece of 2¼ inch diameter, non-fluted; or 2½ inch diameter fluted drill string.
- The footclamp shall not open on loss of supply air pressure.
- The footclamp shall not deform either the 2¼ inch diameter, non-fluted; or the 2½ inch diameter, fluted drill string preventing the sampling apparatus from passing through it.
- The measurement between the contact surfaces of the jaws of the footclamp, when in the closed, or engaged, position shall be less than 2¼ in.
- The close rate of the jaws of the footclamp shall not exceed 1.0 fps.
- The footclamp, by design, shall prevent accidental insertion of appendages into mechanisms capable of inflicting injury.
- The footclamp shall interface with the pipe wiper (aka--“frisbee”).
- The footclamp shall interface with the drill rod washer assembly.

3.2 ENGINEERING TASKS

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

- Provide overall task management and schedule
- Prepare Development Test Plan and Report
- Perform Development Testing
- Provide day-to-day guidance of design services during generation of fabrication and installation drawings

- Conduct design review as directed by Design Authority
- Provide engineering support during fabrication
- Generate Engineering Change Notices (ECNs) as required
- Provide engineering support during acceptance testing
- Update preventive maintenance procedures as required
- Update operation procedures as required
- Update Essential Drawing List (1998b) as required
- Update Drawing Evaluation Report (1998c) as required.

Fabrication will be performed to unreleased drawings which will be clearly marked "DEVELOPMENT CONTROL." The "redline" process will be used to document any necessary design changes. Day-to-day "redlines" shall be approved by the Design Authority or Cognizant Engineer, or authorized delegate as required by Development Control Requirements (HNF 1999a). After final approval by the Design Authority and Cognizant Engineer, all "redline" changes will be incorporated into the fabrication drawings prior to release. All drawings will be prepared, approved, and released per Engineering Drawing requirements (HNF 1999b). Any subsequent changes will be done per Engineering Document Change Control Requirements (HNF 1997a). All subsequent design media and engineering documentation generated in support of this task will reference Engineering Task Number ETN-99-0005

3.3 VERIFICATION AND TECHNICAL REVIEWS AND MODIFICATION MANAGEMENT

The design media requiring verification and review will include new fabrication drawings for the replacement footclamp and any subsequent design changes identified during fabrication. Design verification requirements for the new drawings and any ECNs 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).

The current Safety Equipment List (SEL)(HNF1998e) classifies the footclamp as a safety class (SC) component. ECN 173679 removes the pneumatic footclamp from Table 6-1, FG/RMCS Credited Design Safety Features, of SAD-35 (WHC 1997). When Addendum Five of the Basis for Interim Operations (BIO) is approved, the SEL will be revised to reflect the BIO. Addendum Five of the BIO classifies the footclamp as General Service (GS) Defense in Depth (DID). The implementation of the new footclamp design and the release of Addendum Five of the BIO are projected to occur at approximately the same time, therefore this footclamp will be classified GS/DID. The BIO and its companion documents constitute the Authorization Basis for Hanford tank waste sampling equipment.

DynCorp will test and qualify each assembly to ensure that the functional criteria specified on the assembly drawing (H-2-690138) has been met.

3.4 SOFTWARE DEVELOPMENT TASKS

There is no software development associated with this task.

3.5 PROCUREMENT TASKS

The footclamp bases will be fabricated onsite by DynCorp Tri-Cities Services, Inc. The majority of any procurement associated with this task will be subcontracted to DynCorp Tri-Cities Services, Inc. for parts necessary for replacement footclamp fabrication. Any long lead items required for fabrication may be procured through LMHC Characterization Procurement. LMHC Characterization Procurement has ordered three MAXIDRILL Model 3030 Footclamps to be modified. LMHC Characterization Procurement purchased one MAXIDRILL Model 3030 Footclamp previously to determine whether the functional criteria necessary for use during RMCS were met by this particular design. This previously purchased footclamp will also be modified and qualified for core sampling use.

3.6 INSTALLATION TASKS

The footclamp is a portable piece of equipment and as such will not be permanently installed. The footclamp is used with the Push and Rotary Mode Core Sampling Systems, its installation is accomplished for each sampling event by the normal core sampling setup procedure. The configuration of the riser equipment to include the footclamp is managed by drawings H-2-690134 and H-2-821457.

3.7 PRE-OPERATIONAL AND OPERATIONAL TESTS

Pre-operational testing will consist of the acceptance testing which will be performed by DynCorp personnel. Operational testing will consist of a functional test and will be conducted by Characterization Maintenance and Operations per instructions in the installation work package. LMHC Quality Assurance will observe all testing.

3.8 SHIPPING AND HANDLING

After being green-tagged, the footclamp assemblies will be palletized and shipped to 2101-HV. The newly fabricated footclamps, classified as GS DID, will be segregated from the tubing spider type footclamp that is currently approved for Safety Class use.

3.9 ACCEPTANCE FOR BENEFICIAL USE

A formal acceptance for beneficial use process and form will be used for this task per HNF 1998d.

3.10 RISK ASSESSMENT

The main envisioned risk is that the footclamp containment base will not pass pre-operational testing. Appropriate engineering rigor will be used to minimize these risks.

There is also risk associated with Addendum Five of the BIO not being approved/implemented as presumed. If Addendum Five of the BIO is not approved/implemented then the 241-Z-361 footclamps will not be affected. However, the footclamps for RMCS use will have to be upgraded to SC assemblies and may entail additional verification/qualification documentation.

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:	H. F. Shumake Jr.

Lockheed Martin Hanford Corporation (LMHC) will provide funding and overall task management, Cognizant Engineer support for document review and Unreviewed Safety Question (USQ) screening preparation, and Design Authority support.

Responsible Manager:	R. M. Boger (NUMATEC)
Responsible Cognizant Manager:	J. S. Schofield
Responsible Cognizant Engineer/USQ Screener:	R. N. Dale
Characterization Project Design Authority:	G. P. Janicek

DynCorp Tri-Cities Services (DYN), Inc. will be responsible for fabrication, assembly and acceptance testing of the footclamp base assembly.

Responsible Manager:	M. A. Butterworth
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5.0 SCHEDULE

SUBTASK	START DATE	FINISH DATE
Prepare development test plan and report	3/10/99	4/9/99
Design/Generate Fabrication/Assembly Drawings	3/24/99	4/26/99
Fabrication to include acceptance testing Z-361/CPO	4/29/99/-TBD*	7/14/99/-TBD*
Delivery Date Z-361/CPO	6/4/99/-TBD*	7/14/99/-TBD*
Closeout (ABU, Essential Drawing List, etc.)	7/10/99	-TBD*

*These dates are dependent on Addendum Five of the BIO.

6.0 COST ESTIMATE

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

SUBTASK	COGEMA	LMHC	LMSI	DYN (Z-361 Footclamps)	DYN (CPO Footclamp)
Issue ETP	40	10			
Fabrication Drawings	60	20	12		
Assembly Drawings	30	10	16		
Fabrication	20			\$54k	\$20k
Closeout Tasks	30				
TOTAL	180	40	28	\$54k	\$20k

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

7.0 DEVELOPMENT 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, including within this ETP, HNF-4434.

- Description of the work to be performed Pre-released version of Drawing H-2-690138, and HNF-4434, Sec. 3.0
- Restrictions and/or special conditions None.
- Inspection/fabrication criteria Fabrication Request (J-10) and HNF-4434, Sec. 9.0
- Work Order Number Fabrication Request (J-10) and HNF-4434, Sec. 12.0
- Material Requirements Pre-released version of Drawing H-2-690138
- Special Testing Requirements HNF-4434, Sec. 3.7 and Pre-released version of Drawing H-2-690138
- Safety Class Fabrication Request (J-10) and HNF-4434, Sec. 10.0

• Approval Designator	Fabrication Request (J-10) and HNF-4434, Sec. 9.0 and 10.0
• Shipping and Handling Instructions	Fabrication Request (J-10) and HNF-4434, Sec. 3.8
• Delivery Date	HNF-4434, Sec. 5.0

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

8.0 CONFIGURATION MANAGEMENT

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

9.0 QUALITY ASSURANCE

Quality Assurance 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 and design authority. All documents assigned an approval designator "Q" shall be reviewed and approved by Quality Assurance.

10.0 SAFETY AND AUTHORIZATION BASIS

Safety 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 and design authority. All documents assigned an approval designator "S" shall be reviewed and approved by Safety.

No authorization basis or permitting documentation changes are anticipated, however, an Unreviewed Safety Question Screening/Determination will be completed on any changes made.

11.0 SYSTEM ENGINEERING

This task plan defines the work required to design, generate drawings, fabricate and assemble a footclamp containment base for use during RMCS operations. The footclamp interfaces with the sampling equipment are shown on Drawings H-2-690134 and H-2-821457. The existing design requirements are included in the DCM (HNF 1998a). This activity supports the Tank Farms task identified in the Work Breakdown Structure (WBS) as task number 1.1.1.1.1.3.1.9, Engineering, Troubleshooting and Design Assistance (HNF 1998f).

12.0 CLOSEOUT COSTS

Closeout costs could vary depending on when closeout occurred but would be limited to less than 100 hours. The closeout costs could include time to ensure that partially completed datasets, ECNs, and work packages are placed in a retrievable condition.

13.0 REFERENCES

- Drawing, Unreleased, H-2-690138, *Footclamp Assembly (RMCST)*, Hanford Site, Richland, WA
- Drawing, Hanford Document Control, H-2-690134, *Drill String Arrangements (RMCST)*, Hanford Site, Richland, WA
- Drawing, Hanford Document Control, H-2-821457, *Drill String Arrangements (Truck #2)*, Hanford Site, Richland, WA
- HNF, 1997a, HNF-PRO-440, Rev. 1, *Project Hanford Policy and Procedure System, Engineering Document Change Control Requirements*, Fluor Daniel Hanford, Inc., Richland, WA
- HNF, 1997b, HNF-PRO-245, Rev. 1, *Project Hanford Policy and Procedure System, Design Verification Requirements*, Fluor Daniel Hanford, Inc., Richland, WA
- HNF, 1997c, HNF-PRO-233, Rev. 1, *Project Hanford Policy and Procedure System, Review and Approval of Documents*, Fluor Daniel Hanford, Inc., Richland, WA
- 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, WA
- 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, 1998e, HNF-SD-WM-SEL-044, Rev. 2, *A Safety Equipment List for Rotary Mode Core Sampling Systems Operation in Single Shell Flammable Gas Tanks*, COGEMA Engineering Corporation; Richland, WA
- HNF, 1998f, HNF-SP-1230, Rev. 1, *Tank Waste Remediation System Waste Characterization Fiscal Year 1999 Multi-Year Work Plan WBS 1.1*, 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, WA

HNF, 1999b, HNF-IP-0842, Vol. IV, *TWRS Administration*, Sec. 4.25, *Engineering Drawings*, Lockheed Martin Hanford Corporation, Richland, WA

HNF, 1999c, HNF-IP-0842, Vol. IV, *TWRS Administration*, Sec. 4.28, *Testing Practices Requirements*, Lockheed Martin Hanford Corporation, Richland, WA

WHC, 1997, WHC-SD-WM-SAD-035, Rev. 0-b, *A Safety Assessment of Rotary Mode Core Sampling in Flammable Gas Single Shell Tanks: Hanford Site, Richland, Washington*, Westinghouse Hanford Corporation, Richland, WA

14.0 APPENDIX A—ACCEPTANCE FOR BENEFICIAL USE

ACCEPTANCE FOR BENEFICIAL USE (ABU)					
3. Document No. HNF-TBD-	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. 623388
9. Final ABU () Partial ABU (X)			10. ATP Rerun Required () Yes () No		
11. Description of Work Re-design, fabricate, and assemble MAXIDRILL Model 3030 Footclamp to enhance safety.					
12. Description of Work to be Completed Footclamp Containment Base		13. Scheduled Completion Date TBD	14. Responsibility for Completion HF Shumake Jr.	15. Impact on Operations/Safety Safety 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)
TRAINING:					
• Training manuals (NA)					
• Training to Operating Crews (X)				D. Shuford	Yes
• Training to Maintenance Crews (NA)					
ENGINEERING:					
• Engineering Procedure (NA)					
• Final Safety Analysis Report (FSAR) (NA)					
• Safety Assessment (SA) BIO Addendum 5 Reconciliation (X)			-TBD-	-TBD-	Yes
• Functional Design Criteria (FDC) DCM Update (X)			HNF-SD-WM-CR-062		No
• Design Review Report (NA)					
• Conceptual Design Report (CDR) (NA)					
• Supplemental Design Requirements Document (SDRD) (NA)					
• System Design Description (SDD) (NA)					
• Test Procedures/Specifications Test Report (X)				H.F. Shumake Jr. (Development)	Yes
• Safety Equipment List (Update) (X)			HNF-SD-WM-SEL-044	H.F. Shumake Jr.	No
• Environmental Report (NA)					
• Environmental Permits (NA)					

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 (NA)				
• Stress/Design Report (NA)				
• Equipment Specification (NA)				
• Procurement Specification (NA)				
• Construction Specification (NA)				
• Essential Material Specification (NA)				
• Technical Specification (NA)				
• As-built Drawing (X)		H-2-640138	H.F. Shumake Jr.	Yes
• Interface Control Drawings (X)		H-2-821457, H-2-690134	H.F. Shumake Jr.	Yes
• Computer Software (NA)				
• Essential/Support Dwg. List (X)			H.F. Shumake Jr.	Yes
<u>OPERATIONS:</u>				
• Operating and Maintenance Manuals(NA)				
• Operating Procedures (X)		TBD	R.N. Dale	TBD
• Operation Instructions (NA)				
• Calibration Procedures (NA)				
• Preventative Maintenance Procedures(X)		TBD	TBD	TBD
• Operations Safety Requirements (NA)				
<u>QUALITY ASSURANCE:</u>				
• Inspection Plan (NA)				
• QAPP (NA)				
• QAP JP (NA)				
• NEC Inspection (NA)				
<u>PROCUREMENT ACTIVITIES:</u>				
• Vendor Information (NA)				
• Material List (NA)				
• Spare Parts (X)			AB Cockrell	Yes
• Purchase Requisition (NA)				
• ALARA Management Worksheet (NA)				
• Other <u>Commercial Grade Item forms</u> (NA)				

<u>PROJECTS: CHARACTERIZATION OPERATIONS AND ENGINEERING</u>	
Signature	Date
Cog/Field Engineer R.N. Dale	
Cog/Field Mgr. J.S. Schofield	
QA J.S. Sparks	
Safety J.A. Ranschau	
Modification Projects R.M. Boger	
Design Authority G.P. Janicek	
Operations, D.H. Shuford	
Design Engineer H.F. Shumake Jr.	