

## Gallagher, Carol

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**From:** Donna Gilmore <donnagilmore@gmail.com>  
**Sent:** Tuesday, December 26, 2017 6:00 PM  
**To:** Wise, John; Gallagher, Carol  
**Subject:** [External\_Sender] Comments for Docket ID NRC-2016-0238 NUREG/CR 2214 Managing Aging Processes In Storage (MAPS Report)

These issues need to be addressed in Docket ID NRC-2016-0238 NUREG/CR 2214 Managing Aging Processes In Storage (MAPS Report). Consider the issues below as comments to NUREG/CR 2214. It does not adequately address them.

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10/24/2017  
82FR 49233

On 12/21/2017 3:47 PM, Donna Gilmore wrote:

Regarding your criticality response, you agree that your assumption of no criticality in dry storage assumes no water enters the canister, as you noted below with the statement "the criticality safety control during storage **does rely on the exclusion of water from the canister.**"

I highly recommend you make this clarification in your public outreach and on your website as one of your safety assumptions regarding risk of criticality in dry storage. I'm sure the majority of the public and decision makers do not know this.

Regarding risks of breach of canister (through-wall cracks), your statements that this cannot happen in 20 years and would possibly take decades is based on false assumptions. I have read your responses to my comments you referenced in *ISG-2, Revision 2 Response to Stakeholder Comments* (ADAMS ML16117A082). Link:  
<https://www.nrc.gov/docs/ML1611/ML16117A082.pdf>

Regarding the 2-year old Diablo Canyon canister that has all the conditions for cracking, you admit there are salts and a temperature low enough for moisture to stay on the canister and dissolve salts. However, you claim there would be insufficient humidity at the Pacific Coast locations for moisture to dissolve (deliquesce) the salts on the canister, which we both agree can trigger the initiation of cracking. You need to reevaluate your source data regarding California Pacific Coast weather. As stated in this California Climate Zones document, frequently daily fog is common along the San Diego and San Luis Obispo coastline. [https://www.pge.com/includes/docs/pdfs/about/edusafety/training/pec/toolbox/arch/climate/california\\_climate\\_zones\\_01-16.pdf](https://www.pge.com/includes/docs/pdfs/about/edusafety/training/pec/toolbox/arch/climate/california_climate_zones_01-16.pdf)

I raised this issue with Darrell Dunn in one of the NRC meetings, asking him where the location was of his NOAA weather data. He said he used Vandenberg Air Force Base. That is not relevant to San Onofre. I sent him the above link, but did not receive a response. I also sent him some photos of evening and morning fog along the coast. I live 5 miles from San Onofre and have a view of the coastline from my backyard. Maybe pictures would help you understand this better.

Photo of San Onofre in morning fog. <https://sanonofresafety.files.wordpress.com/2017/12/la-174296-me-0919-surf-19-jpg-20130506fog.jpg>

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Template = ADM - 013  
E-RIDS = ADM-03  
Add = J. Wise (JPW)

Photo taken about 5 miles northeast of San Onofre. Frequent fog is common. It's so thick here you cannot see the ocean.

[https://sanonofresafety.files.wordpress.com/2017/12/20171125\\_164412coastalfognearsanonofre.jpg?w=640](https://sanonofresafety.files.wordpress.com/2017/12/20171125_164412coastalfognearsanonofre.jpg?w=640)

Photo taken about 5 miles northeast of San Onofre at a similar location on a clear evening. You can see Catalina Island in the distance and Dana Point Harbor to the right. [https://sanonofresafety.files.wordpress.com/2017/12/20171123\\_164900\\_sunsetnearsanonofre.jpg?w=640](https://sanonofresafety.files.wordpress.com/2017/12/20171123_164900_sunsetnearsanonofre.jpg?w=640)

Your August 5, 2014 meeting summary admits once cracks starts they can go through the wall in 16 years. I participated in that meeting. In that meeting you also said canisters would not have a low enough temperature for moisture to stay on the canister for 30 years. However, the 2-year old Diablo Canyon canister information proves that is not true.

Also, the EPRI report you referenced cherry picked data to reach their conclusion of many decades before through-wall cracks. Here is a link to the evidence of that. Please let me know if you disagree with these points and why. Otherwise, please quit using that EPRI report as justification.

<https://sanonofresafety.files.wordpress.com/2013/06/epri-critiqueandkoebergplant2015-05-17.pdf>

The Sandia Lab report you referenced found salt particles on the Diablo canister. Since there was limited access (only through the outlet air vent in the cask) it was only a partial search of dust particles, yet it was enough to find salts. The report admits they may have found more salt if they had access through the inlet air vent, since this is where salt would most likely enter the cask. SANDIA REPORT SAND2014-16383, "Analysis of Dust Samples Collected from Spent Nuclear Fuel Interim Storage Containers at Hope Creek, Delaware, and Diablo Canyon, California," Charles R. Bryan and David G. Enos, July 2014 (<http://prod.sandia.gov/techlib/access-control.cgi/2014/1416383.pdf>).

Regarding Aging Management, you do not consider aging management in the initial 20-year license. You relicensed Calvert Cliffs dry storage installation where similar thin-wall canisters are used. However, you are not requiring them to inspect for cracks. Instead only requiring a visual inspection, which, as you know, cannot adequately find cracks or measure depth of cracks. And you're only requiring they perform the visual inspection on one canister at the facility.

The word "inspection" is being used loosely by the nuclear industry, including the NRC. You know existing facilities have no idea how many of their canisters have cracks or how deep the cracks may be. Also, even if they eventually figure out how to find cracks and depth of cracks, you have no proven method to repair these cracks once the canisters are loaded with nuclear fuel waste.

To make matters worse, the NRC allow decommissioning nuclear facilities to destroy their spent fuel pools, yet neither the NRC or Edison have explained how you could possibly repair canisters (with or without a pool) or deal with leaking canisters. Both the NRC and Edison have avoided giving a straight answer to what they will do with through wall cracks. Show me the approved plan in writing, not some vague statement it's up to the license to figure this out as needed. How will these canisters ever be transported with even partial cracks?

I have read the other documents you referenced. They do not provide evidence for your claims. We can go into that further, but I don't need to waste more of my time if the above facts are going to be ignored by the NRC.

Do you realize the consequences if San Onofre canisters start leaking and potentially explode from gases building up from the high burnup fuel or from a criticality of water entering through the cracks?

- Do you realize we're talking about major Southern California evacuations, many likely permanent.
- Do you realize the economic impact to California, the nation and even the world?

Now is not the time to play bureaucratic nuclear roulette with our country. Please step up and do the right thing.

If this is not your decision, please tell me who is running the show? When I spoke to some of the NRC Commissioners (former and current), they didn't even know the truth about these issues, so apparently the truth is being stopped at a lower level. Please give me the name of the person or persons. I've worked in government. I know the working level staff doesn't get to make the final decisions on issues with this level of consequences. So who does?

And Tom, who made the decision to go with Holtec thin-wall canisters and install them in a constantly soggy ground? I was told by Manuel Camargo that it wasn't you and it wasn't him. However, he would not give me any names. Please give me the name or names.

I appreciate the NRC responding to my email. I have yet to hear from Tom Palmisano.

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On 12/21/2017 11:15 AM, Wise, John wrote:

Donna,  
I'm responding on behalf of Mike Layton regarding your December 13, 2017, email (below) on the potential for canister cracks to impact criticality in the HI-STORM UMAX spent fuel storage system. I'll do my best to address your larger points.

The HI-STORM UMAX system does credit the use of borated material within the canisters for neutron absorption. The canisters use fixed borated neutron absorbing material in the fuel basket to provide criticality safety control of the contents during

storage. In addition to using fixed borated neutron absorbing material, PWR spent fuel pools use borated water that is present during loading operations, however, the borated water is removed from the canister prior to storage. The fixed borated material remains in place within the canister throughout the storage life. **However, as you note, the criticality safety control during storage does rely on the exclusion of water from the canister**, and that is what led the NRC staff to ask Holtec to evaluate how criticality will be prevented.

The UMAX system uses the double contingency principle, which requires at least two unlikely independent events to occur simultaneously before a criticality event would be possible. For the HI-STORM UMAX system, the **unlikely events are the flooding of the Cavity Enclosure Container (CEC) and a breach of the canister sufficient to allow ingress of water**. As described in the Holtec letter you referenced (ADAMS ML13032A008), Holtec provided an evaluation to justify the unlikelihood of flooding scenarios for the CEC and the water intrusion scenarios for the canister. The NRC staff evaluated Holtec's justification and found it to be acceptable before approving the UMAX design.

With regard to one aspect of the double contingency principle, canister breach, the NRC has previously addressed your concerns related to the conditions for cracking of the Diablo Canyon canister and timeframe for the growth of a through-wall crack. In each case, the NRC staff found no technical basis to support these positions. The NRC evaluations of these topics are documented in the response to your comments on ISG-2, Revision 2 (ADAMS ML16117A082, Comments 19 and 29).

Finally, as you are aware from your participation in our recent public meetings, the NRC has issued aging management guidance in NUREG-1927 and Draft NUREG-2214 that includes periodic canister inspections to provide early detection of flaws in the renewed storage period. When finalizing Draft NUREG-2214, the NRC staff will evaluate all submitted public comments on the proposed aging management activities to address cracking of stainless steel canisters. If you haven't already done so, please use this comment opportunity to provide any new information that you believe the NRC should consider in finalizing the canister inspection guidance.

Thank you for your interest in this matter,

John

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John Wise, PhD, PE  
Sr. Materials Engineer, Renewals and Materials Branch  
Division of Spent Fuel Management  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission

#### References

Response to stakeholder comments received on Interim Staff Guidance (ISG)-2, Revision 2, "Fuel Retrievability in Spent Fuel Storage Applications," ADAMS ML16117A082.

NUREG-1927, Revision 1, "Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel," ADAMS ML16179A148.

NUREG-2214, "Managing Aging Processes in Storage (MAPS) Report – Draft Report for Comment," ADAMS ML17289A237. (Comment at [www.regulations.gov](http://www.regulations.gov); Docket ID: NRC-2016-0238)

**From:** Donna Gilmore [mailto:donnagilmore@gmail.com]  
**Sent:** Wednesday, December 13, 2017 10:52 AM  
**To:** Tom Palmisano <Tom.Palmisano@sce.com>; Layton, Michael <Michael.Layton@nrc.gov>  
**Cc:** Street, Joseph@Coastal <Joseph.Street@coastal.ca.gov>; Ken Alex <ken.alex@gov.ca.gov>; Barker, Kevin@Energy <Kevin.Barker@energy.ca.gov>; Griffith, Andrew <ANDREW.GRIFFITH@nuclear.energy.gov>; Wise, John <John.Wise@nrc.gov>; Tiseman2 <tiseman2@aol.com>; Peter Lam <peterlam1@aol.com>; Per Peterson <peter@nuc.berkeley.edu>; Dayna Bocheo <dayna.bocheo@coastal.ca.gov>; Cy Oggins <cy.oggins@slc.ca.gov>; Toni Iseman <tiseman2@aol.com>; Lori Donchak <loridonchak@gmail.com>  
**Subject:** [External\_Sender] Criticality impact of thin-wall dry storage canisters

In this Holtec document to the Nuclear Regulatory Commission, Holtec admits a criticality (uncontrolled radioactive release) can occur if fresh (unborated) water enters the MPC (multi-purpose thin-wall canister).

Holtec Response to First Request for Additional Information (RAI)  
for HI-STORM UMAX Canister Storage System (TAC No.  
L24664), January 30, 2013 (ML13032A008).  
<https://www.nrc.gov/docs/ML1303/ML13032A008.pdf>

I have recently learned that no credit is given by the NRC for the borated material in the dry storage canister. It is there only for loading spent fuel from the borated spent fuel pool into the canister and transferring the canister to the concrete storage overpack.

Therefore, if there is a through-wall crack in the canister that eventually allows unborated water inside the canister (from rain, fog, on-shore surf, tsunami or other cause) and there is a criticality, please provide information as to what exactly will happen and what possible remediation plan can be used and will be used at San Onofre, if any. With the Holtec UMAX system, since there are no drains in the UMAX holes where the canisters sit, this appears to be even more problematic.

As you know, a two-year old Diablo Canyon canister was found to have all the conditions for cracking in a two-year old canister. Temperature low enough for moisture to dissolve salt particles. Corrosive magnesium chloride salt particles were found.  
<https://sanonofresafety.files.wordpress.com/2011/11/diablocanyonscc-2014-10-23.pdf>

Both Diablo Canyon and San Onofre are located in a similar Coastal environment with frequent on-shore surf and frequent fog. See Climate Zone 5 and 7 on this California Climate Zones document.  
[https://www.pge.com/includes/docs/pdfs/about/edusafety/training/pec/toolbox/arch/climate/california\\_climate\\_zones\\_01-16.pdf](https://www.pge.com/includes/docs/pdfs/about/edusafety/training/pec/toolbox/arch/climate/california_climate_zones_01-16.pdf)

San Onofre has a history of stress corrosion cracking on similar materials, according to the NRC.

I realize you do not know if any thin-wall canisters in the entire U.S. have started to crack since you have no way to and have not inspected any for cracks or depth of cracks. You are only able to check for some visual precursors for cracks, but as you know, this is not a reliable method to find cracks or know depth of cracks.

Since the thin-wall stainless steel canister designs are relatively new (most systems in use are less than 12 years old), we are just reaching the timeframe where through-wall cracks are more likely to occur.

<https://sanonofresafety.files.wordpress.com/2015/10/d32-caskinventorybystate2017-05-18.pdf>

This 2014 NRC 8/5/2014 meeting summary document states once cracks start they can grow through the wall of the canister in 16 years. The original estimate for cracking initiation by the NRC (in this same 2014 document) was 30 years. This was based on the assumption the canister temperature would be too hot for moisture to stay on the canister long enough to dissolve the salts for at least 30 years. I participated in that 8/5/2014 meeting. As you know, that 30 year assumption is wrong due to temperature conditions found on the two-year old Diablo Canyon canister (loaded with high burnup fuel). <https://www.nrc.gov/docs/ML1425/ML14258A081.pdf>

Thank you,

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