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September 4, 2003

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: USNRC Docket No. 71-9261, TAC L23474
HI-STAR 100 Certificate of Compliance 9261
Replacement Pages for SAR Revision 10

References:
1. Holtec Project 5014
2. Holtec letter to NRC Document Control Desk dated August 21, 2003

Dear Sir:

As previously discussed with our NRC project manager, enclosed please find replacement pages for HI-STAR 100 Safety Analysis Report, Revision 10. The replacement pages are necessary to restore previously approved information to the SAR and to correct a printing error. Please replace the following pages in your copy of the SAR:

1. Remove existing pages 1.3-3 through 1.3-12 and replace with the enclosed pages.

2. Remove existing pages 7.1-19 though 7.1-22 and replace with the enclosed pages.

If you have any questions pertaining to the enclosed information, please contact the undersigned at (856) 797-0900, extension 668.

Sincerely,

Brian Gutherman, P.E.
Manager, Licensing and Technical Services

Document ID: 5014495

Enclosures: As Stated

Distribution: USNRC Document Control Desk (w/enclosures)
Mr. Meraj Rahimi, USNRC (w/ 2 sets of enclosures and 2 updated compact disks)

NMSS01

Table 1.3.1

HI-STAR 100 ASME BOILER AND PRESSURE VESSEL CODE APPLICABILITY

HI-STAR 100 Component	Material Procurement	Design	Fabrication	Inspection
Overpack containment boundary	Section II; and Section III, Subsection NB, NB-2000	Section III, Subsection NB, NB-3200	Section III, Subsection NB, NB-4000	Section III, Subsection NB, NB-5000 and Section V
Overpack intermediate shells, radial channels, outer enclosure	Section II; and Section III, Subsection NF	Section III, Subsection NF, NF-3300	Section III, Subsection NF, NF-4000	Section III, Subsection NF, NF-5360 and Section V
MPC helium retention boundary	Section II; and Section III, Subsection NB, NB-2000	Section III, Subsection NB, NB-3200	Section III, Subsection NB, NB-4000	Section III, Subsection NB, NB-5000 and Section V
MPC fuel basket	Section II; and Section III, Subsection NG, NG-2000 for core support structures (NG-1121)	Section III, Subsection NG, NG-3300 and NG-3200 for core support structures (NG-1121)	Section III, Subsection NG, NG-4000 for core support structures (NG-1121)	Section III, Subsection NG, NG-5000 and Section V for core support structures (NG-1121)
Lifting Trunnions	Section II; and Section III, Subsection NF, NF-2000	ANSI N14.6	Section III, Subsection NF, NF-4000	ANSI 14.6 See Chapter 8
MPC Basket Supports (Angled Plates)	Section II, and Section III, Subsection NG, NG-2000 for internal structures (NG-1122)	Section III, Subsection NG, NG-3300 and NG-3200 for internal structures (NG-1122)	Section III, Subsection NG, NG-4000 for internal structures (NG-1122)	Section III, Subsection NG, NG-5000 and Section V for internal structures (NG-1122)
Damaged Fuel Container	Section II, and Section III, Subsection NG, NG-2000	Section III, Subsection NG, NG-3300 and NG-3200	Section III, Subsection NG, NG-4000	Section III, Subsection NG, NG-5000 and Section V

Table 1.3.2

LIST OF ASME CODE ALTERNATIVES FOR HI-STAR 100 SYSTEM

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
MPC, MPC basket assembly, and HI-STAR overpack steel structure.	Subsection NCA	General Requirements. Requires preparation of a Design Specification, Design Report, Overpressure Protection Report, Certification of Construction Report, Data Report, and other administrative controls for an ASME Code stamped vessel.	Because the MPC and overpack are not ASME Code stamped vessels, none of the specifications, reports, certificates, or other general requirements specified by NCA are required. In lieu of a Design Specification and Design Report, the HI-STAR SAR includes the design criteria, service conditions, and load combinations for the design and operation of the HI-STAR 100 System as well as the results of the stress analyses to demonstrate that applicable Code stress limits are met. Additionally, the fabricator is not required to have an ASME-certified QA program. All important-to-safety activities are governed by the NRC-approved Holtec QA program. Because the cask components are not certified to the Code, the terms "Certificate Holder" and "Inspector" are not germane to the manufacturing of NRC-certified cask components. To eliminate ambiguity, the responsibilities assigned to the Certificate Holder in the various articles of Subsections NB, NG, and NF of the Code, as applicable, shall be interpreted to apply to the NRC Certificate of Compliance (CoC) holder (and by extension, to the component fabricator) if the requirement must be fulfilled. The Code term "Inspector" means the QA/QC personnel of the CoC holder and its vendors assigned to oversee and inspect the manufacturing process.
MPC	NB-1100	Statement of requirements for Code stamping of components.	MPC vessel is designed and will be fabricated in accordance with ASME Code, Section III, Subsection NB to the maximum practical extent, but Code stamping is not required.
MPC	NB-2000	Requires materials to be supplied by ASME-approved material supplier.	Materials will be supplied by Holtec approved suppliers with Certified Material Test Reports (CMTRs) in accordance with NB-2000 requirements.

Table 1.3.2 (continued)

LIST OF ASME CODE ALTERNATIVES FOR HI-STAR 100 SYSTEM

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
MPC basket supports and lift lugs	NB-1130	NB-1132.2(d) requires that the first connecting weld of a nonpressure-retaining structural attachment to a component shall be considered part of the component unless the weld is more than 2t from the pressure-retaining portion of the component, where t is the nominal thickness of the pressure-retaining material. NB-1132.2(e) requires that the first connecting weld of a welded nonstructural attachment to a component shall conform to NB-4430 if the connecting weld is within 2t from the pressure-retaining portion of the component.	The MPC basket supports (nonpressure-retaining structural attachments) and lift lugs (nonstructural attachments used exclusively for lifting an empty MPC) are welded to the inside of the pressure-retaining MPC shell, but are not designed in accordance with Subsection NB. The basket supports and associated attachment welds are designed to satisfy the stress limits of Subsection NG and the lift lugs and associated attachment welds are designed to satisfy the stress limits of Subsection NF, as a minimum. These attachments and their welds are shown by analysis to meet the respective stress limits for their service conditions. Likewise, non-structural items, such as shield plugs, spacers, etc. if used, can be attached to pressure-retaining parts in the same manner.
MPC, MPC basket assembly, and HI-STAR overpack steel structure.	NB-3100 NG-3100 NF-3100	Provides requirements for determining design loading conditions, such as pressure, temperature, and mechanical loads.	These requirements are not applicable. The HI-STAR SAR, serving as the Design Specification, establishes the service conditions and load combinations for the storage system.

Table 1.3.2 (continued)

LIST OF ASME CODE ALTERNATIVES FOR HI-STAR 100 SYSTEM

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
MPC	NB-3350	NB-3352.3 requires, for Category C joints, that the minimum dimensions of the welds and throat thickness shall be as shown in Figure NB-4243-1.	The MPC shell-to-baseplate weld joint design (designated Category C) may not include a reinforcing fillet weld or a bevel in the MPC baseplate, which makes it different than any of the representative configurations depicted in Figure NB-4243-1. The transverse thickness of this weld is equal to the thickness of the adjoining shell (1/2 inch). The weld is designed as a full penetration weld that receives VT and RT or UT, as well as final surface PT examinations. Because the MPC shell design thickness is considerably larger than the minimum thickness required by the Code, a reinforcing fillet weld that would intrude into the MPC cavity space is not included. Not including this fillet weld provides for a higher quality radiographic examination of the full penetration weld. From the standpoint of stress analysis, the fillet weld serves to reduce the local bending stress (secondary stress) produced by the gross structural discontinuity defined by the flat plate/shell junction. In the MPC design, the shell and baseplate thicknesses are well beyond that required to meet their respective membrane stress intensity limits.
MPC, MPC basket assembly, and HI-STAR overpack steel structure	NB-4120 NG-4120 NF-4120	NB-4121.2, NG-4121.2, and NF-4121.2 provide requirements for repetition of tensile or impact tests for material subjected to heat treatment during fabrication or installation.	In-shop operations of short duration that apply heat to a component, such as plasma cutting of plate stock, welding, machining, coating, and pouring of Holtite are not, unless explicitly stated by the Code, defined as heat treatment operations. For the steel parts in the HI-STAR 100 System components, the duration for which a part exceeds the off-normal temperature limit shall be limited to 24 hours in a particular manufacturing process (such as the Holtite pouring process).

Table 1.3.2 (continued)

LIST OF ASME CODE ALTERNATIVES FOR HI-STAR 100 SYSTEM

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
MPC and HI-STAR overpack steel structure	NB-4220 NF-4220	Requires certain forming tolerances to be met for cylindrical, conical, or spherical shells of a vessel.	The cylindricity measurements on the rolled shells are not specifically recorded in the shop travelers, as would be the case for a Code-stamped pressure vessel. Rather, the requirements on inter-component clearances (such as the MPC-to-overpack) are guaranteed through fixture-controlled manufacturing. The fabrication specification and shop procedures ensure that all dimensional design objectives, including inter-component annular clearances are satisfied. The dimensions required to be met in fabrication are chosen to meet the functional requirements of the dry storage components. Thus, although the post-forming Code cylindricity requirements are not evaluated for compliance directly, they are indirectly satisfied (actually exceeded) in the final manufactured components.
MPC Lid and Closure Ring Welds	NB-4243	Full penetration welds required for Category C Joints (flat head to main shell per NB-3352.3)	MPC lid and closure ring are not full penetration welds. They are welded independently to provide a redundant seal. Additionally, a weld efficiency factor of 0.45 has been applied to the analyses of these welds.
MPC Lid-to-Shell Weld	NB-5230	Radiographic (RT) or ultrasonic (UT) examination required.	Only UT or multi-layer liquid penetrant (PT) examination is permitted. If PT alone is used, at a minimum, it will include the root and final weld layers and each approximately 3/8 inch of weld depth.
MPC Closure Ring, Vent and Drain Cover Plate Welds	NB-5230	Radiographic (RT) or ultrasonic (UT) examination required.	Root (if more than one weld pass is required) and final liquid penetrant examination to be performed in accordance with NB-5245. The MPC vent and drain cover plate welds are leak tested. The closure ring provides independent redundant closure for vent and drain cover plates.

Table 1.3.2 (continued)

LIST OF ASME CODE ALTERNATIVES FOR HI-STAR 100 SYSTEM

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
MPC Enclosure Vessel and Lid	NB-6111	All completed pressure retaining systems shall be pressure tested.	The MPC vessel is seal welded in the field following fuel assembly loading. The MPC vessel shall then be pressure tested as defined in Chapter 8. Accessibility for leakage inspections preclude a Code compliant pressure test. All MPC vessel welds (except closure ring and vent/drain cover plate) are inspected by volumetric examination, except that the MPC lid-to-shell weld shall be verified by volumetric or multi-layer PT examination. If PT alone is used, at a minimum, it must include the root and final layers and each approximately 3/8 inch of weld depth. For either UT or PT, the maximum undetectable flaw size must be demonstrated to be less than the critical flaw size. The critical flaw size must be determined in accordance with ASME Section XI methods. The critical flaw size shall not cause the primary stress limits of NB-3000 to be exceeded. The inspection results, including relevant findings (indications) shall be made a permanent part of the user's records by video, photographic, or other means which provide an equivalent retrievable record of weld integrity. The video or photographic records should be taken during the final interpretation period described in ASME Section V, Article 6, T-676. The vent/drain cover plate welds are confirmed by helium leakage testing and liquid penetrant examination and the closure ring weld is confirmed by liquid penetrant examination. The inspection of the weld must be performed by qualified personnel and shall meet the acceptance requirements of ASME Code Section III, NB-5350 for PT or NB-5332 for UT.
MPC Enclosure Vessel	NB-7000	Vessels are required to have overpressure protection.	No overpressure protection is provided. The function of MPC vessel is as a helium retention boundary. MPC vessel is designed to withstand maximum internal pressure considering 100% fuel rod failure and maximum accident temperatures.

Table 1.3.2 (continued)

LIST OF ASME CODE ALTERNATIVES FOR HI-STAR 100 SYSTEM

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
MPC Enclosure Vessel	NB-8000	States requirements for nameplates, stamping and reports per NCA-8000.	HI-STAR 100 System to be marked and identified in accordance with 10CFR71 and 10CFR72 requirements. Code stamping is not required. QA data package to be in accordance with Holtec approved QA program.
Overpack Containment Boundary	NB-1100	Statement of requirements for Code stamping of components.	Overpack containment boundary is designed, and will be fabricated in accordance with ASME Code, Section III, Subsection NB to the maximum practical extent, but Code stamping is not required.
Overpack Containment Boundary	NB-2000	Requires materials to be supplied by ASME-approved material supplier.	Materials will be supplied by Holtec approved suppliers with CMTRs per NB-2000.
Overpack Containment Boundary	NB-7000	Vessels are required to have overpressure protection.	No overpressure protection is provided. Function of overpack vessel is as a radionuclide containment boundary under normal and hypothetical accident conditions. Overpack vessel is designed to withstand maximum internal pressure and maximum accident temperatures.
Overpack Containment Boundary	NB-8000	States requirements for nameplates, stamping and reports per NCA-8000.	HI-STAR 100 System to be marked and identified in accordance with 10CFR71 and 10CFR72 requirements. Code stamping is not required. QA data package to be in accordance with Holtec's approved QA program.
MPC Basket Assembly	NG-2000	Requires materials to be supplied by ASME-approved material supplier.	Materials will be supplied by Holtec approved supplier with CMTRs in accordance with NG-2000 requirements.

Table 1.3.2 (continued)

LIST OF ASME CODE ALTERNATIVES FOR HI-STAR 100 SYSTEM

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
MPC Basket Assembly	NG-4420	NG-4427(a) allows a fillet weld in any single continuous weld to be less than the specified fillet weld dimension by not more than 1/16 inch, provided that the total undersize portion of the weld does not exceed 10 percent of the length of the weld. Individual undersize weld portions shall not exceed 2 inches in length.	Modify the Code requirement (intended for core support structures) with the following text prepared to accord with the geometry and stress analysis imperatives for the fuel basket: For the longitudinal MPC basket fillet welds, the following criteria apply: 1) The specified fillet weld throat dimension must be maintained over at least 92 percent of the total weld length. All regions of undersized weld must be less than 3 inches long and separated from each other by at least 9 inches. 2) Areas of undercuts and porosity beyond that allowed by the applicable ASME Code shall not exceed 1/2 inch in weld length. The total length of undercut and porosity over any 1-foot length shall not exceed 2 inches. 3) The total weld length in which items (1) and (2) apply shall not exceed a total of 10 percent of the overall weld length. The limited access of the MPC basket panel longitudinal fillet welds makes it difficult to perform effective repairs of these welds and creates the potential for causing additional damage to the basket assembly (e.g., to the neutron absorber and its sheathing) if repairs are attempted. The acceptance criteria provided in the foregoing have been established to comport with the objectives of the basket design and preserve the margins demonstrated in the supporting stress analysis. From the structural standpoint, the weld acceptance criteria are established to ensure that any departure from the ideal, continuous fillet weld seam would not alter the primary bending stresses on which the design of the fuel baskets is predicated. Stated differently, the permitted weld discontinuities are limited in size to ensure that they remain classifiable as local stress elevators ("peak stress", F, in the ASME Code for which specific stress intensity limits do not apply).
MPC Basket Assembly	NG-8000	States requirements for nameplates, stamping and reports per NCA-8000.	The HI-STAR 100 System will be marked and identified in accordance with 10CFR71 and 10CFR72 requirements. No Code stamping is required. The MPC basket data package will be in conformance with Holtec's QA program.
Overpack Intermediate Shells	NF-2000	Requires materials to be supplied by ASME-approved material supplier.	Materials will be supplied by Holtec approved supplier with CMTRs in accordance with NF-2000 requirements.

Table 1.3.2 (continued)

LIST OF ASME CODE ALTERNATIVES FOR HI-STAR 100 SYSTEM

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
Overpack Containment Boundary	NB-2330	Defines the methods for determining the T_{NDT} for impact testing of materials.	T_{NDT} shall be defined in accordance with Regulatory Guides 7.11 and 7.12 for the containment boundary components.
Overpack Containment Boundary	NF-3320 NF-4720	NF-3324.6 and NF-4720 provide requirements for bolting.	These Code requirements are applicable to linear structures wherein bolted joints carry axial, shear, as well as rotational (torsional) loads. The overpack bolted connections in the structural load path are qualified by design based on the design loadings defined in the SAR. Bolted joints in these components see no shear or torsional loads under normal storage conditions. Larger clearances between bolts and holes may be necessary to ensure shear interfaces located elsewhere in the structure engage prior to the bolts experiencing shear loadings (which occur only during side impact scenarios). Bolted joints that are subject to shear loads in accident conditions are qualified by appropriate stress analysis. Larger bolt-to-hole clearances help ensure more efficient operations in making these bolted connections, thereby minimizing time spent by operations personnel in a radiation area. Additionally, larger bolt-to-hole clearances allow interchangeability of the lids from one particular fabricated cask to another.

Table 1.3.3

MATERIALS AND COMPONENTS OF THE HI-STAR 100 SYSTEM

OVERPACK [1, 2]

Primary Function	Component [3]	Safety Class [4]	Codes/Standards (as applicable to component)	Material	Strength (ksi)	Special Surface Finish/Coating	Contact Matl. (if dissimilar)
Containment	Inner Shell	A	ASME Section III; Subsection NB	SA203-E	Table 2.3.4	Paint inside surface with Thermaline 450 (Note 5). External surface to be coated with a surface preservative.	NA
Containment	Bottom Plate	A	ASME Section III; Subsection NB	SA350-LF3	Table 2.3.4	Paint inside surface with Thermaline 450 (Note 5).	NA
Containment	Top Flange	A	ASME Section III; Subsection NB	SA350-LF3	Table 2.3.4	Paint inside surface with Thermaline 450. Paint outside surface with Carboline 890 (Note 5).	NA
Containment	Closure Plate	A	ASME Section III; Subsection NB	SA350-LF3	Table 2.3.4	Paint inside surface with Thermaline 450. Paint outside surface with Carboline 890 (Note 5).	NA
Containment	Closure Plate Bolts	A	ASME Section III; Subsection NB	SB637-N07718	Table 2.3.5	NA	NA
Containment	Port Plug	A	Non-code	SA193-B8	Not required	NA	NA
Containment	Port Plug Seal	A	Non-code	Alloy X750	Not required	NA	NA

Notes:
1) There are no known residuals on finished component surfaces.
2) All welding processes used in welding the components shall be qualified in accordance with the requirements of ASME Section IX. All welds shall be made using welders qualified in accordance with ASME Section IX. Weld material shall meet the requirements of ASME Section II and the applicable Subsection of ASME Section III. For parts beyond the purview of ASME Section III, compliance with Section IX and Section II of the Code shall be observed to the extent practicable.
3) Component nomenclature taken from drawings in Chapter 1.
4) A,B and C denote important to safety classifications as described in NUREG/CR-6407. NITS stands for Not Important To Safety.
5) Thermaline 450 and Carboline 890 were the product names at the time of initial licensing. Chemically identical products with different names are permitted. For example, Carboline 890 was re-named Carboguard 890 in 2000, with no change to the coating material and is , therefore, acceptable for use where Carboline 890 is specified.

h. Close the drain port valve and pressurize the MPC to a mininum of 85 psig with helium.

i. Close the vent port.

Note:
The leakage test is performed to provide the user with an indication of the integrity of the weld for all MPC types. The CoC required secondary containment helium leakage test for the MPC-68F and MPC-24EF is performed after MPC closure operations are completed. (See Step 7.1.6.5) The leakage detector may detect residual helium in the atmosphere. If the leakage tests detects a leak, the area should be flushed with nitrogen or compressed air and the location should be retested.

j. Perform a helium leakage rate test of the MPC lid-to shell weld using the tracer gas-sniffer method in accordance with the Mass Spectrometer Leak Detector (MSLD) manufacturer's instructions and ANSI N14.5 [7.1.5]. The sum of the MPC Helium Leak Rates shall meet the requirements of Section 8.1.3..

k. Repair any weld defects in accordance with the site's approved weld repair procedures. Re-perform the Ultrasonic, Liquid Penetrant, Hydrostatic and Helium Leakage tests if weld repair is performed.

27. Drain the MPC as follows:

ALARA Warning:
Dose rates will rise as water is drained from the MPC. Continuous dose rate monitoring is recommended.

a. Attach a regulated helium or nitrogen supply to the vent port.

b. Attach a drain line to the drain port shown on Figure 7.1.24.

c. Deleted.

d. Open the gas supply valve and record the time at the start of MPC draindown.

e. Deleted.

f. Blow the water out of the MPC until water ceases to flow out of the drain line. Shut the gas supply valve.

g. Disconnect the gas supply line from the MPC.

h. Disconnect the drain line from the MPC.

28. Dry the MPC as follows:

Note:
When the MPC is dried under the "load and go" operations, The Forced Helium Dehydrator (FHD) will be used to remove water to the levels required in the CoC. The FHD operates in two distinct phases. In Phase 1, liquid water is removed through a forced evaporation process. In Phase 2, heated, dry helium is circulated through the MPC to reduce the remaining water vapor to below required limits. It is recognized that certain MPCs may have been prepared for storage at an ISFSI under 10 CFR 72 where drying was performed using the vacuum drying technique. If vacuum drying was used, the MPC shall have been held at a pressure of $\leq$ 3 torr for $\geq$ 30 minutes to be considered adequately dried prior to helium backfill operations.

a. Connect the FHD to the MPC vent and drain port RVOAs. See Figure 7.1.25.

b. Purge the FHD and connecting piping to remove oxygen from the lines.

c. Operate the FHD through Phase 1 to remove liquid water.

d. Operate the FHD through Phase 2 to remove the water vapor. Helium shall be circulated though the MPC for greater than or equal to 30 minutes with the temperature at the demoisturizer outlet held less than or equal to 21 °F.

29. Backfill the MPC as follows:

Note:
Backfill requires use of 99.995% (minimum) purity helium.

a. Continue operation of the FHD system with the demoisturizer on.

b. While monitoring the temperatures into and out of the MPC, adjust the helium pressure in the MPC to provide a fill pressure as required in Table 1.2.3.

c. Open the FHD bypass line and Close the vent and drain port RVOAs.

d. Disconnect the FHD from the MPC.

30. Weld the vent and drain port cover plates as follows:

a. Wipe the inside area of the vent and drain port recesses to dry and clean the surfaces.

b. Place the cover plate over the vent port recess.

c. Deleted.

Note:
The vent and drain port cover plates are provided with two small threaded holes with set screws for the injection of helium. The set screws may be installed or removed during welding.

d. Deleted.

e. Tack weld the cover plate.

f. Visually inspect the tack welds.

g. Weld the root pass on the vent port cover plate.

h. Perform a liquid penetrant examination on the vent port cover plate root weld.

i. If required, complete the vent port cover plate welding and perform a liquid penetrant examination on the final weld pass.

j. Repeat Steps 30.a through 30.i for the drain port cover plate.

31. Perform a leakage test of the MPC vent and drain port cover plates as follows:

Note:
The leakage test is performed to provide the user with an indication of the integrity of the weld for all MPC types. The CoC required secondary containment helium leakage test for the MPC-68F and MPC-24EF is performed after MPC closure operations are completed. (See Step 7.1.6.5) The leakage detector may detect residual helium in the atmosphere from the helium injection process. If the leakage tests detects a leak, the area should be blown clear with compressed air or nitrogen and the location should be retested. The following process provides a high concentration of helium gas into the cavity. Other methods that ensure a high concentration of helium gas are also acceptable.

a. If necessary, remove the cover plate set screws.

b. Flush the cavity with helium to remove the air and immediately install the set screws recessed ¼-inch below the top of the cover plate.

c. Plug weld the recess above each set screw to complete the penetration closure welding.

d. Perform a liquid penetrant examination on the plug weld.

e. Flush the area around the vent and drain cover plates with compressed air or nitrogen to remove any residual helium gas.

f. Perform a helium leakage rate test of vent and drain cover plate welds using the evacuated envelope-gas detector method in accordance with the Mass Spectrometer Leak Detector (MSLD) manufacturer's instructions and ANSI N14.5 [7.1.5]. The sum of the MPC Helium Leak Rates shall meet the requirements of Section 8.1.3.

g. Repair any weld defects in accordance with the site's approved code weld repair procedures. Re-perform the leakage test as required.

32. Weld the MPC closure ring as follows:

ALARA Note:
The closure ring is installed by hand. No tools are required. The closure ring may be provided as a complete ring or in multiple sections. In the case of the single ring, no radial connecting welds are needed. Portions of the closure ring may be installed while the MPC is filled with water and after the lid-to-shell weld is complete to reduce dose.

a. Install and align the closure ring. See Figure 7.1.8.

b. Tack weld the closure ring to the MPC shell and the MPC lid.

c. Visually inspect the tack welds.

d. Lay the root weld between the closure ring and the MPC.

e. Perform a liquid penetrant examination on the closure ring root welds.

f. If necessary, complete the closure ring welding and perform a liquid penetrant examination on the closure ring final welds.

g. Remove the Automated Welding System.

h. If used, remove the AWS baseplate shield. See Figure 7.1.12 for rigging.

7.1.6 Preparation for Transport

1. Remove the annulus shield and seal surface protector and store it in an approved plant storage location

ALARA Warning:
Dose rates will rise around the top of the annulus as water is drained from the annulus. Apply appropriate ALARA practices.

2. Attach a drain line to the HI-STAR 100 overpack drain connector and drain the remaining water from the annulus to the spent fuel pool or the plant liquid radwaste system (See Figure 7.1.17).

3. Install the overpack closure plate as follows:

a. Remove any waterproof tape or bolt plugs used for contamination mitigation and ensure that the threaded holes in the MPC lid are plugged to prevent radiation streaming.

b. Clean the closure plate seal seating surface and the HI-STAR 100 overpack seal seating surface and install new overpack closure plate mechanical seals.

c. Remove the test port plug and store it in a site-approved location. Discard any used metallic seals.