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Characterization Sampling Equipment Status Report - April through June 1996

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Abstract: This report is the third status report on Characterization Sampling Equipment. It covers April through June 1996 activities. Subsequent reports are intended to be issued quarterly.

The degree of success in sample recovery and in the availability of equipment to take samples is reported on as are the measures being taken to track and improve recovery and availability. Planned activities are also presented.

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CHARACTERIZATION SAMPLING EQUIPMENT STATUS REPORT-
APRIL THROUGH JUNE 1996

WHC-SD-WM-RPT-251
Revision 0

Prepared By:

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G.P. Janicek

WESTINGHOUSE HANFORD COMPANY

JULY 1996

**CHARACTERIZATION SAMPLING EQUIPMENT STATUS REPORT
APRIL THROUGH JUNE 1996**

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CHARACTERIZATION SAMPLING EQUIPMENT STATUS REPORT APRIL THROUGH JUNE 1996

EXECUTIVE SUMMARY

Characterization Equipment Engineering (CEE) still continues to make significant progress towards the project goals of Characterizing the Hanford High Level waste tanks. Four systems were operational during this reporting period, three Rotary-mode core sampling truck systems and one push-mode truck system.

As noted in the last report, the planned efforts outlined in Engineering Task Plan, WHC-SD-WM-ETP-159, "Improving Sampling Recovery, Engineering Task Plan" (Blanchard 1995) for this reporting period have been delayed. This was done to support the testing efforts required to document the safety concerns noted in the Safety Assessment (SA) of Rotary Mode Core Sampling in Flammable Gas Single Shell Tanks: Hanford Site, Richland, Washington, WHC-SD-WM-SAD-035, Revision 0.

The availability average for the Core Sampling Systems for this quarter is 69%, including the unavailability of Truck System #4 for four (4) weeks due to outage time required for upgrading the truck for Flammable gas sampling. Excluding the flammable gas upgrade outage time, the overall Core Sampling System availability was 72%, the same as reported last quarter.

It is noteworthy, that Characterization Equipment Engineering achieved the 65% availability goal as of the end of the 3rd quarter, including the Flammable gas upgrade outage.

1.0 INTRODUCTION

The purpose of this report is to status the activities and plans for improving sampling recovery and equipment availability/reliability. The reports are meant to be the library of facts for CEE deliverables to Characterization Project.

2.0 HIGHLIGHTS - 3rd QUARTER FY96

This report statuses the activities and plans accomplished by CEE for the period from April 1, 1996 through June 30, 1996.

2.1 IMPROVING SAMPLE RECOVERY

All planned activities associated with improving sample recovery were canceled due to the large efforts needed to support the ignitability testing and bit temperature testing. The funding for the support of the "Tank Sampling Assistance Panel" (TSAP) was needed to support the safety assessment and testing and this made it necessary to cancel all TSAP planned activities for this fiscal year.

2.1.1 Key Parameters

During this quarter, three rotary-mode truck systems, and one push-mode system actively sampled waste in the Hanford waste tanks.

Truck Number	Obtained Samples from...	Riser Number
1 (Push Mode)	Tank 241-AW-101	24B
1 (Push Mode)	Tank 241-AN-105	12A and 7B
2	Tank 241-S-101	11
2	Tank 241-S-111	8 and 14
2	Tank 241-S-109	14
3	Tank 241-U-102	19 and 9
3	Tank 241-U-106	19 and 2
3	Tank 241-U-107	8
3	Tank 241-BY-102	10A
4	Tank 241-U-108	7, 9 and 2

During this quarter 174 samples were obtained, Trucks 2, 3 and 4 obtained 104 samples and Truck #1 obtained 70 samples.

2.1.2 Data

Color profiles of the extruded samples are on file in CEE, as well as in the 222-S laboratory. CEE developed a colored "Core Sample Extrusion Template" see figure A01. This template is used by the laboratory and others to describe the sample medium as noted on the template, which adds to the understanding and provides a common description for the samples.

2.1.3 Sampling Improvements

Due to the concerted efforts needed to support the Ignitability Testing and Bit Temperature Testing efforts planned towards sampling improvements noted in WHC-SD-WM-ETP-159, "Improving Sample Recovery, Engineering Test Plan" were canceled until fiscal year 1997. During this period a total of 46 individual core segments were X-rayed as requested by operations.

X-Ray Imaging System XRI-004 was brought out of field service prior to its semi-annual date to repair a faulty internal standards manipulator. On May 8, 1996 after the service was complete an accident occurred while the system was being hooked to a towing vehicle on which the hitch was located 34.25 inches from the ground. A slight bump of tractor caused the XRI system flip over, spilling the contents of the X-ray cooling system (ethylene glycol) and 13 gallons of the insulating oil (Shell, DIALA-R, AX) from the damaged high voltage generator. An Off-Normal Occurrence Report (RL--WHC-GENERAL-1996-008) was prepared.

The X-ray power supply and high voltage tank and the image intensifier were returned to the vendor for repair and re-calibration. The internal lead shutters on the X-ray tube were replaced. Repair and replacement of damaged components was completed during the third week of June. System XRI-004 is currently in use for Retained Gas Sampler (RGS) sample segments in 241A Tank farm.

System XRI-003 semi-annual service was scheduled to be completed on July 7, 1996 and be ready to be returned to the field. System XRI-002 six month service date (6/1) was extended for 30 days with the concurrence of the Radiological Control Organization. The system will also have the sealants and exterior safety switch installed to address flammable gas issues. System XRI-001 will be removed from the field for semi-annual service at the end of July.

A demonstration of a linear diode array X-ray imaging device was performed during June. This digital device was temporarily installed in XRI-004 directly in front of the image intensifier face-

plate. This device directly produces a digital X-ray image which can be printed as being acquired in a full length, full size image of the sample segment (approximately 24 inches long). This equipment can be installed as an up-grade to the XRI systems. The vendor has informally been requested to provide an approximate cost estimate (ROM) for the installation of the up-grade.

2.1.4 Studies/Tests

The testing efforts required to support the safety assessment activities were conducted per WHC-SD-WM-TP-411, Revisions 0 and 1, "Test Plan for Core Drilling Ignitability Testing" at the U.S. Bureau of Mines, Pittsburgh, Pa. The test results are documented in WHC-SD-WM-TRP-257, "Core Drilling Ignitability Testing", Revision 0. The purpose of the testing noted above was to determine if an ignition of flammable gasses would occur while core sampling. Many different dynamic processes occur while sampling, but only a limited number of these which have a direct bearing on the flammable gas ignition issue required testing. The dynamic processes of interest can be generally categorized as follows:

- What ignition hazard of the sampling bit/waste interface exists while rotary drilling?
- What ignition hazard of the drill string/riser tube interface exists while rotary drilling?
- What ignition hazard of the sampler and associated ancillary equipment within the drill string exists before, during, and after a sample is obtained?

Note that each of these items involve drilling equipment which can make direct contact with the flammable gas mixture found in some of the waste tanks.

The above categories were further broken down into the following six ignition questions which the testing was designed to address:

1. Will an ignition of a flammable gas occur while drilling into rock in a waste tank?
2. Will an ignition of a flammable gas occur while drilling into a steel object in a waste tank?
3. Will an ignition of a flammable gas occur after an accidental drop of sampler and the subsequent impact onto the internal surface of the drill bit?
4. Will an ignition of a flammable gas occur after an accidental drop of the Remote Latching Unit and subsequent impact onto a sampler?
5. Will and ignition of a flammable gas occur during an impact caused by a misalignment of the Quill Rod Adapter and drill string?
6. Will an ignition of a flammable gas occur during frictional rubbing of the drill string against a steel riser?

Each item tested was identical to warehouse stock used in normal drilling operations. Some of the items tested required modifications during testing, and therefore the final modification made to the item became the new standard design to be used for field sampling operations.

Additional testing was performed and documented in WHC-SD-WM-TRP-252, Revision 0, "Standard Rotary Bit Temperature Testing". This testing program was a joint effort between Westinghouse Hanford Company, CEE and Los Alamos National Laboratory (LANL). Testing was requested by LANL in support of safety assessment preparation activities noted above. The testing program noted in the report was a very flexible in that daily inputs were received from LANL. Therefore an informal test plan was used as the basis for initial test activities. This testing helped establish the equipment parameters required to safely rotary drill.

2.1.5 Evaluations

All core sampling during this period was done in push mode, no drill string rotation was used. Core profiles for each tank sampled are shown in figures A02 Through A11. Trucks #2, #3 and #4 obtained 104 samples during the period and truck #1 obtained 70 samples. Recovery percentages are calculated per Internal Memo, 75210-016-95-4, "Sample Recovery Measurement Parameters" dated June 24, 1996.

Truck #1 completed three cores on two double-shell tanks with very deep waste (22 segments each), the 2nd of two cores on AW-101 and both cores on AN-105. Average recovery on AW-101 was an outstanding 95%. Similarly, recovery averaged in excess of 92% on AN-105. Waste conditions in both tanks were very soft. Tank AN-105 will be discussed further in the subsequent quarterly report when details of the 2nd core become available. Twelve Retained Gas Samples were successfully captured using this system during the period. Figure A12 documents the performance of truck #1 thus far in FY 1996.

The tanks which follow were all sampled with the rotary mode systems, trucks #2, #3, and #4. Figure A13 indicates the performance of the rotary systems from October 1995 through June 1996. A dramatic improvement in sample recovery is apparent in Figure A13 during late March. This improvement is due directly to changes in the sampler configuration and sampling process. Average recovery for samples obtained during the quarter was an impressive 84%, a 42% improvement from that of the previous quarter.

The final of three cores was obtained from tank S-101 during April. Average recovery was 41% for the first two cores, but recovery improved to 94% on the final core of this tank. Of significance is the fact that the eight segments of the final core on S-101 were completed in a single day, demonstrating the ability of the rotary mode equipment and personnel to excel when conditions are favorable. The waste encountered in S-101 was very soft, penetration forces

remained below 500 pounds on nearly all segments.

Three cores including 30 samples were taken on tank U-108 between April and mid May. Performance was very good, averaging 83%. The waste in U-108 was relatively soft, seldom did waste penetration forces exceed 1000 pounds.

Tank U-102 was sampled in late April. Sample recovery was outstanding, averaging 87% for the 16 samples obtained between the two cores. Waste conditions were relatively soft in the upper half, requiring only 1000 pounds of penetration force. A hard layer was encountered on both sides of the tank on the 3rd segment from the bottom. Partial penetration of the layer was achieved, however at 2800 pounds the drill string buckling limit prevented further waste penetration.

Sampling on tank U-106 was very successful during mid May. Sample recovery ranged between 72% and 100% on all 10 samples from the two cores obtained. Average recovery was 90% on this tank. All samples were obtained in 3 consecutive days, a significant event considering that the truck was relocated on the tank between the two cores. This accomplishment once again demonstrates advancements in the core sampling process. The waste encountered in U-106 was very soft, penetration forces remained below 500 pounds on all segments.

Tank S-111 was sampled in late May and early June. Two cores were attempted. The 11 segments of first core were completed successfully, requiring 2000 pounds to penetrate near the tank bottom. An impenetrable layer was encountered on the 3rd of 11 segments of the 2nd core. Several techniques were attempted including pushing almost 4000 pounds to break through the layer, with very limited success. Recovery was very good despite the waste penetration resistance, averaging 89% for all 18 samples taken.

One core was successfully captured with little waste penetration resistance from BY-107 in early June. Average recovery for the 5 segments was 86%. The second scheduled core for this tank was postponed until July due to changing priorities. This tank will therefore be discussed further in the subsequent quarterly report.

The first of two scheduled cores was attempted on tank BY-102 in late June. A hard layer requiring almost 2000 pounds to penetrate was encountered half-way through the 8 segments of the first core. A second hard layer was encountered, halting waste penetration, at the start of the final segment of this core. Recovery of the dry saltcake was good despite the significant waste penetration resistance, averaging 64% for all samples. This tank will be discussed further in the subsequent quarterly report when information becomes available on the 2nd core.

Tank S-109 was the final location for sampling activity during the period. Seven samples were

obtained from a single core. Recovery was very good in the dry saltcake, averaging almost 80%, however a hard layer was encountered about one third of the way to the tank bottom, preventing full penetration in push mode with 4000 pounds. This tank will be discussed further in the subsequent quarterly report when information becomes available on the 2nd core.

2.2 EQUIPMENT AVAILABILITY/RELIABILITY IMPROVEMENTS

Equipment currently available to the Characterization Project for obtaining samples of wastes from underground tanks includes vapor samplers, grab samplers, auger samplers, and core samplers. The vapor, grab, and auger samplers are relatively simple devices and are easily deployed in the field with minimal attendant equipment. Core samplers require in-tank insertion by a complex, special-built drill rig truck with its own contingent of support equipment, which could include, for example, an exhauster, a diesel generator, electrical distribution and nitrogen supply trailers, a breathing air compressor, etc. A core sampling system (CSS) entails a much more complex operation and has a greater potential to adversely impact Characterization Project objectives and schedules. For this reason a CSS is the primary focus of equipment availability/reliability improvements. The approach to improving equipment availability and reliability is documented in an Engineering Task Plan (Janicek 1995).

2.2.1 Equipment Development

Characterization Operations has had in its inventory, since July 11, 1995, four CSSs: truck system #1, capable only of push-mode core sampling, and truck systems #2,#3,#4 capable of both push- and rotary-mode core sampling, each using the universal core sampler. Truck system #1 was acquired for use first, followed by truck system #2 in order to add rotary-mode capability, and then in 1995 truck systems #3 and #4 were added simultaneously to improve overall sampling equipment availability. Each truck system comprises the drill-rig truck itself and all necessary supporting equipment. The individual truck systems are depicted in cartoon fashion in Figures A14, A15, A16 & A17. Truck system #1 component equipment is configured differently than truck system #2, and both #1 and #2 are configured differently than #3 and #4, reflecting the design evolution of the sampling trucks, themselves. For reasons of safety, reliability, and availability, as discussed in the last Quarterly Report (reference req'd) there has been an ongoing attempt to revise truck system #1 and #2 configurations to match that of #3/#4. As reported then, the acquisition of one (1) additional generator (for truck system #1) and two (2) additional electrical distribution trailers (for truck systems #1 and #2) was being pursued. The generator has been delivered and is now part of truck system #1 (G-A, in Figure A14). Regarding the two electrical distribution trailers, being fabricated onsite, the one for truck system #1 is nearing completion and the one for truck system #2 has been put on-line (DT-B, in Figure A15).

During this reporting period the Exhauster for truck system #4 (EX-C, in Figure A17) has been undergoing extensive modifications to make it intrinsically safe for exhausting flow-through air (and generated gases) from flammable gas, watchlisted tanks. The modification has required the procurement of a special Flammable Gas Detection System to monitor for flammable gas conditions and to shutdown sampling operations should set-point threshold levels for certain gases be detected. This was being done for truck system #4 during this reporting period, because truck #4, itself, is the first to be undergoing flammable gas modifications (see Section 2.2.2, below). Full implementation of this system is expected during the next reporting period. Procurement of similar systems for trucks #2 and #3 is planned.

2.2.2 Equipment Modifications

As reported in the past, the acquisition of truck systems #3 and #4 was accomplished using design drawings from truck system #2 and making minimal changes thereto, so as to expedite the acquisition. This resulted in a list being generated of known modifications to sampling trucks #2, #3, and #4 that would improve their operational reliability, but which would have to wait to be implemented during future maintenance outages. Operational experience has seen a growth in the number of items on this list. Figure A18 depicts a listing of thirteen (13) of the more visible modifications planned and their status, updated from the previous reporting period, as regards each of the four trucks.

In addition to reliability modifications, modifications to improve safety, operability, maintainability, availability (as a result of operational and field problem experience), and those required to satisfy the safety assessment of rotary-mode operation in flammable gas watchlist tanks have been identified and listed for each truck. Figures A19, A20, A21, & A22 depict such a listing for truck system #4. A similar listing has been generated for each truck on a truck system basis. During the previous reporting period, the listing for truck system #3 was shown since it was undergoing a planned maintenance and modification outage during that time. During the current reporting period, the listing for truck system #4 is being shown since a planned maintenance and modification outage for truck system #4 was initiated in June. During this outage flammable gas modifications are planned for truck system #4 as well. These modifications primarily rely on elimination of ignition sources in the in-tank and out-of-tank sampling and support equipment exposed to flammable gas pathways. It is anticipated that because of the extensive modifications planned for this truck system, they will not be completed until well into the next reporting period. The full scope of flammable gas modifications necessary to the truck systems was documented during this reporting period in Corbett [1996].

Previously established weekly meetings involving design engineering, field engineering, operations, and maintenance to review and status the required modifications to each truck system continued during this reporting period and are intended to be an ongoing activity. Normally, the

truck system currently in a planned outage and/or the next truck system scheduled for an outage are concentrated on during this meeting. Truck system #4 was the only one to undergo an outage during this reporting period.

As reported previously, specific improvements (reliability and flammable gas) to the remote latching unit mechanism (RLU) design were made, were being tested, and were intended to be deployed during the current reporting period. In actuality, testing and fabrication were completed during this reporting period but the new mechanical RLU will not be installed on truck #4 (see Figure A18) and put into field service until completion of the truck #4 maintenance and modification outage, sometime in August 1996. The RLU is used to set and retrieve samplers in the drill string.

2.2.3 Management of Equipment Problems

Management of equipment problems continues as reported previously. Logbooks are kept by Characterization Operations and Characterization Field Engineering for each truck system. These are used to document equipment problems experienced in the field and other field-related activities. A sampling problem database created by Characterization Equipment Design is used to collect, sort, analyze, assign responsibility, and document closure for problems related to sampling operations and equipment, as gleaned from the logbook systems identified. The database is available to everyone on the Characterization Project via a computer drive on the local area network. It can be found at network share, \\WHC128\ACTLOG, commonly referred to as "K" drive. During the reporting period an additional 211 "problem" entries were made to this database (see Figures A23 through A29). As can be seen from these figures, not all of these are specific sampling equipment problems demanding engineering attention. Many are smaller "problems" requiring a maintenance response and many are of a personnel or material resource nature. A few involve the language or interpretation of operating procedures. The weekly meeting established between representatives of design engineering, field engineering, operations, and maintenance during the last reporting period was continued during this period and will be an ongoing activity. The purpose of this meeting is to review the weekly input to the "problem" database and establish problem solution responsibility. Those problems designated as belonging to design engineering are further reviewed within design engineering and are assigned to an individual engineer to resolve. If it's determined that the solution requires an equipment design modification, that is so noted and the required modification is added to the truck system modification database (see item 2.2.2 above).

It was reported previously that the number one cause of sampling equipment downtime has been associated with the grapple hoist system. For the first half of FY96 this problem area had accounted for a full 24% of equipment unavailability. As can be seen from combining the 211 entries in Figures A23 through A29 this continues to be the number one problem, followed by

RLU and hydraulic system problems. It should be noted, however, that some entries refer to the same instance of a problem. It's just that they are reported from a different source, i.e., the operations log (O), engineering log (E), or the Job control system (J). As reported previously, some modifications have been implemented to address these high profile problem areas. Others, e.g., cable level-wind system, are still planned for implementation.

It is well recognized that all equipment field problems are not the result of faulty design. Sometimes the fault can be traced to faulty procedures. Often problems are the result of human error or lack of training or understanding of how the equipment is intended to function. In an effort to improve equipment availability (or incidence of unavailability) as regards operator understanding Characterization Equipment Design initiated (earlier in FY96) a supplemental "training" program for operations and maintenance personnel. Once a week, for four weeks, each of the four shifts is trained in a specific area of sampling equipment operation. During this reporting period three such sessions were conducted which included the topic areas of:

- o April 18, 1996 through May 9, 1996 - Modifications to Truck #3 and Truck #4.
- o May 16, 1996 through June 6, 1996 - Sampling Truck On-board Hydraulic System - basic operation, limits of operations, operational care and maintenance, problem recognition.
- o June 13, 1996 through July 11, 1996 - Nitrogen Purge Gas System (N2 Trailer and Sampling Truck) - basic operation, control system, associated hazards of operation, problem recognition, flammable gas modifications.
- o June 13, 1996 through July 11, 1996 - Exhauster System - flammable gas modifications, new Flammable Gas Detection System.

During the previous reporting period it was reported that a new, unique problem surfaced as a result of mixing and interchanging truck system component equipment in the field in response to certain components being or becoming inoperative and in order to not have to cease sampling operations. The problem was one of "similar" or "like" pieces of support equipment not being truly "interchangeable", and the resultant damage caused by these incompatibilities. It was also reported that short term controls were effected, and that long term solutions planned included: 1) creating and maintaining truck system design configurations, and 2) modifying existing and new pieces of truck system component equipment to enhance interchangeability. The first long term solution has been initiated but will not be fully implemented until the next reporting period, so discussion of same will be deferred to that time. The second long term solution is well under way as was seen earlier in Section 2.2.1. Cartoons (Figures A14, A15, A16 & A17) depicting present truck system configuration have been modified from those previously reported and show progress towards achieving equipment interchangeability. Continued equipment modifications are planned to achieve the future configurations shown in Figures A30, A31, A32, & A33. [Note: Truck #1 differs from #2, #3, and #4 since it is only capable of push-mode operation, whereas, the

others are capable of rotary-mode as well]. No new, unique problems surfaced during this reporting period.

2.2.4 Equipment Problem Analysis/Corrective Actions

As reported in the past, the immediate response to an equipment problem in the field that shuts down operations is normally one of repair-in-place or replace with a spare component to facilitate resumption of operations whenever possible. After the fact, the problem or failure is analyzed as to cause and whether corrective actions in the form of equipment modifications are warranted. In some instances the root cause of the problem or failure is not readily apparent and an analysis is required. During this reporting period no new equipment problems or failures were encountered. Consequently no analyses or corrective actions were required.

During this period, as well as the previous one, core sampling was limited to push-mode only because of flammable gas issues with rotary-mode sampling. It was previously reported that in an effort to permit higher downforces when in push-mode, tank riser sleeves were designed, fabricated, and deployed to act as strongbacks for the drill string which is inserted through them. And, that an analysis report was commissioned to support operation in both push- and rotary-mode operation with riser sleeves of various lengths. This analysis (Ziada [1996]) was completed and formally issued during this reporting period. The analysis computes and reports the permissible downforces to be used during both push-mode and rotary-mode, at various drill string rpm.

2.2.5 Availability/Reliability Evaluations

As reported previously, the working definitions for availability and reliability of sampling equipment have been established in Janicek (1995). As defined, the availability of CSSs is tracked daily. Concurrence in equipment status is established between Characterization Equipment Engineering and Characterization Operations. Equipment availability, as shown in Figures A34 & A35, was 69% for this reporting period and 66% overall average for the first three quarters of FY96. Contrast this with 57% and 72%, respectively, for the first and second quarters of FY96 and overall average 64.5% for first half of FY96.

During the current reporting period the schedule of tanks to be sampled was again revised to accommodate push-mode sampling since rotary-mode gas flammability issues were still undergoing resolution. Meanwhile, modifications addressing flammable gas issues were initiated on truck system #4. It is anticipated that all modifications can be implemented to enable truck system #4 to commence rotary-mode field operations sometime during the next reporting period. [NOTE: The time that any given truck system is down for a planned maintenance and modification outage is "charged" as unavailable time for purposes of calculation]. The FY96 goal of attaining an average 65% availability was achieved at the very end of this reporting period.

3.0 CURRENT ISSUES

It is imperative that rotary-mode sampling operation is achieved soon. The ability to sample in push-mode alone is fast becoming limited as higher and higher push-mode down forces are being required to obtain full sample cores in the remaining waste tanks. During this reporting period a number of cores had to be terminated short of their goal because of this.

Approval of the "Safety Assessment of the Rotary Mode Core Sampling In Flammable Gas Single Shell Tanks, Hanford Site, Richland, Washington" is expected by the end of July 1996. The second and third tier reviews have been completed and completion and final approval by DOE will allow sampling of flammable gas tanks.

Qualification for the Rotary Mode Core Drilling in Flammable Gas Tanks is pending the completion of the DOE Operational Readiness Evaluation for operating the RMCS System in flammable gas environment is scheduled to complete in September 1996, this will permit starting sampling in September 1996.

4.0 PLANNED ACTIVITIES FOR NEXT REPORTING PERIOD

Complete ATP/OTP for RMCST #4 which includes incorporation of the flammable gas modifications noted in WHC-SD-WM-DRR-053, "Design Review Report for RMCST Modifications for Flammable Gas Tanks, Final Design". It is anticipated that the completion of ATP/OTP will be at the end of August 1996.

Equipment availability/reliability improvements during this reporting period have mainly focused on hardware. And, in particular, on modifications to support high profile equipment problem areas and flammable gas upgrades to enable returning to rotary-mode operation. This emphasis will continue for the next reporting period. It is anticipated that truck system #4 modifications will be completed in the next quarter and that it be returned to rotary-mode service. As soon as this can be accomplished truck system #3 will be brought in for flammable gas (rotary-mode operation) upgrades.

5.0 REFERENCES

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APPENDIX

CORE SAMPLE EXTRUSION TEMPLATE

L1: LIQUID V6: VOID

M2: SALT SLURRY

S102
CORE130
SEG 5

B106
CORE127
SEG 106

M3: WET SALT

U129
CORE128
SEG 8

J127
CORE129
SEG 3

M4: MOIST SALT

L129
CORE128
SEG 3

L127
CORE129
SEG 3R

M5: DRY SALT

J127
CORE134
SEG 2

J125
CORE131
SEG 3

P2: SLUDGE SLURRY

B203
CORE120
SEG 4

B112
CORE118
SEG 1

D4: WET SLUDGE

B203
CORE115
SEG 7

HAW101
CORE132
SEG 7

D4: NO CATEGORY

D5: DRY SLUDGE

S102
CORE130
SEG 11

B203
CORE122
SEG 10

AN-105 PMCS CORE PROFILE

FILE: AN105.CRD
DATE: 07/24/96

RISER #12A ELEV: 668.75'

RISER #7B ELEV: _____

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

RGS - Retained Gas Sample
96-307 - Grapple cable birds nested.

TANK BOTTOM CENTER
ELEVATION 63.

AW-101 PMCS CORE PROFILE

FILE: AW101.CRD
DATE: 06/02/96

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

BY-102 RMC9 CORE PROFILE

RISER #10A ELEV: 650.09'

RISER #5 ELEV: 650.08'

FILE: BY102.CRD
DATE: 07/24/96

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

96-361 - HBD sounded immediately after starting final sample.
CORE 159 - Could not install riser sleeve due to bent riser. Could not penetrate beyond 2nd segment.

CORE 157
6/19/96-6/21/96

EXPECTED
PROFILE

CORE 159
7/8/96-7/8/96

TANK
BOTTOM
CENTER
ELEVATION
601.65'

A-04

BY-107 RMC8 CORE PROFILE

RISER #8 ELEV: 649.85'

RISER #9B ELEV: 649.85'

FILE: BY107.CRD
DATE: 07/24/96

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

CORE 161 - Zip cord shows hole in waste below riser 8. Sample #96-251 and 96-252 not used.
96-247A - Grapple hold brake failure after segment was completed.
96-388A - Grapple cable birds nested after stroke.

A-05

8-101 RMC9 CORE PROFILE

FILE: S101.CRD
DATE: 05/12/96

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

A-06

8-109 RMCS CORE PROFILE

RISER #14 ELEV: 664.12'

RISER #16 ELEV: 664.10'

FILE: S109.CRD
DATE: 07/23/96

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

A-07

A-08

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

U-102 RMC9 CORE PROFILE

FILE: U102.CRD
DATE: 05/17/96

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

A-09

U-106 RMC8 CORE PROFILE

FILE: U106.CRD
DATE: 05/23/96

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

U-108 RMCS CORE PROFILE

FILE: U108.CRD
DATE: 05/23/96

Profile reflects primary parameters for each sample. Data may be adjusted given information such as previous water additions.

Truck 2, 3, 4 Sample Recovery (10/1/95 - 6/30/96)

7/21/96 8:53 PM RMCS DATE Chart 2

RMCS Reliability Modifications

RMCS Truck

Description of Modification	1	2	3	4
1. Replace purge gas pressure regulator	n/a	next	Comp.	Comp.
2. Modify grapple hoist drum	n/a	ECN	Comp.	Comp.
3. Modify grapple load cell	n/a	ECN	Comp.	Comp.
4. Modify mechanical counters	ECN	ECN	Comp.	Comp.
5. Modify remote latch unit (RLU) hoist drum spool to incorporate a cable level-wind system	ECN	ECN	*10/96	*8/96
6. Replace current electrical RLU with mechanical RLU	ECN	ECN	*10/96	*8/96
7. Provide new pendant control	next	next	10/96	next
8. Replace pressure transducers	next	next	10/96	Comp.
9. Install purge gas filter	n/a	next	Comp.	Comp.
10. Provide bellows on shielded receiver	ECN	ECN	ECN	ECN
11. Economy crane replacement	ECN	ECN	ECN	ECN
12. Replace shielded receiver lifting rams	next	Comp.	Comp.	Comp.
13. Modify platform rotation hydraulics	n/a	next	next	8/96
14. Remove O ₂ monitor	n/a	ECN	Comp.	Comp.

* Scheduled with flammable gas modifications.

Next= ECN is complete, ready for next scheduled outage.

ECN= need an ECN or ECN is in signature stage.

Required Modifications to Truck System #4

Item #	"P" #	Description	Type	FGAS	FGAS	FGAS	NON-FGAS	NON-FGAS	Engineer + Planner	ECN Status	ECN #	Package Number(s)	Notes	Perform in field?	Perform which Outage?	Crafts Req'd	Craft Shifts of Work	PMP Chg Req'd	POP Chg Req'd	SPL Chg Req'd
				Rot	Push	RGS	Rot	Push												
		RMCST #4																		
1		Install purge gas filter to remove particulates from nitrogen gas to prevent plugging of purge gas components	AVL						Kostelak + Swaters	ready	622094 624394	95-00383 COMP	Material staged	Not rec	Next	Filter	Shop - 1 F-1	Yes	No	Yes
2		Replace shielded receiver lifting frame hydraulic cylinder with larger cylinder to increase margin of safety	SAF						Wilson + Campeau	ready	628719	ES-96-00104 COMP	Safety Material staged	No	Next	Milwright Welder Filter Painter	M-2 W-1 F-0.5 P-1	No	No	Yes
3		Modify existing platform rotation hydraulics to more accurately control rotation positioning	REL						Wilson + Campeau	ready	626643	96-00003 WRK-REL RETEST	MAT	No	Next	Filter Inst. Tech.	F-1 I-1	No	No	Yes
4		Modify drill rig traverse cylinder clevis to allow for positional adjustment	OPER						Kostelak + Swaters	In prep			New design/package	Yes	Next	Milwright Operator	M-1 O-1	No	No	No
5		Safety railings for drill unit	SAF						Wilson + Swaters	ready	628721	95-00525 COMP	Safety related Shop work Need J-7	Yes	Next	Pipe Shop Filter Welder	Shop-4 F-1 W-1	No	No	No
6		Shielded receiver hole cover	SAF						Wilson + Swaters	ready	626641	ES-96-30073 COMP	Safety related - ATP/DTP assigned Was not done on TR2 outage	Yes	Next	Milwright	M-1	No	No	No
7		Gear Guard for rotational speed pickup	SAF						Wilson + Campeau	ready	624380	ES-96-30109 COMP	Safety related Material staged	Yes	Next	Sheetmetal	S-0.5	No	No	No
8		Replace purge gas pressure regulator	REL						Kostelak + Campeau	ready	626634	96-00004 RETEST	Pressure test will be required - do under PM Material staged	Not rec	Next	Filter	F-1	No	No	Yes
9		Modify grapple hoist drum	REL						Kostelak + Swater	ready	630006	ES-96-00094 COMP		Yes	Next	Milwright Operator Inst. Tech.	M-2 O-1 I-1	No	No	No
10		Synthetic oil changeout (gear box) + Remove shielded receiver mech counter reset mechanism	AVL							N/A	N/A	ES-96-217 COMP	Needed for trucks 3 & 4	No	Next	Rigger Milwright Crane		Yes	No	No
11		Remove oxygen monitors	OPER						Ziade + Campeau	ready	630010	ES-96-00129 COMP		Yes	Next	Inst. Tech.	I-0.5	Yes	???	?
12		Install fan air flow deflector on drill rig	SAF						Ziade +	needed			Safety / ALARA issue with HPTs	No	TBD	Sheetmetal	S-2 shop S-1 field	No	No	No
13		Replace current electrical remote latch unit with mechanical RLU	FGAS	X	X	X			Deichehr +	ready	628711	ES-96-00157 WRK-REL	New drawings (H-2-690142) in design review trucks 1,2,3,4	No	TBD	see 628720	see 628720	Yes	Yes	Yes
14		Modify RLU hoist drum spool to incorporate a cable level-wind system	REL						Ziade +	ready	628724	ES-96-00159 WRK-REL	Design complete in shop All parts labeled except drum	No	on hold	Milwright Electrician	M-4 E-0.5	No	No	Yes

A-19

Item #	Op #	Description	Type	FGAS	FGAS	FGAS	NON-FGAS	NON-FGAS	Engineer + Planner	ECN Status	ECN #	Package Number(s)	Notes	Perform in field?	Perform which Outage?	Crafts Req'd	Crafts Shifts at Work	CRP Chg Req'd	SPL Chg Req'd
15		Replace current hoist with weather rated unit. (replaces acro crane unit to prevent platform overhead)	REL						Criddle	ready	629461		ECN in review	Yes	TBD		Yes	No	?
16		Modify grapple load cell	REL						Smalley	ready	630067	J3-ES-96-00104 REL-CAMP	Modification completed in field on 3/4/98	Yes	Next	Midnight	M-0.5	Yes	No
17		Replace pressure transducers	MAIN						Criddle	ready	629735	ES-96-00147			COMP		Yes	No	Yes
18		Modify grapple mechanical counter.	REL						Wilson	ready	630019	ES-96-00176 COMP			COMP		Yes	Yes	No
19		Re-design lifting jack supports (for side loads)	SAF						Ziada + Criddle	needed					6/98		Yes	Maybe	
20		Modify lifting jack hydraulics	OPER						Ziada	needed					TBD		Yes	Yes	
21		Modify air compressor mount for on/off switch	REL						Ziada	needed					TBD				
22		Provide shade on control console (aircraft)	OPER						Ziada	needed					TBD		No	No	
23		Provide electrical interface for array unit	OPER						Derivis	ready		ES-96-362 COMP			TBD		No	No	
24		Provide bellows on shielded receiver	AVL						Ziada	needed					TBD		No	Yes	
25		Provide new pendant control cord	REL						Criddle	draft					TBD		No	No	
26		Provide pendant interchangability	OPER						Criddle	draft					TBD		No	No	
27		Sample hoist spring washer between hoist and hoist - accommodate shielded location	FGAS						Wilson	needed			Trucks 1,2,3,4		TBD		No	Yes	
28		Call out outlier - change from CS to SS	FGAS	X	X	X			Ziada	ready	631126				TBD		No	No	Yes
29		Replace grapple load cell modification	REL						Wilson	needed		COMP	Modification underway mod #16 above completed on 3/4/98		COMP		Yes	No	
30		Provide stainless tools	FGAS	X	X	X			Kostelink	N/A			Ltr given to Ops		TBD		Yes	No	
31		Re-locate starter key for drill rig	OPER						Corbett	In prep			needed on 2,3,4		TBD		No	No	
32		Replace grapple head	REL						Wilson	ready	629716	ES-96-227 COMP	ECN for all trucks TR42, 509		TBD		No	No	Yes
33		Install new placards	OPER							needed		ES-96-224 WRK-REL			TBD		No	No	No
34		440.2 gauge to shielded wet weather cover - hose reel, piping for fire line purge	FGAS	X	X	X			Wilson + Campau	ready	629706	ES-96-00157 WRK-REL	TR43, 44		TBD		F-5 Welder Midnight Tech Midnight	F-5 W-0.5 M-0.5 L-0.5	
35		Add intrinsic safety barrier to load cell for shielded net.	FGAS	X	X	X			Wilson	ready	629707	ES-96-00156 WRK-REL			TBD		Midnight F-1.0	M-0.5 F-1.0	
36		Modify shielded net base assembly - add required penetrations	FGAS	X	X	X			Wilson + Smith	In app	629708	ES-96-00161 COMP			COMP		Midnight F-1.0	M-4.0 F-1.0	
37		Obtain sample hoist dip ring. Replace with steel hange	FGAS	X	X	X			Smith's Wilson	ready	629709	ES-96-00159 WRK-REL			TBD		Midnight	M-0.5	
38		Review drawing notes for mech RLU and fire line	FGAS	X	X	X			Campau Wilson	ready	629710	N/A			TBD		Midnight	M-1.0	
39		Obtain sample hoist load cell mounting bracket	FGAS	X	X	X			Wilson + Smith's	ready	629712	ES-96-00161 COMP			COMP		Midnight	M-1.0	

Item #	Item #	Description	Type	FGAS	FGAS	NON- FGAS	NON- FGAS	Engineer Planner	ECN Status	ECN #	Package Number(s)	Notes	Perform in field?	Perform in field?	Crane Req'd	Crane Req'd	POP Req'd	SPL Req'd
40		Add relief valve for 2-purge in weather cover.	FGAS		X			Wilson	ready	628713	ES-96-00165 COMP	Continuation of ECN 628708	COMP		Flare	F-0.5		
41		Delete latching control electrical chassis to support main RLU	FGAS	X	X			Carpenter Wilson	ready	628714	ES-96-00155 WRK-REL		TBD		Flare	F-0.5		
42		Delete latching control electrical chassis to support main RLU	FGAS	X	X			Swiers Wilson	In app	628715	N/A	no field work req'd - drawing change only	TBD		N/A	N/A		
43		Delete latching control electrical chassis to support main RLU	FGAS	X	X			Wilson	ready	628717			TBD					
44		Modify host cable weight assembly for new mech RLU	FGAS	X	X			Wilson + Carpenter	ready	628720	ES-96-00159 WRK-REL		TBD		Midnight	M-2.0		
45		Add PELE BAYON RATE alarm to instrument enclosure	FGAS	X	X			Carpenter Swiers	ready	628740	ES-96-00153 WRK-REL	ECN in review	TBD		Midnight	M-2.0		
46		Add pressure switches to monitor purge gas pressure	FGAS	X	X			Swiers Carpenter	ready	628741	ES-96-00151 WRK-REL	ECN in review	TBD		Midnight	M-2.0		
47		Electric modifications to support adding intrinsically safe barriers to local control function & removing latching control	FGAS	X	X			Swiers Carpenter	ready	628742	ES-96-00155 WRK-REL	ECN in review	TBD		Midnight	M-2.0		
48		Add handles to leveling gas bases.	SAF					Swiers	ready	631121			TBD					
49		Provide PLC logic changes	FGAS	X	X			Wilson Carpenter	ready	631121	ES-96-00167 WRK-REL	Supports ECN 628740, 41, 42	TBD		Midnight	M-2.0		
50		Modify Daytime lead cell indicators for full safe operation.	FGAS	X	X			Swiers Carpenter	ready	632396	ES-96-00155 WRK-REL	needs PLC changes	TBD		Midnight	M-2.0		
51		Provide hydraulic bed cell indicators for full safe operation.	REL					Swiers	ready	632397	N/A	part of PLC ECN 6287375	TBD		Midnight	M-2.0		
52		Provide hydraulic bed cell indicators for full safe operation.	REL	X	X			Carpenter Swiers	ready	632397	ES-96-00155 WRK-REL	Supports ECN 628740, 41, 42	TBD		Midnight	M-2.0		
57		Revise purge gas supply on truck from N2 to argon	FGAS					Swiers	ready	632397	ES-96-00155 WRK-REL	The modification would only be required if item 58, 59, 1st 60 are not implemented. The modification would only be required if item 57 is not implemented.	TBD		Midnight	M-2.0		
58		Modify lead cell connections for grapple and sampler hoist boxes	FGAS					Swiers	ready	632397	ES-96-00155 WRK-REL	The modification would only be required if item 57 is not implemented.	TBD		Midnight	M-2.0		
59		Provide adjustable and flammable drill string sleeves	FGAS					Swiers	ready	632397	ES-96-00155 WRK-REL	The modification would only be required if item 57 is not implemented.	TBD		Midnight	M-2.0		
60		Provide sampler hoist box purging system.	FGAS					Swiers	ready	632397	ES-96-00155 WRK-REL	The modification would only be required if item 57 is not implemented.	TBD		Midnight	M-2.0		
61		Replace RLU updown switch	FGAS					Carpenter Wilson										
62		Provide drill rod stop	FGAS					Wilson										
RMCT SUPPORT EQUIPMENT																		
1		Provide exhaust air (EX-A) interlock system	FGAS	X	X			Robinson +	N/A	N/A		New drawings (H-14-100519, 20, 21, 22, 23, 24, 30, 31, 32) & equipment being furnished by Marlett Engineering	TBD				No	
2		Provide SS quadmatch	FGAS	X	X			Dechert +	ready	631116			TBD				No	
3		Provide inter bay battery water/air 12	FGAS	X	X			Wilson +	ready	N/A		New drawings (H-2-586/28, 131, 132, 133)	TBD			Yes		

Item #	IP #	Description	Type	FGAS	FGAS	FGAS	NON- FGAS	NON- FGAS	Engineer + Planner	ECN #	ECN Status	Package Number(s)	Notes	Perform in field?	Perform Outage?	Crafts Req'd	Craft Shifts Req'd	POP Chg Req'd	SPL Chg Req'd
4		Provide modified samplers - SS	FGAS	X	X	X			Duchet + Kostelak	631116	ready				TBD		No	Yes?	
5		Provide zero gas flow push be	FGAS	X	X	X			Kostelak		needed				TBD		No	?	
6		Provide exhaustor (EX-C) heater	FGAS	X	X	X			Robison	N/A		96-00839	New drawing (H-14-100739)		TBD		Yes	?	
7		Provide N2 relief valve	REL						Corbett	622757	ready		needed on 2.3.4		TBD				
8		Provide HEPA-vented calibration test	MAIN						Corbett	415	in prep		needed on 2.3.4		TBD				
9		Provide HEPA-vented calibration test	REL						Kostelak		needed		needed on 2.3.4		TBD				
10		Provide re-scaled pressure indicator on	OPER						Kostelak		ready		needed on 2.3.4		TBD			No	
11		Shut-off assembly (772)	SAF						Kostelak	626632	ready		needed on 2.3.4		TBD			Yes	
12		Install brake on cable truck chain fall hoist	SAF						Kostelak	630035	ready		needed on all cable trucks		TBD			Yes	
13		Provide Generator load bank into dump	REL						Kostelak	631140	ready		needed on all cable trucks		TBD			No	
14		Change nitrogen filling on spray washer	FGAS	X	X	X			Wilson	631142	ready		needed on 3.4		TBD			No	
15		Provide nitrogen filling on spray washer	REL						Wilson		ready	ES-96-00163	Modification complete		COMP	Filter	F-0.5		
16		Provide N2 relief valve	REL						Stegert + Wilson	631129	in prep				TBD				
17		Provide nitrogen filling on cable washer	OPER						Kostelak	630035	ready		do with item #11		TBD				
18		Provide offset riser supports	FGAS	X	X	X			Wilson	631139	ready				TBD				
19		Provide footclamp retractor hand	FGAS	X	X	X					ready		New drawing (H-2-680136)		TBD				
20		Provide exhaustor (EX-C) breather vent	FGAS	X	X	X			Robison	N/A	N/A	77	THIS ITEM HAS BEEN DELETED						
21		Provide exhaustor (EX-C) regulator	FGAS	X	X	X			Robison	N/A	N/A	96-00841	New drawing (H-14-100742)		TBD				
22		Exhaustor (EX-C) misc details	FGAS	X	X	X			Robison	N/A	N/A		New drawing (H-14-100741)		TBD				
23		Install exhaustor (EX-C) assembly - mech	FGAS	X	X	X			Robison	628144	ready		New drawing (H-14-100740)		TBD				
24		Install cable sled (mechanical)	FGAS	X	X	X			Robison	632390	ready		Mech drawing (H-2-682145)		TBD				
									Robison	632390	ready		Elec drawing (H-14-099122)						
									Robison	632390	ready		Drawing H-2-682145						

CORE SAMPLING EQUIPMENT PROBLEM LOG

7/29/96
11:15 AM
COMBOLOG.XLS

Problem Identity Entry	Sys.	#	Log	Equip #	Problem Description	Prio rity	Org. Resp.	Cause of Problem	Action Taken or Required	Closed (date)	Action Log #	Work Priority	Individual
960401A	TS2	3	E/O		Problems with fast rotation, would not kick in		Maint		Adjusted limit switch	4/1/96			
960401A	TS2	1	E		Need to cut approx 1" of anti-rotations bracket - it currently hits the bottom of the bellows assembly		Maint	Wrong bolt??	ES-96-00102				
960401A	TS2	6	O		Mechanical & electrical counters for RLU not working right		Maint		ES-96-00102	4/1/96			
960401A	TS2	7	O		Ram pressure up gage cracked		Maint		ES-96-00221	4/1/96			
960401A	TS2	2	E		Unintended platform rotation		Des			4/1/96			
960401A	TS2	4	E/O		When HBD was tested, rams did not reverse very quickly		Maint			4/1/96			
960401A	TS2	5	E/O		Instrument cabinet sun shield not secured properly		Maint			4/1/96			
960401B	TS1	1	O		Jib Hoist wires on truck shorted out		Maint						
960401C	TS2	1	E		While trying to remove the grapple head, shaft was over torqued and failed		Maint						
960401J	TS2	1	J		Compressor not hard wired into truck, pressure guage does not work		Maint		ES-96-00218	Yes			
960401J	TS4	2	J		TS&R bellows		Maint		ES-96-00224	4/1/96			
960401J	TS2	3	J		Capacitor on compressor needs to be replaced		Maint		ES-96-00225				
960401J	TS2	4	J		Replace grapple head with new strengthened head		Maint		ES-96-00226	4/3/96			
960401J		5	J		Replace grapple head with new strengthened head		Maint		ES-96-00227				
960401J	TS4	6	J		Modify grapple hoist drum to prevent bird's nesting		Maint		ES-96-00228				
960401J		7	J		Replace grapple head with new strengthened head		Maint		ES-96-00230	Yes			
960401J	TS2	3	J		Purge gas control valve is leaking internally		Maint		Replaced valve	4/1/96			
960401J	TS2	1	J		Thermostat on drum heater not working		Maint			4/1/96			
960401J	TS2	2	J		Slow rotation ramp time to be adjusted down		Maint			4/1/96			
960402B	TS2	1	E		New problem with fast rotation		Maint						
960402J		1	J		Temperature gauge on nitrogen trailer is broken		Maint		ES-96-00231	Yes			
960402J	TS2	1	J		No-shok gauge has cracked glass		Maint		ES-96-00232	4/4/96			
					Hydraulic reservoir is low								
					Thermostat on drum heater not working								
					Sampler hoist counter drifting from zero								
					Slc-ro ramp time to be adjusted down								
					Center light won't come on								
					Purge gas control valve is leaking internally								
960402J	TS2	2	J		Both lights on HBD have burned out		Maint		ES-96-00235	4/2/96			
960402J	TS2	3	J		Unable to initiate fast rotation - suspect proportional control valve		Maint		ES-96-00240	4/3/96			
960403A	TS2	1	E		No x-ray - technician not available		Ops						
960403B	TS2	1	E		No x-ray (apparently couldn't make him a shade hut)		Ops						
960403C	TS2	1	E/O		Water pump on support truck not working		Maint						
960403C	TS2	1	E/O		Water pump on support truck not working		Maint						
960403J	TS2	2	J		R/R switch for water pump on support truck		Maint		ES-96-00248	4/4/96			
960404J	TS3	1	J		Spray washer not working, suspect drum level switch		Maint		ES-96-00250	5/9/96			
960405A	TS4	2	E		DCI on RLU hoist is not functioning properly		Maint		ES-96-00254				
960405A	TS4	1	E		Need to adjust grapple hoist loadcell		Des						Criddle
960405B	TS1	1	O		Contamination problem inside windbreak		Ops						
960405B	TS1	2	O		Longyear not running properly		Maint	Dirty gas					

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CORE SAMPLING EQUIPMENT PROBLEM LOG

7/29/96
11:15 AM
COMBOLOG.XLS

Problem Identity				Equip	Problem Description	Prio rity	Org. Resp.	Cause of Problem	Action Taken or Required	Closed (date)	Action Log #	Work Priority	Individual
Entry	Sys.	#	Log	#									
960405J	TS3	1	J		Sun screen on control console has broken hinge		Maint		ES-96-00255	5/24/96			
960405J	TS3	2	J		Control console has leads exposed at bottom		Maint		ES-96-00256	5/8/96			
960408B	TS1	1	O		Empty casks hot when opened (3 mrem/hr)		Ops						
960408B	TS1	2	O		Problem with crew being hot, no air movement in windbreak		Ops						
960408C	TS4	1	E		Grapple hoist loadcell again not working right		Des		ES-96-00261 (4/9)				
960408J	TS4	2	J		Speed control on sampler hoist doesn't vary speed		Maint		ES-96-00259	4/8/96			
					Ramp time on slow rotation way too long								
960408J	TS3	1	J		Torque converter oil low		Maint		ES-96-00260	4/8/96			
					Hydraulic fittings on platform need tightening								
960408J	TS2	3	J		Replace level switch on support truck		Maint		ES-96-00262	4/9/96			
960409B	TS4	1	E		Bird's nest on grapple hoist		Maint		ES-96-00269	Yes			
960409B	TS1	1	O		Contamination around riser		Ops						
960409B	TS1	2	O		Operator had 7000 counts skin contamination		Ops						
960409J	TS2	1	J		TS&R RPM sensor, it is shutting down truck		Maint		ES-96-00263	4/9/96			
960410B	TS1	1	O		X-ray machine could not be placed due to lack of room		Ops						
960410J		1	J		Water meter on spray wash pump is broken off		Maint		ES-96-00273	5/10/96			
960411B	TS1	1	O		Problem with contamination leaking out at threaded portion where drill string and gas mitigation screw together. Only happens when purging drill string with argon.		Des						
960411J	TS4	1	J		Purge gas manual flow control valve leaks internally		Maint		ES-96-00272				
960411J		2	J		Replace Appleton connector with Hubbell 330 connector for truck air compressor cord		Maint		ES-96-00281	4/11/96			
960412B	TS3	1	E		Ram pressure gauge had hydraulic and glycol leaks		Maint						
960412B	TS3	2	E		Inst tech cannot initialize new disk/magnetic tape for recorder								
960412B	TS4	1	E		Load cell readout higher today than yesterday, cause unknown		Des						
960412J		1	J		Install the rebuilt spray washer pump		Maint		ES-96-00285	4/17/96			
960415A	TS3	1	E/O		Could not connect quill rod to drill string.		Maint	Bushing upside down	ES-96-00286	4/15/96			
960415B	TS1	1	E/O		Bird's nest developed		Maint		ES-96-00288	4/18/06			
960416A	TS3	1	E		RLU counts showed a couple of anomalies on first 2 segments. All readings were perfect after that.		Des	Watch					
960416B	TS3	1	E		No x-ray machine		Ops						
960416C	TS3	1	E		Blue strobe on purge gas cabinet does not flash		Maint		ES-96-00296	Yes			
960416C	TS3	3	E		Need to reset time on VGR to daylight savings time		Maint		ES-96-00296	Yes			
960416C	TS3	2	E		Ramp down function for fast rotation stops abruptly and causes a shock load		Des	As designed		4/16/96			
960416C	TS3	4	E		Noted a 'whine' in Longyear when in 'remote hydraulics'		Des						
960416J		1	J		Rewire mounting panel subassembly to correspond to wiring on trucks 3 and 4 (ECN 618727)		Maint		ES-96-00289				
960416J		2	J		X-ray machine is contaminated and needs servicing		Ope		ES-96-00290	Yes			
960417A	TS3	1	E/O		Instrument enclosure high temp. Air conditioner not running		Maint		ES-96-00296	Yes			
960417A	TS3	2	E/O		Weld blew out on changeout assembly at 18 psi		Des	Old changeout assbly					
960417B	TS3	2	E		Platform rotation not working in fast or slow from console pendant. Suspect d/dl-valve		Des		ES-96-00299 (4/18/96)				

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CORE SAMPLING EQUIPMENT PROBLEM LOG

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COMBOLOG.XLS

Problem Identity				Equip	Problem Description	Prio rity	Org. Resp.	Cause of Problem	Action Taken or Required	Closed (date)	Action Log #	Work Priority	Individual
Entry	Sys.	#	Log	#									
960417B	TS3	1	E		High LFL in drill string. Pressurization method did not work. CGM method did work, but CGM pump got contaminated		Ops						
960417C	TS3	2	E		Fluid leaking from torque converter on to ground		Maint		ES-96-00300	Yes			
960417C	TS3	1	E/O		RPM reading on front DCI erratic		Des						
960417J	TS3	1	J		Adjust torpedo on grapple cable		Maint		ES-96-00297	Yes			
960417J	TS4	2	J		Adjust torpedo on grapple cable		Maint		ES-96-00298				
960418A	TS3	1	E		Tried every method to purge FG. None worked		Ops						
960418A	TS4	1	E		Possible leak in purge gas cabinet to upper half of change out assembly		Maint						
960418B	TS3	1	E		Spurious RPM alarm		Des		ES-96-00301				
960419A	TS4	1	E		Need to adjust VGR clock and need new disk in VGR		Maint						
960419B	TS1	1	E/O		Longyear starter broke		Maint			4/19/96			
960419J	TS3	2	J		TS&R RPM Gauge		Des		ES-96-00114				
960419J	TS3	1	J		Spurious RPM alarm		Des		ES-96-00303				
960422A	TS3	2	E/O		Fast rotation not working again, slow barely working		Des		ES-96-00305	Yes			
960422A	TS3	1	E		Continuing problems with proportional control valve		Des						
960422A	TS3	3	E/O		Sampler weighed ~130 lbs, got stuck 3 feet up.		Ops						
960422J	TS3	1	J		Inspect shielded receiver lifting frame for deformation, not level Adjust hydraulics for lifting frame, runs extremely jerky down Blue strobe not flashing		Maint		ES-96-00308	5/14/96			
960423A	TS4	1	O		Need nitrogen pressure adjusted in nitrogen cabinet		Ops						
960424B	TS1	1	E/O		Grapple cable fouled up again, Had problems dropping the pintle rod.		Ops	Dried waste in quill rod and probably drill string	ES-96-00313	4/29/96			
960425B	TS4	1	E/O		Had problems building up sufficient pressure in drill string prior to unseating sampler (reached 7 psi)		Ops						
960425C	TS3	1	E		Removed two pressure regulators that were recently installed (platform hydraulics)		Des			Yes			
960425J		1	J		Cog eng wants rest of wiring checked for problems (truck support equipment)		Maint		ES-96-00316	6/6/96			
960425J	TS4	1	J		Replace the flow rate controller (FC-3)		Maint		ES-96-00317	4/26/96			
960426C	TS3	4	E/O		Platform rotation could not be achieved		Des	Digi-valve acting up	ES-96-00321	4/29/96			
960426C	TS3	1	E		No x-ray taken - mentioned several times this core		Ops						
960426C	TS3	2	E		Are there any plans to add a quick disconnect to quill rod?		Des						
960426C	TS3	3	E		May have leak in purge gas piping system		Maint						
960429A	TS3	1	E/O		Pulled up quadrat latch without sampler		Des						
960429B	TS3	1	E/O		TS&R ram hydraulics, rams are drifting down		Maint		ES-96-00323	4/29/96			
960430A	TS3	1	E		Design - why do we have a 20 psi deadband for cycling the walkdown function? 10 psi would speed the process		Des						
960501J		1	J		Replace broken cap on distribution trailer with truck #3		Main		ES-96-00332	6/4/96			
960502B	TS1	1	O		Drill string CALCULATIONS incorrect in PROCEDURE		Field						
960503B	TS1	1	O		Not enough people assigned for removing/installing DS		Ops						

CORE SAMPLING EQUIPMENT PROBLEM LOG

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COMBOLOG.XLS

Problem Identity				Equip	Problem Description	Pri rity	Org. Resp.	Cause of Problem	Action Taken or Required	Closed (date)	Action Log #	Work Priority	Individual
Entry	Sys.	#	Log	#									
960503B	TS4	1	E		GRAPPLE COUNTER was not always turning - missing counts on way up and down. - Inspection showed grapple side of 90 degree drive would turn while shaft on counter side would not.		Maint						
960503B	TS1	2	E		The combo of LONGYEAR and DIAMOND DRILL may be causing SAMPLERS to stick		Des						
960503B	TS1	3	E		PISTON of SAMPLER got pushed up before ready to start segment		Ops						
960506B	TS1	1	E/O		Loud noises when raising GRAPPLE & PINTLE. Apparent hangers at QUILL ROD adaptor joint and possibly at drill string joints		Des						
960506B	TS1	2	O		Noises inside GRAPPLE box while raising grapple. Not continuous - intermittent at various revolution counts		Des						
960506C	TS2	1	E		DISTRIBUTION trailer in S-farm apparently not compatible with XRAY unit.		Maint						
960506J	TS3	1	J		Over pressurization may have caused PT-8, PT-9 and PG-4 to malfunction or go out of calibration		Main		ES-96-00353	5/6/96			
960507B	TS2	1	E		Issue with STANDARD conventions for N2, AIR, WATER, PURGE (hose fittings) - Did not sign packages.		Des						
960507C	TS3	1	E		Troubleshooting RAM hydraulics - Pressure Reducing Valve (PRV) for lower ram not functioning properly		Maint						
960507C	TS3	2	E		No SPARES for RAM PRV. - Need higher priority given to a spare parts program that works.		Maint						
960507J		1	J		Rear door struts on all N2 trailers have failed		Main		ES-96-00356	5/23/96			
960508B	TS1	1	O		Inspection of GRAPPLE box revealed that when pulling PINTLE rod, reel, shafts, couplers go out of round (bend?)		Des						
960508B	TS1	1	E		Grapple drum wobbled on shaft - need to reduce clearance from 0.021" to 0.005"		Des						
960508B	TS1	2	E		Grapple cable should start on left hand side of drum rather than near right side, as is a right hand lay		Des						
960508B	TS1	3	E		Grapple cable should start on the drum taper rather than top		Des						
960508C	TS3	1	E		Minor problem with RAMs tending to drop on their own about 1/2". Will cause interference problem during TRAVERSE		Maint						
960508C	TS3	2	E		Minor problem with SR sometimes "jumping" at top of travel due to accumulators in system.		Maint						
960508J		1	J		Service trailer at U-farm breaker panel is missing 2 blanks		Main		ES-96-00368				
960509A	TS3	1	E		RAMs still sinking, HYDRAULICS jerky.		Maint						
960509A	TS3	2	E		PENDANT control stopped working - worked fine after lunch.		Maint						
960509A	TS3	3	E		GRAPPLE motor squeaking when PINTLE rod dropped on each segment.		Maint						
960509C	TS3	1	E/O		High flammable gas - 11% LFL		Ops						
960509J	TS3	1	J		Accumulators A&B may not be properly charged		Main		ES-96-00370	5/29/96			
960510C	TS3	1	E/O		Broken purge gas pressure reducer gage		Main						
960510C	TS3	2	O		Should rebend piping for clearance between PR dial and lexan screen		Main						

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Problem Identity Entry	Sys.	#	Log	Equip #	Problem Description	Priority	Org. Resp.	Cause of Problem	Action Taken or Required	Closed (date)	Action Log #	Work Priority	Individual
960510C	TS3	3	E		Breaking ears off black caps		Main						
960510J	TS2	1	J		#2 support truck needs temp controller reset or repaired		Main		ES-96-00387	5/13/96			
960513J		1	J		N2 Trailer HO-64-04966 needs to have wiring from motor control panel to motor housing replaced		Maint		ES-96-00389				
960513J	TS3	2	J		PG-3 has no gauge needle or gauge cover. Replace		Maint		ES-96-00390	6/4/96			
960514B	TS1	1	E/O		Grapple jaws stuck in open position (2/4)		Des		ES-96-00355	5/14/96			
960514B	TS1	2	E		If a load cell was in use on truck one, could have detected the problem caused by previous item (see Cockrell notes)		Des						
960514J		1	J		V-4 valve is apparently leaking. Repack		Maint		ES-96-00391	6/5/96			
960515A	TS2	1	E		Fingers sticking on grapple, WD-40 seems to work ok.		Des						
960515A	TS2	2	E		Sun shade needs new hinges		Main						
960515B	TS2	1	O		Operator had contaminated personal shirt		Ops		Watch				
960515C	TS2	2	O		Alarm sounded on truck, was acknowledged. Could not find cause, did not repeat.		Ops						
960515C	TS2	1	E		Heard from operators that samplers will not fit through new change-out assemblies		Des						
960515J		1	J		Immersion heater on #2 support truck is defective and needs replacement		Maint		ES-96-00400				
960516A	TS2	1	E/O		Safety Concern with broken hinge on sun shade shut down work		Maint		ES-96-00402				
960516A	TS2	2	O		Safety Concern with 480 volt connector on Kato Light generator shut down work		Maint						
960516C	TS2	1	E/O		Generator low on oil, proc says to use 30W, but record of last fill says 10-40W used, so OPS unwilling to add any type.		Ops						
960516C	TS2	2	O		Fire extinguishers missing from N2 trailer		Ops						
960520B	TS1	1	O		Grapple would not pick up pintle rod. Picked up sampler with RLJ		Ops						
960520J	TS2	1	J		Chart recorder paper not working		Maint		ES-96-00416	5/21/96			
960520J		2	J		Spray washer on support truck #2 is leaking		Maint		ES-96-00417	5/21/96			
960521A	TS2	1	O		High flammable gas 67-125% LEL, various purge methods failed		Ops						
960521J	TS1	1	J		Labels need to be fabricated and installed		Maint		ES-96-00425				
960522J	TS1	1	J		Push mode truck air compressor needs power supplied from 200KW Katolite generator. Fab a cable accordingly		Maint		ES-96-00427	5/24/96			
960523B	TS1	1	E/O		Problem with power connections, plug ins are not flush with connectors		Maint			5/24/96			
960523B	TS1	2	E		Longyear was started & stopped several times. On last start engine started clanging loudly and was immediately stopped. Oil was ~2.5 quarts low. After sitting for 15-20 minutes, oil was normal and engine was restarted and ran fine.		Maint						
960523C	TS2	1	E		Tent is in place but the truck won't fit through the door		Ops			Yes			
960523J	TS3	1	J		Up ram hydraulic gage reads 500+ PSI with no pressure		Maint		ES-96-00431	5/30/96			
960524B	TS2	1	E/O		New generator burned up electrically as soon as they started it.		Des		ES-96-00446				
960524B	TS2	2	O		Need procedure revision for new generator		Field			5/24/96			

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CORE SAMPLING EQUIPMENT PROBLEM LOG

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Problem Identity				Equip		Prio	Org.	Cause of Problem	Action Taken or Required	Closed (date)	Action Log #	Work Priority	Individual
Entry	Sys.	#	Log	#			Resp.						
960524C	TS2	1	O		Operator had to stop grapple motor as slack cable interlock did not work		Ops		Watch				
960524C	TS2	2	O		RLU did not retrieve sampler, cable stopped moving		Des						
960524J	TS4	1	J		Hydraulic cylinder on the left rear jack assembly is leaking		Maint		ES-96-00434				
960528B	TS2	1	E		Bird's Nest in RLU		Des		WS-96-00193	5/31/96			
960528B	TS3	1	E		Hydraulic maintenance ongoing. Replacement of gage, transducers & pressure regulator planned		Maint						
960529B	TS1	1	O		Truck to garage to clean out Longyear gas tank		Maint						
960529J	TS3	1	J		VGR to RF modem cable is not working correctly		Maint		ES-96-00451				
960530C	TS2	1	O		During post RLU testing, found gross leak around shaft seal on slip-ring side		Maint						
960530C	TS3	1	E		Continued maintenance on RLU		Maint						
960530J	TS1	1	J		Power cord insulation showed signs of being damaged through the insulation		Maint		ES-96-00456	6/4/96			
960530J		2	J		Cannon plug on power cord for distribution truck #4 needs to be replaced		Des		ES-96-00457	6/5/96			Daniels
960603B	TS3	1	E/O		Lower Ram Pressure gage overpressurized again		Des		ES-96-00461 (6/4/96)				
960603C	TS3	1	E		Field requests Design put priority on ECN & Fab of shorter QR adapter end pieces		Des		Need NCR				Wilson
960603C	TS3	2	E		BY farm is contaminating sampling equipment		Ops						
960604C	TS3	1	E		Operations reported platform rotation not functioning		Maint	intermittent - watch	ES-96-00465	6/4/96			
960604C	TS3	2	O		Fixed the exhaust pipe that runs out of the tent.		Maint						
960604C	TS3	3	O		HPTs found level over RWPP limits and shut down job.		Ops						
960606A	TS3	1	E/O		Grapple hoist failed, gear reducer output shaft does not turn		Maint		ES-96-00473/474	6/7/96			
960607B	TS4	1	E		While cannibalizing gear reducer for truck 3, the grapple free fell from hard stop to floor, knocking black cap off QR adapter		Maint						
960610A	TS1	1	E/O		RLU would not go into the drill string. Tube out of plumb.		Maint		ES-96-00479	6/10/96			
960611B	TS1	1	E		Work package to adjust travel speed of shielded receiver		Maint		ES-96-00482	6/12/96			
960612C	TS1	1	E		Air sampler broke.		Ops						
960612C	TS1	2	E/O		Onan generator was not level and leaked fuel on ground		Ops						
960612C	TS1	3	E/O		Shielded receiver was not moving smoothly.		Maint						
960613B	TS2	1	O		Green drill string vent lights would not come on		Maint						
960613J		1	J		Slip rings need to be changed and wiring changed to #4		Maint		ES-96-00493	6/25/96			
960614A	TS1	1	E/O		High LFL levels		Ops						
960614B	TS2	1	E		Height of cask stand is just right so that shielded receiver ball valve handle cuts into lower ram hydraulic hose		Des						Wilson
960614B	TS2	2	E		RLU hoist cut out at 1.7 and 1.2 while raising from cask		Maint						
960614B	TS2	3	O		Need to adjust downforce so can get to 3900#		Maint						
960614C	TS1	2	E/O		Truck failed to rotate		Maint	broken coupler	ES-96-00499	6/17/96			
960614C	TS1	1	E/O		RLU came up without sampler		Ops						
960614C	TS1	3	O		Onan generator low oil pressure shut down generator		Maint						
960618C	TS1	1	O		Bit was half way unscrewed when core barrel removed		Ops						
960618J	TS1	1	J		Grapple slack cable did not cut out motor		Maint		ES-96-00505	7/12/96			
960618J	TS1	2	J		Outer surface of conduit between LS-21 & JB-9 is cracked		Maint		ES-96-00512				

CORE SAMPLING EQUIPMENT PROBLEM LOG

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Problem Identity			Equip		Problem Description	Prio	Org.	Cause of Problem	Action Taken or Required	Closed (date)	Action Log #	Work Priority	Individual
Entry	Sys.	#	Log	#			Resp.						
960619C	TS2	1	E/O		Platform hoist pendant is broken		Maint						
960619C	TS2	2	O		Wash pump fitting is leaking		Maint						
960619J	TS2	1	J		Install weather cover on the shielded receiver		Maint		ES-96-00525	6/20/96			
960620C	TS3	1	E		Grapple weight 29# at top. Only goes down to 10# when slack so slack detector not functioning (set point of 8.9#)		Des						
960620J	TS2	1	J		Manual/remote hydraulics switch is broken		Maint		ES-96-00527				
					Hinged cover on 110V outlet on control console is broken								
					Bottom hinge mount nut on safety gate is missing								
960621B	TS2	1	E/O		Shielded receiver lifting frame not square, ram strokes differ		Maint		ES-96-00535	6/21/96			
960621B	TS2	2	E/O		Hydraulic pump could not be warmed up sufficiently to get pressure below 250 psig.		Ops						
960621C	TS2	2	O		Bent ball valve handle & stem on SR		Maint		ES-96-00544				
960621C	TS2	1	O		XRI not functioning		Maint						
960621J		1	J		Freeze connector on spray washer needs replacement		Maint		ES-96-00531	6/26/96			
960624J	TS3	1	J		Grapple load cell calibration		Maint		ES-96-00537	6/28/96			
960624J	TS2	2	J		Fast rotation & traverse do not work on control console		Maint		ES-96-00538				
960625A	TS1	1	E		Hydraulic bottom detector not functioning properly		Maint		ES-96-00541	6/25/96			
960625A	TS2	1	E		Strip chart recorder is not working.		Maint						
960625B	TS2	1	E		Purge gas pressure refusing to hold during sample		Ops						
960626A	TS1	1	E		No X-ray Tech available		Ops						
960626B	TS1	2	E		Pressure switch on the truck air compressor went out		Maint		ES-96-00547				
960626B	TS2	1	E		RLU slack cable weight was too close to interlock setpoint.		Maint		ES-96-00548				
					Motor was kicking on and off.								
960626B	TS1	1	E		CGM went out		Ops						
960626B	TS1	3	E/O		Compressed air regulator on foot clamp went out		Maint						
960626B	TS3	1	E		Ops worked on grapple loadcell		Maint		ES-96-00558	6/28/96			

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Core Sampling Systems Availability (FY1996)

Core Sampling Systems Availability (FY1996)

DISTRIBUTION SHEET

To Distribution	From Characterization Equipment Design	Page 1 of 1 Date 4/26/96
Project Title/Work Order CHARACTERIZATION SAMPLING EQUIPMENT STATUS REPORT - APRIL THROUGH JUNE 1996		EDT No. 617953 ECN No. N/A

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
R. J. Blanchard	S7-12	X			
R. M. Boger	S7-12	X			
A. B. Cockrell	S7-12	X			
J. E. Corbett	S7-12	X			
J. D. Criddle	S7-12	X			
R. N. Dale	S7-12	X			
J. E. Daniels	S7-12	X			
P. R. Deichelbohrer	S7-12	X			
S. J. Eberlein	R2-12	X			
R. U. Elwell	S7-12	X			
D. B. Engelmann	I6-37	X			
L. F. Ermold	S7-84	X			
C. A. Esvelt	S7-12	X			
T. R. Farris	S7-12	X			
D. W. Hamilton	S7-12	X			
C. E. Hanson	H5-09	X			
G. P. Janicek	S7-12	X			
W. W. Jenkins	S2-24	X			
B. R. Johns	S7-12	X			
T. J. Kelley	S7-21	X			
A. J. Kostelnik	S7-12	X			
J. G. Kristofzski	R2-12	X			
C. G. Linschooten	S7-12	X			
J. Lipnicki	S7-12	X			
W. C. Miller	A2-34	X			
A. P. Mousel	S7-12	X			
M. A. Payne	S7-84	X			
D. N. Price	S7-80	X			
R. S. Popielarczyk	R1-30	X			
T. E. Rainey	S7-12	X			
S. H. Rifaey	S1-57	X			
R. E. Raymond (2 xc)	S7-12	X			
F. R. Reitz	S7-12	X			
J. D. Robinson	S7-12	X			
J. S. Schofield	S7-12	X			
J. L. Smalley	S7-12	X			
R. H. Stubbs	S7-12	X			
E. J. Waldo	S7-12	X			
J. R. Weber	S7-12	X			
G. W. Wilson	S7-12	X			
Central Files	A3-88	X			
DOE:					
S. T. Burnam	S7-53	X			
P. R. Hernandez	S7-54	X			
J. F. Thompson, Jr.	S7-54	X			