July 15, 2010

Mr. Todd Sellmer
Packaging Integration
Washington TRU Solution, LLC
P.O. Box 2078
Carlsbad, NM 88221-2078

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR REVIEW OF THE MODEL NO. RH-TRU 72-B SHIPPING PACKAGE

Dear Mr. Sellmer:

By letter dated February 12, 2010, and supplemented on April 19, 2010, Washington TRU Solution, LLC, submitted an amendment request to the U.S. Nuclear Regulatory Commission for Certificate of Compliance No. 9212. Washington TRU Solution, LLC, requested in the letter the addition of new authorized payload canisters, Neutron Shielded Canister, NS15 and NS30 designs that incorporate internal neutron shielding for shipment in the RH-TRU 72-B package.

In connection with the staff's review, we need the information identified in the enclosure to this letter. We request that you provide this information by August 30, 2010. Inform us at your earliest convenience, but no later than August 20, 2010, if you are not able to provide the information by that date. To assist us in re-scheduling your review, you should include a new proposed submittal date and the reasons for the delay.

Please reference Docket No. 71-9212 and TAC No. L24419 in future correspondence related to this request. The staff is available to meet to discuss your proposed responses. If you have any questions regarding this matter, I may be contacted at (301) 492-3147.

Sincerely,

/RA/
Soly I. Soto, Project Manager
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9212
TAC No. L24419

Enclosure: Request for Additional Information

cc w/encl: Christopher Staab

July 15, 2010

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Packaging Integration
Washington TRU Solution, LLC
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Request for Additional Information
U.S. Department of Energy (DOE)
Washington TRU Solutions, LLC
Docket No. 71-9212
Model No. RH-TRU 72-B Shipping Package

Chapter 2 Structural Evaluation

1. Provide the structural material, codes, analysis, etc., and details of the construction of the package in the RH-TRU Safety Analysis Report (SAR), Rev. 5, in order to qualify it for Type B(M), an exclusive use package.

   On page 1.2-7, the applicant has indicated that the package is for an "exclusive use." Elsewhere it has been claimed that the package is for "non-exclusive use" (SAR pg. 3.4-2). The staff needs this information to determine whether it will meet the requirements of the intended function.

   This information is requested by staff for compliance with 10 CFR 71.75.

2. Explain how the structural integrity of the personnel barrier, if any, is maintained during the NCT event. Provide details regarding the deformed shape following the event and the structural analysis that was performed of the personnel barrier.

   RH-TRU SAR, Rev. 5, does not describe the deformed shape of the personnel barrier subjected to NCT loads. Modify and add details that describe the shape of the barrier into the appropriate Section of the SAR.

   This information is requested by staff for compliance with 10 CFR 71.71.

3. Provide structural design details of the CDX grade plywood disc. Explain how this disc is assembled and discuss the behavior of this disc inside the cask when the package is subjected to the regulatory drops for NCT and HAC events.

   The staff found the SAR inadequate in addressing the design details of this component.

   This information is requested by staff for compliance with 10 CFR 71. 33.

4. Provide justification(s), validated by test data presented in Appendix 3.6.4 for maintaining the leak tightness of O-ring under HAC event. Reconcile results with those described in the test report.

   The current documentation provided in the SAR for justification for O-ring leak tightness of the package model is not adequate, especially since the density of the polyurethane foam material for the NS-30 neutron shielded canister is not substantiated adequately.

   This information is requested by staff for compliance with 10 CFR 71.35.

5. Justify comparing maximum analysis displacement to the post-test deformation reported in the SAR. The implication by the applicant is that there is no elastic behavior of the impact limiter.

The staff did not find sufficient and accurate justification for the applicant to assume a totally inelastic behavior of the impact limiter materials. A justification is required to determine the magnitude of the damage sustained by the package subjected to regulatory drops, and to verify the adequacy of the impact limiter design.

This information is requested by staff for compliance with 10 CFR 71.73(c)(1).

6. Provide a complete stand-alone description of the summary of damage to the various structural components for NS-30 model, under NCT and HAC events.

   The staff needs this information to evaluate any potential cross cutting issues with other discipline such as criticality and shielding.

   This information is needed for compliance with 10 CFR 71.35.

   This information is needed for compliance with 10 CFR 71.73(c)(1).

Chapter 3 Thermal Evaluation

1. Indicate whether metallic waste will be placed within the shielded NS15 and NS30 canisters.

   Staff is not able to determine if metallic waste will be placed within the NS15 and NS30 canisters. For example, on page 9 of 52 of the RH-TRU SAR, Rev. 5, Thermal Analysis of RH Shielded Canisters in RH-TRU 72-B Cask, Section 2.5.2, Decay Heat indicates that a paper waste stream is considered for the shielded canisters. However, page 8 of 52, second item under Section 2.3, of Thermal Analysis of RH Shielded Canisters in RH-TRU 72-B Cask mentions metallic waste configurations. Considering that the SAR indicates that a 300 W metallic waste stream results in a surface temperature at the regulatory limit (122^{o}F), provide an analysis of the metallic waste stream inside the NS15 and NS30 shielded RH waste container, unless the NS15 and NS30 shielded RH waste containers will not be used to ship metallic waste stream. It should be mentioned in Section 7, Operating Procedures if metallic waste is not to be shipped in the shielded canisters.

   This information is requested by staff to determine compliance with 10 CFR 71.71.

2. Clarify whether paper waste and metallic waste will not be shipped in the same package.

   The analyses assumed either paper waste or metallic waste. Confirm whether or not paper waste and metallic waste will be shipped in the same package.

   This information is requested by staff to determine compliance with 10 CFR 71.71.

3. Indicate whether the thermal properties used in the thermal analysis are conservative/bounding.

   RH-TRU SAR shows that properties used in the thermal analyses are often not given as a function of temperature. For example, see page 15 of 52, Thermal Analysis of RH Shielded Canisters in RH-TRU 72-B Cask, Table 3-2, page 3.2-3 and Table 3.6.1-1, page 3.6.1-5, RH-TRU 72-B SAR, Rev. 5, February 2010. Therefore, the text should indicate whether the thermal properties at the single temperature conservatively bound the analyses.

This information is requested by staff to determine compliance with 10 CFR 71.71.

4. Discuss the results of the sensitivity analyses for waste placement.

   On page 17 of 52, page 31 of 52, pages 48-50, Thermal Analysis of RH Shielded Canisters in RH-TRU 72-B Cask, Section 4.1, it is mentioned that there were evaluations of sensitivity analyses for waste payload placement and centered/eccentric placement. Explain the extent of the differences in temperature in order to put in perspective the final arrangement chosen for analysis, such as shown in Figure 4-1 and Figure 4-2.

   This information is requested by staff to determine compliance with 10 CFR 71.71.

5. Provide the allowable temperatures of the components used in the RH-TRU 72-B package.

   On page 3.1-3 and page 3.1-4, Table 3.1-1 and Table 3.1-2, of the RH-TRU 72-B SAR, Rev. 5, the allowable limits (not N/A) need to be provided for the items listed in the tables.

   This information is requested by staff to determine compliance with 10 CFR 71.71.

6. Explain the disparate temperature differentials between the OC thermal shield and OC outer shell under NCT and HAC conditions.

   On page 3.4-12, Table 3.4-2 of the RH-TRU 72-B SAR, Rev. 5, February 2010, the temperatures of the OC thermal shield and OC outer shell are very similar, 142^{o}F and 143^{o}F respectively, for the NCT condition, implying a small resistance between the two components, but there is a very large temperature difference between the OC thermal shield (1231^{o}F) and OC outer shell (611^{o}F) for the HAC condition. For a given thermal resistance of the thermal shield, staff is not able to verify why the 1^{o}F temperature increase between the thermal shield and outer shell for NCT should suddenly increase to 620^{o}F for HAC [Temperature differences between the shell and thermal shield of approximately 350^{o}F have been previously seen.]

   This information is requested by staff to determine compliance with 10 CFR 71.71.

7. Clarify the amount of decay heat and distribution of the payload within the RH-TRU 72-B package.

   On page 3.4-13, Table 3.4-5 of RH-TRU 72-B SAR, Rev. 5, it is stated that the canister and container can hold 300 W metallic waste or 21.7 W paper waste. However, clarifications on the canister and container terms are needed. For example, page 39 of 52 of the thermal analysis uses the term *canister* to describe NS15 and NS30 and also mentions that they can hold, for example, six 8-gallon *containers*. Revise Table 3.4-5 to clarify whether the entire package will hold 300 W metallic waste or 21.7 W paper waste.

   This information is needed to determine compliance with 10 CFR 71.71.

8. Justify the accuracy of Figure 3.4-1 and Figure 3.4-2 of the RH-TRU 72-B SAR. In addition, discuss why the 50 W paper waste temperature is higher than the 300 W metallic waste temperature.

   On page 3.4-12, Table 3.4-2 RH-TRU 72-B SAR, Rev. 5 the charts illustrated in Figure 3.4-1 and Figure 3.4-2 show that the average payload temperature is the same for both waste types. In addition, they also show that the waste centerline temperature is higher for the 50 W waste than for the 300 W waste. Higher decay heats tend to result in a larger source temperature. Therefore, Figures 3.4-1 and 3.4-2 need to be revised.

   This information is requested by staff to determine compliance with 10 CFR 71.71.

9. Provide further discussion on the properties of crushed polyurethane foam and charred polyurethane foam.

   On page 3.5-2 RH-TRU 72-B SAR, Rev. 5, it is not clear how the polyurethane foam's thermal conductivity was changed to reflect the crushed foam. In addition, considering that the morphology of the foam is different between uncharred and charred foam provide the basis for stating that the charred foam's thermal conductivity does not change appreciably from the uncharred foam.

   This information is requested by staff to determine compliance with 10 CFR 71.71.

10. Include a Prg calculation that assumes the hypothetical accident condition at the *end* of the maximum 60 day transport period.

    Page 3.5-3 RH-TRU 72-B SAR, Rev. 5. The Prg component of the IV pressure is based on 125.9^{o}F. However, if the hypothetical accident condition occurred at the end of the 60 day transport period, the pressure would have to reflect the 295^{o}F HAC temperature. The pressure values that make up Pmax should reflect the higher temperature associated with the hypothetical accident condition. This would raise the maximum pressure beyond 178.8 psig.

    This information is requested by staff to determine compliance with 10 CFR 71.71.

11. Provide the basis for the O-ring compression dimensions.

    On page 3.6.4-1 RH-TRU 72-B SAR, Rev. 5, the basis for the 26.3 inch dimension on the last sentence of the page was not provided. Similarly, on page 3.6.4-2, the basis for the 31.000 inch dimension on the last sentence of the page was not provided. Confirm the gland (O-ring notch) dimensions are appropriate for the O-ring dimensions provided in the Chapter 1 drawings.

    This information is requested by staff to determine compliance with 10 CFR 71.71.

12. Discuss how the weighted thermal conductivity of the metallic waste in the analysis is conservative/bounding. Likewise, the procedure for combining the waste and cementitious material should be provided in the SAR.

    On page 3.2-1, RH-TRU 72-B SAR, Rev. 5, the third paragraph states: "A weighted conductivity of the metallic waste is calculated assuming the metal is encased in a cementitious material. The relative amount of these materials is determined by adjusting the portions to achieve a maximum allowable payload weight with three completely filled 55-gallon drums. The heat generation is assumed to be *evenly distributed* throughout the drums."

a) Since the mixture thermal property may affect package temperature, a procedure for adjusting the metal and cementitious material in the correct proportions needs to be provided in the SAR.
b) An "evenly distributed" heat generation could result in a non-conservative analysis. As a result, the analysis needs to indicate the sensitivity of the results to a non-uniform heat generation assumption (i.e., localized 'hot spots') especially considering that the surface temperature is equal to the regulatory limit of 122^{o}F.
c) On page 3.6.1-4 RH-TRU 72-B SAR, Rev. 5, the thermal conductivity of the metallic payload is listed as 9.47 Btu/hr ft^{o}F. However, there is no calculation or basis for that value mentioned. Additional discussion is warranted to ensure the 9.47 Btu/hr ft^{o}F thermal conductivity value is bounding for NCT and HAC.

   This information is requested by staff to determine compliance with 10 CFR 71.71.

13. Confirm the gap dimensions and that the modeling arrangement of the HDPE insert results in conservative NCT and HAC temperatures.

a) On page 5.1-30: RH-TRU Payload Appendices, Rev. 1, the fourth paragraph states: "Maintaining a tight contact between the bases of the insert and canister shell will yield *lower* NCT temperatures for the insert and payload and *lower* HAC temperatures …." Confirm the modeling arrangement is such that NCT and HAC temperatures are conservative.
b) On page 5.1-30: RH-TRU Payload Appendices, Rev. 1, February 2010, the fourth paragraph refers to 0.125 inch and 0.375 inch axial gaps for the base and lid ends of the canister. However, on page 37 of 52, Thermal Analysis of RH Shielded Canisters in RH-TRU 72-B Cask, the second to last sentence describes 0.125 inch and 0.5 inch gaps. Confirm that the gaps modeled are consistent and conservative/bounding values.

   This information is requested by staff to determine compliance with 10 CFR 71.71.

14. Considering that there is no "Margin of Error" section in the RH-TRU 72B SAR, Rev. 5, discuss and provide quantification of the conservative nature of the thermal analyses.

   Some issues that should be addressed include:
   a) Averaging the insolation over 24 hours (page 3.6.1-1 RH-TRU 72-B SAR, Rev. 5, February 2010) tends to result in package surface temperatures that are not conservative (per "Thermal Modeling of Packages for Normal Conditions of Transport with Insolation", J.C. Anderson and M.R. Feldman, CONF-951135-28, Proceedings of the ASME Heat Transfer Division, HTD-Vol. 317-2 International Mechanical Engineering Congress and Exposition, November 1995). Applying a transient insolation boundary condition (e.g., 12 hours "on" and 12 hours "off") would result in the 300 W package surface temperatures being above the 122^{o}F limit.
   b) Another potentially non-conservative assumption is a uniform radial gap. Page 38 of 52, Thermal Analysis of RH Shielded Canisters in RH-TRU 72-B Cask, Section 7.4.2 states, "The use of a uniform radial gap is appropriate for NCT and HAC evaluations even though the RH-TRU 72-B package is transported horizontally since the

increase in the radial gap on one side of the HDPE insert will be offset by a corresponding smaller gap on the opposing side." This would indicate the actual situation is not axisymmetric. Therefore, the highest expected temperatures of the package components under NCT and HAC, whether for a "large" gap situation and/or a "small" gap situation, needs to be provided.

c) Confirm that a node sensitivity analysis was performed and results are grid independent.

This information is requested by staff to determine compliance with 10 CFR 71.71.

15. Resolve the inconsistency upon the surface emissivity and absorbtivity values were used in the analyses.

    Page 3.2-4 of RH-TRU 72-B SAR, Rev. 5, lists emissivity and absorbtivity values that are different than those listed on page 3.6.1-1 and page 3.6.1-7.

    This information is requested by staff to determine compliance with 10 CFR 71.71.

16. Clarify the maximum allowable decay heats of paper waste and metallic waste that are expected to be shipped. This will then put into context the decay heat values used in the calculations.

    a) On page 3.4-1 RH-TRU 72-B SAR, Rev. 5, the last sentence states: "The two payload models represent the bounding conditions for all payloads, because the established payload parameter limits *do not approach the conditions represented by the models*." This sentence should be expanded to indicate the maximum decay heats that will be allowed in practice versus the decay heat values used in the calculations. As an example, the modeling of the metallic waste was based on a 300 decay heat. From the quoted sentence above, it would appear that a 300 W decay heat package will not be shipped. Staff is unable to determine if a package will not contain 300 W of metallic waste decay heat and what is the maximum metallic waste decay heat that is allowed to be shipped.
    b) There are a series of statements concerning the allowable decay heats based on a flammable gas generation consideration and vessel design pressure consideration. For example, on page 3.4-3 RH-TRU 72-B SAR, Rev. 5, at the top of page states: "Included in the evaluation is a demonstration that accumulation of potentially flammable gas is precluded." Page 3.4-8 of the SAR states that hydrogen gas generation will be the controlling factor for decay heats of organic material that are below 21.7 W. Pages 5.3-1 to 5.3-3 of the TRAMPAC indicate that the flammable gas limit will be reached if the paper waste decay heat reaches 5.149 W whereas the RH-TRU Payload Appendices (page 2.5-32) indicate that the maximum allowable decay heat is 0.8347W. However, pages 3.4-8 and 3.4-9 then show that a decay heat of 21.7 W generates a pressure that reaches the vessel design pressure. Staff is unable to determine whether the maximum paper waste decay heat that is allowed to be shipped is 0.8347 W, 5.149 W, or 21.7 W.

    This information is requested by staff to determine compliance with 10 CFR 71.71.

17. Confirm the free convection heat transfer correlations that were used in the analyses.

    On Page 3.4-1 RH-TRU 72-B SAR, Rev. 5, the fifth paragraph implies that the heat transfer coefficient correlation provided on page 3.6.1-2, based on *turbulent* flow, is appropriate for *free* convection. Justify, the appropriateness of using a turbulent flow correlation for free convection.

    This information is requested by staff to determine compliance with 10 CFR 71.71.

18. Clarify whether helium formation due to alpha decay was considered in the pressure analysis.

    On page 3.4-3 RH-TRU 72-B SAR, Rev. 5, section 3.4.4.2, staff is unable to identify the effects of the formation of helium due to alpha decay (e.g., decay of Pu) on the pressure analysis.

    This information is requested by staff to determine compliance with 10 CFR 71.71.

    Note: Editorial comment/clarification. Page 6 of 52, Thermal Analysis of RH Shielded Canisters in RH-TRU 72-B Cask, Section 1.2, Purpose states that NUREG-1617 was used for guidance, although the references (page 32 or 52) list NUREG-1609. Clarify if NUREG-1609 was used for guidance and make the appropriate corrections.

Chapter 4 Containment Evaluation

1. Clarify the O-ring test procedure.

   Page 3.6.4-4 to 3.6.4-6 RH-TRU 72-B SAR, Rev. 5, Section 3.6.4.3 Formulation Qualification Test Fixture and Procedure RH-TRU 72-B SAR, Rev. 5, February 2010:

   a) Page 3.6.4-5 discusses ‘rapid’ permeation and saturation of helium at high temperatures. Explain why the small test volume of the O-ring annulus (and hence, time for the test) would not allow helium leak testing at the NCT and HAC O-ring temperatures (approximately 150°F).
   b) Explain what a “rapid, hard vacuum” and the time period that it is “maintained” mean.
   c) In order to minimize the permeation effects during measurement is it possible for a helium atmosphere to be applied after the eight hours at high temperature and then apply Section A.5.3, Gas Filled Envelope – Gas Detector of ANSI N14.5? It is understood that the answer is dependent on the available experimental setup.

   This information is requested by staff to determine compliance with 10 CFR 71.35.

2. Discuss the appropriateness of using the low end of the pressure transducer range and sensitivity to measure the leak tightness criteria, as described in Containment RSI response 1.

   Containment RSI response 1, from the applicant (April 2010) indicated that the preshipment leak test will be based on using the low end of the pressure transducer range and sensitivity. Discuss the appropriateness of using the low end of the pressure transducer range and sensitivity, considering that transducers are usually accurate to a certain percentage (say 1%) of full scale. Operating at the low end of a wide measurement range is not desirable.

This information is requested by staff to determine compliance with 10 CFR 71.35 and 71.41.

3. Discuss the package venting procedure.

   Page 7.1-1 and 7.2-1 RH-TRU 72-B SAR, Rev. 5, mentions package venting. The venting procedure and the appropriate controls should be mentioned in the SAR.

   This information is requested by staff to determine compliance with 10 CFR 71.89.

Chapter 5 Shielding Evaluation

1. Provide an analysis of the effect of lead slumping on dose rate. Show that this is bounded by the effect of lead thinning due to impacts, which is the hypothetical accident condition (HAC) in the SAR.

   On page 4.3-2 of RH-TRU SAR, Rev. 5, the applicant states that "a conservatively maximum bounding lead slump of 0.513 inches is estimated." However, an analysis of the effect of lead slumping on dose was not included. Nor was a justification that leads slumping is bounded by the current HAC provided. Include in the response the output files of any shielding models used to analyze the dose effect of lead slumping.

   This information is requested by staff to show compliance with 10 CFR 71.51(a)(2) and 71.73.

2. Provide NCT activity limits similar to the HAC limits in Table 3.2-2 of the RH-TRAMPAC document.

   Prior to loading the package the shipper needs to rely on the calculated allowable source terms for all isotopes under normal and accident conditions. The pre-shipment radiological survey should be used only for confirming the regulatory dose limit. Also provide the composition and density of the compressed transuranic waste to be shipped in the RH-TRU 72-B. Of particular interest is the amount of hydrogen and other light elements. Staff performed scoping calculations to investigate the amount of self-shielding required to load up to the new curie limits without exceeding the NCT dose limits. To achieve acceptable dose rates for NCT a significant amount of self-shielding is needed. The NRC staff needs this information to determine whether there is enough self shielding to allow shipment of the higher activity waste.

   This information is requested by staff to show compliance with 10 CFR 71.47.

Chapter 6 Criticality Evaluation

1. Provide the output file for the most reactive (highest k_{eff}) Case C model.

   NRC staff frequently needs to request additional sample input/output files to cover what is described in the applicant's document. Submit the bounding or most reactive configurations.

   This information is requested by staff to determine compliance with 10 CFR 71.33 and 71.55.

Note: There is an error in the equation for the mass of Carbon on Page 6.3-7 of the SAR. The MwO term should be MwC.

Chapter 7 Operating Procedures

1. A temperature survey should be included in the operating procedures during loading.

   A temperature survey should be performed, considering that the 300 W payload results in a package surface temperature equal to the 122^{o}F regulatory limit.

   This information is requested by staff to determine compliance with 10 CFR 71. 87.

2. Clarify the preshipment leakage rate test procedure.

   Revise pages 7.4.1-1 and 7.4.1-2, RH-TRU 72-B SAR, Rev. 5, to clarify the following items:
   a) Provide the basis of the 1.32 factor in the equation under item 9 of Section 7.4.1.2. Confirm that it is based on converting the 1 E-3 scc/s to leak rate sensitivity in torr cc/s.
   b) Explain the reason for choosing the sensitivity on the digital readout of the calibrated pressure transducer as the DP value. See Containment RAI Item 2 above.
   c) Discuss the connection between the time determined from page 7.4.1-1 and the statement that the time of the Section 7.4.1.3 leakage rate tests.
   d) Clarify whether using Equation B.14 of ANSI N14.5 will provide the same conclusion as the leak rate procedure discussed in 7.4.1.3.

   This information is requested by staff to determine compliance with 10 CFR 71.87.

3. Revise Chapter 7 of RH-TRU SAR, Rev. 5, to add the shipping time restriction of 60 days.

   Per Chapter 7 of NUREG-1609, procedures for special operational controls, such as the 60 day shipping limit, should be written.

   This information is requested by staff to determine compliance with 10 CFR 71.87.

Chapter 8 Acceptance Tests and Maintenance Program

1. Verify that the vessels should be dried after performing the hydrostatic pressure testing and prior to the leakage rate tests.

   Page 8.1-2 RH-TRU 72-B SAR, Rev. 5, February 2010: Verify the vessels should be dried after performing the pressure testing and prior to the leakage rate tests.

   This information is requested by staff to determine compliance with 10 CFR 71.35.

2. Clarify the method that is used to determine the leakage rate.

   On page 8.1-5 of RH-TRU SAR, Rev. 5, paragraph 8.1.3.2.12 and page 8.1-7, paragraph 8.1.3.5.8 etc., states: "Determine the leakage rate of the system using the leak detector." Clarify if the leakage rate is determined by equitation or by comparing the response time with the calibration standard response time.

   This information is requested by staff to determine compliance with 10 CFR 71.35.

3. Explain how a calibration standard leak is used in the small annular region between O-ring seals.

   On page 8.1-6, item 8.1.3.4.6 of RH-TRU SAR, Rev. 5,: staff is unable to identify how a calibration standard leak is utilized (per page 8.1-2, paragraph 8.1.3.0.2) for the region associated with the small volume between the containment O-ring seal and backfill O-ring seal. Confirm whether a calibration standard leak is used in the small annular region between O-ring seals.

   This information is requested by staff to determine compliance with 10 CFR 71.35.

4. Clarify the helium testing between O-ring seals in Section 8.1.3.3.

   Section 8.1.3.3 of RH-TRU SAR, Rev. 5, item 8.1.3.3.3 refers to paragraphs 8.1.3.2.3 through 8.1.3.2.8 as having a helium atmosphere *below* the Gas Sampling Port O-ring seals. However, paragraphs 8.1.3.2.3 through 8.1.3.2.8 refer to a helium atmosphere in the annular region *between* the containment O-ring and the backfill O-ring; not within the inner vessel. It would appear that there would be a helium atmosphere below the top gas sampling port O-ring seals and not the lower gas sampling port O-ring seal.
   a) Per Figure 4.1-1, there are two gas sampling port O-ring seals. Confirm that the testing of the gas sampling port is associated with only the upper gas sampling port O-ring seal.
   b) Explain the purpose of the lower gas sampling port O-ring seal.
   c) A test port tool diagram is not shown. Explain if it allows the space above the port closure bolt to be evacuated and for that vacuum to be sustained when the helium detector is in operation.

   This information is requested by staff to determine compliance with 10 CFR 71.35.