

72-1008

72-1014



H O L T E C
INTERNATIONAL

Holtec Center, 555 Lincoln Drive West, Marlton, NJ 08053

Telephone (856) 797-0900

Fax (856) 797-0909

BY OVERNIGHT MAIL

July 14, 2000

Mr. Wayne Hodges
Director, Technical Review Branch, SFPO
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Subject: USNRC Docket Nos. 72-1008 and 72-1014
HI-STAR/HI-STORM Multi-Purpose Canister Helium Leak Testing

Reference: Holtec Project 5014

Dear Mr. Hodges:

In accordance with our recent verbal commitments, attached please find helium leakage test results for four different Holtec MPC-68 spent fuel canisters. We provide this information in support of your efforts to risk-inform the regulatory review criteria for the latest generation of dry spent fuel storage systems. These leakage tests were performed at the UST&D shop by welding a temporary lid to the top of the MPC and testing the leak tightness of the of the MPC pressure boundary, comprised of the circumferential, longitudinal, and shell-to-baseplate welds. As you are aware, the MPC lid is leak tested in the field after fuel is loaded into the canister and the lid is welded to the shell.

In order to provide additional information for the Holtec MPC we will also leakage test at least two MPC mock-ups to demonstrate the leak-tightness of the MPC lid-to-shell joint. We will forward that test data as soon as it is available.

Please contact either myself or Mr. Bernard Gilligan at Holtec if you have any questions or require additional information.

Sincerely,

Brian Gutherman, P.E.

cc: Mr. Jack Guttman, USNRC (w/attach.)

Document ID: 5014396

Attachment: Shop Helium Leakage Test Results for MPC S/N 001, 002, 003, and 005

Umssoi Public



Mr. Wayne Hodges
U. S. Nuclear Regulatory Commission
Document ID 5014396
Page 2 of 2

Distribution (w/o attach.):

<u>Recipient</u>	<u>Affiliation</u>
Mr. George Bockhold	Southern Nuclear Operating Company
Mr. Robert Berryhill	Southern Nuclear Operating Company
Mr. Kenneth Phy	New York Power Authority
Mr. J. Nathan Leech	Commonwealth Edison
Dr. Max DeLong	Private Fuel Storage
Mr. Stan Miller	Vermont Yankee Nuclear Power Corporation
Mr. David Larkin	Energy Northwest
Mr. Bruce Patton	Pacific Gas & Electric – Diablo Canyon
Mr. Mark Smith	Pacific Gas & Electric – Humboldt Bay
Mr. Terry Grebel	Pacific Gas & Electric
Mr. Roger Johnson	Pacific Gas & Electric
Mr. Charles Davis	Tennessee Valley Authority – Sequoyah Plant
Mr. Rodney Pickard	American Electric Power
Mr. Eric Meils	Wisconsin Electric Power Company
Mr. Paul Plante	Maine Yankee Atomic Power Company
Mr. Robert Ashe-Everest	Southern California Edison
Mr. Darrell Williams	Energy Operations – Arkansas Nuclear One
Mr. Chris Kudla	Energy Operations – Millstone Unit 1 Decommissioning
Mr. Charles Minnot	Energy Operations – Pilgrim Station
Mr. Vee Dunn	Energy Operations – Grand Gulf Station
Ms. Jodi Furr	Energy Operations – River Bend Station
Mr. Ben Garrett	GPUN – Oyster Creek Nuclear Power Station
Mr. Brian Wohlers	Alliant Energy
Mr. William Swantz	Nebraska Public Power District
Mr. Gary Krieser	Nuclear Management Company
Mr. Matt Eyre	PECO Energy
Mr. Al Gould	Florida Power & Light
Dr. Seymour Raffety	Dairyland Power
Mr. John Sanchez	Consolidated Edison Company
Ms. Kathy Picciott	Niagara Mohawk Power Corporation
Mr. John Donnell	Private Fuel Storage, LLC (SWEC)
Mr. Steve Edwards	Carolina Power and Light
Mr. Simon Hseih	Detroit Edison
Mr. Rick Scofield	Omaha Public Power District
Dr. Stanley Turner	Holtec International, Florida Operations Center



Holtec Center, 555 Lincoln Drive West, Marlton, NJ 08053

HOLTEC
INTERNATIONAL

Telephone (856) 797-0900
Fax (856) 797-0909

Mr. Wayne Hodges
U.S. Nuclear Regulatory Commission
Document ID 5014396
Attachment
9 total pages, including this page

FABRICATION SHOP MPC LEAK TEST RESULTS



INDUSTRIAL TESTING LABORATORY SERVICES CORP.

635 ALPHA DRIVE - R.I.D.C. PARK

PITTSBURGH, PA 15238

PHONE 412-963-1900

FAX 412-963-1926

TEST REPORT

9908-00-0144

MF, QA, BK, JA

PURCHASE ORDER NO. 99-0680 Rev. 0

DATE June 30, 1999

TO: U.S. Tool & Die, Inc.

ITLS REPORT NO. 70362

200 Braddock Avenue

ADDRESS Turtle Creek, PA 15145

ATTENTION Brian Kuntz

REPORT OF: Helium Leak Testing
of one MPC Vessel (hood method)
PWRP-2700-2A

IDENTIFICATION

Test References: ASME Sect. V Art. 10
ITLS Procedure 204 Rev. 3 (1-29-99)
& Attachment 1 (1-29-99)
P.O. requirements

Test Witnessed By: Paul Haines - Southern Nuclear
Mark Soler - Holtec International
Robert Heusey - U.S. Tool & Die

Test Equipment: Veeco Helium Mass Spectrometer Model 90AB
Welch 15cfm Roughing Pump
"T" Manifold with Isolation Valves
Calibrated Leak Capsule SC-8D
Leak Rate: 2.93×10^{-8} Std cc Sec He
Date of Calibration: May 19, 1999

Tracer Gas: 100% Helium

Delay Time: Established at less than 2 minutes on
PWRP-8100-2

Equipment Sensitivity: Start: 1.4×10^{-10} Std cc Sec He
Stop: 1.8×10^{-10} Std cc Sec He

Acceptance: Leakage not to exceed 5×10^{-6} Std cc Sec He

Date Of Test: June 22, 1999



Page 44 of 193

MPC S/N 001 (MPC-68)

The MPC vessel was suitably fixtured and covered with heavy plastic (excluding the test flange), the interior of the vessel was evacuated to 27.8" Hg by use of an auxiliary vacuum pump.

The Mass Spectrometer, now fully operational was calibrated and a sensitivity of 1.4×10^{-10} Std cc Sec He was obtained. At this point, the Mass Spectrometer's roughing pump valve was opened in parallel with the auxiliary pump.

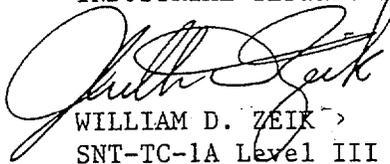
A vacuum of 175 micron's was obtained on the internals of the vessel. The Mass Spectrometer's throttle valve was closed, the method switch turned to **MANUAL** and the throttle valve slowly opened to a maximum vacuum reading that would allow the Spectrometer to operate (1×10^{-4} MM Hg). The auxiliary roughing pump valve was closed.

Pure Helium was purged into the annular space between the outside of the vessel and the inside of the plastic covering for a period of ten (10) minutes before the leak meter was monitored for an additional fifteen (15) minutes.

There was no rise in the leak meter.

One (1) MPC Vessel, PWRP-2700-2A - ACCEPTABLE PER PO REQUIREMENTS

INDUSTRIAL TESTING LABORATORY SERVICES


WILLIAM D. ZEIK
SNT-TC-1A Level III
Cert #SB704 Exp. 10/02





Industrial Testing Laboratory Services Corporation
635 Alpha Drive - R.I.D.C. Park - Pittsburgh, PA 15238
PHONE 412-963-1900 FAX 412-963-1926

TEST REPORT

PURCHASE ORDER: 00-0108 Rev. 0

DATE: 1/12/00

TO: U.S. Tool & Die, Inc.
200 Braddock Avenue
ADDRESS: Turtle Creek, PA 15145

ITLS REPORT NO. 71001

ATTENTION: Bob Henchar

REPORT OF: Helium Leak Testing (welds only)
of one MPC Shell 2700-3

IDENTIFICATION

Test References:

ASME Sect. V Art. 10
ITLS Procedure 204 Rev. 3 (1-29-99)
& Attachment 2 (5-20-99)
P.O. requirements

UST & D
REVIEW/APPROVAL

Test Witnessed By:

Mr. Paul Haines
Mr. Pravinkumar

DTB 1-13-00
QUALITY ASSURANCE

Test Equipment:

Veeco Helium Mass Spectrometer Model 90AB
20 cfm Roughing Pump
"T" Manifold with Isolation Valves
Calibrated Leak Capsule SC-8D
Leak Rate: 2.93×10^{-8} Std cc Sec He
Date of Calibration: May 19, 1999

Tracer Gas:

100% Helium

Delay Time:

Established at less than 2 minutes on PWRP-8100-2

Equipment Sensitivity:

Start: 1.1×10^{-10} std.cc/sec. He
Stop: 1.1×10^{-9} std.cc/sec. He

Acceptance:

Leakage not to exceed 4.3×10^{-6} std.cc/sec He

DURING OUR MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THE PRODUCT DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANY OF ITS COMPOUNDS NOR WITH ANY MERCURY CONTAINING DEVICES EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT. KNOWINGLY AND WILLFULLY FALSIFYING OR CONCEALING A MATERIAL FACT ON THIS FORM OR MAKING FALSE OR FICTITIOUS OR FRAUDULENT ENTRIES ON THIS FORM COULD CONSTITUTE A FELONY PUNISHABLE UNDER FEDERAL STATUTES.

MPC S/N 002
(MPC-68)

Page 67 of 88

Date of Test: January 10, 2000

Test Operator: William D. Zeik, Level III SB704

RESULTS

The MPC Shell was suitably fixtured and all welds were covered with heavy plastic and sealed with tape. The vessel internals was then evacuated with the auxiliary roughing pump.

The Mass Spectrometer now fully operational, was calibrated and a sensitivity of 1.1×10^{-10} std.cc/sec. He was obtained.

At this point, the Mass Spectrometer's rough vacuum valve was opened in parallel with the roughing pump to the vessel for several more hours. The vacuum gage reading stabilized at 1000 microns of Hg. And with the Mass Spectrometer's diffusion pump now in the system, the vacuum reached 500 micron's.

The Mass Spectrometer throttle valve was closed, the method switch turned to **Manual** and the throttle valve slowly opened to a maximum vacuum reading that would allow the Spectrometer to operate (10^{-4} MM Hg). The auxiliary roughing pump valve was closed.

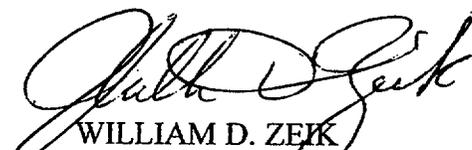
Pure Helium was purged into the annular space between the outside of the vessel and the inside of the plastic for a period of 15 minutes before timing was started for the 15 minutes monitor time.

The Helium Mass Spectrometer's sensitivity at the end of the test was 1.1×10^{-9} std.cc/sec. He.

There was no detectable leakage.

One 2700-3 MPC Shell - **ACCEPTABLE PER P.O. REQUIREMENTS**

INDUSTRIAL TESTING LABORATORY SERVICES


WILLIAM D. ZEIK
SNT-TC-1A LEVEL III
Cert. #SB704 Exp. 10/02

UST & D
REVIEW/APPROVAL


QUALITY ASSURANCE



Industrial Testing Laboratory Services Corporation
635 Alpha Drive - R.I.D.C. Park - Pittsburgh, PA 15238
PHONE 412-963-1900 FAX 412-963-1926

TEST REPORT

PURCHASE ORDER: 00-01101

DATE: 1/27/00

TO: U.S. Tool & Die, Inc.
200 Braddock Avenue
ADDRESS: Turtle Creek, PA 15145

ITLS REPORT NO. 71026-2

ATTENTION: Bob Henchar

REPORT OF: Helium Leak Testing (welds only)
of one MPC Shell 2700-4

IDENTIFICATION

Test References:

ASME Sect. V Art. 10
ITLS Procedure 204 Rev. 3 (1-29-99)
& Attachment 2 (5-20-99)
P.O. requirements

UST & D
REVIEW/APPROVAL

Test Witnessed By:

Mr. Paul Haines
Mr. Pravinkumar

DTB 1-29-00
QUALITY ASSURANCE

Test Equipment:

Veeco Helium Mass Spectrometer Model 90AB
20 cfm Roughing Pump
"T" Manifold with Isolation Valves
Calibrated Leak Capsule SC-8D
Leak Rate: 2.93×10^{-8} Std cc Sec He
Date of Calibration: May 19, 1999



Tracer Gas:

100% Helium

Delay Time:

Established at less than 2 minutes on PWRP-8100-2

Equipment Sensitivity:

Start: 1.9×10^{-10} std.cc/sec. He
Stop: 2.9×10^{-9} std.cc/sec. He

Acceptance:

Leakage not to exceed 4.3×10^{-6} std.cc/sec He

DURING OUR MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THE PRODUCT DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANY OF ITS COMPOUNDS NOR WITH ANY MERCURY CONTAINING DEVICES EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT. KNOWINGLY AND WILLFULLY FALSIFYING OR CONCEALING A MATERIAL FACT ON THIS FORM OR MAKING FALSE OR FICTITIOUS OR FRAUDULENT ENTRIES ON THIS FORM COULD CONSTITUTE A FELONY PUNISHABLE UNDER FEDERAL STATUTES.

MPC S/N 003 (MPC-68)

Date of Test: January 18, 2000

Test Operator: William D. Zeik, Level III SB704

RESULTS

The MPC Shell was suitably fixtured and all welds were covered with heavy plastic and sealed with tape. The vessel internals was then evacuated with the auxiliary roughing pump.

The Mass Spectrometer now fully operational, was calibrated and a sensitivity of 1.9×10^{-10} std.cc/sec. He was obtained.

At this point, the Mass Spectrometer's rough vacuum valve was opened in parallel with the roughing pump to the vessel for several more hours. The vacuum gage reading stabilized at 1000 microns of Hg. And with the Mass Spectrometer's diffusion pump now in the system, the vacuum reached 500 micron's.

The Mass Spectrometer throttle valve was closed, the method switch turned to **Manual** and the throttle valve slowly opened to a maximum vacuum reading that would allow the Spectrometer to operate (10^{-4} MM Hg). The auxiliary roughing pump valve was closed.

Pure Helium was purged into the annular space between the outside of the vessel and the inside of the plastic for a period of 15 minutes before timing was started for the 15 minutes monitor time.

The Helium Mass Spectrometer's sensitivity at the end of the test was 2.93×10^{-9} std.cc/sec. He.

There was no detectable leakage.

One 2700-4 MPC Shell - **ACCEPTABLE PER P.O. REQUIREMENTS**



INDUSTRIAL TESTING LABORATORY SERVICES

William D. Zeik
WILLIAM D. ZEIK
SNT-TC-1A LEVEL III
Cert. #SB704 Exp. 10/02

UST & D
REVIEW/APPROVAL

1 JTB 1-29-06
QUALITY ASSURANCE



Industrial Testing Laboratory Services Corporation
635 Alpha Drive - R.I.D.C. Park - Pittsburgh, PA 15238
PHONE 412-963-1900 FAX 412-963-1926
E-mail: info@itls-labs.com

TEST REPORT

PURCHASE ORDER: 00-02130 Rev. 1

DATE: 5/26/00

TO: U.S. Tool & Die, Inc.
200 Braddock Avenue
Turtle Creek, PA 15145

ITLS REPORT NO. 71480

ATTENTION: Mr. Dan Bolling

REPORT OF: Helium Leak Testing of a Hi-Star MPC 68F Shell
PWRP #2801-1 Rev. 0, Project #9925

IDENTIFICATION

Test References: ASME Sect. V Art. 10
ITLS Procedure 204 Rev. 3 (1-29-99)
& Attachment 2 (5-20-99)
P.O. requirements

Test Witnessed By: Mr. Tony Frazier

Test Equipment: Veeco Helium Mass Spectrometer Model 90AB
49 cfm Roughing Pump
"T" Manifold with Isolation Valves
Calibrated Leak Capsule SC-8D
Leak Rate: 2.53×10^{-8} Std cc Sec He
Date of Calibration: May 5, 2000

Tracer Gas: 100% Helium

Delay Time: Established at less than 2 minutes on PWRP-8100-2

Equipment Sensitivity: Start: 1.6×10^{-10} std.cc/sec. He
Stop: 1×10^{-9} std.cc/sec. He

Acceptance: Leakage not to exceed 4.3×10^{-6} std.cc/sec He

DURING OUR MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THE PRODUCT DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANY OF ITS COMPOUNDS NOR WITH ANY MERCURY CONTAINING DEVICES EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT. KNOWINGLY AND WILLFULLY FALSIFYING OR CONCEALING A MATERIAL FACT ON THIS FORM OR MAKING FALSE OR FICTITIOUS OR FRAUDULENT ENTRIES ON THIS FORM COULD CONSTITUTE A FELONY PUNISHABLE UNDER FEDERAL STATUTES.

MPC S/N 005 (MPC-68F)

Date of Test: May 25, 2000
Test Operator: William D. Zeik

RESULTS

The MPC Shell was suitably fixtured and all welds were covered with heavy plastic and sealed with tape. The vessel internals was then evacuated with the auxiliary roughing pump.

The Mass Spectrometer now fully operational, was calibrated and a sensitivity of 1.6×10^{-10} std.cc/sec. He was obtained.

At this point, the Mass Spectrometer's rough vacuum valve was opened in parallel with the roughing pump to the vessel. With the Mass Spectrometer's diffusion pump now in the system, the vacuum reached 500 micron's.

The Mass Spectrometer throttle valve was closed, the method switch turned to **Manual** and the throttle valve slowly opened to a maximum vacuum reading that would allow the Spectrometer to operate (10^{-4} MM Hg). The auxiliary roughing pump valve was closed.

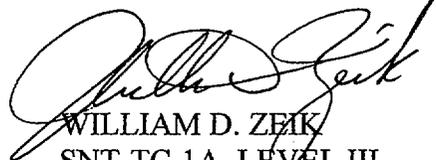
Pure Helium was purged into the annular space between the outside of the vessel and the inside of the plastic for a period of 15 minutes before timing was started for the 15 minutes monitor time.

The Helium Mass Spectrometer's sensitivity at the end of the test was 1×10^{-9} std.cc/ sec. He.

There was no detectable leakage.

One MPC 68F - ACCEPTABLE PER P.O. REQUIREMENTS

INDUSTRIAL TESTING LABORATORY SERVICES


WILLIAM D. ZEIK
SNT-TC-1A LEVEL III
Cert. #SB704 Exp. 10/02