**COMMERCIAL - WASTE AND SPENT-FUEL
PACKAGING PROGRAM**

QUARTERLY REPORT

for the period

JANUARY THROUGH MARCH 1981

APRIL 1981

Prepared for the
UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE
Under Contract DE-AC-08-80NV10061

WESTINGHOUSE ELECTRIC CORPORATION
ADVANCED ENERGY SYSTEMS DIVISION - NEVADA OPERATIONS
Post Office Box 708
Mercury, Nevada 89023

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

DISCLAIMER

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, mark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Printed in the United States of America

Available from:

National Technical Information Service
U. S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22162

Price: Printed Copy \$ 5.00
 Microfiche \$ 3.50

DOE/NV/10061-6

**COMMERCIAL WASTE AND SPENT FUEL PACKAGING PROGRAM
QUARTERLY REPORT**

JANUARY THROUGH MARCH 1981

A. R. HAKL

DISCLAIMER
This book was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

**WESTINGHOUSE ELECTRIC CORPORATION
ADVANCED ENERGY SYSTEMS DIVISION - NEVADA OPERATIONS**

**Post Office Box 708
Mercury, Nevada 89023**

**Prepared for the
UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE
Under Contract DE-AC-08-80NV10061**

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

INTRODUCTION

This document is a report of activities performed by Westinghouse Advanced Energy Systems Division - Nevada Operations at the E-MAD Facility, Area 25, Nevada Test Site, in meeting subtask objectives during the second quarter of Fiscal Year 1981. These activities include: transfer of the Fuel Temperature Test (FTT) assembly from the West Process Cell to the Hot Bay where it was disassembled; boiling water calorimetry, Weld Pit calorimetry, encapsulation, and temporary storage of the fuel assembly used in the FTT; completion of the first Climax Test fuel exchange; testing to evaluate moisture accumulation in Drywells; Plasma Arc Welder development; receipt, installation, and activation of the RAM/CAM system and alpha/beta/gamma counting system.

GLOSSARY

AESD-Large	Westinghouse Advanced Energy Systems Division at Large, Pennsylvania
AESD - Nevada Operations	Westinghouse Advanced Energy Systems Division located at the Nevada Test Site Operations
AGNS	Allied General Nuclear Services at Barnswell, South Carolina
BWR	Boiling Water Reactor
BWIP/NSTF	Basalt Waste Isolation Program/Near Surface Test Facility
CAM	Constant Air Monitor
DOE/NV	United States Department of Energy, Nevada Operations Office
E-MAD	Engine Maintenance, Assembly and Disassembly Building, Area 25, NTS
FTT	Fuel Temperature Test
HLW	High-Level Waste
LLNL	Lawrence Livermore National Laboratories
PWR	Pressurized Water Reactor
QMP	Quality Methods and Procedures

RAM	Remote Area Monitoring (System)
R-MAD	Reactor Maintenance, Assembly and Disassembly Building, Area 25, NTS
SAD	Safety Assessment Document
STV	Surface Transport Vehicle

OBJECTIVES

- Initiate modification of the E-MAD East Process Cell
- Issue E-MAD activity schedule
- Issue final report of Acoustic Emission Study
- Submit Quality Assurance Program Plan
- Issue E-MAD report for first Climax fuel exchange
- Issue Quality Assurance Manual
- Complete Tests I-A, I-B, and I-C of Drywell Evaluation
- Modify and test BWR fuel handling tool
- Fabricate and test lifting tool for 12" canister
- Install CAM/RAM console and printout system
- Initiate Plasma Arc Welder Development Program

HIGHLIGHTS

- Fuel Temperature Test assembly transferred from the West Process Cell to the Hot Bay and disassembled.
- Tests I-A, I-B, and I-C, and Test II of Drywell Evaluation completed. Decision made to perform Test III, which is in progress.
- First Climax fuel exchange completed.
- Alpha/beta/gamma counting system received and installed and operation initiated.
- CAM/RAM system wiring completed and old system removed (except for Stack Monitors still in use). Hot Bay alarm system connected and checked out in Master Control Room.
- Purchase orders for RAM system expansion components and Stack Monitoring System issued.
- Quality Assurance Program Plan published and Quality Assurance Manual issued.
- Acoustic Emission Development Program final report transmitted.
- Plasma Arc Welder Development Program initiated.

NARRATIVE SUMMARY

WORK TASK NUMBER

ACTIVITY

1.2.4.2.1

Canister Cutter

There were no canister cutter activities during this time period.

1.2.4.2.2

Pit Adapters

The Lag Storage Pit seismic grid, pit adapters for Weld Pit modifications, and all associated drawings were received. Work orders are being prepared for assembly, modification, installation, and reidentification.

1.2.4.2.3

EDP Plasma Welder Development

A test plan was prepared and initiated for development of a Plasma Arc Welder. The program is continuing, with welds being performed with and without filler metal, on continuous welds as well as starts and stops. A different grade of pipe is being used to resolve problems in material compatibility. Some delays have resulted from motor failures. A program review meeting was held at E-MAD, with AESD-Large Engineering personnel, and a revised plan and schedule are being prepared.

1.2.4.2.4

EDP Ultrasonic Weld Inspection System

At DOE direction, AESD-Large has terminated all activities associated with this task. As a result, the scheduled AESD - Nevada Operations milestone to receive the system by May 15 will be adjusted as directed by DOE/NV.

1.2.4.2.5

Grapples

A prototype lifting tool for the sealed 12 inch canister was fabricated, specifications and drawings were completed, and a work order prepared for fabrication of the tool.

WORK TASK NUMBER**ACTIVITY**

Hardware was received for modification of the BWR fuel handling tool, for use on the HLW log.

1.2.4.2.7

Safety Assessment Document (SAD) Update

Drafts of the first sections of the SAD addendum for HLW log handling have been completed and distributed for internal review.

1.2.4.2.9

Data Acquisition**a. Drywell Interaction Test (Drywell 1, 2, 3 Array)**

Highest thermocouple temperatures, after 4,732 hours of operations were:

Fuel Assembly	In Drywell	Canister Temperature °F	Temperature °C	Liner Temperature °F	Temperature °C
B-43	1	177.5	80.8	135.9	57.7
B-41	2	193.2	89.6	150.9	66.1
B-03	3	200.4	93.6	155.4	68.6

b. 2 kw Drywell Test (Fuel Assembly D-22)

At 4,992 hours of operation, the maximum canister temperature was 297.5°F/147.5°C; the highest liner temperature was 240.3°F/115.7°C. Data acquisition from this test will terminate on April 6, 1981.

1.2.4.2.10

Drywell Evaluation

The following tests have been completed:

Test I-A: Drywells 1, 2, 3 and 5 were inspected for condensation under the drywell covers.

Test I-B: Drywell condensate collection was measured and recorded using a collection system designed and fabricated for this purpose.

WORK TASK NUMBER

ACTIVITY

Test I-C: Thermocouples were placed in the annulus of Drywell 5 to monitor conditions in the annulus.

Test II: Drywells 1, 2, 3 and 5 were periodically inspected to identify the source of water.

A program review meeting was held and the decision was made to perform a third test which will demonstrate proposed changes to be made to the drywells to eliminate the moisture accumulation. This test is currently in progress.

1.2.4.2.11

Acoustic Emission

A feasibility study of application of Acoustic Emission monitoring for the inspection of spent fuel canister closure seal welds was completed at the Westinghouse Forest Hills, Pennsylvania plant. The final report of test results was transmitted to DOE/NV, completing this task.

1.4.2.2.3

Climax Fuel Transfers

The FTT assembly was removed from the West Process Cell to the Hot Bay, where it was disassembled. Boiling water calorimetry and Weld Pit calorimetry were performed on the removed fuel assembly (D-15/LM0147) which was then encapsulated and temporarily stored in the E-MAD Lag Storage Pit.

Fuel assembly D-09/LM0143 was received from the Climax test facility and placed in lag storage. Fuel assembly D-15/LM0147 was retrieved from storage, loaded into the STV and released to LLNL for transport to the Climax site for testing. A report of these activities was transmitted to DOE/NV.

WORK TASK NUMBER

ACTIVITY

1.6.5.1.2

Capability Maintenance

a. Seventeen tours of E-MAD were conducted by the AESD - Nevada Operations staff for:

- (1) Defense Military Applications Group
- (2) DOE Headquarters Group
- (3) Students of Southern Utah State College, Clark County Junior Academy of Science, and San Diego State University
- (4) Citizens of Canada, West Germany, and the Republic of South Africa.
- (5) The Nuclear Attache of the French Embassy
- (6) Earth Sciences Review Group
- (7) State Planning Council Members
- (8) An NRC Group
- (9) Government employees and Government Contractor employees from Savannah River and other sites.

b. **Safety**

- (1) The 13,000 Curie cobalt-60 source annual leak test was completed; no leakage was detected. During the test, readings were taken at various stations of the RAM system, with good correlation among the units.
- (2) Air samples were collected at the Bruning blueprint machine to determine if ethanolamine (from activator fluid) is being released into surrounding air. Levels appear to be within OSHA guidelines.
- (3) An alpha/beta/gamma counting system was received, set up, checked out, and placed in operation.

c. **Operator Qualification and Training**

- (1) Operators were qualified in: operation of radiation shield doors (4), safety wiring (1), rectilinear

WORK TASK NUMBER

ACTIVITY

manipulator operation (7), floor mounted handling system (3), master-slave manipulator (1), wall mounted handling system (1), turntables (3), forklifts (1), data logger (1), wall periscopes (3), and pass-thru drawers (2).

- (2) Fifty-two hours were expended in classroom training on various remote handling and facility equipment and safety wiring. Hands-on training, totaling 325 hours was conducted for the RAM system, facility equipment and systems, remote handling equipment, and manned control car.
- (3) Six operators have received training on the Xerox Word Processing Systems recently installed in E-MAD.
- (4) A training session was held to acquaint all secretaries on various applications of a recently acquired transparency copier.

d. Documentation

- (1) The overall AESD - Nevada Operations documentation program was revised to more systematically meet requirements of the "NNWSI Management and the Overview Quality Assurance Program Plan" (NVO-196-18), the AESD - Nevada Operations "Quality Assurance Program Plan" (TME-3060), and Westinghouse AESD Divisional Procedures. The newly defined categories are:
 - a. Divisional Procedures - Nevada (DPN)
 - b. Engineering Procedures (EP)
 - c. Quality Assurance Procedures (QMP-N)
 - d. Health and Safety Procedures (HSP)
 - e. Facility and Equipment Procedures (FEP)
 - f. Technical Operations Procedures (TOP)

WORK TASK NUMBER

ACTIVITY

- (2) Three TOPs were revised and published. The first two DPNs were completed and distributed: Calibration and Control of Standards and Test and Equipment; and Receiving Material, Equipment, and/or Services at AESD - Nevada Operations E-MAD Facility.
- (3) The activity report of the first Climax fuel exchange was issued.

e. Facility and Equipment Maintenance/Repair

- (1) A new heavy-duty master-slave manipulator was received, inspected, and stored for future use.
- (2) R-MAD shield window frames, from which the windows were removed for refurbishment, were returned to R-MAD for storage.
- (3) Annual maintenance was completed on the Hot Bay floor mounted handling system, one turntable, four shield doors, spacer car, and flatcars; semi-annual maintenance on the emergency generator unit; quarterly maintenance on miscellaneous rolling stock.
- (4) A condenser water pump rotating unit and casing rings were machined for use in the HVAC (heating, ventilation and air conditioning system).
- (5) Modification of the PWR fuel handling tool was completed and the tool was successfully tested.

f. Energy Conservation

The E-MAD Energy Conservation Employee Awareness Committee initiated Phase II of the program, "Comprehension." A movie, "The American Dream," depicting electrical and mechanical advancement in this country, was shown to all E-MAD employees.

WORK TASK NUMBER

ACTIVITY

1.6.5.1.3.1

AGNS Heater

No funds have been allocated for AESD-Large to ship the AGNS heater during FY-1981. Achievement of the AESD - Nevada Operations milestone to receive and store the heater by April 30, 1981 is therefore in jeopardy.

1.6.5.1.3.2

CAM/RAM and Stack Monitoring Engineering Support

Wiring was completed for the CAM/RAM systems in Room 108 and the systems are operational, except for a CAM/computer interface system which has not yet been received. The Hot Bay alarm system was connected in the Master Control Room and satisfactorily checked out.

The purchase order for a new Stack Monitoring System was issued. The tentative delivery date is January 1982.

Purchase orders have been issued to expand the RAM system console to accept data from the CAM system and Stack Monitor, and to provide an E-MAD floor plan display of the RAM units at the gatehouse.

1.6.5.1.3.3

Activation of the East Process Cell

Work on this task was discontinued by DOE direction.

1.8.2

Project Control

The one year schedule, Hot Bay activity schedule, and detailed logic diagrams for all FY-1981 work tasks were revised to reflect updated information.

1.8.4

Quality Assurance

- a. The "AESD - Nevada Operations Quality Assurance Program Plan" was completed and transmitted for DOE approval.
- b. The AESD - Nevada Operations Quality Assurance Manual was transmitted to DOE and internal distribution was completed.

**WESTINGHOUSE
AESD - NEVADA OPERATIONS
QUARTERLY REPORT
DISTRIBUTION LIST**

D. J. Barnett
N. M. Crawford
C. B. Dimmerling
J. E. Donnelly
D. C. Durrill
A. R. Hakl
D. L. Hollingsworth
J. E. Janne
M. E. Joyner
R. E. Lowder
R. C. Mairson
R. L. Malloy
R. A. McClure
E. J. Powada
B. L. Robbins
M. R. Secord
H. C. Snow
A. P. Weber
J. B. Wright
DOE/TIC (27)