ALION
SCIENCE AND TECHNOLOGY

4525 Weaver Parkway, Suite 230
Warrenville, Illinois 60555
tel: 630.393.1215 fax: 630.393.1235
www.alionscience.com

March 07, 2008
261-4779-LTR-05

Mr. Michael L. Scott
Chief, Safety Issues Resolution Branch
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Mail Stop O-11A11
Washington, DC 20555-0001

Subject: Resolution of NRC Questions Regarding ALION VUEZ 30 Day Testing Program Status of Responses

Reference:
1. Alion Letter 261-4779-LTR-01, Dated February 8, 2008 entitled Resolution of NRC Questions Regarding ALION VUEZ 30 Day Testing Program Status of Responses.
2. NRC Questions – Alion Follow Up Issues – Corrected-Bolded, sent February 13, 2008.

Dear Mr. Scott:

As stated in the Reference 1 letter, the attached is our response to Alion Problem Statements Nos. 13 and 14. A table has been included indicating the status of each open item. The NRC comments and questions are taken from Reference 2.

Alion Problem Statement No. 13

What is the impact of neglecting the fiberglass binder in the experiment?

The following response encompasses NRC comment No. 19.

19. What is the impact of neglecting the binder of heat-treated fibrous insulation?

Explain why neglecting the binder does not have a significant adverse impact on the test results.

Response:

Temp-Mat insulation® (i.e., a trade name for a glass fiber felt insulation that meets ASTM C1086 requirements) does not have a binder since the product relies instead on mechanical bonding of the fibers with one another. It does have an organic content, < 1%, consisting of oil used to lubricate the glass fibers during the needling process of Temp-Mat manufacture. The residual oils and other volatiles from the manufacturing process will, over time, evaporate or burn off and become airborne as a result of elevated containment and process piping temperatures. Most Temp-Mat insulation and other insulating materials found inside containment have been installed and in-service for lengthy periods of time. The residual organic materials would, therefore, not

necessarily be present at the time of the accident. During or following a LOCA, the Temp-Mat insulation will be exposed to boiling or near boiling process fluids.

The protocol for the VUEZ testing boiled the Temp-Mat and NUKON® fibers is to drive off any lubricating oil, binder, or manufacturing residue material prior adding the fiber to the tanks. Some of the Temp-Mat material was also baked, prior to adding it to the tanks, to drive off residual manufacturing material. This method of preparation was appropriate and intended to simulate the exposure and interaction of the fibers with hot surfaces during service and the hot reactor fluid after an accident. It is recognized if the Temp-Mat insulation is newly installed, then some residual manufacturing material could be present on the fibers, leach into the post-LOCA fluid and potentially contribute to chemical effects. During this scenario, the trace amounts of residual oils and other manufacturing material, dissolved in 250 000 or more gallons of post-LOCA fluid resulting in ppb level concentrations, would be so small as to not have any significant impact on or contribute to any chemical interaction.

Alion Problem Statement No. 14

What is the impact of fluid sampling on the experiment?

The following response encompasses NRC comment Nos. 22 and 23.

22. What is the impact of the volume reduction caused by the removal of fluid during testing, to make room for debris samples, on the concentration of dissolved chemical species in the test tank?

23. What is the impact of removing fluid during testing on the test results? Note that the removed fluid may contain a finite quantity of dissolved chemical species, particulate, or other fine debris.

Response:

There is no impact on test fluid composition or concentration of dissolved chemical species caused by the removal of fluid during testing, to make room for debris samples. Removing fluid does not change the constituents or chemical composition of the fluid. In determining the quantity of debris to be added, the reduced volume of fluid was considered and the quantity of material to be added, adjusted accordingly. Following the addition, samples were made to confirm that the fluid was within test specification.

The large test tank volume is 560 liters and the small loop volume is 59 liters. The test procedures do require the removal of solution in order to analyze the corrosion products in solution. In general, sampling was performed to determine calcium, aluminum, silicon, zinc levels. The Vuez tests, in general, removed no more than 2 to 3 % of the test fluid. Based on the ICP results, a 5% reduction in tank volume has no significant impact on the experiment as the concentration levels are relatively high and the resulting volumetric change does not significantly impact the overall concentrations or constituents within the test loop. During testing, the fluid is constantly circulated ensuring that removed fluid is the same as the test fluid in concentration and constituents. The concentration levels of test materials are confirmed, during the test, to be within the test specifications and bounds as part of the sampling process.

It is recognized that small quantities of non-transportable particulate were not included in the test for their chemical impacts. Small quantities, by definition, do not significantly affect test results. If a mass or volume of material could affect the test results, it is added to the test mixture.

As stated above, the relatively small amounts of fluid removed to allow for the addition of test material has no impact on overall fluid composition. ICP results confirm that the removal of fluid, for analysis, does not significantly change the overall balance of material and therefore does not change the potential for chemical interactions.

If you have any questions or require additional information please contact me at (630) 846-6787 or Steven Unikewicz at (703) 439-7133.

Sincerely,

Robert Choromokos
Manager, Energy Services Division

cc: P. Mast
S. Unikewicz
Owner's Group Distribution

Table 1: ALION VUEZ CE Testing Questions

No.	NRC Issue/Comment	No.	ALION Problem Statement	Completion Date	Status
1 3 4	Prototypicality of poured debris bed Prototypicality of poured debris bed Representativeness of debris size distribution	1	Provide the basis for the debris bed preparation, including the size characteristics and method of formation relative to the prototype debris bed.	Feb 29 2008	working
5 6	Maximum load versus thin-bed testing Maximum load versus thin-bed testing	2	How are the chemical effects captured for the range of debris loadings possible in the plant specific analysis given the impact of chemical effects could be different for different debris loading conditions?	Feb 15 2008	Sent
7	Flat plate representative of filled strainer volumes	3	Why is the debris bed on a flat plate representative of a debris bed on a complex shape and filled strainer volumes?	Feb 15 2008	Sent
9	Bypass flow around bed - edge effects	4	Describe the impact of the VUEZ screen configuration and suction piping on the results. The screen may exhibit bypass flow at the edges of the debris bed. How is this prevented or considered in the results?	Feb 29 2008	Sent
10	Debris settling in tanks	5	Address the adequacy of the turbulence levels in the tank to ensure adequate circulation around all coupons/materials and material in suspension.	Mar 14 2008	
21 20	Flow conditions and material interaction Tank mixing versus time of material interaction	6	Address any material settling inside the tank and the impact on the results.	Mar 14 2008	
8	Gas void issues and impact on results	7	Describe the impact of gas void issues under the debris bed on the results.	Mar 21 2008	
2	Technical basis of bump-up factor	8	Provide the basis for the bump up factor and illustrate with an example.	Feb 29 2008	Working

Table 1: ALION VUEZ CE Testing Questions (cont'd)

No.	NRC Issue/Comment	No.	ALION Problem Statement	Completion Date	Status
11 12 13 14 18	Test parameters ensure a conservative test Basis for temperature correction Basis for timing of acid addition Basis for timing of LiOH addition pH shock and impact on head loss	9	Provide the basis for the selection of the time, temperature, chemistry and materials used for the test to ensure a conservative test is performed with respect to plant conditions.	Feb 15 2008	Sent
15	Impact of elevated pH due to debris in DM water	10	What is the impact of the elevated pH due to debris dissolution in demineralized water on the results of the experiment.	Mar 21 2008	
16	Impact of sudden temperature drop in HX	11	What is the impact of a sudden temperature drop from a heat exchanger and the potential for thermal cycling?	Mar 14 2008	
17	Representativenss of plate for failed metallic coatings	12	What is the basis for representing failed metallic coatings as metallic sheets?	Feb 22 2008	Sent
19	Inclusion of fiberglass binder in experiment	13	What is the impact of neglecting the fiberglass binder in the experiment?	Mar 7 2008	Sent
22 23	Volume change due to material additions Effect of sampling on chemical concentrations	14	What is the impact of fluid sampling on the experiment?	Mar 7 2008	Sent
24	Repeatability of tests	15	Are the tests repeatable?	Feb 15 2008	Sent
25	Measurement uncertainties	16	How are measurement uncertainties accounted for in the development of the test parameters and application of the experimental results.	Mar 28 2008	
26	Copy of test procedure for large Elisa Loop	17	Provide a copy of the large loop test procedure.	Feb 15 2008	Sent
27	Copy of alkyd coatings chemical report	18	Provide a copy of the alkyd coatings chemical report?	Feb 15 2008	Sent
28	Quality assurance	19	Provide a summary of any quality assurance issues noted and their impact on results or corrective actions taken.	Mar 28 2008	