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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

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15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Desig-nator	(G) Reason for Trans-mittal	(H) Origi-nator Dispo-sition	(I) Receiv-er Dispo-sition
1	WHC-SD-WM-DRR-057	ALL	0	Final Design Report for Cone Penetrometer Platform	Q	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	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1	1	Cog.Eng.R.Y. Seda	R.Y. Seda	7/23/96	H5-09	R.E. Raymond			S7-12	3	
1	1	Cog. Mgr.C.E. Hanson	C.E. Hanson	7/24/96	H5-09	R.J. Blanchard, Design Authority			S7-12	1	1
1	1	QA M.L. McElroy	M.L. McElroy	7/30/96	S7-07				S7-12		
		Safety				Central Files			A3-88	3	
		Env.									
1		C.G. Linschooten, Ind. Review	by Seda for C.G. Linschooten per telecon 7/30/96		S7-12						
1	1	G.N. Boechler		7/30/96	H5-09						

18. R.Y. Seda	19.	20. C.E. Hanson	21. DOE APPROVAL (if required) Ctrl. No.
R.Y. Seda 7/23/96	C.E. Hanson 7/24/96	C.E. Hanson 7/24/96	[ ] Approved [ ] Approved w/comments [ ] Disapproved w/comments
Signature of EDT Originator Date	Authorized Representative for Receiving Organization Date	Cognizant Manager Date	

BD-7400-172-2 (04/94) GEF097

BD-7400-172-1 (07/91)

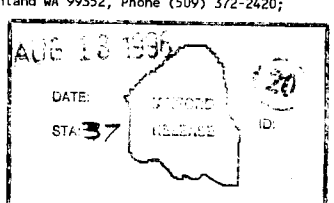
Final Design Report for Cone Penetrometer Platform

R.Y. Seda
WHC, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: 140822 UC: 2070
Org Code: 75250 Charge Code: N4H4A
B&R Code: EW3120074 Total Pages: 84

Key Words: Cone Penetrometer Platform, Final Design Report

Abstract: The final design report documents the completion of the design review meetings for acceptance of the cone penetrometer from the vendor. All design comments have been dispositioned and closed. Open items dealt with completion of the safety assessment, operational procedures, operational testing and readiness review.



Release Stamp

Release Approval Date

Approved for Public Release

FINAL DESIGN REPORT

FOR

CONE PENETROMETER PLATFORM

Issued by:

R.Y. Seda

Tank Waste Remediation System
Characterization Project

1.0 SCOPE

The design review strategy for the Cone Penetrometer Program, is to utilize the independent review form of the design verification, per WHC-CM-6-1, Standard Engineering Practices (EP 4.1 Design Verification). Several design review sessions were held at approximately the 30%, 60% and 100% phases of the cone penetrometer design, to brief the independent reviewers, and to solicit their comments. A system design review will be performed once the safety assessment is complete. Attached are the meeting minutes and RCR's from the reviews, which show the acceptability of the design from the cone penetrometer vendor (reference Purchase Requisition 357153).

The object of these reviews is to provide design verification to insure equipment function, personnel safety, and compliance with WHC-CM-6-1, Standard Engineering Practice and Performance Specification WHC-S-0241.

2.0 SUMMARY

An independent design review committee was selected in accordance with EP 4.1. A design review was performed at 30% , 60% and 100% levels. The final design review was held on June 5, 1996.

Due to schedule and budget constraints, design and fabrication were completed concurrently. The reviews were scheduled to accommodate the parallel work schedule. For example, the 30% design review, the overall system was examined with an in-depth review of the substructure which was the first item fabricated. All fabricated equipment had to be approved by WHC. The vendor design approval packages were included in the design reviews.

The final review examined the penetrometer platform design, hardware integration of the Raman spectroscopy system, and hardware and software integration of the moisture probe to the platform. The standard sensor package, bottom detection sensor, Raman probe, consoles, support trailer, guide tube, push rods, hydraulics, safety logic, operational ergonomics and all other vendor supplied equipment was included in the final review. All design comments, relating to WHC-S-0241, have been dispositioned and closed. Most open items dealt with completion of the safety assessment or the operational readiness review. The moisture probe meets the requirements in functional design criteria, WHC--SD-WM-FDC-047, as indicated in WHC-SD-WM-ATR-145. Based on these reviews, the vendor design has been accepted.

3.0 GENERAL DESIGN DESCRIPTION

The cone penetrometer is a hydraulically driven instrumented rod which is pushed into the waste and measures chemical and physical properties in situ. The rod is supported by a guide tube which provides structural support to the rod. The rod is assembled by screwing rod sections into a instrumented tip as the rod is pushed into the waste.

The following properties are measured:

Physical Properties:

Yield Strength	Surface Moisture
Shear Strength	Full Moisture Content Profile
Compressive Strength	Temperature Profile
Stratigraphy	Water Level

Chemical Properties:

Species Identification
Relative Concentration

A detailed design description of the cone penetrometer platform and the moisture probe are located in WHC-SD-WM-SDD-062 and WHC-SD-WM-SDD-063.

4.0 REVIEW DOCUMENTS

Vendor (ARA) drawings were reviewed . The major assemblies examined included:

HO53-1A	Platform Top Assembly
HO00-4A	Push System Assembly
HO52-2A	Platform Subframe Assembly
HO43-5A	Cone Assembly, 2.00 Piezo
HO59-3A	Skid Electrical Distribution Panel
HO61-3A	Body Van
HO77-6A	Trailer Assembly

5.0 REVIEW COMMENTS RECORDS

The following table is a listing of reviewers for the 30 %, 60% and 100% design reviews.. All generated RCR's were dispositioned and signed off as closed, except for sections which were left as open items. A copy of each dispositioned RCR and opened RCR are

included as attachments of this report.

Reviewer	Discipline
L.S. Krogsrud	Safety
D.J. Foust	Safety/Radiation Control
M.E. Nolen	Safety
J.E. Kane	Safety/Radiation Control
J.K. Bajwa	Safety Assessment
G.R. Bloom	Retrieval
R.L. Hand	Retrieval
P.W. Gibbon	Retrieval
F.M. Jones	Electrical Equipment
J.H. Bussell	NEC Compliance
J.M. Silko	DOE-RL
P.R. Hernandez	DOE-RL
F.A. Jensen	MacTec
P.R. Diechelbohrer	Characterization Equipment Design
C.G. Linschooten	Characterization Equipment Design
G.N. Boechler	Characterization Equipment Development
C.E. Hanson	Characterization Equipment Development
R.Y. Seda	Characterization Equipment Development
R.E. Raymond	Characterization Equipment
M.L. McElroy	Quality Assurance
L.D. Draper	Operations
F.G. Abatt	Stress Analysis
J.P. Strehlow	Stress Analysis
R.L. Butler	Procurement
T.R. Thomas	INEL

6.0 CONCLUSIONS AND OPEN ITEMS

The following open items were noted during the design review but were outside the scope of the performance specification. These items shall be addressed and closed when funds are available. When funds become available, the Safety Assessment, Operational Procedures, Operational Test Procedure and Readiness Review efforts will be initiated. The activities will close all the outstanding unclosed issues from the operations design reviews. The responsible person to close the open issues is noted in the attached table.

All open RCR items are either related to operating procedures or possible changes due to the Safety Assessment. None of the open items were related to the design adequacy of

meeting the performance specification.

OPEN ISSUES:

Final Design

	Reviewer	Description	Responsible Person
1	F. Johansen	Testing of the Raman optical array for thermal stability of the optical elements at tank operating temperatures is needed.	K. Kyle
2	M.L. McElroy D.J. Foust C.G. Linschooten	Wood deck and rails on support trailer are a radiological control problem. The wood should be replaced with a non-porous material	R.Y. Seda
3	C.G. Linschooten	Operating procedures requiring a camera to be installed in the tank, to prevent overflow at the washer station, in case of a lollypop on the penetrometer or guide tube, are needed.	R.Y. Seda
4	C.G. Linschooten	Step-by-step sequencing of clamping operations procedure are needed.	R.Y. Seda
5	G.R. Bloom	The safety assessment needs to be completed as well as any modifications required by the assessment.	R.Y. Seda
6	G.R. Bloom M.E. Nolen	Operating procedures need to be completed to assure operability of the design. Procedures should include tying down the 3000 psi hydraulic line from the trailer to the platform.	R.Y. Seda
7	G.R. Bloom J.H. Bussell	Radiation design analysis needs to be completed to assure acceptable radiation protection to operators.	R.Y. Seda
8	J.M. Silko M.E. Nolen	The guide tube shoe anchor could benefit from the addition of a second wiper, so that a wiper sandwiches the guide tube.	R.Y. Seda

	Reviewer	Description	Responsible Person
9	M.E. Nolen	An industrial hygienist needs to examine the operation of the cone penetrometer to determine the frequency and location of atmospheric checks.	R.Y. Seda
10	M.E. Nolen	Seats need to be provided for the operators	R.Y. Seda
11	J.H. Bussell	Standard dosimeter will indicate a higher neutron dose than Hanford Neutron Combo dosimeters. Equipping personnel around skid with Hanford Combo Neutron dosimeters is suggested.	R.Y. Seda
12	J.H. Bussell	Need radiation monitors at washer for gamma and beta.	R.Y. Seda
13	M.L. McElroy	Administrative controls are required to keep the ingress/egress doors to control the work atmosphere and accessibility of pest.	R.Y. Seda
14	M.L. McElroy	The transport and storage, both onsite and offsite, of the neutron source must be thought out completely, i.e. special handling tools, procedures, permanent storage, custodial obligations, etc.	R.Y. Seda
15	M.L. McElroy	Drip/catch pans maybe required for leakage of hydraulic fluids on tanks that petroleum base products are not allowed.	R.Y. Seda
16	M.E. Nolen	Hoses and cables need to be labeled.	R.Y. Seda
17	C.G. Linschooten	The drawings do not indicate the ballast filler material nor weight.	R.Y. Seda
18	C.G. Linschooten	All items to be carried or picked need the weight to be indicated on the part.	R.Y. Seda
19	C.G. Linschooten	Assembly and subassembly and dimensions of drawings need to be improved	R.Y. Seda

	Reviewer	Description	Responsible Person
20	G.R. Bloom	The ATP needs to confirm shear strength accuracy meets specifications needs be completed before cone penetrometer delivery.	G.N. Boechler
21	M.E. Nolen	Need all specifications on the winch and trolley system. Label trolley for load allowed and load test it.	R.Y. Seda
22	M.E. Nolen	Need the height and location of the computer display monitors for ergonomic concerns.	R.Y. Seda
23	F.M. Jones	The single line diagram need to show overload device, output protective device size, cable and connector size, cable strain relief and seismic support, grounding detail, DP main breaker and how heater, pumps and DP heater will operate.	R.Y. Seda
24	F.M. Jones	Electrical distribution panel needs to identify fuses. Electrical drawings need to show 24 V and 12V power supplies.	R.Y. Seda
25	C.G. Linschooten	Electrical hookups need to be compatible with new tank farm hook ups requirements	R.Y. Seda
26	M.L. McElroy	ATR, when issued, needs all sensor calibration curves.	G.N. Boechler
27	C.G. Linschooten	Contractual operations need to be finalized.	G.A. Barnes

60% Design

	Reviewer	Description	Responsible Person
1	R.E. Raymond	A mission analysis needs to be completed.	R.Y. Seda
2	C.E. Hanson	Need to plug into TCRs.	R.Y. Seda
3	C.G. Linschooten	Operational contract issues need to be resolved	R.Y. Seda

	Reviewer	Description	Responsible Person
4	C.E. Hanson	Operational procedures need to be developed which include bagging and rigging procedures.	R.Y. Seda
5	C.E. Hanson	Dome loading analysis for the cone penetrometer need to be finalized..	R.Y. Seda
6	P.R. Diechelbohrer	QA approval is needed for Raman spectroscopy neutral network.	R.Y. Seda

30% Design

	Reviewer	Description	Responsible Person
1	L.S. Krogsrud P.R. Hernandez	Operational procedures are needed.	R.Y. Seda
2	J.K. Bajwa J.E. Kane	Shielding of the hands during installation needs to be investigated.	R.Y. Seda
3	C.G. Linschooten	Use of anti spark materials needs to be investigated.	R.Y. Seda
4	R.L. Hand	Operational contract issues need to be resolved.	G.A. Barnes

7.0 DOCUMENTATION

The following items are provided as attachments to this report:

1. RCR copies
2. Meeting Minutes

Review copies of drawings provided to the review member are available in the vendor files. All released documentation referenced in the report will be available using vendor files or controlled document numbers located in the text where the document is cited.

8.0 REFERENCE

WHC-S-0241, Rev 2, "Specification for Enhanced Cone Penetrometer System"

WHC-SD-WM-SDD-062, Rev 0, "Cone Penetrometer Moisture Probe System Design Description"

WHC-SD-WM-SDD-063, Rev 0, "System Design Description Cone Penetrometer System"

WHC-SD-WM-ATR-145, Rev 0, "Cone Penetrometer Moisture Probe Acceptance Test Report"

WHC-SD-WM-FDC-047, Rev 1, "Functional Design Criteria Cone Penetrometer Moisture Probe"

Appendix A: 100% Design Review

MEETING MINUTES

Subject: Cone Penetrometer Final Design Meeting

TO: Distribution **BUILDING** 2920 George Washington Way

FROM: R.Y. Seda **CHAIRMAN** [redacted] GN Boechler

Department-Operation-Component	Area	Shift	Date of Meeting	Number Attending
TWRS			6/5/96	19

Distribution:

Attenders:

David J. Foust	WHC	ES&Q (Radiation Control)
Mat E. Nolen	WHC	ES&Q (Industrial Safety)
L.(Steve) Krogsrud	WHC	ES&Q
Mike L. McElroy	WHC	Quality Assurance
G. (Jerry) R. Bloom	WHC	Disposal Engineering
Ron L. Butler	WHC	Contracts Administration
Lonnie D. Draper	WHC	Operations
Rosa Y. Seda	WHC	Char. Equipment Development
Geoff A. Barnes	WHC	Char. Equipment Development
Carl E. Hanson	WHC	Char. Equipment Development
G. (Nick) Boechler	WHC	Char. Equipment Development
Fred M. Jones	WHC	TWRS Engineering (Electrical)
Jim H. Bussell	WHC	TWRS Engineering (NEC Compl.)
Chris G. Linschooten	WHC	Char. Equipment Design
Paul R. Deichelbohrer	WHC	Char. Equipment Design
John M. Silko	DOE	
Kevin Kyle	LLNL	
Wes Bratton	ARA	
Fred Johansen	SAIC	

Other: J.S. Schofield, WHC
J.S. Lee, WHC
T.R. Farris, WHC
Rick E. Raymond, WHC
Dennis W. Hamilton, WHC

These are the meeting minutes documenting the final design presentation and meeting. The purpose of the meeting was to present the final design of the cone penetrometer system for tank waste. A vendor drawing package was distributed to the attenders of this meeting for independent review. Review Comment Record (RCR) will be generated and resolved after the meeting. This final design covers the design up to date. Changes associated with completion of the safety assessment will be covered at a later date.

This design covers the design of the cone penetrometer (CP) platform, which includes the support trailer and skid. The skid and support trailer were built by Applied Research Associates (ARA). Two other packages have been added to ARA's system. These include the Raman spectroscopy package, developed by Lawrence Livermore National

Laboratory and the moisture probe package, developed by SAIC. The Raman spectroscopy system uses its own computer and the moisture probe shares the same computer with the rest of the CP system.

The CP instrument package includes the physical properties sensors, Raman spectroscopy sensor, moisture sensor probe and tank safety sensors. The physical properties package includes sensors which will measure physical parameters. The physical sensor package includes tip pressure, pore pressure and sleeve friction. Load cells at the tip (tip pressure) measure resistance of the material ahead of the tip while side load cells (friction sleeve) measure the friction as the cone pushes into the waste. Hydrostatic pressure (pore pressure) is measured by a sensing device also located within the tip. Safety related sensor include an inclinometer, redundant bottom detection system and side and tip thermistors. The inclinometer measures inclination to avoid rod buckling. The bottom detector measures if the tip is in proximity to the metal tank bottom. Temperature gauges alarm and shut down at a predetermined temperature. The CP sensor package cables are disconnected after a run with a 30 pin LEMO connector. The moisture probe is then lowered into the push rod interior. The moisture probe measures moisture content and tank temperature through two B-10 lined sensors and a thermistor. This package has undergone final design and acceptance testing.

The CP tip instrument package has been design to NFPA Class 1 Division 1 requirements. The sensor package is intrinsically safe by use of barriers and special conduits. A sealing flange and potting material exists between the sensor package and the explosion proof rods. The rods will be tested to 500 lbs to qualify for an explosion proof housing, per calculations on maximum peak pressure. The moisture probe is contained in the CP explosion proof housing, so that the system can be used in a Class 1 Division 1 environment.

The Raman spectroscopy sensor will perform chemical speciation. The sensor is insensitive to water and operates in the near infrared area. The detection level is 0.1% in solids and liquids. It consists of a laser, monochromator, fiber optics, optics and housing with a metal brazed sapphire window. The window was chosen for its strength and chemical resistance and protrudes outward between 0 to 5/1000 inches to prevent material from clogging on the window. A 2 inch adaptor connects the Raman housing to the 1.75 inch OD rod. The sensor is potted on the top. Seals used were viton o-rings. The laser and computer are rack mounted. The 250 feet radiation hardened fiber optics will be removed at the end of a run. The fiber optic cables are fairly flexible. The optics have a 4 inch bend radius while the other sensor cables have a 6 inch bend radius. The Raman spectroscopy sensor has been pressure tested and load tested. A neural network will be incorporated with the computer software at a later date. The fiber optic cable are aligned with a SMA connector (7) to the monochromator for slit alignment. The laser works with a 758 nm laser at 300 mV laser output. There was some concern regarding the inner section of the raman spectroscopy housing which was made of aluminum. This section is located in the interior of the body and is not in contact with the waste.

The CP is powered by the support trailer. The trailer contains the generator, hydraulic pump, decontamination system and hydraulic reservoir. A diesel engine (John Deere) drives the hydraulic pump (300 psi, 30 mpm) and generator (800 kWatt) . The hydraulic reservoir contains up to 700 gallons. The hydraulics and decontamination hoses are unique as well as the 2 electrical cables. These are 50 feet long.

The engine can run approximately 3 days due to the 36 gallon tank capacity. The support trailer contains a wood decking which needs to be changed, for decontamination purposes. Other concerns were regarding the cables and hoses not being marked. These hoses and cables are design such that they are not interchangeable.

The skid weight 20 tons and can be fully ballasted to 43 tons and jacked up 4 1/2 feet high minimum to accommodate the riser adaptor and decontamination units. The skid is divided into two sections. The computer is contained in an environmentally controlled room with the Raman spectroscopy computer, laser, moisture probe calibration block and a workbench. The hydraulics are contained in the open section of the skid. A communication system exists between these two sections as well as a clear plexiglass door. Several safety features exist on the skid. These include skid tilt, emergency stop (palm button) and leveling bubble. The legs have been seismically analyzed. These are acceptable up to a 42 inch leg extension. A trolley system exists for the 3 1/2 inch and 6 inch guide tubes. The overhead winch has 500 lbs lifting capability. The x-y positioned has a total travel of 12 inches and clamps mechanically in the x direction and hydraulically in the y direction.

The computer system consists of monitor, computer, junction box, VXI D/A system, NIM BIN, UPS, printer, line conditioners and modem. These are contained in a 6 feet full height rack. The junction box contains the intrinsically safe barriers. The D/A system contains 22 analog channels and 32 digital channels. A battery backup exists inside the control room. There is some concern on the possible effects of the battery backup on the operator. The number of ventilation room changes will be examined to determine if the battery design needs to be changed.

Several safety features exist for tank integrity. These include mechanical means as well as alarms. Safety legs, mechanical clamps and double hydraulic clamps exist to avoid dropping the skid on the tank and dropping the guide tube and push rod into the waste. A dome load alarm exist in which the user inputs the skid configuration (ballast, 1/2 ballast and no ballast) and monitors the ram force as not to exceed the limit. Other tank safety systems include the redundant bottom detector, high tip force, depth alarms and high temperature alarm.

The basic operation of the cone penetrometer system as follow:

RISER PREPARATION

This activity will be performed prior to the installation of the cone penetrometer to verify riser availability and ensure that there are no obstructions. The inspection will provide the following information:

* Zip cord measurements to provide distance from top of the riser to waste surface and riser length measurements.

* Video camera footage to provide a view of the inside of the tank and in particular, the waste surface below the riser.

* For 4 inch risers, the riser will be measured for diameter, ovality and straightness of the riser.

INSTALLATION

* Install riser adapter and decontamination unit
* Place skid over riser using crane (legs fully extended)
* Ground all equipment
* Position support trailer (off the tank, when possible) and connect to skid. This includes decontamination water, hydraulic lines and electrical power.
* Level skid
* Position X-Y to within ±0.25 inches of riser center
* Ballast as required
* Re-level, if needed

INSTALLATION OF GUIDE TUBES AND PUSH RODS

* Assemble Guide tube to length required to reach top of waste
* Lower Guide tube in place with crane. Secure guide tube with clamps.
* Lower push rod in one meter sections.

PHYSICAL PROPERTIES AND RAMAN TEST RUN

* Push cone penetrometer push rod into waste
* Data acquisition system collects data (Raman and physical properties) during push
* Data acquisition system monitors all safety conditions
* Reach end condition (tank bottom)
* Disconnect electrical and fiber optic cable from probe

MOISTURE PROBE TEST RUN

* Load moisture sensor source in probe housing
* Calibrate moisture probe in calibration block
* Position moisture sensor over push rod
* Lower moisture sensor in push rod and take moisture/temperature readings.
* Retract moisture sensor. Remove source and store moisture probe.

EQUIPMENT REMOVAL

* Start decontamination system
* Attach coupler - allow crane to lift both rod and guide tube at the same time. Decontaminate equipment.
* Cover with plastic containment sleeve and monitor radiation levels using standard tank farm techniques while removing from the riser. Guide tube an push rods will be broken down such that the push rod or guide tubes in contact with the waste are disposed.
* Seal riser.
* Remove trailer and skid, in reverse of installation.

TEST COMPLETION:

* Remove unit to lowboy for transport
* Analyze Data
* Prepare report
* Prepare workplan for next location

The deployment of the cone penetrometer in the field date is undetermined due to funding constraints. Attached are the slides used

during the presentation. Drawings submitted during the final design review will be independently reviewed.

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
June 8, 1996	
3. Project No.	4. Page
	1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	PAUL QEICHELBOHRER	CHARACTERIZATION EQUIPMENT	373-2037 S7-12

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

6/5/96
Date

Paul Qeichelbohrer
Reviewer/Point of Contact

PAUL QEICHELBOHRER
Author/Originator

11. CLOSED

6/5/96
Date

Paul Qeichelbohrer
Reviewer/Point of Contact

PAUL QEICHELBOHRER
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
	Looks good			

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
June 8, 1996	
3. Project No.	4. Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	Steve Krogsrud	TWRS/TFP	M0281/2-2302

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

6/18/96
Date

R.Y. Seda for S. Krogsrud per telecon
Reviewer/Point of Contact

R.Y. Seda
Author/Originator

11. CLOSED

6/19/96
Date

R.Y. Seda for S. Krogsrud per telecon
Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
	No comment			

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
June 8, 1996	
3. Project No.	4. Page
	1 of 21

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	G.R. Bloom	TWRS Disposal Retrieval Engineering	2440 Stevens/6-0590

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7/2/96
Date

RY Delle for GR Bloom per telecon
Reviewer/Point of Contact

GR Bloom
Author/Originator

11. CLOSED

Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	The safety assessment continues to be the critical path for the cone penetrometer deployment and operation but was not presented at the design review. There is a high risk to the project design without a completed safety assessment.		The purpose of the design review was to finalize the contract with Applied Research Associates. A system final design review with the safety assessment and procedures will be completed. This would include all the systems on the cone penetrometer.	0
2	Operating procedures need to be completed to assure operability of the design.		The contract with ARA states that they will be providing procedures to WHC. A rough draft has been submitted and a final one will be provided.	0
3	The radiation design analysis needs to be completed to assure the current design is operable and provides acceptable radiation protection to operators.		INCORPORATED. A analysis will be completed prior to the end of the fiscal year.	0
4	The ATP confirming shear strength accuracy meets specification needs to be completed before cone penetrometer delivery.		Before the cone penetrometer can be delivered, the cone penetrometer must first have to pass the ATP (which includes the shear strength test).	0

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SKID, CONE PENETROMETER DESIGN/FABRICATION DRAWINGS				

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

RY Sida for FM Jones per CC mail

7/8/96
Date

Reviewer/Point of Contact

F.M. Jones
Author/Originator

11. CLOSED

June 14, 1990
Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	H059-A SKID ELECTRICAL DISTRIBUTION PANEL			
	Rework "SINGLE LINE DIAGRAM to show: -Overload device for Skid Distribution panel. -Actual size of generator output protective device. -Cable and connector size. -Cable strain relief and seismic support. -Grounding detail. -The DP main breaker (100 A) on the Single Line Diagram. -How the heaters, pumps and DP heater will operates without tripping the generators output breaker (87 Amps).		WHC has requested from ARA all these items.	0

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
2	**H059-3A** ELECTRICAL DISTRIBUTION PANEL -Identify the fuses in the circuit controlled by K-18. -Size the fuses in the circuit controlled by K-18.		WHC has requested from ARA all these items and changes.	0
3	H130-3A -The term 120V AC "DIRTY" is not acceptable. -If this is unfiltered or unregulated, say so. -Show the 24 V and 12 V power supplies on one of the drawings.		WHC has requested from ARA all these items and changes.	0
4	GENERAL			

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
	-The drawings are not approved.		-WHC has requested from ARA to fix the drawings.	O
	-Show seismic analysis that includes overhead structures on the skid.	HOLD	-The seismic analysis is contained in ETS-W-96-849, "Cone Penetrometer Skid Seismic Analysis". The model used for the cone penetrometer is described in section 2.1 Model Description. It was completed by F.G. Abatt, March 19, 1996.	
	-Batteries (lead acid) shall be vented to outside area.		-The ventilation for the lead acid batteries is adequate. The air conditioning units change air 25 times per hour each (total of two units). OSHA requires 5 room changes per hour. The ventilation is adequate for OSHA venting requirements.	
	-(ALARA) Isolation valve should be used on the riser for personnel protection (Radiation shine) during setup.	HOLD	> • <u>This response has not considered ALARA. The isolation valve would be used to close-off the tank following removal and reinstallation of the flange. A 4 inch hole (flange opening) in a tank is unacceptable.</u> -Before any isolation valves are used, an analysis estimating the dose will be completed. At all times (except when craning in the guide tube or push rod or combination), two clamps will be ON at all times on the guide tube and push rod. This basically provides the same protection as an isolation valve. When the guide tube or push rod is being crane in, there should be no manual operations around the riser. > • <u>Okay, close this item.</u>	

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	F. Johansen	SAIC	2-7738

17. Comment Submittal Approval:

Organization Manager (Optional)

7/3/96
Date

10. Agreement with indicated comment disposition(s)

F. Johansen
Reviewer/Point of Contact

BY Sida for F. Johansen
Author/Originator

11. CLOSED

Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Suggest a test on the Raman optical array to check the thermal stability of optical elements at tank operating temperatures.		A test is planned this month. It will cover ranges from 70 to 120 C.	O

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	John M. Silko	DOE-RL/CHD/WSD	2704HV/3-9876

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7/2/96
Date

R.Y. Sola for JM Silko per telecon
Reviewer/Point of Contact

JM Silko
Author/Originator

11. CLOSED

Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Guide Tube Shoe (Chisec - toothed) anchor * Consider addition of a second wiper so that a wiper sandwiches the guide tube shoe'w seal. * Benefits: Cleaner Break of seal by cone penetrometer tip; and better cleaning of sticking waste without compromising the seal (shredding) prematurely during CP withdrawal of push rod.		The design was adequate for the requirements in the performance specification, which did not include a pressure setting. After the safety assessment, the pressure settings will be revisited and the system will be redesigned.	O

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12 Jun 96	
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Cone Penetrometer	1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	Matthew E. Nolen	WTF IS	MO-281/106/2-2918

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7/16/96
Date

RY Avila for M E Nolen per conversation
Reviewer/Point of Contact

Author/Originator

11. CLOSED

Date

Reviewer/Point of Contact

Author/Originator

REVIEW COMMENT RECORD (RCR)	1. Date 12 Jun 96	2. Review No.
	3. Project No. Cone Penetrometer	4. Page 2 of 1

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Is the potting compound approved for use in an explosive environment? IE UL approved?	Men	The purpose of the encapsulation is to provide an additional barrier between flammable vapors and possible ignition sources. The sensors package has been made intrinsically safe. Encapsulation (potting) is an accepted ignition prevention method for Class I, Div 1 Group B locations. This potting material is meets the requirements for an explosive environment but is not UL listed. None of the UL listed potting materials were appropriate for the tank environment (temperature).	C
2	WHC-SD-WM-SDD-063 Page 27: Is it ground only or bond and ground? Ref the current tank farm procedures.	Men	The current method is ground and bond. This is what the specification requires.	C
3	What are the feet sizes? (Elephant and normal)	men	The elephant feet are 18 inch diameter (H088-6A) and the pads are 12 inches in diameter (H065-2A). The pads will be on the elephant feet all the time, so your "footprint" is 18 inches in diameter.	C
4	Are there any locking stops for the HVAC unit?	Men	No. The unit is fixed on the top of the skid (it does not roll around).	C

REVIEW COMMENT RECORD (RCR)	1. Date 12 Jun 96	2. Review No.
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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
5	What is the air flow? (ACH or CFM)	men	340 CFM for a 400 cu feet room. The ATP showed that the number of room changes per hour was 25 for each air conditioning unit (total 2).	C
6	Why a lead acid battery? NICAD?	Men	Economy. The room changes is adequate for this battery type. 50 plus ACH.	C
7	Are there any exposed pinch points on the AC rails?	Men	None found in the ATP.	C
8	3000psi - secure lines to prevent flailing	men	INCORPORATED.	0
9	Label all connectors	men	INCORPORATED.	0
10	Wood deck on support trailer needs to be made of metal as well as the stake bed rails. No wood in farms.	Men	Incorporated. The wood will be replaced with metal.	0
11	Need all of the specifications on the winch and the trolley system to ensure it will hold what it is designed for.	Men	The winch is rated to 5,000 lbs. Vendor information is being obtained on the winch and trolley system.	0
12	Label trolley for load allowed.	Men	The winch is currently labeled. Inspection will verify this.	0
13	load test winch	men	The winch is rated to 5,000 lbs and will be tested in the OTP.	0

REVIEW COMMENT RECORD (RCR)	1. Date 12 Jun 96	2. Review No.
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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
14	Where and how will atmospheric checks be made during operation of the unit.	Men	The core sample truck has atmospheric checks made around the drill string. An industrial hygienist needs to examine the operation to determine frequency and location.	0
15	Ergonomic concerns for monitors. Need height and placement of monitors.	Men	The height and location were not on the drawings. WHC has requested from ARA to include these in the drawings.	0
16	Are there any seats to be used?	Men	No, contingent to funding. To be resolved.	0
17	Add a wafer to the unit. (An additional thick washer to scrape the barrel of the probe. Thick - thin - thick.	Men	The design was adequate for the requirements in the performance specification, which did not include a pressure setting. After the safety assessment, the pressure settings will be revisited and the system will be redesigned.	0

DON'T SAY IT --- *Write It!* DATE: 16 July 96

TO: Rosa Y Seda

FROM: Matthew E. Nolen

Telephone: 372-2918
cc:Hulsey, S

SUBJECT: Cone Penetrometer RCR

The open items are to remain open until the final construction and OTP of the piece of equipment. The specifications are enrout from Rosa Y Seda as of 16 July 96. The ergonomic concerns will be reviewed along with the atmospheric check requirements by Roger Mitchell, CIH before and during the OTP. The final design is needed to determine just what must be done to protect the workers.

Matthew E. Nolen
Industrial Safety Engineer
WTFTP, EH&S

REVIEW COMMENT RECORD (RCR)

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	C.G. Linschooten	CED	2704HV/3-1617

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7-3-96 C.G. Linschooten

Date Reviewer/Point of Contact

Author/Originator

11. CLOSED

Date Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	The ballast loads do not indicate what the total weight is and what is it filled with. Like lead, water or sawdust.		The ballast weights are fully encased lead filled A36 steel boxes. The ballast are set as 2 front ballast (15,000 lb each) and four back ballast (6,000 lb each). This information is required for lifting the ballast to install on the CP. WHC will ask ARA to incorporate this information on the drawings.	O
2	All items that have to be carried or picked should have a weight indicated on the drawing and the part.		This comment is in the same order as comment 1. WHC will ask ARA to incorporate this change.	O
3	Are lifting loads tested like 1 1/2 times nominal loads and recorded?		WHC-SD-WM-ATP-151 will be testing lifting device as follow: Critical welds shall be examined prior to and after loading the cone penetrometer to 1.5 times the maximum operating load. Critical welds shall be identified by WHC prior to fabrication. Examination shall consist of VT and MT or PT per AWS D1.1 on the final weld pass.	C
4	Do the drawings reflect the actual (as built) conditions?		No. WHC has requested better drawings from ARA. However, WHC level of effort drawings were not requested.	O

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
5	Are the electrical hook-ups compatible with the new hook-up requirements in the Tank Farm (see Jim Daniels/Bruce Johns)?		Jim Daniels and Fred Jones have reviewed the documentation and cannot make any conclusions. WHC has requested from ARA the documentation required to evaluate this.	O
6	Is ARA going to run the whole show or not?		Assuming that there was money in the budget for operation of the CP, ARA would be running the system with operations running the setup and shutdown of the system.	O
7	Mechanical holding clamp on guide tube or penetrometer will it catch a falling tube?		Yes. Analysis has been conducted on it.	C
8	Is there a minimum waste tank level where we will be operate or not operate.		Yes, these are the minimum waste depth on the measurements desired: Physical Properties 8 inches Chemical Species 24 inches Surface Moisture Measurements: 32 inches Profile Moisture Measurements: 60 inches	C
9	Are the dual cylinder in the system tested and do they operate O.K. like at maximum required speed.		Yes. The cylinders were tested during ATP. They operate at 2 cm/sec with a maximum speed of 10 cm/sec.	C
10	Raman system. How hard or brittle does the potting compound get in radiation fields?		The Raman spectroscopy assembly and associated optics have been tested for 17 days in a NaOH, NaNO3 and NaNO2 simulant in the gammaray pit. The total exposure was 350,000 Rad. The test results were that the assembly survived the radiation and chemical effects.	C

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
11	Is the whole system weather protected - snow & ice and hot sun and dust. Maximum operating temp and minimum like last winter. Max wind velocity allowed.		Not all components will be exposed to the environment (the control console room for example is protected since it is enclosed). The components outside are weather proof. The components are the following: control room enclosure, hydraulic ram, guide tube and push rods and associated racks and the trailer. These components were built to the following outside environment. Operating temperature: 10 to 120 °F Storage temperature: -40 to 120 °F Humidity: 10-100 % Elevation: 0 - 600 feet above sea level Exposed equipment to withstand sand and dust	C
12	Prevent overflow of washer station in case of a lollypop on the penetrometer or Guide		Operating procedures will require a camera to be installed to verify water flow and no lollipops.	O
13	Do we have a written step by step sequence of the clamping operation		We only have a draft but a final version will be provided by the vendor.	O
14	If the hydraulic clamping seals fail and the manual clamp is moved can the rods or tube free fall?		Yes, since you have described total failure. The preliminary safety assessment indicates a probability of 1×10^{6}. The hydraulic clamping system is designed to have a clamp on at all time except when the safety system is overridden (for example, when craning in the guide tube, you do not want any clamps in the way). At that time, you would have the crane holding onto your guide tube. The mechanical clamp will hold the push rod and guide tube in the event that the hydraulics would fail.	C
15	How often is re-calibration of the instrument necessary.		Before insertion, the sensor package will be recalibrated.	C

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
16	The drawings need next-used on. We should be able to go from the top drawing to the details and subdetails parts and vice-versa.		WHC has requested better assembly/subassembly drawings from ARA.	0
17	Drawings need better dimensioning		WHC has reviewed/redlined the drawings and requested that ARA fix the drawings.	0

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
CONE PENETROMETER FINAL DESIGN REVIEW	CPO/CONE PEN.	M.L. MCELROY	CPQA/75820	2704HV/B122/373-5588

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

RY Sida for, ML McElroy per telecon

7/5/96
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1.	Reviewed the System Design Description, WHC-SD-WM-SDD-063, and have "typo" and questions, only. Will send marked copy for your review.		O.K.	C
2.	The ingress/egress doors should have automatic door closures to control work atmospheres and the accessibility of pests.	MLM	The current configuration does not have automatic door closures. This will have to be completed as an administrative control. Automatic doors pose an emergency egress hazard.	C
3.	The transport and storage, both onsite & offsite, of the neutron source must be thought out completely, ie. special handling tools, procedures, permanent storage, custodial obligations, etc.	MLM	In process of completing. The procedure and custodial obligations will be similar to the LOW source.	0
4.	The initial calibration, and recall calibration of any gauges, meters, etc. must be taken into consideration for the design.	MLM	ATR will contain all sensor calibration curves. Before insertion, the sensor package will be recalibrated.	0
5.	The design of the hydraulic system must take into account the type of hydraulic fluid used, ie. some organic, petroleum base products may not be used over some tanks. Will drip/catch pans be used under the Cone Pen. system?	MLM	Yes, if needed.	0

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
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N/A	2 of 2

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
6.	As brought up during the meeting, the use of "wood" being used in the design for equipment must be looked at more closely, ie. support trailer decking.	MLM	The wood will be substituted with metal.	O
7.	Realize the drawings were not to be made to Hanford Plant Standards, but they do lack some detail for making changes or repairs to the system. Chris Linschooten will comment further on the drawing quality.		O.K.	C

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	JH Bussell	TWRS/Eng	6/9621

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

J. Bussell

7/2/96

Date

Reviewer/Point of Contact

BY Linda for J. Bussell per Fillmore

Author/Originator

11. CLOSED

Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Standard dosimeter will indicate a higher neutron dose than Hanford Neutron Combo dosimeters. Suggest equiping personnel around skid with Hanford Combo. Neutron dosimeters otherwise neutron doses will be high because of thermal neutrons. Call me, if you have any questions.		A radiation dose analysis is being completed to determine what the operators will be subjected to. These dosimeter seem to be a good idea. Could you send me some information on them?	0
2	Need radiation monitors at washer gamma and beta.		Incorporated	0
3	Need to calculate dose rate to operator from tank.		Incorporated	0

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	D.J. Foust	TWRS/CPO/ES&H Radiological Control	2704HV/6-8215

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

6/18/96
Date

DJ Foust
Reviewer/Point of Contact

CY Sole for DJ Foust per telecon
Author/Originator

11. CLOSED

6/21/96
Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Wood deck and rails on support trailer are a radiological control problem. The wood should be replaced with a non-porous material.		Incorporated.	0

8-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Final Design Review	Cone Penetrometer	L. Draper	TWR/TCP	2704HV/B117 2-1084

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

6/27/96
Date

BY Sida for L. Draper per Telecon
Reviewer/Point of Contact

L. Draper
Author/Originator

11. CLOSED

6/27/96
Date

BY Sida for L. Draper per Telecon
Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	NO Comment			

Appendix B: 60% Design Review

MEETING MINUTES

Subject: Cone Penetrometer 60% Design Review

TO: Distribution **BUILDING** 3250 Port of Benton Road (SAIC building)

FROM: R.Y. Seda **CHAIRMAN** G.N. Boechler

Department-Operation-Component	Area	Shift	Date of Meeting	Number Attending
Char. Equipment			2/6/96	26

Distribution:

Attendees:
P.R. Deichelbohrer, WHC
J.H. Bussell, WHC
C.G. Linschooten, WHC
R.E. Raymond, WHC
F. Jensen, MacTec
G.F. Vargo, WHC
J. Bloom, WHC
K. Kyle, LLNL
P. Gibbon, WHC
G.N. Boechler, WHC
J.M. Silko, DOE-RL
L. Draper, WHC
M.L. McElroy, WHC
R.M. Nelson, WHC
J. Bajwa, WHC
D. Bowser, DOE-RL
C.E. Hanson, WHC
T. Thomas, INEL
M. Nolen, WHC
O. Jaka, WHC
P. Nguyen, WHC

Other:
J.S. Schofield, WHC
J.S. Lee, WHC
T.R. Farris, WHC
D.W. Hamilton, WHC

The purpose of this meeting was to independently review and comment the design of the cone penetrometer to date. The system is compromised of three major components. These are the cone penetrometer platform (support trailer and skid), cone penetrometer moisture probe and cone penetrometer Raman spectroscopy system. The moisture probe has been designed and fabricated by SAIC and was being installed on the cone penetrometer skid. The Raman spectroscopy system was designed and fabricated by Lawrence Livermore National Laboratory. The attached viewgraph describe the system in its entirety.

The cone penetrometer consists of an instrumented metal rod which is pushed into the tank waste. The rod is supported by a support sleeve or guide tube which provides structural support to the rod. The rod is assembled by screwing hollow sections of the rod into the tip. The basic package consists of sensors to measure tip pressure, pore pressure and sleeve friction. Load cells at the tip (tip pressure) measure resistance of the material ahead of the tip while side load cells (friction sleeve) measure the friction as the cone pushes into the waste. Hydrostatic pressure (pore pressure) is measured by a sensing device also located within the tip. The Hanford cone penetrometer sensor package includes the basic package plus an inclinometer, redundant bottom detection system and two temperatures gauges (side and tip). A proposed Raman spectroscopy sensor will be located behind the standard package for chemical speciation.

The tank interior has been classified as a NEC Class 1 Division 1 environment. In order to fulfill this requirement, the system has been designed to meet the requirements outlined for a NEC Class 1 Division 1 environment by either using intrinsically safe equipment or housing the equipment in an explosion proof housing. Instrumentation safety barriers are UL listed. The instruments which are intrinsically safe are the tip and side load cells, tip and side thermistors, two axis electrolytic potentiometer sensor for inclination, the redundant giant magnetoresistive ratio sensor for bottom detection and the fiberoptic Raman spectroscopy sensor. A report has been issued which addresses how the system fulfill the requirements.

The Raman spectroscopy sensor determines unknown chemical constituents via the chemical vibrational spectra. A near-infrared, mode stabilized semiconductor laser shines light into the radiation hardened fiberoptic cable. The light shines into the waste via a diamond coated sapphire window, which provides a transparent viewing port to the waste. A silvered hypotenuse right angle prism connects the optical axis of the probe window with the optical axis of the vertical penetrometer. Light is reflected or scattered into the waste. A small shift in frequency occurs when the molecules reflect or scatter the light. The shift occurs when the molecule undergoes a vibrational transition at a characteristic frequency when reflecting or scattering a light wave. The input and output are collimated (the parallel light rays from the laser beam are either expanded or shrunk), with focussing of the excitation laser beam and the returning Raman signals. The returning Raman signals are collected with seven fiber optic cables and filtered through a long pass filter to remove scattered laser light. A monochromater emits a range of wavelengths to the charge coupled device (CCD), which is employed as a Raman signal detector. A computer is used to analyze the spectra collected from the CAD. Relative concentrations can be deduced from these measurements.

The moisture probe changes were reviewed. The moisture probe system final design has been previously reviewed by safety, QA and WHC engineering. The changes consists of adding surface moisture capabilities to the system. For tank profiles, two B-10 neutron detectors are used while for surface measurements, one B-10 neutron detector is used. Test were run to calibrate the system for surface moisture measurement.

Final design details will be reviewed in the 100% design review. The final design review is scheduled for March 1996. Attached are viewgraph of the presentations.

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer 60% Design Review	Cone Penetrometer	J.H. Bussell	74430	6-9671

17. Comment Submittal Approval:

Organization Manager (Optional) Date

10. Agreement with indicated comment disposition(s)

RY Acde for JH Bussell per cc mail

Reviewer/Point of Contact

RY Acde

Author/Originator

11. CLOSED

3/8/96

Date

RY Acde for JH Bussell per cc mail

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Radiation testing of Raman to 200 kRads should be broke up in increments to determine failure point.		The total exposure for the cone penetrometer is 302.4 kRad for 2 weeks (assuming 900 Rad/h). Part studies by Robert Donahoe (1994) at LANL showed a maximum signal loss of 21% after exposure to 532.5 KRad gamma radiation. The darkening was due to the formation of colore centers in the glass fiber, lenses and filters. The dielectric coating on the filters was unaffected. The report concluded that the reduced signal associated with the exposure of the integrated raman probe at 177.5 Rad/min does not appear to be a critical factor in the Hanford waste tank environment. No losses are expected during the testing, so increments of 200 Rad are not necessary.	
2	Pipe handling areas should be painted with paint or coatings that can be decontaminated		The push rod nor the guide tube are planned to be painted or coated at this point. The clamps on the push rod and guide tube most likely will be removing any paint or coating on these pipes. The portions which contact the waste in the push rod and guide tube are expected to be disposed.	

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer 60% Design Review	Cone Penetrometer	G. Abatt	ICF KH	ETC2/6-5574

17. Comment Submittal Approval:

Organization Manager (Optional)

Date

10. Agreement with indicated comment disposition(s)

RY Seda for GAbatt per ccmail

Reviewer/Point of Contact

RY Seda

Author/Originator

11. CLOSED

3/11/96

Date

RY Seda for GAbatt per ccmail

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	A crane is to be used for moving the CP sureled removing the push rod and guide tube. Have the loads imposed on the tank by the crane during the operations been addressed?		Yes, as far as locating the crane outside the tank (20 feet away from the tank).	

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer 60% Design Review	Cone Penetrometer	C.G. Linschooten		

17. Comment Submittal Approval:

Organization Manager (Optional) — Date

10. Agreement with indicated comment disposition(s)

RY Seda for CG Linschooten per email

Reviewer/Point of Contact — Date

RY Seda

Author/Originator

11. CLOSED

3/8/96

Date

RY Seda for GG Linschooten per email

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Will moisture probe box be weather proof to -20 F (as seen last week) and to 103F (or more) for the summertime, including dust storms and snow and rain.		Yes, the probe is design to operate at temperature between -40 to 120 °F, Humidity: 10-100 % Elevation: 0 - 600 feet above sea level Exposed equipment to withstand sand, dust, snow, ice and rain.	

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
2	Bottom detection sensor. Can it differentiate between bottom of tank liner and heavy metals on the bottom of the tank. How accurate and reliable is it?		There are three systems used to measure the bottom of the tank. These are: depth gage, tip gage and the magnetometer. The depth gage is the gage used to verify that your push rod does not exceed the maximum depth of the tank. The same administrative controls that the core sample truck uses will be in place with the cone penetrometer (putting in only what you need as far as push rod). The tip gage measures the force on the tip and compares it to the allowable stresses based on some analysis done on the tanks (the report is over 400 pages long). The magnetometer detects the presence of ferrous metals from as far as 6-8 inches. As long as your material is not ferrous, it can differentiate it.	
3	What is the guide tube size and length of individual pieces. How does the membrane work?		The guide tube is 3.5 and 6.00 inches in diameter (two sizes). The 3.5 guide tube is 22.31 inches long and the 6.00 guide tube is 26.41 inches long. The membrane design has not been finalized. The membrane will be attached at the end of the guide tube and will seal the guide tube until the push rod penetrates it.	
4	If the craft refuses to let the vendor operate, are we ready to train our own craft in time?		The operational specification is currently being worked out between operations.	
5	I would like to see drawings with more practical tolerances. And better as-built drawings. Radii and chamfers are missing. Weld call-out full weld and part is skip welded (moisture probe drawings).		We are trying to obtain better drawings from the vendor.	

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
6	What is the deterioration of the glass lenses and sapphire lenses in a radiation field? What is our worst case and how long?		The total exposure for the cone penetrometer is 302.4 kRad for 2 weeks (assuming 900 Rad/h). Part studies by Robert Donahoe (1994) at LANL showed a maximum signal loss of 21% after exposure to 532.5 KRad gamma radiation. The darkening was due to the formation of color centers in the glass fiber, lenses and filters. The dielectric coating on the filters was unaffected. The report concluded that the reduced signal associated with the exposure of the integrated raman probe at 177.5 Rad/min does not appear to be a critical factor in the Hanford waste tank environment.	

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer 60% Design Review	Cone Penetrometer	R.E. Raymond	CEE	2704HV/3-3647

17. Comment Submittal Approval: R E Raymond
Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)
2/6/96 — Date
R E Raymond — Reviewer/Point of Contact
Author/Originator

11. CLOSED
3/18/96 — Date
R E Raymond — Reviewer/Point of Contact
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Delete the FeCN DQO from your design criteria list. The FeCN safety issue is scheduled for completion in May and the data needs are redundant with other DQOs		DONE.	
2	Add the "Historical Tank Content" DQO to your criteria list.		DONE.	
3	Please conduct a systems engineering mission analysis diagram - see me for details.		A mission analysis is being completed.	
4	If you can increase the controlled operator environment.		What is the question?	
5	Do not use lead - creates mixed waste.		The lead will be poured into steel boxes, so that no mixed waste will generated.	

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Cone Penetrometer 60% Design Review	Cone Penetrometer	G.R. Bloom	TWRS Disposal Retrieval Engineering	2920 GWY/6-0590

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

3/5/96
Date

RY Seda for GR Bloom per telecon
Reviewer/Point of Contact

R Y Seda
Author/Originator

11. CLOSED

3/5/96
Date

RY Seda for GR Bloom per telecon
Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Hazard analysis and safety assessment were not presented and appear to be the critical path for the cone penetrometer operation. These items need to be accelerated to keep the project on schedule.		Hazard analysis and safety assessment has been completed and approved by WHC (WHC-SD-WM-SAD-032). This document has gone for DOE approval. Approval date is expected on April 2, 1996.	Closed
2	The cone penetrometer skid weight when fully loaded may exceed the active allowable load for some tanks. The tanks which cannot be characterized need to be identified.		Prior to going to any tank, the dome loading will be examined. Stress analysis WHC-SD-DA-212 covers dome loading (including those which cannot be characterized). This report should be out once it has been finalized with Shafik Rifaey.	
3	The tanks to be characterized by the cone penetrometer, their priority and the schedule need to be identified to assure meeting TWRS programmatic needs.		This effort needs to be accelerated. Your input will be required as we progress. A plan with the tanks and schedule will be completed by August 15, 1996.	
4	Operating procedures need to be available for 100% design review to assure operability of final design.		ARA is developing operating procedures as part of the O&M manual. A review copy of the procedures will be ready for the 100% design review.	

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
5	The sensor probe instrument connector design needs to assure inadvertent disconnection during probe insertion.		The current design will be tested to verify this does not occur.	
6	Radiation fields above riser need to be determined and considered in assuring operator safety during operation over tanks like SY-102 & 101 which have higher radiation fields.		The radiation exposure for the cone penetrometer will be no more than that of the current rotary core sample truck. An analysis will be presented at the 100% design review, which will occur at the end of March.	
7	Alignment procedures need to be specified for platform and alignment box positioning over riser.		Operating procedures will be included for these steps.	
8	Steel probe contact with guide tube contact should be evaluated as a spark source.		This has been evaluated and has been determine that it is of no consequence (see ETS-W-96-447).	
9	Correlations between CPT data and rheological properties need to be confirmed before full scale operation.		Further testing, in April, will confirm the properties. WHC-SD-WM-ATP-146 will cover the tests.	

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Cone Penetrometer 60% Design Review	Cone Penetrometer	C.E. Hanson	CED	H5-09/6-4810

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

3/4/96
Date

R T Seda for CE Hanson per e-mail
Reviewer/Point of Contact

R T Seda
Author/Originator

11. CLOSED

3/4/96
Date

R T Seda for CE Hanson per e-mail
Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Need to establish contacts on "plugging" into TCRs		This is something which is being worked on.	Open
2	Need to work on Operational Contract issue		A review copy of the contract has been written. A meeting with operation and procurement is being set up to discuss contract issues.	Open
3	Need to work on "bagging" out procedure of components.		The guide tube and push rod will be pulled out simultaneously out of the tank to minimize contamination. This will be decontaminated and surveyed on its way out of the tank. Bagging will either be completed while it is being pulled out or at a different location (off the skid). This detail is being worked out.	Open
4	Dome Loading...Need to check with TF Operations and assure there isn't a problem.		Getting signature from Shafik Rifaey on stress analysis to confirm data is valid. The analysis already has been reviewed by personnel that originally performed dome loading analysis. It is not anticipated that obtaining the signature will be a problem. This effort might initiate other analysis that could also help.	Closed

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
5	Need to get through set up with operations and crane and rigging and get refined procedure.		Working on it.	Open

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer 60% Design Review	Cone Penetrometer	Phong Nguyen	SAIC/TFA	372-7756

17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)

11. CLOSED

Organization Manager (Optional)	Date	Reviewer/Point of Contact	Date	Reviewer/Point of Contact
		Author/Originator		Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
	Very good organization however I believe some presenters were not well prepared & unfamiliar with the topics.			

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer 60% Design Review	Cone Penetrometer	P. Deichelbohrer	CED	2704HV/3-2037

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

3/5/96
Date

R Y Seda for P Deichelbohrer per cemail
Reviewer/Point of Contact

R Y Seda
Author/Originator

11. CLOSED

3/5/96
Date

R Y Seda for P. Deichelbohrer per cemail
Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Shaft Encoder circuits		DONE. Geoff Barnes has given Chris Linschooten this material and he was supposed to share this information with you.	Closed
2	Thermistor circuits		DONE. Geoff Barnes has given Chris Linschooten this material and he was supposed to share this information with you.	
3	You are going to throw away: CP pipe the stabilizer the tip instrumentation the Raman probe the cable/fibering, etc... for each tank. will this be cheaper than the rotary mode sampling?		The following will be thrown away: Contaminated CP pipe (that has touched waste), stabilizer (that has touched waste), tip instrumentation, Raman probe (if necessary). The saving of 300K per hole comes from no laboratory analysis disposal tranportation, ect...	
4	Raman probe in the CP is no substitute for lab analysis of core samples.		Lab analysis is not needed in all tanks.	
5	How are you going to prevent the operator from sabotaging the operation by pulling the instrument cable before the CP is fully inserted?		Administrative controls	
6	How will ballast be transported to the tank top? Crane? fork truck?		Crane.	

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
7	How are you going to get QA to approve the neural network results?		This is the response I obtained from Kevin Kyle: "Good question. In theory, we were going to test the neural network with the hotcell Raman system. The problem is that there is now no hot cell Raman system due to loss of funding. Simulant tests will be run at LLNL both during neural network training and later on in blind testing, but I really can't say how the QA will work. I'll be writing QA in as an FY97 task through CMST (EM-50), giving the work to Fred Reich's group or Bev Crawford's group, whoever has more ready acess to the hot cell facility. This year, I am simply not funded for QA."	

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer 60% Design Review	Cone Penetrometer	M.L. McElroy	CPE-QA	2704HV/3-5588

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

3/4/96 Date — M.L. McElroy Reviewer/Point of Contact

R.T. Sedi Author/Originator

11. CLOSED

3/4/96 Date — M.L. McElroy Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Many risers may not be vertical, or are bent or may have obstructions (welds, etc.). Will there be a means of riser characterization before sampling?		Yes. A plug gauge similar to the one used on TC installations will be used.	CLOSED
2	Besides the x-y movement of the push system, will there be the capability for vertical tilt, if riser is beyond vertical? Beyond 5°?		The leveling system could do this however the rod strength would be significantly lessened.	
3	What system will there be for monitoring tank parameters, i.e., hydrogen levels? S.A. Requirements?		Same as the Core sample truck (hydrogen sniffers, etc.)	
4	The OSDs and OSRs and SA are continually changing as tank characterization takes place. The controls from these documents must be incorporated into the CP design, ie, 30 diameters of open riser must be maintained for tank top electrical equipment.		The project is trying to stay up on the changes through Dennis Hamilton and Jeff Smalley.	
5	Will WHC perform ATP on site, with all interfaces before sampling of any tanks. This would include testing of O rings, procedures, software and hardware.		WHC is planning on performing an ATP on the cone penetrometer next month. This will include testing of the O-rings, hardware and software. From the ATP, procedures will be written.	

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
6	As an alternate removal scenario, will there be a bagging system in the case of decontamination failure or insufficient decontamination?		Bagging the push rod and guide tube in the event of insufficient decontamination will be implemented.	CLOSED
7	After data acquisition, where does the data go? Who analyzes the data and reports the findings and documents?		Where the data and report is being coordinated with the people who do the tank sampling plans. This is a detail which is currently being worked on.	
8	Will WHC receive copies and results of all testing? i.e. pressure tests, push tests, chemical tests, ect?		Yes, this is required.	

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer 60% Design Review	Cone Penetrometer	T. R. Thomas		

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

2/6/96 (Date) T. R. Thomas (Reviewer/Point of Contact)

Author/Originator

11. CLOSED

Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
	Good Review			

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer 60% Design Review	Cone Penetrometer	Kevin Kyle	LLNL	510-423-3693

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

3/8/96
Date

R.Y. Seda for K. Kyle per telecon
Reviewer/Point of Contact

R.Y. Seda
Author/Originator

11. CLOSED

3/8/96
Date

R.Y. Seda for K. Kyle per telecon
Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Guide tube design: if it goes all the way to the solid waste, information on surface slurrier and sludges will be missed. Is it necessary for guide tube to anchor in waste?		Since most tanks contain materials of unknown strengths, it is very likely that the guide tube will be installed. The guide tube provides structural strength (buckling) to the push rod. The maximum length of rod (unsupported) which we could deploy without buckling is probably 20 feet (this is in slushy materials).	
2	ARA must decide on a final penetrometer pipe design. The latest design are still under consideration and have not been finalized.		ARA has the final configuration.	
3	Organic tanks end users would like the top few feet characterized for organics. Can deployment include 1 inch push and hold intervals during collection of Raman data?		No. A 1 cm/sec push will invalidate any rheological data which has been obtained. Instead, a scheme in which the push rod is pushed and stopped (every 6 inches) can be implemented.	

Appendix C: 30% Design Review

MEETING MINUTES

Subject: Cone Penetrometer 30% Design Review

TO: Distribution **BUILDING** 3250 Port of Benton Road (SAIC building)

FROM: R.Y. Seda **CHAIRMAN** G.N. Boechler

Department-Operation-Component	Area	Shift	Date of Meeting	Number Attending
Char. Equipment			9/6/95	21

Distribution:

Attendees:
W. Bratton, ARA
J. Shinn, ARA
F.P. Johansen, SAIC
C.G. Linschooten, WHC
M.L. McElroy, WHC
F.G. Abatt, KEH
J.E. Kane, WHC
J.K. Bajwa, WHC
F.M. Jones, WHC
R.L. Butler, WHC
P.R. Hernandez, DOE-RL
P.R. Deichelbohrer, WHC
J.H. Bussell, WHC
R.L. Hand, WHC
R.M. Nelson, WHC
J.M. Silko, DOE-RL
C.E. Hanson, WHC
L.S. Krogrud, WHC
J.P. Strehlow, WHC
R.Y. Seda, WHC
G.N. Boechler, WHC

Other:
J.S. Schofield, WHC
J.S. Lee, WHC
T.R. Farris, WHC
R.E. Raymond, WHC
D.W. Hamilton, WHC
G.T. Dukelow, WHC
D.W. Bowser, DOE-RL

The purpose of the meeting was to discuss the preliminary design of the skid mounted cone penetrometer. Applied Research Associates (ARA) presented the design while Science Application International Corporation (SAIC) presented the operation of the moisture probe. The cone penetrometer system consists of the CPT skid and its support trailer.

The cone penetrometer consists of an instrumented metal rod which is pushed into the tank waste. The rod is supported by a support sleeve or guide tube which provides structural support to the rod. The rod is assembled by screwing hollow sections of the rod into the tip. The basic package consists of sensors to measure tip pressure, pore pressure and sleeve friction. Load cells at the tip (tip pressure) measure resistance of the material ahead of the tip while side load cells (friction sleeve) measure the friction as the cone pushes into the waste. Hydrostatic pressure (pore pressure) is measured by a sensing device also located within the tip. The Hanford cone penetrometer sensor package includes the basic package plus an inclinometer, redundant bottom detection system and two temperatures gauges (side and tip). A proposed Raman spectroscopy sensor will be located behind the standard package. The purpose of this sensor is for chemical speciation.

The basic operation of the system entails first installing the guide tube, and then the push rod. The cable bundle is removed such that a 1.00 inch hole is left. The moisture probe then surveys the tank to obtain surface moisture and temperature and moisture content profiles. Testing has been completed on both the moisture probe and cone penetrometer. For test results, please contact Rosa Seda.

The basic operation of the cone penetrometer system as follow:

1. Riser preparation

   This is a routine activity performed prior to the installation of the cone penetrometer to verify riser availability and ensure that there are no obstructions for installation and operation of the cone penetrometer. This inspection will provide the following detailed information:

   * Zip cord measurements to provide distance from top of the riser to waste surface and riser length measurements.

   * Video camera footage to provide a view of the inside of the tank and in particular, the waste surface below the riser.

   * For 4" risers, the riser will be measured for diameter, ovality and straightness of the riser.

2. Installation, Operation and Removal:

   POSITION SKID AND SET-UP:

   * Install riser adapter and decontamination unit
   * Place skid over riser using crane (legs fully extended)
   * Ground all equipment
   * Position support trailer (off the tank) and connect to skid
   * Level skid
   * Position X-Y to within $\pm$0.25 inches of riser center
   * Ballast as required

   INSTALL GUIDE TUBE:

   * Assemble Guide tube to length required to reach top of waste
   * Lower Guide tube in place with crane
   * Assemble push rod and begin cone penetrometer push (about 4 feet into the waste)
   * Push guide tube so that it seats into the hard waste (about 2-6 inches into the waste). The guide tube will be assembled only if a hard push (i.e., 35 tons) is required.
   * Continue cone penetrometer push

   CONDUCT PENETRATION:

   * Push cone penetrometer into waste
   * Data acquisition system collects data during push
   * Data acquisition system monitors all safety conditions
   * Reach end condition (tank bottom)
   * Disconnect electrical cable from probe
   * Conduct moisture and temperature survey

   EQUIPMENT REMOVAL:

* Start decontamination system
* Attach coupler - allow crane to lift both rod and guide tube at the same time. Decontaminate equipment.
* Cover with plastic containment sleeve and monitor radiation levels using standard tank farm techniques while removing from the riser. Guide tube and push rod will be broken down prior to bagging of equipment. Dispose of guide tube and push rod.
* Seal riser.

TEST COMPLETION:

* Remove unit to lowboy for transport
* Analyze Data
* Prepare report
* Prepare workplan for next location

Cone penetrometer technology is at least 50 years old. The technology was originally developed in the Netherlands for foundation design. The technology has evolved since then and is currently used in environmental remediation, such as field screening. The advantage of this technology is that it provides continuous measurements in-situ. The cone penetrometer is capable of taking water samples (1 liter). Primary cone penetrometer measurements are sleeve friction, tip stress and pore pressure. ARA has penetrated soil depths of 150 feet average and a maximum of 300 feet.

The Hanford cone penetrometer is unique in that guide tubes support the rod (for buckling purposes) and the range of materials strength is wide. The tip stress averages for sludge simulant testing was around 15 psi while the saltcake simulant testing was between 6,000 to 10,000 psi. The basic layout of the skid includes the control room with workbenches and the data acquisition room and a hydraulic area. The skid contains two exits and a door between the control room and hydraulic area. The control room is enclosed while the hydraulic area is open.

The hydraulic rams will be located around the center of the skid. The skid will weigh between 15 and 25 tons, unballasted. Ballasting weight will be placed on the skid. Steel ballast will weigh around 2,000 lbs. Lead encased in steel ballast were discussed but rejected in the meeting since these ballast would be considered mixed waste, if contaminated. The skid is 8 feet maximum off the ground.

The safety envelop of the cone penetrometer will be limited through the computer through force limitations, the bottom detection system and the length of the push rod. The force limitations will depend on the force required to penetrate the material. A maximum of 40 feet of guide tube will be used to support the push rod. The clamps on the rods will automatically keep the guide tube and push rod from dropping, similar to a foot clamp. Two size guide tubes will be implemented. The sizes are 3.5 inch OD and 6 inch OD guide tubes. For a 4 inch riser, the 20 inch long guide tubes will roughly weigh 18 lbs while for 12 inch riser or larger, the guide tubes will weigh around 130 lbs. The guide tube use ACME threads and push rod use taper threads. These are locked in place with a pipe wrench. The thread design may be changed since ARA will be manufacturing the push rod and guide tube. The cone penetrometer probe will use no brass (material compatibility) thermistors and is spark resistance since the probe and rod and guide tube are manufactured from austenitic stainless steel. Depth is measured through the displacement of cylinders through linear transducers.

The support trailer will have a goose neck and is roughly 28 feet in length. The hydraulic pump, decontamination unit, diesel electrical generator, and water storage (100 gallons at 130F) are located on the support trailer. The unit will be within a 75 foot radius of the skid. The unit is considered to be off the tank if it is located 20 feet away from the tank. DST has a dome limit of 50 tons (temporary loading) and SST have a dome loading of 100 tons maximum. The unit will be operate up to 4 days of continuous run. The unit will weigh less than 15,000 lbs, and can be haul from its location with a 1 ton pick up truck. The diesel generator will be a 100 hp generator.

The cone penetrometer instrumentation is being designed to be explosion proof. The main instrumentation will limit energy which can be transmitted. The magnetic bottom detection is considered an energy storage unit (coil) and will be encapsulated. The housing will be explosion proof. The load cells are considered a wheatstone bridge and will have safety barriers located on the top. The neutron probe is not considered intrinsically safe but it is contained within an explosion proof enclosure. A special cable has been used to dissipate static charge. The issue of UL testing was discussed. UL testing consists of testing the unit in a hydrogen chamber and detonating it. The cost is between $15,000-$20000 and takes up to 4 weeks. OSHA permits that the unit can be documented (analyzed) to prove it is explosion proof. The latter method has been chosen. Jim Bussell will provide safety barrier manufacturers to ARA. The unit will be grounded using 2 to 3 grounds at 2 risers.

The moisture probe is deployed with a californium 252 source. This source is contained in a shielded containers. The source is installed in the moisture probe prior to insertion into the push rod cavity. Prior to entry, the moisture probe is calibrated in a cadmium lined unit. The unit reads at every inch for 12 seconds. Critical moisture content measurement is 20% and can be measured within 3%.

Decontamination of the unit is accomplished with spray wash system which discharges water into the tank. A discussion occurred on collecting the water inside another tank. This concept would require the use of shielded hoses and tanks.

The final design review will occur on January, 1996. Attached are the slides used during the presentation.

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Preliminary Design Review	Cone Penetrometer	L.S. Krogsrud	TWRS/NSS	2751/2-2302

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/28/95
Date

L S Krogsrud
Reviewer/Point of Contact

R Y Seda
Author/Originator

11. CLOSED

9/28/95
Date

L S Krogsrud
Reviewer/Point of Contact

R Y Seda
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	On diagram noticed a "Brass Thermocouple". Brass is not compatible with high PH waste. Check compatibility of materials.		The side temperature sensor cap will be changed from brass to stainless steel. The remainder of the probe housing will be insulated from the stainless steel cap and temperature sensor by a high strength plastic (Hydlar) housing. This insulations assists in having the sensor measure the temperature of the waste and not the probe housing.	Closed
2	FDC says system is safety class 3. I agree with this except if a bottom sensor is used to detect and protect the tank bottom from puncture. That system maybe safety class 1.		1. According to WHC-4-46, a safety class 1 item identifies items which are necessary to protect the health and safety of the offsite public, or that prevent a nuclear criticality. Puncturing the tank bottom does not fall under the definition above. I am checking with the safety assessment group to verify the safety class. 2. Even if we had a safety class 1 system on the CP, it does make the whole system a safety class 1 system.	Closed

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3	Any licensing requirements for WHC to use moisture probe source?		WHC is licensed to handle Cf252 sources and currently has several on site. The ownership of the CPMP source will be transferred from SAIC to WHC through the cognizant safety organization.	Close
4	Define operational responsibilities. WHC-S-0241 states WHC will operate		This issue is being resolved through a separate operations contract. The operations contract will be placed by March 1996. WHC-S-0241 will be changed so that it only addresses design issues.	Open

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Preliminary Design Review	Cone Penetrometer	Paul Deichelbohrer	Characterization Equipment	2704HV/373-2037

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/28/95
Date

RY Seda for P. Deichelbohrer per CC mail
Reviewer/Point of Contact

RY Seda
Author/Originator

11. CLOSED

9/26/95
Date

RY Seda for P. Deichelbohrer per CC mail
Reviewer/Point of Contact

RY Seda
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Sense tip temperature of guide tube as it is pushed into the waste to prevent flammability of organic/ferrocyanide waste.		Guide tube temperature will not be measured since the guide tube will only be seated on the top of the waste (between 2 and 6 inches). As indicated in our testing with saltcake simulant, the temperature increase for a 6 foot push was only 10C. Since we are only seating the guide tube in 6 inches of waste, the temperature increase is minimal.	Open 9/26/95 RYS for PD
2	SAIC Report Page 8 NEAR/FAR ratio does not seem to be sufficiently insensitive to Boron.		This question is not pertinent to the 30% design review for the platform (ARA's design) but here is some information which may help you. The near-far ratio was used to try to remove the effects of the boron neutron absorbers. It essentially did that for a 50% level, but at the 100% level, we would have to use an empirical correction. We suggest that you contact Dan Holslin in San Diego (619 458-3715) for more details on the technique.	Closed

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Cone Penetrometer Preliminary Design Review	Cone Penetrometer	JH Bussell	ISI	L6-38/6-9621

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/25/95
Date

RY Seda for JH Bussell per CC mail
Reviewer/Point of Contact

RY Seda
Author/Originator

11. CLOSED

9/25/95
Date

RY Seda for JH Bussell per CC mail
Reviewer/Point of Contact

RY Seda
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	LEL & Oxygen alarm trips should be hardwired and not dependent on the computer to actuate required actuation.		The LEL, O2 and gaseous vapor alarms are a self contained system located in the control room of the skid. As a self contained unit, they will independently activate audio alarms. The unit will also output a signal to the DAQ system to provide a redundant visual alarm along with making an entry into the comment file of which alarm signaled for future reference.	eCosed

A-6400-090.1 (03/92) WEF011

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Cone Penetrometer Preliminary Design Review	Cone Penetrometer	R. Hand	DST Retrieval Engineering	ETC2/373-3053

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/25/95
Date

R Y Sedla for R Hand per cc mail 9-25-95
Reviewer/Point of Contact

R Y Sedla
Author/Originator

11. CLOSED

9/25/95
Date

R Y Sedla for R Hand per cc mail 9/25/95
Reviewer/Point of Contact

R Y Sedla
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Scope statement indicates that WCH will operate the CP.		The original scope of the project had WHC operating the CP. A separate operations contract is being developed so that a CP vendor operates the CP. The contract will be placed by March 1996. The current performance specification is being modified to eliminate such reference.	Open RYS for RH per cc mail
2	Paragraph 4.2 Data Output. It should be made clear who is responsible for Data to be "Tabulated and Plotted". The ultimate goal is to obtain physical characteristic data.		The cone penetrometer data will be given to Characterization for analysis. The cone penetrometer obtains physical data (Retrieval), moisture and temperature profiles (Safety) and possibly chemical speciation data (Waste Compatability).	closed
3	Paragraph 3.3.10 HVAC. This paragraph does not specify exchange rate of air.		Please refer to ECN 623986 in which the air exchange rate is specified.	closed

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Preliminary Design Review	Cone Penetrometer	Jasbir Bajwa	SA&NE	450 Hills/372-1478

17. Comment Submittal Approval:

Organization Manager (Optional)

9/25/95
Date

10. Agreement with indicated comment disposition(s)

RY Sedan for Jasbir Bajwa per Telecon 4-25-95
Reviewer/Point of Contact

RY Sedan
Author/Originator

11. CLOSED

9/20/95
Date

RY Sedan for Jasbir Bajwa per telecon
Reviewer/Point of Contact

Ron Sedan
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	How is it shielded (guide tubes) when installing rod.		This issue (shielding of hands during installation) is being investigated . Two options are being considered to address the issue of radiation beaming. One option is to preassemble both the push rod and guide tube and installing these remotely with a crane. Another option is to manufacture tools which would allow the guide tube and push rod to be assembled remotely.	Open RYS for JB.
2	Decon system (Why not washed while inside the trucks?)		The decontamination system washes the guide tube and push rod while inside the tank. No trucks will be used in this system except for transportation purposes. I believe you are asking about catching the decontamination water after it has washed the guide tube and push rod. This issue is being investigated further from the design side (shielding and catching of the water) as well as from the permitting side.	Open RYS for JB

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Cone Penetrometer Preliminary Design Review	Cone Penetrometer	R.E. Kane	CSSO/Safety Rad Control	2704HV/6-8387

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9-26-95
Date

RY Seda for JE Kane per telecon
J. E. Kane 9-26-95
Reviewer/Point of Contact

RY Seda
Author/Originator

11. CLOSED

9/26/95
Date

RY Seda for JE Kane per telecon
Reviewer/Point of Contact

RY Seda
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	What precautions are being taken to address radiation beaming from the open tank as each section of the guide tube and rod are installed.		Two options are being considered to address the issue of radiation beaming. One option is to preassemble both the push rod and guide tube and installing these remotely with a crane. Another option is to manufacture tools which would allow the guide tube and push rod to be assembled remotely. This issue is currently being worked out.	Open per RCVS [illegible] JEK per [illegible]

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Cone Penetrometer Preliminary Design Review	Cone Penetrometer	John Silko	CHD-Sample Collection/Equipment	TWRS 373-9876

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/25/95
Date

R Y Seda for J. Silko per telecon
Reviewer/Point of Contact

R Y Seda
Author/Originator

11. CLOSED

9/25/95
Date

R Y Seda for J Silko per telecon
Reviewer/Point of Contact

R Y Seda
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	SAIC to resolve "seal" issue with neutron moisture sensor tool. explosivity vs instrinsically safe.		This issue has been resolved. The NEC report covers the issue in detail.	Closed
2	Ballast on skid - I suggest "paired" hanging, saddle-weights (deployed/added in pairs on opposing horizontal vectors relative to C.O.G.)		The ballast will be mounted on the skid with the use of a crane such that the weights will be distributed uniformily on the skid. The actual details have not been completely worked out but your suggestion is being considered.	Closed
3	Complete correlation chart (initial chart can be "rough" and later "fine-tuned" to acutal experience encounted tank waste conditions). I would like to reserve "strong" input on this.		The correlations chart will be completed with field data as well as data obtained during the ATP test.	Open RYS for JS per telecon

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Cone Penetrometer Preliminary Design Review	Cone Penetrometer	C.G. Linschooten	Characterization Equipment	2704HV/373-1617

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/26/95
Date

RY Seda for CG Linschooten per telecon 9/26/95
Reviewer/Point of Contact

RY Seda
Author/Originator

11. CLOSED

9/26/95
Date

RY Seda for CG Linschooten per telecon 9/26/95
Reviewer/Point of Contact

RY Seda
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Anti-Spark Materials for penetrometer		The probe tip is be made out of 304 stainless steel, the probe body is be made out of 4340 steel alloy (the exterior will be chrome plated or tungsten carbide plated) and the rod material is 4130 steel alloy. The guide tube will be a steel alloy. According to an internal memo "Selection of spark resistant tube materials for use in Tank 101-SY", austenitic stainless steels or nickel-chromium alloys are acceptable to resist sparking or other ignition reactions. 304 stainless steel is an austenitic stainless steel. The other materials may have a problem with sparking but this issues is being resolved. WHC-S-0241, Rev 1 states that the CP components in the tank will not spark.	Open 9/26/95 CG Linschooten per telecon
2	Leveling for uneven ground - How much needed?		WHC-S-0241, Rev 1 states that a minimum of 2 feet of leveling travel is required.	Closed

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
3	How much clearance is there between the outside of the penetrometer tube and the inside of the guide tube?		Both sets of guide tubes will have an ID of 2.25 inches. The rods will be most likely a 1.75 inch OD rod and the probe will have a 2.0 inch OD. A 2.0 inch OD rod is being considered but is not currently in the plan.	Closed

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Preliminary Design Review	Cone Penetrometer	Paul Hernandez	RL-CHD	376-2209

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/27/95
Date

RY Seda for Paul Hernandez per e-mail
Reviewer/Point of Contact

RY Seda
Author/Originator

11. CLOSED

9/27/95
Date

RY Seda for Paul Hernandez per e-mail
Reviewer/Point of Contact

RY Seda
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Confirm that water content readings are minimally affected by presence of dissolved H2.		The amount of hydrogen gas in the waste is estimated to be a maximum of 3% by volume or .000002% by weight. The water in the waste is at a 10-20% wt% which means the hydrogen in waste is .01-.02% by weight. The hydrogen in water is approximately 4 orders of magnitude more than the gaseous hydrogen. Thus the error from the gaseous hydrogen is neglible.	Closed
2	Sliding glass door - could it be easily broken? Any other materials considered?		The sliding glass door will be a wire grid reinforced safety glass. This will prevent the possibility of broken glass while maintaining strength and full view.	closed
3	Upon decontamination can the water be minimized, or captured w/out going into the tank. (It could affect follow-on Rotary Mode sampling results).		This issue is being examined further since it was not in the original scope of work. Design issues such as shielding and capturing the water as well as permitting issues are being examined to determine the feasibility of the concept.	Open RY Seda for Paul Hernandez per e-mail
4	Check w/Operations to determine if support trailer is best as crane dependent, towable by truck or both.		Operations has indicated that the support trailer towed by truck would be preferred.	closed

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
5	Verify w/HAMTECH union that outside vendors will be "allowed" to operate the CPT.		This issue is being resolved through a separate operations contract. The operations contract will be placed by March 1996.	Open RTS for PH per EC M-26
6	Verify that outside vendors will not be required to comply with lengthy, elaborate procedures to operate CPT in tank farms.		This issue is being resolved through a separate operations contract. The operations contract will be placed by March 1996.	Open RTS for PH per EC M-26

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Cone Penetrometer Preliminary Design Review	Cone Penetrometer	Carl Hanson		ETC1/376-4810

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/25/95
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

9/25/95
Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Decon system...Discussed using "Drum Pick UP" of waste water. Need to finalize decontamination method and give to ARA.		This issue is being investigated from the design side (shielding and catching of the water) as well as from the permitting side.	OPEN CHH 9/25/95
2	Need to identify size of fuel tank for diesel general (Is 4 days adequate?)		The performance specification states that the CP sensors will be in the tank for a period of 2 weeks without degradation. This is to accommodate for any maintenance/repairs required. The actual operation time for the full tank scan is probably in the order of 1 or 2 days. A 4 day supply is a conservative estimate for fuel tank size.	CLOSED CHH 9/25/95
3	Investigate if there are any permitting issues w/this diesel generator.		No permitting issues exist for portable generator of 500 hp or less.	CLOSED CHH 9/25/95
4	Investigate shielding reqd to protect workers from "Hand Dose" while inserting rod and guide tube.		This issue is being investigated. Two options are being considered to address the issue of radiation beaming. One option is to preassemble both the push rod and guide tube and installing these remotely with a crane. Another option is to manufacture tools which would allow the guide tube and push rod to be assembled remotely.	OPEN

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Preliminary Design Review	Cone Penetrometer	M.L. McElroy	CPQA	2704HV/3-5588

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/25/95 Date — M.L. McElroy Reviewer/Point of Contact

R.Y. Seda Author/Originator

11. CLOSED

9/25/95 Date — M.L. McElroy Reviewer/Point of Contact

R.Y. Seda Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Noticed that a teflon filter and brass sensor unit will be used in probe design - these materials are questionable when used in organic/H2 atmospheres.		The side temperature sensor cap will be changed from brass to stainless steel. The remainder of the probe housing will be insulated from the stainless steel cap and temperature sensor by a high strength plastic (Hydlar) housing. This insulation assist in having the sensor measure the temperature of the waste and not the probe housing. The standard pore pressure filter material consist of polyethanlene (sp) plastic material. The viewgraph was incorrect in stating teflon. We can change this to a sintered metal (stainless steel) filter if required.	Closed
2	For the program, state permitting may be needed to be addressed; i.e. EPA permits for diesel power operation.		No permitting issues exist for portable generators with less than 500 hp.	
3	Who or what organization will analyze the end data?		Characterization.	

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
4	Aluminum decking is to be used - be aware that cracking of welds and materials has been a problem. Also, any organic spill on aluminum will cause toxic fumes and deterioration of the aluminum, as per 101-SY study.		The skid system is designed strictly for in-situ testing of the tank waste material and not sampling. No tank material will be retrieved with the unit and therefore organic materials will not encounter the decking material. The aluminum decking will not experience the same loads (rotating) that the core sample truck experiences. The design has yet to be finalized (bolting vs welding the deck on the skid) but your comment is being considered.	Closed

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Preliminary Design Review	Cone Penetrometer	F.N. Jones	WHC IEC	52/02 373-1269

17. Comment Submittal Approval:

Organization Manager (Optional) — Date

10. Agreement with indicated comment disposition(s)

9-6-95 — Date

F.N. Jones — Reviewer/Point of Contact

R.Y. Seda — Author/Originator

11. CLOSED

9-6-95 — Date

F.N. Jones — Reviewer/Point of Contact

R.Y. Seda — Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
	30% Design Review 9/6/95		Slides were mailed to Fred Jones.	closed
	Slide Presentation 9/6/95			

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Cone Penetrometer Preliminary Design Review	Cone Penetrometer	F.G. Abatt	ICF KH/Mechanical Engineering	2920 GWW 376-5574

17. Comment Submittal Approval:

Organization Manager (Optional) _____ Date _____

Reviewer/Point of Contact _____ Author/Originator _____

10. Agreement with indicated comment disposition(s)

Reviewer/Point of Contact _____ Author/Originator _____

11. CLOSED

Date _____

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
	No Comments			

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Review of Cone Penetrometer, DOT-7A Type A Package Documentation Received		D. L. Kelly	PO&D/84400	MO-404/1100 Area 372-2276

17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (Optional)	R Y Seda for D L Kelley per cc mail	R Y Seda for D L Kelley per cc mail
	Reviewer/Point of Contact	Reviewer/Point of Contact
	10/2/95	10/2/95
	Date	Date
	R Y Seda	R Y Seda
	Author/Originator	Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1.	General Comment: Documentation from the Mounds document (MLM-3245) is supplied for the DOT-17C, 5-gal drum as being approved as a DOT-7A Type A package. The documentation references testing and evaluation methodology that was used; however, the appendices from the Mounds document were not included from the manufacturer. How does the shipper know that the regulatory performance requirements of this packaging have been met?		Frontier has certified the container as approved by DOT as DOT-7A Type A. The appendices from the Mound Labs test document have been requested from Frontier.	Open R Y Seda for D L Kelley per cc mail
2.	Mounds document, Page A-8, the last bullet of the "Restrictions/Specifications" section states the following, "The shipper must determine that the actual contents are closely simulated by the test contents. If this is not true, testing/analysis must be conducted and documented to demonstrate Spec 7A compliance with the actual contents." Since the appendices have not been provided, how can the shipper determine if the test contents and actual contents being shipped are similar?		The source is a 10 microgram californium 252 special form source. The cavity at the center of the drum will contain the source and source holder which will only weigh a few ounces. The Frontier Technology Radioactive Shipping Cask Certificate certifies the drum for radioactive materials with 3 forms: 1) Solids-any particle size 2) Solids-large particle size only (sand, concrete, debris, soil, etc...) 3) Solids - objects with no significant dispersible or removable contamination. The source fits the description of 3).	Closed

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
3.	General Comment: Upon my review of the Mounds document, it was found that the actual contents used for testing the DOT-17C, 5-gal drum were flour, fluorescein, sand, and lead. These test contents differ significantly from the actual contents being shipped. There is no test or evaluation documentation included in the manufacturer's information to support that the contents being shipped would survive any of the DOT-7A Type A tests.		As the weight of the source falls within the spectrum of the weights tested, the package will not be affected by the source. We are not aware of any requirement that the actual source be included in the shipping container tests. The source transportability is certified separately by DOT.	closed
4.	Drawing A50240-AA00: With the 3-4 inch head space in the drum, it appears that if the drum were dropped flat onto the top lid, there would be a chance that the steel pipe would ram into the drum lid, damaging the packaging significantly. Also, it is not known how tightly the plywood/masonite spacers fit around the pipe to deter shifting of contents. The performance of the WEP material is not known. Page A-8, "Restrictions/Specifications," states: The shipper must assure that the contents are securely fastened and positioned within the package. Each shipper must assure that the radiation level at the surface of the package will not increase by more than 20 percent.		The pipe shown in Drawing A50250-AA00 will not ram the upper lid. This pipe is fixed in the drum with the WEP cast in place, which also holds the spacers in place. The pipe should remain in place. The WEP material survived the drop test.	Closed

Author: Donna L Kelly at ~WHC3
Date: 10/2/95 9:30 AM
Priority: Normal
Subject: Re: RCR
---------- Message Contents ----------

Thank you for getting back to me. I'm sorry that it has taken me quite some time to get back to you--between classes and travel, I just haven't been here.

The RCR is acceptable to me, and I have no further comments. As long as you receive the requested information from Frontier, and are satisfied with their evaluation/test documentation, and have this documentation for your files, you should be covered.

Donna

---------- Reply Separator ----------

Subject: RCR
Author: Rosa Y Seda at ~WHC131
Date: 9/21/95 3:56 PM

Donna, the attached RCR is for the 30% design review for the cone penetrometer. Your comments were not necessarily pertinent to the design review (it only covered the rig, not the moisture probe...we have already done a 90% design review on the moisture probe) BUT I went ahead and asked SAIC to resolve your comment. Attached is a copy of the RCR with your comments and their resolution. Please review the RCR and sign-off if you agree with them. If you are not satisfied, we will set up a meeting with you, Characterization Equipment Development and SAIC (they are here about twice a month) to resolve the issues once and for all.

Rosa