NRC FORM 699
(11-2017)

U.S. NUCLEAR REGULATORY COMMISSION

CONVERSATION RECORD

NAME OF PERSON(S)/TITLE CONTACTED OR IN CONTACT WITH YOU	DATE OF CONTACT	TYPE OF CONVERSATION
Abdulsalam Shakhatreh	06/06/2023	☐ E-MAIL ☑ TELEPHONE ☐ INCOMING ☑ OUTGOING
E-MAIL ADDRESS	**TELEPHONE NUMBER**	
	301-576-2978	
ORGANIZATION	**DOCKET NUMBER(S)**	
Robatel Technologies, LLC	07109365	
LICENSE NAME AND NUMBER(S)	**MAIL CONTROL NUMBER(S)**	

SUBJECT
RAI Structural Responses Clarification Call

SUMMARY AND ACTION REQUIRED (IF ANY)
NRC Participants: Chris Allen and Janine Smith

The call to discuss the attached questions commenced at approximately 2 P.M. In discussing question 2.1, Robatel provided calculation results that demonstrated how performing stress calculations in accordance with the Regulatory Guide did not produce the stresses that resulted in the lowest margin of safety. Robatel also committed to using a note or some other method in the safety analysis report (SAR) to identify that these calculations had been performed. In addressing question 2.2, Robatel intended to modify the SAR to more consistently identify pressures in units of pounds per square inch gage (psig) and also to clarify that the units associated with the pressure values utilized in calculations are psig. For question 2.3, Robatel stated their intention to provide a more detailed thermal expansion explanation in SAR section 2.7.4.2. Finally, Robatel presented calculations related to question 2.8 that demonstrated their approach to calculate clearances between the bolts and bolt holes, as outlined in their proprietary responses to a request for supplemental information, produced results that differed from the approach suggested by the NRC staff by insignificant amounts. Robatel also stated they would make editorial changes to the SAR, e.g., correcting SAR table numbers referenced in the text, that were identified by the NRC staff during the call. The call subsequently concluded at approximately 3:10 P.M.

NAME OF PERSON DOCUMENTING CONVERSATION
Chris Allen

SIGNATURE	DATE OF SIGNATURE
William C. Allen	06/07/2023

STRUCTURAL

2.1 The response does not demonstrate how evaluating cold conditions of normal conditions of transport (NCT) using both a maximum internal pressure and decay heat results in the most unfavorable cask stresses. It simply explains what was done, which is already presented in the SAR.

The objective of the NCT Cold Case (@ -40 deg. F) in Table 1 of RG 7.8 is to maximize the package contraction. The applicant is using a maximized internal pressure and including decay heat, both of which are in conflict with the recommended NCT Cold Case combination. Per SAR Table 2.6.7-2, the minimum factor of safety for Cold conditions is 2.0, so not a lot of margin.

Verify the following in the applicant's response:

- 182.71 kPa is reported in the SAR as 26.5 psia, not psig, as cited in the response.
- Reg. Guide 7.6 is cited; should this be RG 7.8?
- SAR Table 6-1 is cited but could not be found; was this intended to be Tables 2.6.7-1 and -2?

2.2 The response does not clarify the maximum internal cask pressure employed in the various NCT evaluations and the hypothetical accident conditions (HAC) fire accident. The basis of the concern is what exact pressure values are employed in these FEM analyses. It is noted that Sections 7.2.2 and 8.2.3 of Calculation RTL-001-CALC-ST-0402, Rev. 0, cite the 35 psig (241 kPa) and 85.3 psig (588 kPa) pressures as being employed in the NCT and HAC analyses, respectively. It would be helpful if in the SAR these numerical values were specifically stated as being employed in the analyses.

Verify the following in the applicant's response:

- It is stated that all pressure values presented in the SAR provide parenthetical psig or psia values, although SAR Section 2.6.1.1 and 3.3.2.5 cite both psig and psia values for the 342.7 kPa value
- It is state that 250 kPa is employed in lieu of 241 kPa in some cases for conservatism, however Table 2.13.3-1, reports 250 kPa as equivalent to 35 psig, which is what 241 kPa is also cited as being. (A pressure of 250 kPa is not found in the RTL-001-CALC-ST-0402 calculations.)

2.3 The response does not specifically demonstrate how the omission of thermal expansion effects in the evaluation of HAC drop conditions with hot ambient conditions results in the most unfavorable cask stresses. It provides an explanation and rationale as to why the thermal effects are not included.

Based primarily on the SRP section 2.4.6.1, which states that thermal stresses should be present during this HAC drop conditions, it does not appear that the thermal stress is being considered as a self-relieving secondary stress for the impact conditions, so should be included in the stress evaluation.

It is noted that the last justification points cite Appendix F, F-1341.1 and F-1342(a), which are applicable only to plastic analyses, while this package employs an elastic analysis model.

2.8 The evidence provided in the response to ensure that the stated minimum horizontal gap at all lid closure bolts is achieved prior to shipment and during transport to ensure that shear load transfer to the lid closure bolts is circumvented is not conclusive.

The applicant states that alignment pins are used to facilitate lid placement during installation. A review of the SAR dwgs. reveals that only one pin per lid is employed, which would allow the lid to rotate about this pin, possibly allowing the lid bolt holes to be non-concentric with the bolts/threaded bolt holes.

Tables 2 and 4 provide lid hole versus bolt edge dimensional information. The information presented seems to be the result of assuming the expansion or contraction of the bolt hole vs. the bolt, assuming they are initially concentric. The concern is the radial expansion or contraction of the lid toward the bolt face, which is not captured in this table. Please recalculate and provide the revised results.