



DEPARTMENT OF ENERGY
Office of Civilian Radioactive Waste Management
Office of Geologic Disposal
Yucca Mountain Site Characterization Project Office
P.O. Box 98608
Las Vegas, NV 89193-8608

WBS 1.2.11
QA: N/A

FEB 14 1994

Robert F. Pritchett
Technical Project Officer
for Yucca Mountain
Site Characterization Project
Reynolds Electrical & Engineering Co., Inc.
P.O. Box 98521
Las Vegas, NV 89193-8521

ISSUANCE OF SURVEILLANCE RECORD YMP-SR-94-025 RESULTING FROM YUCCA MOUNTAIN
QUALITY ASSURANCE DIVISION (YMQAD) SURVEILLANCE OF REYNOLDS ELECTRICAL &
ENGINEERING CO. INC. (REECO) (SCP: N/A)

Enclosed is the record of Surveillance YMP-SR-94-025 conducted by the YMQAD
of REECO's Surveillance SR-004-94 of Construction Tunneling Services (CTS)
facilities in Kent, Washington, and CTS subtier suppliers EBCO Industries
Ltd., Richmond, British Columbia; and Nickolson Manufacturing Company,
Seattle, Washington, February 2-4, 1994.

The purpose of the surveillance was twofold: (1) the witnessing of REECO
Surveillance SR-004-94 to determine adequacy; and (2) to obtain a degree of
confidence in relation to CTS operations, scheduled progress, and performance
of CTS subtier contractors.

No Corrective Action Requests were issued as a result of this surveillance.

This surveillance is considered completed and closed as of the date of
this letter. A response to this surveillance record and any documented
recommendations is not required.

If you have any questions, please contact either Robert B. Constable at
794-7945 or Donald J. Harris at 794-7356.

Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

YMQAD:RBC-2024

Enclosure:
Surveillance Record YMP-SR-94-025

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FEB 14 1994

cc w/encl:

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OFFICE OF
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.

PAGE 1 OF 3
Surveillance No. YMP-SR-94-025

QUALITY ASSURANCE SURVEILLANCE RECORD

SURVEILLANCE DATA

¹ ORGANIZATION/LOCATION: REEC/Seattle/Van.	² SUBJECT: Tunnel Boring Machine	³ DATE: 2/2/94
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⁴SURVEILLANCE OBJECTIVE: Maintain a degree of confidence in CTS meeting their schedule for the TBM and witness REEC/ Surveillance SR-004-94 to determine adequacy.

⁵ SURVEILLANCE SCOPE: Surveillance of REEC's surveillance of Construction and Tunneling Services performance in meeting the requirements of the contract and Specification YMP-025-1-SP05, Section 11910 for the TBM, design fabrication, welding, inspection, subassembly and assembly.	⁶ SURVEILLANCE TEAM: Team Leader: <u>D. J. Harris</u> Additional Team Members: <u>J. Blaylock</u> <u>P. Cotter</u>
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⁷ PREPARED BY: <u>Ronald J. Harris</u> <u>1/31/94</u> Surveillance Team Leader Date	⁸ CONCURRENCE: <u>AC Spina</u> <u>1-31-94</u> QA Division Director Date
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SURVEILLANCE RESULTS

⁹BASIS OF EVALUATION / DESCRIPTION OF OBSERVATIONS:

See Pages 2 and 3

¹⁰ SURVEILLANCE CONCLUSIONS:

See Page 3

¹¹ COMPLETED BY: <u>Ronald J. Harris</u> <u>2/9/94</u> Surveillance Team Leader Date	¹² APPROVED BY: <u>AC Spina</u> <u>2/14/94</u> QA Division Director Date
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9 BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS:

This Surveillance Record contains the results of a surveillance observation conducted by the Office of Civilian Radioactive Waste Management Yucca Mountain Quality Assurance Division (YMQAD) of Reynolds Electric and Engineering Company, Inc. (REECo) surveillance of Construction and Tunneling Services, Inc. (CTS) performance in meeting the requirements of YMP-025-1-SP05, Section 11910, Specification for a Tunnel Boring Machine and CTS Proposal No. 5078. The REECo Surveillance Plan was SR-004-94.

EBCO Industries Ltd., Richmond, British Columbia and Nickolson Manufacturing Company, Seattle, Washington, were visited on February 3, 1994 (EBCO) and February 4, 1994 (Nickolson).

Documentation for the fabrication and assembly of the Tunnel Boring Machine (TBM) was reviewed to determine compliance with the specification and CTS proposal. The documentation reviewed included: design drawings, Shop Travelers (EBCO), Manufacturing and Inspection Plans (Nickolson), American Weld Society (AWS) Weld Procedures, Welder Qualification Reports, Ultrasonic Test Reports (for Critical Welds) and Heat Treatment Charts. The documentation reviewed was determined to be in compliance with the requirements.

Visual observation consisted of witnessing in-process preheating/welding and examination of weld joints at fit-up (tacked), partial welds and completed welds. There were a couple of critical welds that had been repaired by EBCO and re-ultrasonic examined in local areas, and a couple of welds were documented as deficient for undercut. These non-critical welds were dispositioned to be reworked. Overall, the welding was found to be in accordance with the drawing and code requirements.

Personnel at EBCO and Nickolson were interviewed to determine their overall knowledge relative to the specification, drawings and code requirements. As a result of these interviews, it was ascertained that personnel working on the TBM were familiar with the specification, drawings and code requirements.

At the Nickolson facility, fasteners were randomly checked against a U.S. Department of Energy furnished list of suspect/counterfeit fasteners. This check included fasteners installed on the assembled subcomponents that were visible, and a check of CTS dedicated fasteners in a storage location. No suspect/counterfeit fasteners were identified. In a couple of instances, CTS was using fasteners from Nickolson's stores for the initial assembly. These bolts were painted red for visibility and will be replaced with CTS supplied bolts with final assembly of the TBM at the Yucca Mountain Site.

The CTS Project Management Team has moved fulltime into Nickolson Manufacturing to support the TBM assembly and testing operations.

CTS has slipped schedule due to time lost waiting for arrival of the main bearing; however, CTS is continuing to schedule the assembly of the TBM to meet CTS original schedule. In addition, CTS has authorized a full schedule of overtime in the assembly shop at Nickolson to effectively meet the original schedule.

The status of spares parts was discussed with the REEC Co Contract Administrator and CTS. CTS submitted a recommended list of custom built spares parts with long lead times to REEC Co in June 1994. To date no spares have been ordered (other than the main bearing) to take advantage of the prices quoted, for when spare parts are produced at the same time as the production item. The Management and Operating (M&O) contractor did an independent evaluation of spares needed which agreed with CTS recommendation. It is recommended that the Yucca Mountain Site Characterization Project Office authorize money for the procurement of the recommended spares in order to preclude any major impact to the tunnel boring schedule. The status of preparation of maintenance procedures was also discussed with CTS. The maintenance procedures will be firmed up during the individual component/system testing at Nickolson. Maintenance activities will be identified by area/component and scheduled on a daily, weekly and monthly basis. Recommended predictive maintenance hasn't been decided yet. Use of oil analysis to predict wear has been discussed. The M&O and Peter Kiewit should review the latest industry practices and confer with CTS to determine a course of action.

It is noted that the TBM shop test is tentatively scheduled for March 9 through 11, 1994. Once the shop test is completed, the teardown and shipment of the TBM will commence.

The following personnel were contacted during the surveillance:

S. Graham, Senior Sales Engineer, EBCO
M. Koeslmaier, Quality Assurance Director, EBCO
K. Nilson, Assembly Engineer, CTS
C. Preston, Quality Assurance Manager, CTS
E. Reiter, Senior Quality Assurance Specialist, REEC Co
S. Short, Project Engineer, CTS
R. Sunday, Procurement, REEC Co
P. Wilson, Senior Quality Assurance Specialist, REEC Co

¹⁰ SURVEILLANCE CONCLUSIONS:

The REEC Co Surveillance SR-004-94 was performed and documented on the REEC Co Yucca Mountain Site Characterization Project YMP Surveillance Plan Checklist satisfactorily. Overall, the YMQAD representatives concur that CTS is managing and coordinating the fabrication and assembly of the TBM exceedingly well. The two major subcontractors, EBCO and Nickolson, are performing satisfactorily in all phases of their assigned work.