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ENGINEERING TAK PLAN N2 VS H2O AS PURGE
HYDROSTATIC HEAD

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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

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1	1	Prog. Eng. JC Mast	<i>John Mast</i>	3/18/96							
1	1	Prog. Mgr. CE Hanson	<i>Carl Hanson</i>	3/18/96							

18. <i>John Mast</i> Signature of EDT Originator Date: 3/18/96		19. <i>Dennis W. Hamilton</i> Authorized Representative for Receiving Organization Date: 3/20/96		20. <i>Dennis W. Hamilton</i> Designated Manager Date: 3/20/96		21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments	
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N2 vs H2O as Purge / Hydrostatic Head

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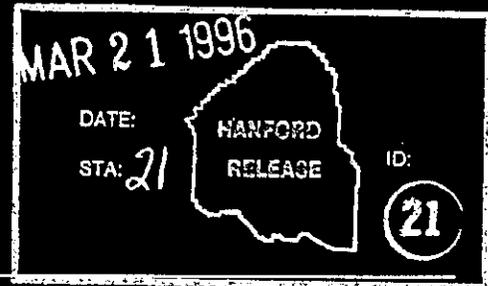
Key Words: Purge Gas
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Rotary Mode Core Sampling
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Abstract: This document provides the information to explain to the customer the ETP for the N2 vs H2O as Purge / Hydrostatic Head. This ETP follows the format discribed in Issuance of New Characterization Equipment Engineering Desk Instructions, 75200-95-013.

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Karen A. Roland 3/21/96
Release Approval Date



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WHC-SD-WM-ETP-191
Rev. 0

**ENGINEERING TASK PLAN
WHC-SD-WM-ETP-191
for
N₂ vs H₂O as PURGE / HYDROSTATIC HEAD**

1.0 INTRODUCTION

Westinghouse Hanford Company (WHC) has been working hard to meet the schedules set forth by Department of Energy- Richland office (DOE-RL).

To accomplish this task WHC built 3 Core Sampling Trucks that could operate in a Rotary Mode and drill through the hard salt cake layer that is on top of the liquid layers of some tanks. These trucks are labeled Truck #2, #3 and #4.

In December, 1995 a Core Sampling Truck was taking a sample in one of the tanks. The drill string was left in the tank over night because they could not complete the entire core sample during the shift. The next day the drill string was gas sampled to be sure there was not a safety concern. The criteria for the gas samples is that the sample must be below 25% of the lower flammability limit LFL for hydrogen gas. From the samples that were taken it was found that the levels were much higher. Because of this new information, all rotary mode drilling by Core Sampler trucks was curtailed until the Safety Assessment could be reviewed to ensure adequate safety measures during sampling.

Los Alamos National Laboratory (LANL) wrote the Safety Assessment (SA) (i.e. LA-UR-92-3196) to control the work done on tank 241-SY-101. This tank was a known hydrogen gas producing tank. LANL was successful in writing an SA that was accepted by DOE-RL to control the intrusive tank operations that were needed. Because of their success, they were asked by Characterization Equipment Engineering (CEE) to review and rewrite the current SA.

It appears from the draft SA that has been presented to CEE, that the restrictions that maybe needed to safely rotary drill will delay the schedule that has been agreed to sample tanks. If the schedule is delayed, WHC will not be able to keep its commitments to DOE-RL. Because of these possible delays, Characterization Equipment Development (CED) has been asked to investigate the possibility of using a different medium to cool the bit during rotary drilling. This medium will also act as a hydrostatic head fluid.

Currently Nitrogen gas is used to cool the drill bit and function as the hydrostatic head. To use this gas there are many controls that have to be used to maintain a safety envelope in which to operate the truck. Because of the complexity of using the Nitrogen gas, an alternative medium will be investigated.

2.0 SCOPE

Characterization Equipment Development (CED) will ask a team of engineers and scientists from several organizations to meet and discuss the possibility of using a different medium to cool the bit during rotary drilling. This medium could be used to hydrostatically

balance the waste column in the drill string also. It is preferred if it could do both.

The customer that will be able to use this information is Characterization Equipment Design (CEDE). Dennis Hamilton the manager of CEDE will provide information and direction as to the feasibility of some proposed solutions.

2.1 Physical Description

CED will develop a team of individuals from several different organizations that will team together to search for a solution. CED will act as the lead to the team to help direct the team to a final solution.

There is currently a very complete data base of material and information from past testing that was done. In this information there is over 10 separate documents listed that may have information related to the task. This information will be investigated to see if there has been adequate testing done to determine a different medium. This investigation of other documents will ensure that any suggested testing in the future will not be a remake of an existing test done in the past.

STEP 1) The team will meet to brainstorm and decide if there is further action that can be taken and what direction that should be. The results of these sessions will be documented in a summary report.

STEP 2) The team will suggest either that adequate testing has been done and there is or is not a suitable replacement fluid or that testing is needed to suggest an adequate fluid for replacement. If management wishes to pursue further testing then at that time the team will return in one week to suggest a schedule and cost for the testing.

2.2 Engineering Tasks

Each member of the team will attend a meeting setup by the team lead. Each team member will help to review all documents found as relevant to the task. Each team member will be delegated certain tasks to be carried out so that the work load is shared equally.

Each team member will be given new tasks if STEP 2 is initiated. This area will be further defined at a later revision to the ETP.

The Engineering Task Number assigned to this task is ETN-96-0017.

2.3 Verification

Verification methods may be needed for STEP 2 but at this time that is not known. This area will be further defined at a later revision to the ETP.

3.0 ORGANIZATION

Characterization Equipment Development will act as the lead and chair the discussions by the team. CED will be responsible for the work orders written to the other organizations. CED will be responsible for the summary report that is to be issued to CEE.

Representative from CED: John Mast

A representative from the 222-S laboratory will provide information to the team with respect to the operation of the lab on the samples that come into the lab. This representative will help to review the documents that are available and suggest requirements needed to obtain good samples for the lab. (Examples: moisture content that could be added, tracers, etc)

Representative from 222-S laboratory: Dave Dodd

A representative from Characterization Equipment Design who is a technical expert on how the Core Sampler Trucks work in rotary mode will help to review the available documents and suggest requirements needed to sample a RMW tank.

Representative from CE Design: Jeff Smalley

A representative from Characterization Field Engineering who is a technical expert on how the Core Sampler Trucks work in rotary mode will help to review the available documents and suggest requirements needed to sample a RMW tank.

Representative from CFE: Andy Mousel

A representative from Safety Programs who is familiar with the sampling operations will attend the meetings.

Representative from Safety Program: Robert Cash

A representative from the past Core Sampler Truck Program office who has past

knowledge of the activities and tests that were documented. This representative will help to review the documents that are available and suggest solutions to the problems.

Representative : Mike Minette

A representative from Evaluation and Planning will attend to ask questions related to the Data Quality Objectives that are setup at this time.

Representative from E&P: Wayne Winkleman

A representative from Process Control will attend to ask questions related to the chemical makeup of the tanks and how the sampling methods will affect the samples.

Representative from Process Control: Nick Kirsch

A representative from the Organic Safety Program will help to answer questions about the tank waste and its importance related to moisture content.

Representative from OSP: Dave Turner

4.0 SCHEDULE

If step 2 is implemented then at that time a schedule will be put together.

5.0 COST ESTIMATE

It is estimated that the summary report will take approximately 4 man weeks total time to complete. It will take approximately 1 week to prepare the report and 3 weeks for the review. At this time only the team lead will charge to TCPN # N4H3A.

6.0 SAFETY

Safety will be a concern with any recommendation that is made by the task team. A more in-depth evaluation for safety will be addressed in STEP 2.

7.0 SYSTEM ENGINEERING

System Engineering will be addressed if STEP 2 is taken. Currently there is no design function anticipated.

8.0 REFERENCES

References will be added to this section as the documents that will be reviewed are identified.

DISTRIBUTION SHEET

To Distribution	From Characterization Equipment Development John C. Mast	Page 1 of 8 Date 03/18/96
Project Title/Work Order N2 vs H2O as Purge / Hydrostatic Head		EDT No. 607004 ECN No. N/A

Name	MSIN	Text With All Attach	Text Only	Attach. / Appendi x Only	EDT/ECN Only
RJ Blanchard	S7-12	X			
RJ Cash	S7-14	X			
MR Chunn	S7-03	X			
JD Criddle	S7-12	X			
DA Dodd	T6-50	X			
DW Hamilton	S7-12	X			
CE Hanson	H5-09	X			
NW Kirch	R2-11	X			
JC Mast	H5-09	X			
MJ Minette	H8-64	X			
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