

**Subject:** FW: Re: FW: Loose Holtec bolts  
**From:** "McIntyre, David" <David.McIntyre@nrc.gov>  
**Date:** 3/27/2018 2:45 PM  
**To:** "donnagilmore@gmail.com" <donnagilmore@gmail.com>

Ms. Gilmore – NRC staff responses to your questions below.

Regards,

**David McIntyre**  
Office of Public Affairs  
U.S. Nuclear Regulatory Commission  
301-415-8200

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**From:** Donna Gilmore [<mailto:donnagilmore@gmail.com>]  
**Sent:** Friday, March 23, 2018 1:50 PM  
**To:** McIntyre, David <[David.McIntyre@nrc.gov](mailto:David.McIntyre@nrc.gov)>  
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**Subject:** [External\_Sender] Re: FW: Loose Holtec bolts

I have some additional questions and comments.

1. Why did Holtec change the shim design?

Holtec has indicated the change was made to improve their ability to fabricate the shims, without impacting canister performance.

2. What was wrong with the old shim design?

NRC is not aware of any issues with the original shim design.

3. Was this change treated as like-for-like, so it did not go through the NRC license amendment review and approval process?

Holtec stated the change was made under their quality assurance program under 10 CFR 72.48 design change authority.

4. There are four San Onofre Holtec canisters loaded with the defective shim design. Tom Palmisano, SCE, said they did not inspect the bottom of the shims in their mandatory pre-loading inspection of those four canisters. He said it wasn't feasible to inspect the bottom. He attempted to assure the public at last night's Community Engagement Panel's meeting that everything is fine with those four canisters, but I and others were not fooled. What are the implications of having defective shims? I would like to see NRC's technical analysis of this. I trust the NRC technical staff more than whatever Holtec or Edison says.

Holtec's and SCE evaluations are on-going. The NRC does not see an immediate threat to public health and safety from the four currently loaded casks at San Onofre, based on the information reviewed to date and the NRC's knowledge of the cask design from the NRC staff's detailed technical review of the previously approved

cask. The NRC is performing its oversight role of the licensee and the vendor. The NRC is reviewing the vendor and licensee evaluations of the potential impact of the shim performance. The NRC's oversight activities are continuing.

5. Tom Palmisano admitted they have no safe way to unload those canisters back into the pool and it has never been done at any location. He said heat from the fuel assemblies in dry storage would be over 200 degrees C. Putting hotter assemblies back into a cooler pool would be a major "reflooding problem". My technical research on this issue confirms that. That is one reason the NRC should stop approving hotter fuel into dry storage and should stop approving high burnup fuel. High burnup fuel only makes the problem worse with hydrides that develop in the zirconium cladding, uranium pellets and even the aluminum alloy fuel baskets, creating hydrogen gas explosion risks, in addition to the temperature risks. Zirconium hydrides ignite at 270 degrees C.

NRC's position on the topic of acceptable cladding temperatures limits is documented in the Interim Staff Guidance (ISG-11) Revision 3 "Cladding Considerations for the Transportation and Storage of Spent Fuel": "In order to assure integrity of the cladding material, the following criteria should be met:

1. For all fuel burnups (low and high), the maximum calculated fuel cladding temperature should not exceed 400C (752F) for normal conditions of storage and short-term loading operations (e.g., drying, backfilling with inert gas, and transfer of the cask to the storage pad)."
6. Tom said we would need a hot cell to safely unload. It's clear the NRC's reasons for saying dry storage is safe is based on false assumptions that fuel would never need to be unloaded, would never have through-wall cracks, and would never be loaded incorrectly. Therefore, the NRC should mandate a hot cell at every facility with dry storage. The dry storage container technical specifications you approve requires that fuel must be able to be unloaded in both wet (pool) and dry (hot cell) fuel handling facilities. Yet you allow empty pools to be destroyed and do not require on-site hot cells. I am not aware of any U.S. locations with hot cells large enough to unload these canisters and reload fuel assemblies into new containers. The TAN facility (the only one large enough to do this) was demolished.

Thank you for the comment.

7. Palmisano said both broken and bent shim pins (bolts) have been found. This appears to be a quality control and design problem at Holtec. The NRC should require independent quality control and discontinue the 50.59 process for Holtec. They have demonstrated they do not have the skill set or management ability to perform this work. I recommend the NRC complete an independent investigation of the Holtec manufacturing facility and process to ensure there are no other problems, since, as I'm sure you know, this is a symptom and not the root cause. The root cause is this should have never happened if adequate management, quality and design control measures were in place.

Thank you for the comment.

8. Please halt all Holtec installations in the country until this and potentially related issues are investigated and all issues resolved.

Thank you for the comment.

9. Please use this as an opportunity to evaluate the current NRC standards that allow uninspectable canisters to be used with no ability to unload them. Please require only proven thick-wall casks designed to be inspected, maintained and repaired and monitored in a manner to PREVENT leaks, explosions and criticalities -- not just monitored AFTER leaks occur. At San Onofre and elsewhere, too much is at risk to do

otherwise. California provides 40% of the U.S. cargo imports and exports. It's located adjacent to the I-5 international freeway. California is the 6th largest economy in the world. A radioactive explosion of one or more of these Chernobyl disaster cans will require permanent evacuations, destabilize the local economy, the state economy, national economy and perhaps the world economy. The health and safety of a large percent of the U.S. population is being put at risk because your standards are unsafe. Our national food and water supply is being put at risk. Now is the time this must be solved, before it is too late. Please be honest with the elected officials and regulators and tell them the truth about how close we are to these Chernobyl cans around the country exploding. They need to know before it is too late. Our local community can help give you the courage you need to do the right thing.

Thank you for the comment.

10. See attached press release from Edison regarding the defective shim design. Please let me know if you have any comments or corrections or additions to what they have written.

We have no comments on the press release.

11. Palmisano said they are loading the canisters at 28 kW each. Since this is a record high temperature (over double what San Onofre has done in the past), are you independently verifying that the convection cooling through the air vents is adequate to keep the fuel from becoming damaged. Please do this and share the result with me.

The approved design allows for storage of 32kW which is greater than the 28kW SCE has reported loading at SONGS. The NRC is performing its oversight role of the licensee and the vendor. The NRC is reviewing the vendor and licensee evaluations of the potential impact of the shim performance. The NRC's oversight activities are continuing.

12. Palmisano said they are not treating high burnup fuel as damaged, so they are not putting it in damaged fuel cans. Since you know high burnup fuel can become damaged during dry storage, and NRC staff said they want Holtec to confirm high burnup fuel in dry storage has not become damaged before transport, how can this possibly be accomplished?

In the past, high burnup fuel had been conservatively treated like damaged fuel and stored in damaged fuel canisters. NRC's research on the behavior of high burnup fuel has continued and shown the high burnup fuel cladding behavior does not warrant that conservative level of treatment. Some of this information is presented in NRC documents such as NUREG/CR 7198.

NRC requirements for transportation are provided in 10 CFR Part 71. In addition, the specific conditions established for each transportation package must also be met and NRC will perform its oversight functions during these transportation activities.

13. NRC staff also told Holtec they want Holtec to confirm there are no partial cracks in the canisters before transport, how can this be accomplished with no method to inspect existing canisters. And if they did find cracks, what can they possibly do right now to replace canisters or repair them. Holtec President said it would not be feasible to repair canisters without introducing another condition for cracking in stainless steel.

Thank you for the comment.

14. The NWTRB released a December 2017 report on Department of Energy Spent Nuclear Fuel. Most of this is relevant to commercial spent fuel. I highly recommend you read this. It discusses the importance of requiring fuel and fuel containment to be inspected, maintained, monitored and retrievable. Risks of hydrogen explosions and other major problems can result, if this is not done. <http://www.nwtrb.gov/docs/default-source/reports/nwtrb-mngmntanddisposal-dec2017-508a.pdf?sfvrsn=12>

Thank you for the comment.

15. The NRC has been stating their is insufficient humidity at San Onofre for moisture to dissolve salt on the canisters, which is one of the major triggers for cracks to start in the canisters. You also state, once a crack starts it can go through the wall in 16 years. San Onofre receives frequent daily fog, on-shore winds and surf. Please reevaluate or position on the risks at San Onofre. Here is a photo on a typical morning or evening at San Onofre. I suggest your material engineers, such as Darrell Dunn, make this a screen saver if they have any doubt about the humidity at San Onofre.

Thank you for the comment.



Thank you,

Donna Gilmore  
SanOnofreSafety.org  
949-204=7794

On 3/22/2018 1:51 PM, McIntyre, David wrote:

Ms. Gilmore – I am responding to your email inquiry to Pierre Saverot of the NRC's Division of Spent Fuel Management regarding news reports of loose bolts found in Holtec canisters at Vermont Yankee. We received a similar inquiry from Mr. Paul Gunter of Beyond Nuclear. Our response is below.

Regards,

**David McIntyre**  
*Office of Public Affairs*  
*U.S. Nuclear Regulatory Commission*  
301-415-8200

**1. Why is the U.S. reactor site not identified where an apparent generic design modification in the Holtec International Hi-Storm 100 dry cask storage system resulted in action taken by Vermont Yankee to delay the offloading of high-level nuclear waste into its Hi-Storm 100 casks?**

Answer: The condition with the broken shim standoff bolt was first identified at San Onofre. On February 20, 2018, Southern California Edison officials conducted a mandatory pre-loading inspection of multi-purpose canisters (MPCs), looking for foreign material. They found a small piece of stainless steel approximately 4 inches long and 7/16 inch in diameter inside the bottom of one of the MPCs. The canister was shipped back to Holtec, which identified the piece of stainless steel as one of the "shim standoffs" that are attached to the bottom of the aluminum shims located around the periphery of the MPCs. Holtec inspected other canisters at its facility, and found another with a broken standoff bolt.

On March 6, Southern California Edison halted loading and informed the NRC of the issue. They have since resumed loading using MPCs with a different approved shim design.

**2. Are there other U.S. operators with Hi-Storm 100 dry cask storage systems conducting similar inspections?**

Answer: Yes. Holtec is currently conducting an extent-of-condition analysis and a root-cause analysis. In the meantime, the company has notified the following sites that have loaded or received canisters of this design: Dresden, Grand Gulf, Hatch, Vermont Yankee, Columbia, San Onofre, Watts Bar and Callaway.

**3. Are international users of Hi-Storm 100 dry cask storage systems being alerted to the loose bolts event?**

Answer: Holtec has informed us there are no international customers who have received canisters with this shim design.

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**From:** Donna Gilmore <[donnagilmore@gmail.com](mailto:donnagilmore@gmail.com)>  
**Sent:** Thursday, March 22, 2018 1:39 PM  
**To:** Saverot, Pierre  
**Subject:** [External\_Sender] Loose Holtec bolts

Hi Pierre,

Do you anything about the loose basket bolts they found at Vermont Yankee and another nuclear plant. Was the other nuclear plant San Onofre?

They've started loading Holtec canisters at San Onofre.

Trying to find out about this, but not sure who to ask at the NRC.

Thanks,  
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