72-1008
72-1014

HOLTEC 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 Guttmann, USNRC (w/attach.)

Document ID: 5014396

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

NMSS01Public

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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.
200 Braddock Avenue
ADDRESS Turtle Creek, PA 15145

ITLS REPORT NO. 70362

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

HOLTEC MS Q.A. APPROVED

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

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

HOLTEC MS Q.A. APPROVED

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. ITLS REPORT NO. 71001
ADDRESS: 200 Braddock Avenue
Turtle Creek, PA 15145

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

DAB 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

MPC S/N 002
(MPC-68)

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 x 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 x 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
DB 1-13-00
QUALITY ASSURANCE

DURING OUR MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THE PRODUCT DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANYOF 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 FRADULENT ENTRIES ON THIS FORM COULD CONSTITUTE A FELONY PUNISHABLE UNDER FEDERAL STATUTES.

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. ITLS REPORT NO. 71026-2
200 Braddock Avenue
ADDRESS: Turtle Creek, PA 15145

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
Test Witnessed By:	Mr. Paul Haines Mr. Pravinkumar
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

UST & D
REVIEW/APPROVAL

1-29-00
QUALITY ASSURANCE

HOLTEC PK Q.A. APPROVED

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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 x 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 x 10^{-9} std.cc/ sec. He.

There was no detectable leakage.

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

HOLTEC PK Q.A. APPROVED

INDUSTRIAL TESTING LABORATORY SERVICES

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

UST & D
REVIEW/APPROVAL
1-29-06
QUALITY ASSURANCE

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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 FRADULENT 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 x 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 x 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

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