



U.S. Department of Energy  
**Office of River Protection**

P.O. Box 450  
Richland, Washington 99352

03-ESQ-047

JUL 24 2003

Mr. E. S. Aromi, President  
and General Manager  
CH2M HILL Hanford Group, Inc.  
Richland, Washington 99352

Dear Mr. Aromi:


CONTRACT NO. DE-AC27-99RL14047 – U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION (ORP) ASSESSMENT REPORT, A-03-ESQ-TANKFARM-005, OF CH2M HILL HANFORD GROUP, INC. (CH2M HILL) PROGRAMS FOR PROCUREMENT, INSPECTION, AND ACCEPTANCE TESTING

This letter forwards the results of the ORP assessment of the CH2M HILL programs for procurement, inspection, and acceptance testing conducted June 9 through 13, 2003. Three Findings were identified during the assessment. The Findings represent isolated cases of noncompliance and resulted in no significant safety issue. The Findings are discussed further in the Notice of Finding (Attachment 1). The assessment report is included as Attachment 2.

The assessment team concluded, with the exception of Findings A-03-ESQ-TANKFARM-005-F-01, F-02, and F-03, CH2M HILL's programs for procurement, inspection, and acceptance testing were effective and met contractual requirements.

If you have any questions, please contact me, or your staff may call Robert C. Barr, Director, Office of Environmental Safety and Quality, (509) 376-7851.

Sincerely,

  
Roy J. Schepens  
Manager

ESQ:PRH

Attachments (2)

### Notice of Finding

The responsibilities of CH2M HILL Hanford Group, Inc. (CH2M HILL) as they relate to the Quality Assurance (QA) requirements of CH2M HILL's scope of work, are defined in the River Protection Project Tank Farm Contract, Part I – The Schedule, Section H, H.30 *Quality Assurance System*. H.30 states, "The Contractor shall develop and implement a company specific Quality Assurance Program (QAP), supported by documentation that describes its overall implementation of Quality Assurance (QA) requirements." The QAP shall be developed based on:

- Title 10 Code of Federal Regulations (CFR) Part 830.122 for all nuclear facilities and projects within the scope of that document;
- DOE O 414.1A, *Quality Assurance*, requirements for facilities and projects not within the scope of 10 CFR 830.120; and
- Office of Civilian Radioactive Waste Management *Quality Assurance Requirements and Description*, DOE/RW-0333P, for those elements of CH2M HILL's scope of work that involve the interim storage of spent nuclear fuel and high-level radioactive waste.

CH2M HILL's QA program is defined in TFC-PLN-02, *Quality Assurance Program Description*, (QAPD). Implementing procedures describe processes to meet the requirements described in CH2M HILL's QAPD.

During performance of an assessment of CH2M HILL's programs for Procurement, Inspection, and Acceptance Testing, conducted June 9 through 13, 2003, at CH2M HILL's offices, the U.S. Department of Energy, Office of River Protection (ORP) identified three Findings.

**A-03-ESQ-TANKFARM-005-F-01** – Test personnel made unauthorized technical procedure changes during acceptance tests.

#### Requirement:

- Section 4.1 of Fluor Federal Services, Inc. (FFS) document 134 00.00.1100, dated May 1, 2002, *Quality Management Program*, stated, "Manuals, procedures, practices, drawings, and specifications are issued, controlled, and maintained in accordance with approved practices according to the following guidelines .... Work activities are performed according to approved documents only .... Revisions to controlled documents, other than minor changes, are reviewed and approved by the organizations that originally reviewed and approved the documents."
- FFS Practice 134 200 1200, dated March 1, 2001, stated, "If a change to an ATP [Acceptance Test Procedure] is necessary, the test director or the FFS design engineer determines if the change is major or minor. The ATP test is stopped until the change is approved .... Editorial changes are considered minor .... Changes not defined as minor editorial changes are considered major changes (technical) and require the use of a Design Change Notice."

**Discussion:**

Contrary to the above, test personnel made technical changes to ATPs without using Design Change Notices. Some of these involved assuring the correct electrical lineup was in place for the test. Document control processes, such as the use of design change notices, assure test procedure changes are accurate. The following examples illustrated this problem:

- During conduct of ATP RPP-9358, Revision 0-0, on August 14, 2002, technical changes were made to the initial circuit breaker lineup specified in Section 4.3.6 without using a Design Change Notice.
- During conduct of ATP RPP-7849, Revision 0-0, on September 5, 2002, technical changes were made to the initial circuit breaker lineup specified in Section 4.3.6 without using a Design Change Notice. As a result, test step 5.2.2.1 could not be performed as written and was not performed. This step required closing panel board AZ801A-EDS-DP-123 breaker 8, but it was already closed.
- For the ATP documented in acceptance test report W-211-AP24-ATR-001, Revision 0, one of the columns in data sheet 8.3.1 was changed by pen-and-ink without review or approval by the organizations that originally approved the document. The test was performed in May 2001. The column appeared to be changed from MS 3-2 to SD 3-2; however the existing text was obliterated by the change. The assessors determined this was not a minor change because it affected the nomenclature of equipment. FFS Practice 134 200 1200 defines changes to equipment nomenclature in ATPs as "major changes."
- For the ATP documented in acceptance test report W-211-AN5-ATR-001, Revision 0, the requirement in Appendix A, "Installer," Item 4 to *complete* and submit alarm system preliminary Certificate of Completion was initialed and marked "*(in progress)*." Therefore, this work was not performed in accordance with the approved document. This test was performed in May 2001.
- FFS ATPs, such as RPP-7855, *241-AZ-VP Encasement Leak Detector AZVP-WT-LDSTA-224 Acceptance Test Procedure*, included a statement at the beginning of the procedure, "Test steps within individual sections in Section 5.0 are to be performed sequentially, unless otherwise noted or as directed by the Test Director." This provision provided the test director with erroneous latitude in execution of the test. Technical changes, such as re-sequencing of test steps, require the use of a Design Change Notice.

**A-03-ESQ-TANKFARM-005-F-02** – There were errors during the conduct of a test.

**Requirements:**

- Paragraph 2.3 of HNF-IP-0842, Volume 2, Section 4.4.1, Revision 3e, stated, “Give detailed, understandable, and complete directions ....” and “Perform Verbatim Repeat Back when acknowledging short directions from the sender.”
- Section 5.1 of FFS Practice 134 000 1100, dated May 1, 2002, stated, “Personnel know the requirements for work they perform and the capability of the tools and processes they use .... Line managers ensure that personnel working under their supervision are provided necessary training, resources, and administrative controls to accomplish assigned tasks ....”

**Discussion:**

The assessors observed the conduct of a test of the Master Pump Shutdown System on June 10, 2003. This test was being conducted because test execution errors caused data loss during an earlier performance of the test. The FFS Test Director was also the principal operator of the equipment being tested. Failure to perform the test correctly could result in an inaccurate record of performance of the Master Pump Shutdown System. Also, improper communications during the testing could result in misalignment of Tank Farm valves. Contrary to the requirements cited above:

- A CH2M HILL operator performing valve operations in the AN Farm did not repeat back valve operation directions during the conduct of the test.
- The FFS Test Director, using a 2-way radio, ordered valve operations using incomplete and ambiguous language such as “Open the valve now, please.” He did not identify the valve to be opened, and did not require a repeat-back.
- The FFS Test Director was not familiar with the equipment and executed steps incorrectly. At one point he stopped the test and started it over because he was confused. During the remainder of the test, it was necessary for the Test Director to contact the system expert (SE) by cellular telephone and have the SE explain how to execute the test steps as the test was continued.

**A-03-ESQ-TANKFARM-005-F-03** – Maintenance work packages and Routine Work Requests did not provide adequate direction for testing.

**Requirements:**

- TFC-PLN-02, Revision A-1, *Quality Assurance Program Description*, Section 2.8.2.1.3 stated, “Acceptance parameters and other inspection or test requirements shall be

- specified by the cognizant design organization as part of the design output documentation and work planning process and shall be included in work control documents.”
- TFC-PLN-02, Revision A-1, *Quality Assurance Program Description*, Section 2.8.2.3.1.b stated, “Test procedures shall include or reference test objectives and provisions for assuring that prerequisites for a given test have been met, that adequate instrumentation is available and used, that necessary monitoring is performed, and that suitable environmental conditions are maintained before beginning. In lieu of specially prepared written test procedures, appropriate sections of related documents such as industry standards, supplier manuals, equipment maintenance instructions, or approved drawings or travelers with acceptance criteria can be used. Such documents shall include adequate instructions to assure the quality of work, and the manner and application of their use shall be specified.”

### Discussion:

Contrary to the above, test requirements identified in maintenance documents did not provide sufficient information to assure that adequate tests would be performed. The following examples illustrated this condition:

- The test requirements for work package WS-03-00262/M, *241-S-112 – Disconnect Saltwell from Communications Loop*, stated, “Perform post-software testing per data sheets” providing no further instructions. The assessors found two pages of data sheets in the work package, but there were no instructions regarding how to accomplish the test. The data sheets did not contain adequate instructions to assure the quality of work.
- The test requirements for work package 2E-02-00453/W, *241-AY Replace 101/102, ANN Press Gauges*, (Work Instructions, Step 6.0) stated, “Check that the range of AY102-VTA-PDI-101 is 0 to 1.0 in. w.g. and AY101-VTA-PDI-221, is .03 to 3.0 in. w.g. and record on the J-5.” No procedure was provided to accomplish this verification, and test results were not entered on the J-5 form. Therefore, the test procedure did not include or reference test objectives and provisions for assuring that the prerequisites for the test had been met, that adequate instrumentation was available and used, that necessary monitoring was performed, and that suitable environmental conditions were maintained before beginning. However, there was an un-referenced procedure included in the work package, along with data sheets, which appeared to have actually been used to accomplish the test. The procedure was 6-PCD-514, Revision B-3, *Dwyer Photoelectric Series 3000 and Capsu-Photohelic Series 43000 Differential Switches and Gauges*.
- The test requirements in work package WS-03-00255/O, *241-S-C Setup to Support SL-117 Pressure Test*, stated, “Leak check all jumpers that were disturbed (disconnected and reconnected to transfer system during pressure test) that are physically connected (or expected in the foreseeable future to be active) [to the] waste transfer system [sic].” The procedure did not provide a description of how the test was to be conducted, acceptance criteria, or any other information to assure the quality of the work.

03-ESQ-047  
Attachment 1  
A-03-ESQ-TANKFARM-005

ORP requests that CH2M HILL provide, within 30 days from the date of the letter that transmitted this Notice, a reply to the Findings above. The reply should include: 1) admission or denial of the Findings; 2) the reason for the Findings, if admitted, and if denied, the reason why; 3) the corrective steps that have been taken and the results achieved; 4) the corrective steps that will be taken to avoid further Findings; and 5) the date when full compliance with the applicable commitments in CH2M HILL's QAPD will be achieved. Where good cause is shown, consideration will be given to extending the requested response time.

03-ESQ-047  
Attachment 2  
A-03-ESQ-TANKFARM-005

U.S. DEPARTMENT OF ENERGY  
Office of River Protection  
Environmental Safety and Quality

ASSESSMENT: TANK FARM CONTRACTOR PROCUREMENT, INSPECTION, AND  
ACCEPTANCE INSPECTION QUALITY ASSURANCE

REPORT: A-03-ESQ-TANKFARM-005

FACILITY: CH2M HILL Hanford Group, Inc.

LOCATION: P.O. Box 1500, H6-63  
Richland, Washington 99352

DATES: June 9 through 13, 2003

ASSESSORS: Paul R. Hernandez, Lead Assessor  
David H. Brown, Assessor  
Larry Dell, Assessor

APPROVED BY: N. Hunemuller, Team Lead, Quality and Industrial Safety

Attachment 2  
A-03-ESQ-TANKFARM-005

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## TANK FARM CONTRACTOR PROCUREMENT, INSPECTION, AND ACCEPTANCE TESTING QUALITY ASSURANCE

### EXECUTIVE SUMMARY

#### INTRODUCTION

This assessment of CH2M HILL Hanford Group, Inc. (CH2M HILL) covered the following specific areas:

- Procurement (Section 1.2);
- Inspection (Section 1.3); and
- Acceptance Testing (Section 1.4).

The assessors concluded that, notwithstanding Findings A-03-ESQ-TANKFARM-005-F-01, -F-02, and -F-03, CH2M HILL had established and effectively implemented processes for procurement, inspections, and acceptance testing activities.

#### SIGNIFICANT OBSERVATIONS AND CONCLUSIONS

##### Effectiveness of Procedures

The assessors reviewed CH2M HILL's procedures for procurement, inspections, and acceptance testing activities. The assessors confirmed these procedures contained the requirements of the CH2M HILL *Quality Assurance Program Description*, (QAPD) TFC-PLN-02, Revision A, and were adequately implemented.

##### Procurement

The assessors concluded that CH2M HILL had appropriate processes for procurement planning, preparation and documentation of procurement actions, selection and award of vendors, and the evaluation of supplier's performance. The management and staff interviewed were cognizant of the procurement requirements and documented their activities adequately. CH2M HILL had adequate procurement processes, knowledgeable staff, and effective implementation for all procurement actions reviewed. The assessors did not identify issues with CH2M HILL procurement activities.

##### Inspection

The assessors concluded CH2M HILL's processes for inspection, including in-process, receiving, and final inspections were adequate, effectively implemented, and contained the requirements of the CH2M HILL's QAPD.

Acceptance Testing

The assessors concluded CH2M HILL had appropriate processes for identification and execution of tests resulting from both maintenance and construction work. However, there were three Findings. These documented noncompliances with no significant safety issues for unauthorized technical procedure changes, errors during the conduct of a test, and inadequate direction for testing. Except for Findings A-03-ESQ-TANKFARM-005-F-01, -F-02, and -F-03, CH2M HILL had an adequate process for identifying and accomplishing tests.

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## TANK FARM CONTRACTOR PROCUREMENT, INSPECTION, AND ACCEPTANCE TESTING QUALITY ASSURANCE

### 1.0 REPORT DETAILS

#### 1.1 Introduction

In accordance with the River Protection Project (RPP) Tank Farm Contract,<sup>1</sup> CH2M HILL Hanford Group, Inc. (CH2M HILL) must comply with the accepted and approved *Quality Assurance Program Description*, (QAPD) TFC-PLN-02, Revision A.

The assessors reviewed CH2M HILL's processes for procurement, inspection, and acceptance testing to determine if they complied with the commitments in the QAPD and the related implementing procedures. Work processes evaluated by the assessors included procurement, inspection, and acceptance testing. The onsite review was conducted from June 9 through June 13, 2003. An exit meeting was conducted on June 13, 2003.

#### 1.2 CH2M HILL Hanford Group, Inc. Procurement Program

##### 1.2.1 Assessment Scope

The assessors reviewed procedures and documents describing the processes for procurement planning, procurement of services and materials, selection and award of vendors, quality assurance (QA) grading, and technical buyer actions. The assessors interviewed personnel involved in the procurement process including management, buyers, project engineers and QA staff. Using a checklist derived from CH2M HILL's QAPD the assessors evaluated the effectiveness of CH2M HILL's procurement process for selected activities.

##### 1.2.2 Observations and Assessments

###### Procurement Planning

The assessors reviewed procedures, reviewed records, and interviewed CH2M HILL, Fluor Hanford, Inc. (FHI), and subcontractor personnel responsible for planning and documenting procurement activities in the following areas:

- AN-241 Exhauster procurement;
- W-464 procurement of architectural engineering (AE) services;
- QA oversight of construction management contractor;
- FHI Acquisition Verification Services (AVS) management of the Evaluated Suppliers List (ESL); and,
- Tank Waste Information Network System (TWINS) hardware and software development

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<sup>1</sup> Contract (DE-AC27-99RL14047) between the U.S. Department of Energy, Office of River Protection and CH2M HILL Hanford Group Inc., dated September 30, 1999.

The assessors found that the procurements were planned, that the planning was documented in Buyer's records, and that there was evidence to indicate a systematic approach to the procurement process.

#### Content and Review of Procurement Documents

The assessors reviewed procedures, reviewed records, and interviewed CH2M HILL, and subcontractor personnel responsible for documenting procurement activities and record keeping in the following areas:

- AN-241 Exhauster procurement;
- W-464 procurement of AE services; and
- TWINS hardware and software development

The assessors determined that records were organized and maintained in three-ring binders and that they contained statements of work, intended use of items and services, safety designations and quality levels, vendor documentation and nonconformance reporting requirements, provisions for hold points and/or reviews, and flowdown of requirements.

#### Supplier Evaluation and Selection

The assessors reviewed procedures, reviewed records, and interviewed CH2M HILL personnel responsible for performing evaluations and vendor selection. The records included competitive bids for materials and sole source contracts for services. There were no issues identified in this area.

#### Supplier Performance Evaluation

The assessors reviewed CH2M HILL procedures, reviewed CH2M HILL and FHI records, and interviewed FHI personnel to determine the adequacy of the process to qualify vendors for inclusion on the ESL. Evaluations performed by FHI were adequately performed and documented. There were no issues identified in this area.

### **1.2.3 Conclusions**

The assessors concluded that CH2M HILL had appropriate processes for procurement planning, preparation and documentation of procurement actions, selection and award of vendors, and the evaluation of supplier's performance. The management and staff interviewed were cognizant of the procurement requirements and documented their activities adequately. CH2M HILL had adequate procurement processes, knowledgeable staff, and effective implementation for all procurement actions reviewed.

### 1.3 Inspection

#### 1.3.1 Assessment Scope

The assessors reviewed CH2M HILL's procedures for inspection, including in-process, receiving, and final inspections, to verify these procedures contained the requirements of the CH2M HILL's QAPD. In addition, the assessors examined open and closed work packages, purchasing records, and inspector qualification records to determine if inspection work processes were being effectively implemented.

#### 1.3.2 Observations and Assessments

##### Receiving Inspection

The assessors reviewed a sample of completed receipt inspection reports and observed one FHI receipt inspection of Eberline alpha and beta continuous air monitors (CAM). Receipt Inspection activities were provided to CH2M HILL by, FHI AVS. Purchase order number 00019359 required receipt inspection personnel to verify identification of items with part and model numbers, and verify a calibration report and certificate of calibration was included in the shipment. FHI AVS adequately implemented their process for CH2M HILL for receiving inspection. The assessors did not identify any issues in the implementation of receipt inspection requirements of CH2M HILL or its subcontractors.

The assessors also examined inspector qualification documentation packages to determine if four FHI AVS personnel were qualified to perform receipt inspection and vendor audits. The assessors did not identify any issues with the qualification of receipt inspectors and audit personnel.

##### In-process Inspections

The assessors examined work packages involving work on safety system and safety class (SC) components to verify in-process inspections were being performed per the requirements of TFC-ESHQ-Q\_INSP-C-01, Revision A-1, *Control of Inspections*, (Control of Inspections) dated January 28, 2003, and those specified in work packages. The assessors determined through examination of the work packages that CH2M HILL in-process inspection activities were adequately prescribed by and effectively performed in accordance with procedures and instructions. The assessors did not identify issues in the implementation of work process requirements.

##### Final Inspections

The assessors interviewed CH2M HILL QA personnel and examined 12 work packages involving work on safety system and SC components to verify final inspections were being performed per the requirements specified in the CH2M HILL QAPD, the Control of Inspections procedure, and work package instructions.

CH2M HILL's Control of Inspections procedure required final inspection/verification or retests as appropriate be performed, at a minimum, of SC/safety significant structures, systems, and components constructed, fabricated, modified, or installed as part of CH2M HILL's River Protection Project activities. The final inspection activity was to be performed to ensure that the work and associated inspections were documented as complete and all requirements had been satisfied before system turnover/acceptance or operational tests. In addition, inspection documentation was to include the type of observation (in-process/final) and references to inspection criteria documents.

The assessors determined the following closed work packages did contain the elements necessary to demonstrate compliance with the requirements for final inspection.

- 2W-00-01298/M, 242T, *CASS/TMACS Alarm Connection Phase 2*;
- 2E-03-00251/M, *241-AP Repair Annulus CAMS*; and
- 2E-03-00180/1, *241-AP VTP Vacuum Pump/AP 296-VTP-P-514*, a Routine Work Request (RWR).

The CH2M HILL Control of Inspection procedure, Attachment A, Supplementary Requirements for Inspection, required inspection requirements and related acceptance criteria to be established by the responsible Engineering organization, working with responsible quality representatives, as needed, and documented in current, approved, and controlled design documents. The assessors determined the following ready-to-work work packages contained inspection requirements and related acceptance criteria necessary to ensure procedure compliance for final inspection.

- 2E-03-00826/1, *241-MISC-XFER-SYS and AVPA-WT-LDSTA-119*;
- WS-03-00206/M, *241-SX-102 Install Above Pit Manifold*;
- WS-03-00127/M, *241-BY-106, Install Above Pit TFPT*;
- WS-03-00786/M, *241-C-106, FLYGT Pumps Installation*;
- 2E-03-00686/P, *204-AR Flow and Func*;
- 2E-03-00568/P, *241-AW-UTP Annual*;
- 2E-03-00670/P, *241-AZ HEME RIHS*;
- 2E-03-00846/P, *241-AW 105 CAM Change and Func*; and
- 2E-03-00613/P, *241-AN 101/104 CAM Cal and Func*.

### 1.3.3 Conclusions

The assessors concluded CH2M HILL's processes for inspection, including in-process, receiving, and final inspections were adequate, effectively implemented, and contained the requirements of the CH2M HILL's QAPD.

## 1.4 Testing

### 1.4.1 Assessment Scope

The assessors reviewed procedures describing the processes for identifying test requirements, developing test plans, developing test procedures, and executing tests. This primarily included acceptance test procedures (ATP) and post-maintenance tests. The assessors compared these to

testing activities and documentation in Waste Feed Operations and Closure Projects. The testing evaluated by the assessors was performed by both Fluor Federal Services, Inc. (FFS) and CH2M HILL personnel.

#### 1.4.2 Observations and Assessments

Notwithstanding Findings A-03-ESQ-TANKFARM-004-F-01 through F-03, CH2M HILL had a coherent program for identifying test requirements, developing test plans, developing test procedures, and executing tests. However, they were aware of weaknesses in their program and were developing new processes to address them. The new process involved institution of a new test organization to be accountable for all features of testing. The new organization was scheduled to be fully functional by October 2003.

##### Informal Test Procedure Changes

The assessors reviewed a sample of completed acceptance tests performed by FFS for construction work. The assessors found test directors deviated from ATPs without obtaining the required test procedure changes. These were on Projects W-211 and W-314. Procedure deviations identified in a recent U.S. Department of Energy (DOE), Office of River Protection (ORP) assessment transmitted in ORP letter from R. J. Schepens to E. S. Aromi, CH2M HILL, "U.S. Department of Energy, Office of River Protection (ORP) Assessment Report, A-03-ESQ-TANKFARM-003, of CH2M HILL Hanford Group, Inc. (CH2M HILL) Program for the Control of Documents, Records, and Work Processes," 03-ESQ-037, dated July 14, 2003, were also considered by the assessors when they evaluated this problem.

In a DOE Richland Operations Office (RL) letter from K. A. Klein to R. D. Hanson, FHI, "Unacceptable Document Change Control Practices," 00-ESD-115, dated September 29, 2000, DOE previously documented problems with ATP compliance during FFS testing. DOE accepted the FHI response (describing FFS corrective actions) and subsequently closed the issue. The document control issues identified during this current assessment were not as serious as those identified in 00-ESD-115. However, they indicate the problem was not fully resolved by the earlier corrective actions. The assessors described the problem in Finding A-03-ESQ-TANKFARM-004-F-01.

##### Incorrectly Executed Test

The assessors observed the conduct of one test. This was a test of the Master Pump Shutdown System for the Waste Feed Operations project. This was an acceptance test being repeated because data was lost during an earlier attempt to accomplish the test. An FFS Test Director conducted the test with participation by a CH2M HILL operator and a CH2M HILL electrician, among others. The test addressed performance of computer equipment and software involving operation and remote position indication of valves in the AN Tank Farm.

During the test, the Test Director also served as the principal operator of the equipment, but he was not familiar with its operation. Additionally, he did not use required conduct of operations communications practices during the test. For example, when the Test Director used a 2-way radio to order that a valve be positioned, he said, "Open the valve, please." He did not identify



Attachment 2  
A-03-ESQ-TANKFARM-005

the valve and did not require a repeat-back of the order. The CH2M HILL operator did not provide the required repeat-back of orders.

Because the Test Director was not adequately familiar with the equipment, he made a number of errors while executing test steps. He became confused, and at one point stopped the test in order to start over. At this point, he used his cellular telephone to call a system expert who was familiar with the equipment, and the expert talked him through the ensuing procedure steps.

When the assessors brought this problem to the attention of CH2M HILL and FFS management, they took action to assure the test was re-accomplished properly from the beginning. The assessors documented this problem in Finding A-03-ESQ-TANKFARM-004-F-02.

### Maintenance Tests

Following corrective maintenance and minor system modifications, CH2M HILL personnel conducted maintenance tests. These tests were usually specified in the work package or in the RWR documents. The tests were executed by CH2M HILL craft personnel as they completed the work specified in the work package or RWR.

The assessors reviewed a sample of work packages and RWRs, finding that tests were specified as required by CH2M HILL procedures. However, the tests were not described in adequate detail to assure they were performed adequately to assure the quality of work.

The test requirements in work package WS-03-00255/O, *241-S-C Setup to Support SL-117 Pressure Test*, stated, "Leak check all jumpers that were disturbed (disconnected and reconnected to transfer system during pressure test) that are physically connected (or expected in the foreseeable future to be active) [to the] waste transfer system [sic]." The procedure did not provide a description of how the test was to be conducted, acceptance criteria, or any other information to assure the quality of the work.

The test requirements for work package WS-03-00262/M, *241-S-112 – Disconnect Saltwell from Communications Loop*, stated, "Perform post-software testing per data sheets." The assessors found two pages of data sheets in the work package, but there were no instructions regarding how to accomplish the test. Also, data sheets referred to the use of software forces. "Software forces" are artificial software configurations that serve a similar function to a wire jumper in an instrument panel. It is therefore important that software forces be cleared when the work is complete. However, there was no documentation evident in the work packages to verify that the software forces had been cleared when the test was completed. (A common practice is to use a log, much like the logs used for temporary jumpers and for lifting and landing electrical leads. Clearing of the software forces is then documented in the log.)

The test requirements for work package 2E-02-00453/W, *241-AY Replace 101/102, ANN Press Gauges*, (Work Instructions, Step 6.0) stated, "Check that the range of AY102-VTA-PDI-101 is 0 to 1.0 in. w.g. and AY101-VTA-PDI-221, is .03 to 3.0 in. w.g. and record on the J-5." No procedure was provided to accomplish this verification, and test results were not entered on the J-5 form. Therefore, the test procedure did not include or reference test objectives and provisions for assuring that the prerequisites for the test had been met, that adequate

instrumentation was available and used, that necessary monitoring was performed, and that suitable environmental conditions were maintained before beginning. However, there was an un-referenced procedure included in the work package, along with data sheets, which appeared to have actually been used to accomplish the test. The procedure was 6-PCD-514, Revision B-3, *Dwyer Photoelectric Series 3000 and Capsu-Photohelic Series 43000 Differential Switches and Gauges*.

The assessors documented the inadequate maintenance test descriptions in Finding A-03-ESQ-TANKFARM-004-F-03.

### **1.4.3 Conclusion**

The assessors concluded CH2M HILL had appropriate processes for identification and execution of tests resulting from both maintenance and construction work. However, there were three findings. These documented noncompliances with no significant safety issues for unauthorized technical procedure changes, errors during the conduct of a test, and inadequate direction for testing. Except for these Findings, CH2M HILL had an adequate process for identifying and accomplishing tests.

## **2.0 EXIT MEETING SUMMARY**

The assessors presented preliminary assessment results to members of CH2M HILL's management at an exit meeting held on June 13, 2003. CH2M HILL acknowledged the findings and conclusions presented.

The assessors asked CH2M HILL whether any materials examined during the assessment should be considered as proprietary data. No proprietary data were identified.

## **3.0 REPORT BACKGROUND INFORMATION**

### **3.1 Partial List of Persons Interviewed**

M. R. Adams, Buyer Technical Representative  
W. L. Adams, CH2M HILL, Quality Assurance Engineer  
J. M. Aguirre, FFS River Protection Project  
M. V. Bang, Lead Construction Materials Procurement  
R. E. Bauer, CH2M HILL Closure Projects  
K. S. Botteneau, FHI, Team Lead, Acquisition Verification Systems  
W. H. Bryant, CH2M HILL Maintenance  
J. R. Bunch, CH2M HILL Planning  
J. M. Cannon, CH2M HILL, Quality Field Support, Quality Assurance Engineer  
K. A. Colosi, Lead Project Engineer  
A. Y. Cooper, FH, Manager, Acquisition Verification Systems  
W. S. Cottrell, Sr. Procurement Specialist  
J. J. Davis, CH2M HILL RadCon

B. L. Debban, CH2M HILL Closure Project Planning  
 J. Deskin, FFS Engineering  
 R. B. Dunn, CH2M HILL Waste Feed Operations  
 M. A. Fish, CH2M HILL Engineering  
 G. T. Frater, Engineer  
 J. C. Geisbush, CH2M HILL Strategic Planning and Mission Analysis  
 D. L. Gilson, CH2M HILL Projects  
 H. M. Hassell, Manager, Program Quality Support  
 J. M. Hay, CH2M HILL Maintenance  
 A. R. Hendrickson, Technical Buyer  
 G. L. Hickman, FFS Engineering  
 R. Higgins, CH2M HILL, Director of Quality Assurance  
 J. R. Janecke, Lead of Procurement Services  
 J. O. Knight, Technical Specialist  
 R. L. Legg, CH2M HILL Waste Feed Operations Planning  
 J. L. Logston, CH2M HILL, Quality Field Support, Quality Assurance Engineer  
 M. L. McElroy, CH2M HILL, Manager Quality Assurance Services  
 C. T. Narquis, FFS QA  
 T. E. Nugent, FFS River Protection Project G. R. Porter, NHC, Project Engineer  
 B. L. Sharer, CH2M HILL Maintenance  
 R. L. Schlosser, CH2M HILL Engineering  
 F. A. Schmorde, CH2M HILL Projects  
 N. E. Parsons, CH2M HILL Closure Projects  
 C. V. Phillips, CH2M HILL Startup and Testing  
 D. H. Poyner, FHI, Inspector Acquisition Verification Systems  
 T. J. Quale, Jr., CH2M HILL Startup and Testing  
 T. A. Swarers, CH2M HILL Closure Projects  
 J. D. Thorne, CH2M HILL Closure Projects  
 J. J. Verderber, CH2M HILL, Quality Assurance Engineer  
 M. W. Wells, Director of Procurement  
 D. V. Wilczynski, CH2M HILL Startup and Testing  
 T. E. Yehl, CH2M HILL Closure Projects

### **3.2 Records Reviewed**

#### **3.2.1 Documents**

1. WS-03-00206/M, 241-SX-102 Install Above Pit Manifold, dated June 12, 2003
2. WS-03-00127/M, 241-BY-106, Install Above Pit TFPT, dated March 6, 2003
3. WS-03-00786/M, 241-C-106, FLYGT Pumps Installation, dated March 19, 2003
4. 2W-00-01298/M, 242T, CASS/TMACS Alarm Connection Phase 2, dated September 12, 2002
5. 2E-03-0025/M, 241-AP Repair Annulus CAMS, dated April 21, 2003
6. 2E-03-00686/P, 204-AR Flow and Func, dated May 22, 2003
7. 2E-03-00568/P, 241-AW-UTP Annual, dated June 3, 2003
8. 2E-03-00670/P, 241-AZ HEME RIAS, dated June 13, 2003

Attachment 2  
A-03-ESQ-TANKFARM-005

9. 2E-03-00826/1, 241-MISC-XFER-SYS and AVPA-WT-LDSTA-119, dated May 30, 2003
10. 2E-03-00846/P, 241-AW 105 CAM Change and Func, dated June 3, 2003
11. 2E-03-00613/P, 241-AN 101/104 CAM Cal and Func, dated June 16, 2003
12. 2E-03-00180/1, 241-AP VTP Vacuum Pump/AP 296-VTP-P-514, dated January 30, 2003
13. 2E-03-00251/M, 241-AP Repair Annulus CAMS, dated June 11, 2003
14. Work Document W110, 2E-03-00304/I, *Install New Belts on 102-AY Annulus Exh Fan*, dated June 11, 2003
15. Work Document W110, 2E-03-00180/1, *241-AP replace Primary Stack CAM Vacuum Pump*, dated June 11, 2003
16. QAIP SWSD-TR-2003-007, Alpha & Beta CAMs (Monitors & Heads & Cables), dated May 5, 2003
17. Purchase Order report 00019359, Revision 2, dated June 6, 2003
18. Report of Calibration, 21266/PO19359-1
19. Certificate of Calibration, Thermo Eberline, Serial number 1677, dated June 5, 2003
20. ORP letter from R. J. Schepens, E. S. Aromi, CH2M HILL, *Periodic Report of Safety and Quality Oversight Activity for August and September 2002*, 02-QAO-054, dated October 18, 2002
21. WP-2E-02-00543/W, *241-AY Replace 101/102 Ann. Pressure Gages*
22. WP-2E-02 00784/M, *241-AZ Rotate AZ Water Meter 90 Degrees and Modify Enclosure*
23. WP-2E-02-00942/W, *241-AW Pressure Switch*
24. WP-2E-02-02102/L *108-AP Electrical Jumper*
25. WP-2W-02-00-744/M, *241-C Isolate Power to Foam Covered Pits*
26. WP-2W-01-0113/M, *241-BY, Install Electrical to Support New Enraf*
27. WP-2W-00-01343/W, *241-BY, Light Pole D/S Inspection and Upgrade*
28. WP-2W-03-151/P, *242-S Pressure Instrument Cals [due 04/18/03]*
29. WP-2W-02-01678/P, *241-BY SHMS Cals [Due 02/25/03]*
30. WP-2W-00-01106/M, *242-T Replace Existing Stack CAM with AMS-4*
31. WP-WS-03-00252/M, *241-SX-A Two S-C Hydrotest SL-117*
32. WP-WS-02-00669/M, *241-S-112 LOW Removal and Install Exh Inlet FLT*
33. WP-WS-03-00255/O, *241-S-C Setup to Support Pressure Test SL-117*
34. WP-WS-03-0027, *241-U-111 PIC Skid Communication*
35. WP-WS-02-00744/M, *241-C-106 Install Portable Exhauster*
36. WP-WS-03-0020/W, *241-C-106 Megger Power Wiring*
37. WP-WS-02-00488/W, *241-S/SX Perform HIHTL Flush and Inspection*
38. RWR 2E-03-00584/1
39. RWR 2E-03-00597/1
40. RWR 2E-03-00464/1
41. RWR 2E-03-00676/1
42. RWR 2E-03-00722/1
43. RWR 2E-03-00463/1
44. RWR 2E-03-00245/1
45. RWR 2E-03-00252/1
46. RWR 2W-03-00464/1
47. RWR 2W-03-00485/1
48. RWR 2W-03-00489/1

49. ECN 675253, *Suppl Dwg Change to Remove Low & Install Vent Inlet to Support Planned Waste Retrieval Activities*
50. JHA TF-SJHA-0341, Revision 1
51. WFO-03-002, Revision 3
52. TO-040-540 F-18 dated December 23, 2002
53. USQ Screen TF-03-1363-S, Revision 0
54. 5-RM-467, A-12 *Functional Check for AS-Y CAM*
55. 6-FCD-077, D-3, *Stack Sampling, Monitoring, and Annulus CAM Enclosure System*, dated January 10, 2002
56. 3-VBP-157, B-22, *Breather Filter In-Place Leak Test*, dated February 27, 2003
57. *Evaluated Supplier List*, CH2M HILL, issue date October 7, 2002
58. Premeir 05 05 03, *Acquisition Verification Services Source Surveillance/Inspection Activities Report*, dated May 15, 2003
59. FHI letter from A. Y. Cooper to A. R. Hendrickson, CH2M HILL, *Supplier Quality Assurance Evaluation for Entry on the Evaluated Supplier Listing for Fluor Hanford – Premier Technology, Incorporated*, FH-0302027, dated May 19, 2003
60. FHI Form A-6000-211, *Evaluation Results of Suppliers, Quality Assurance/Verification Program*, for Premier Technology, dated May 7, 2003.
61. FHI Form A-6000-211, *Evaluation Results of Suppliers, Quality Assurance/Verification Program*, for Premier Technology, dated August 26, 2002.
62. FHI letter from A. Y. Cooper to A. R. Hendrickson, CH2M HILL, *Supplier Quality Assurance Evaluation for Entry on the Evaluated Supplier Listing for Fluor Hanford – Premier Technology, Incorporated*, FH-0203917, dated August 26, 2002
63. Project W-314, *Request for Pre-Award Evaluation for Premier Technology*, dated August 23, 2002.
64. FHI letter from A. Y. Cooper to W. A. Crook, Fluor Daniel Northwest, *Supplier Quality Assurance Evaluation for Entry on the Evaluated Supplier Listing for Fluor Daniel Hanford – Premier Technology, Incorporated*, FDH-9957712, dated October 12, 1999
65. CH2M HILL Request for Proposal, *RFP 00000392, W-314 Exhauster Procurement*, dated March 28, 2002
66. CH2M HILL Statement of Work, Requisition # 86236, *Exhauster Procurement for W-314*, Revision 0, dated March 28, 2002
67. CH2M HILL Document, *Potential Contractor List, 00000392 W314 Exhausters*, dated June 5, 2002
68. CH2M HILL *Procurement Quality Clauses, General Information*, dated January 20, 2003
69. CH2M HILL Statement of Work, Requisition # 77289, *Tank Waste Information Network System (TWINS) Operations and Maintenance for 2003*, dated September 11, 2002

### 3.2.2 Procedures and Other Directives

1. TFC-PLN-02, Revision A-1, *Quality Assurance Program Description*, dated March 1, 2003
2. TFC-OPS-MAINT-C-01, Revision C-2, *Tank Farm Contractor Work Control*, dated March 21, 2003
3. TFC-ESHQ-Q\_INSP-C-01, Revision A-1, *Control of Inspections*, dated January 28, 2003

4. TFC-ESHQ-Q\_ADM-D-04, Revision A-1, *Quality Assurance Program Description Implementation Matrix*, dated March 31, 2003
5. TFC-ESHQ-Q\_INSP-C-05, Revision A-3, *Independent Review and Approval of Documents*, dated March 31, 2003
6. HNF-PRO-263, Revision 7, *Qualification and Certification of Inspection and Test Personnel*, dated December 12, 2002
7. TFC-ESHQ-Q\_INSP-C-03, Revision A-1, *Test Control*
8. TFC-MD-18, Revision A-1, *Use of Planning Checklists*
9. HNF-IP-0842, Volume 4, Section 2.12, Revision 0e, *Test and Evaluation*
10. HNF-IP-0842, Volume 4, Section 4.28, Revision 0f, *Testing Practices and Requirements*
11. TFC-ENG-STD-08, Revision A, *Post Maintenance Testing*
12. TFC-OPS-MAINT-C-01, Revision C-2, *Tank Farm Contractor Work Control*
13. FFS Practice 134 000 1100, dated May 1, 2002, *Quality Management Program*
14. TFC-BSM-CP-CPR-C-03, Revision A-1, *Buyer's Technical Representative Process*, dated November 19, 2002
15. HNF-IP-0842, Volume 11, Section 2.5, Revision 0d, *Graded Quality Assurance*, dated September 6, 2002.
16. TFC-BSM-CP-CPR-CPR-P-01, Revision A, *Procurement Planning*, dated December 27, 2002
17. TFC-BSM-CP-CPR-C-05, Revision B, *Procurement of Services*, dated February 24, 2003
18. TFC-BSM-CP-CPR-C-06, Revision B-1, *Procurement of Items (Materials)*, dated May 15, 2003
19. TFC-BSM-CP-CPR-P-03, Revision A, *Selection and Award*, dated April 15, 2003

### 3.2.3 Problem Evaluation Reports

1. PER-2003-0736, *Assessment review WS-02-00300/M numerous discrep. found*, dated February 19, 2003
2. PER-2002-6410, *Differential Pressure Equipment Not returned to Service per Safety Class Requirement*, dated December 3, 2002
3. PER-2003-1374, *QA review of work package observation*, dated April 2, 2003
4. PER-2002-3965, *S-101 Readiness Assessment Finding*, dated July 24, 2002
5. Per-2002-5326, *Recommendation for 'Subcontractor Oversight Plan'*, dated October 1, 2002

### 3.3 Assessment Procedures Used

ORP M 220.1 R1, *ORP Integrated Assessment Program*, dated May 16, 2002

### 3.4 List of Items Opened, Closed, and Discussed

#### 3.4.1 Items Opened

#### Findings

**A-03-ESQ-TANKFARM-003-F-01** – Test personnel made informal, unauthorized procedure changes during acceptance tests. See Section 1.4.2 for details.

**A-03-ESQ-TANKFARM-003-F-02** – There were errors during the conduct of a test. See Sections 1.4.2 for details.

**A-03-ESQ-TANKFARM-003-F-03** – Maintenance work packages and RWRs did not provide adequate direction on testing. See Section 1.4.2 for details.

Observations

**3.4.2 Items Closed**

None

**3.4.3 Items Discussed**

None

**3.5 List of Acronyms**

AE	Architectural engineering
ATP	Acceptance test plans
AVS	Acquisition Verification Services
CAM	Continuous Air Monitor
CH2M HILL	CH2M HILL Hanford Group, Inc.
DOE	U.S. Department of Energy
ESL	Evaluated Suppliers List
FFS	Fluor Federal Services
FHI	Fluor Hanford, Inc.
ORP	Office of River Protection
QA	Quality Assurance
QAPD	Quality Assurance Program Description
RL	Richland Operations Office
RWR	Routine Work Request
SC	safety class
TWINS	Tank Waste Information Network System

E-STARSTM Report  
Task Detail Report  
07/25/2003 03:14

**TASK INFORMATION**

<b>Task#</b>	ORP-ESQ-2003-0043	<b>Status</b>	CLOSED
<b>Subject</b>	CONCUR:03-ESQ-047;ORP) ASSESSMENT REPORT, A-03-ESQ-TANKFARM-005, OF CH2M HILL PROGRAM FOR PROCUREMENT, INSPECTION, AND ACCEPTANCE TESTING		
<b>Parent Task#</b>		<b>Due</b>	
<b>Reference</b>	03-ESQ-047	<b>Priority</b>	None
<b>Originator</b>	Mosby, Debbie A	<b>Category</b>	None
<b>Originator Phone</b>	(509) 376-9106	<b>Generic1</b>	
<b>Origination Date</b>	07/14/2003 15:11	<b>Generic2</b>	
<b>Remote Task#</b>		<b>Generic3</b>	
<b>Deliverable</b>	None	<b>View Permissions</b>	Normal
<b>Class</b>	None		
<b>Instructions</b>	BCC: ESQ OFF FILE ESQ RDG FILE MGR RDG FILE JH SWAILES, AMTF RC BARR, ESQ DH BROWN, ESQ PR HERNANDEZ, ESQ NK HUNEMULLER, ESQ JS O'CONNOR, OPA		

**ROUTING LISTS**

1	Route List	Inactive
	<ul style="list-style-type: none"> <li>● Hernandez, Paul R - Approve - Cancelled - 07/25/2003 15:14</li> <li>● Hunemuller, Neal K - Approve - Approved - 07/22/2003 09:24</li> <li>● Barr, Robert C - Approve - Cancelled - 07/25/2003 15:14</li> <li>● Swailes, John H - Approve - Approved with comments - 07/23/2003 10:06</li> <li>● O'Connor, Judith S - Approve - Approved - 07/23/2003 13:01</li> <li>● Erickson, Leif - Approve - Approved - 07/24/2003 08:02</li> <li>● Schepens, Roy J - Approve - Approved - 07/24/2003 15:36</li> </ul>	

**ATTACHMENTS**

*No Attachments*

**COMMENTS**

**Poster** Swailes, John H (Struthers, Deborah J) - 07/23/2003 10:07

Approve

Steve Signed for John Swailes 7/23/03

**TASK DUE DATE HISTORY**

*No Due Date History*

**SUB TASK HISTORY**

*No Subtasks*

**RECEIVED**  
**JUL 28 2003**  
**DOE-ORP/ORPCC**



E-STARS™ Report  
Task Detail Report  
07/14/2003 03:15

**TASK INFORMATION**

<b>Task#</b>	ORP-ESQ-2003-0043	<b>Status</b>	Open
<b>Subject</b>	CONCUR:03-ESQ-047;ORP) ASSESSMENT REPORT, A-03-ESQ-TANKFARM-005, OF CH2M HILL PROGRAM FOR PROCUREMENT, INSPECTION, AND ACCEPTANCE TESTING		
<b>Parent Task#</b>		<b>Due</b>	
<b>Reference</b>	03-ESQ-047	<b>Priority</b>	None
<b>Originator</b>	Mosby, Debbie A	<b>Category</b>	None
<b>Originator Phone</b>	(509) 376-9106	<b>Generic1</b>	
<b>Origination Date</b>	07/14/2003 15:11	<b>Generic2</b>	
<b>Remote Task#</b>		<b>Generic3</b>	
<b>Deliverable</b>	None	<b>View Permissions</b>	Normal
<b>Class</b>	None		
<b>Instructions</b>	BCC: ESQ OFF FILE ESQ RDG FILE MGR RDG FILE JH SWAILES, AMTF RC BARR, ESQ DH BROWN, ESQ PR HERNANDEZ, ESQ NK HUNEMULLER, ESQ JS O'CONNOR, OPA		

**ROUTING LISTS**

1 Route List Active

- Hernandez, Paul R - Approve - Awaiting Response *Paul Hernandez 7/22/03*
- Hunemuller, Neal K - Approve - Awaiting Response *NK 7/22/03*
- Barr, Robert C - Approve - Awaiting Response *RC Barr 7/24/03*
- Swailes, John H - Approve - Awaiting Response *John Swailes 7/23/03*
- O'Connor, Judith S - Approve - Awaiting Response *Jo 7/23/03*
- Erickson, Leif - Approve - Awaiting Response *Leif Erickson 7/24/03*
- Schepens, Roy J - Approve - Awaiting Response

**ATTACHMENTS**

No Attachments

**COMMENTS**

No Comments

**TASK DUE DATE HISTORY**

No Due Date History

**SUB TASK HISTORY**

No Subtasks

-- end of report --

**RECEIVED**  
 JUL 28 2003  
 DOE-ORP/ORPCC