NRC FORM 699
(9-2003)

U.S. NUCLEAR REGULATORY COMMISSION

CONVERSATION RECORD

DATE
09/14/2011

TIME
11:00 AM

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU
See below

TELEPHONE NO.
800-369-3331

ORGANIZATION
Holtec International

SUBJECT
Discussion of Holtec Letter to the Byron Nuclear plant of October 2010.

TYPE OF CONVERSATION
- ☐ VISIT
- ☐ CONFERENCE
- ☒ TELEPHONE
  - ☐ INCOMING
  - ☒ OUTGOING

SUMMARY *(Continue on Page 2)*

NRC - John Goshen, Jorge Solis
Holtec - Tammy Morin, Evan Rosenbaum, Robert Tindal, Debu Mitra-Majundar, Luis Hinojosa.

The NRC Staff questions several statements made by Holtec in its letter to the Byron nuclear plant in October 2010. Holtec provided the attached draft response to the staff's questions. The NRC will review and provide any followup with Holtec if necessary.

From Holtec-
Holtec considers that two questions were asked, one regarding a specific statement in the Byron letter and then the subsequent question on the ITS categorization of the components involved in annulus flushing and supplemental cooling. The attachment addresses the second question on ITS categorization.

For the first question, consider the following for discussion today:

The letter states "If the cooling system fails to maintain the annulus temperature below the specified 125 deg F, there is a possibility of the peak cladding temperature exceeding the 1058 deg F limit."

Continue on Page 2

ACTION REQUIRED
None

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
John Goshen	John Goshen	09/14/2011

ACTION TAKEN

TITLE OF PERSON TAKING ACTION	SIGNATURE OF PERSON TAKING ACTION	DATE

CONVERSATION RECORD (Continued)

SUMMARY *(Continue on Page 3)*

The intent of this sentence to point out that in some cases, e.g. low MPC-32 heat loads, if the cooling system (annulus flushing equipment) fails, the PCT limit will NOT be exceeded. The letter goes on, in the next paragraph, to inform the user of how to preclude the possibility of the PCT limit being exceeded. This is by taking administrative steps to monitor the operation of the system so that consequences can be avoided or mitigated. This was acknowledged in NRC's Information Notice 2011-10, Item #2 in the section labeled "Discussion".

We understand that taking this particular sentence out of context can lead the reader to form different conclusions and this can be clarified further if Staff feels it is necessary.

Continue on Page 3

CONVERSATION RECORD (Continued)

SUMMARY *(Continue on Page 4)*

DRAFT - Response to NRC Phone Query from NRC Staff Regarding Annulus Flushing and Supplemental Cooling on September 8, 2011- DRAFT

Introduction:

During a phone call held on September 8, 2011 between NRC Staff and Holtec the NRC raised the following question on the HI-STORM 100 System (Certificate of Compliance (CoC) 72-1014): Why is an annulus flushing system classified as not important to safety (NITS) while a supplemental cooling system (SCS) is classified as important to safety (ITS) category B (See FSAR Table 8.1.6) when the purpose of both systems is to maintain the fuel peak cladding temperature (PCT) below the licensed limit of 1058°F?

Background Information:

Annulus flushing with water is required during vacuum drying under certain conditions to keep the Multi-Purpose Canister (MPC) shell walls ≤125°F as this ensures consistency with the thermal analysis performed for the vacuum drying condition. Annulus flushing can be performed using commercial items and it can be performed either with a closed system using a chiller or an open system with a supply of demin water. The design of the equipment or system is not prescribed, only the requirement that the MPC shell be ≤125°F. Monitoring the water exiting the MPC/HI-TRAC annulus and ensuring it is ≤125°F meets this requirement.

Design of the SCS is prescribed in the Technical Specifications (TS) Appendix B Section 3.7. It is used after the MPC is dried, backfilled, and sealed, while the MPC is in the HI-TRAC transfer cask. The use of a SCS was approved in Amendment #2 to CoC 72-1014 with an exemption to 10 CFR 72.236(f), which requires passive cooling in dry storage systems. During use of the SCS the MPC is completely seal welded and the HI-TRAC containing the loaded MPC may be moving from the MPC processing area to a different location for MPC transfer.

Discussion:

The SCS and the equipment used for annulus flushing share common attributes. Both cool the MPC shell in the MPC/HI-TRAC annulus, both are used to ensure that the PCT of the fuel remains below the licensed limit during their specified operations, and both require periodic monitoring to assure proper operation. These systems are, however, used in different stages of the loading process and the difference in the safety categorization results from this, as described below.

Annulus Flushing

During annulus flushing, the MPC is in a designated and controlled area for processing while it is being vacuumed dry. Although the lid is welded, there is access to the MPC cavity through the RVOAs located on the vent and drain ports. If fuel is damaged during the vacuum drying process there would be an indication, as occurred at the Surry Nuclear Power Station in 2008 (Surry CR 104571, High Radiation Indications During Vacuum Drying of Spent Fuel Cask). After detecting such an event, the user would have to identify the damaged assembly, re-classify it as damaged fuel, and place it into storage in accordance with the requirements for damaged fuel so that there are no operational safety problems during unloading or future retrievability issues, in accordance with 10CFR72.122(h)(1) . Also if annulus flushing fails in some manner, recovery actions such as reflooding the MPC through the vent and drain ports can mitigate the consequences of its failure.

Supplemental Cooling System

During use of the SCS, when the MPC is completely seal welded, the user has no opportunity to monitor the internals of the MPC and, therefore, no way to tell the status of the cladding. Therefore, confidence in the continued integrity of the cladding relies on the thermal analysis which predicts that the PCT limits will not be exceeded. As a result of this reliance on the operation of the SCS to confirm the continued integrity of the cladding, Holtec requires a higher pedigree of quality assurance on the temperature monitoring devices used with SCS. Again, this is to meet the regulations pertaining to 10 CFR 72.122(h)(1) which requires that the fuel cladding be protected from degradation so that during unloading the condition of the cladding will not pose any operational safety problems; e.g. reconfiguration that could cause a criticality accident upon re-flood or an inability to retrieve the fuel safely from the MPC. It is noted that even if cladding damage could occur during the period where the SCS is use, there will not be any effect on the public health and safety since it has been demonstrated (by analysis) that the MPC confinement boundary will not be compromised. When the use of SCS was approved as an exemption in Amendment #2 of CoC 72-1014, Holtec and the NRC agreed that the ITS level should be ITS-B, to assure a certain level of quality along with the QA record retention required by NUREG/CR-6407 .

Continue on Page 4

CONVERSATION RECORD (Continued)

SUMMARY

Conclusion:

The ITS categorization of an SCS system is elevated to ITS-B compared to the categorization of the equipment used for annulus flushing as NITS since more reliance on the operation of the system, as verified by temperature monitoring, is necessary to ensure the condition of the cladding in compliance with 10 CFR 72.212(h)(1).