

## NRR-PMDAPEm Resource

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**From:** Feintuch, Karl  
**Sent:** Thursday, March 07, 2013 2:28 PM  
**To:** Craig D Sly  
**Cc:** Tregoning, Robert; Carlson, Robert  
**Subject:** FW: DLR question re RES interest in Kewaunee samples - request by DORL PM  
**Attachments:** plant materials wish list 2013-03-07 .docx

Attached is a "wish list" of items that would be valuable to retrieve from Kewaunee after permanent shutdown. It is the list that I received from Rob with some inserted header and footer information. The email sequence below explains the background that we discussed.

The next step would be to match items that are practical to acquire or to measure to schedule(s) of opportunities to obtain them from Kewaunee.

Any near-term, one-time only opportunities would be important to address soon to see if manpower and funding can be acquired in time.

Karl Feintuch

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**From:** Tregoning, Robert  
**Sent:** Thursday, March 07, 2013 7:51 AM  
**To:** Feintuch, Karl; Brady, Bennett  
**Cc:** Carlson, Robert  
**Subject:** RE: DLR question re RES interest in Kewaunee samples - request by DORL PM

Karl:

Thanks for your efforts. Attached is the wish list that we put together for the Zion plant. We ended up getting containment samples, samples from the RPV and surveillance capsules and cabling from Zion. I agree with you that we need to put together a similar list for Kewaunee (and other plants that decide to decommission) so that we can have meaningful dialog about the possibility of getting components.

Regards,

Rob

Robert Tregoning  
Technical Advisor for Materials  
US Nuclear Regulatory Commission  
21 Church Street, M/S CS-5A24  
Rockville, MD 20850  
ph: 301-251-7662  
Blackberry: 301-873-6393  
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**From:** Feintuch, Karl  
**Sent:** Wednesday, March 06, 2013 4:44 PM  
**To:** Brady, Bennett  
**Cc:** Tregoning, Robert; Carlson, Robert  
**Subject:** RE: DLR question re RES interest in Kewaunee samples - request by DORL PM

On 3/5/2013 I spoke with Rob Tregoning and subsequently with Craig Sly of Dominion to establish a point of contact and initiate a conversation about the opportunity offered by Kewaunee's forthcoming final defueling and subsequent decommissioning. (Kewaunee's decommissioning is currently planned for 60 years. I directed Craig to Chuck Tomes, who Rob knows.

All parties recognize that any activity in this regard is distinct from and independent of decommissioning. It is simply that the plant and its components offer opportunities for assessing materials, if motivated parties can agree to address it.

I recollect that many of these plants did extensive photographic studies of components and installations during initial construction. Parties interested in visual evidence of material conditions decades after installation also have an opportunity to gather information.

I hope to establish a dialog among interested parties. The interested parties will determine if the value of the information justifies the financing that it will take.

Perhaps the next step would be to establish or retrieve a list comparable to Zion of components and materials of interest. Collection of some items might occur in May 2013. Others might not be collectable for decades.

Please ensure that anything that I receive for transmittal to Kewaunee is public and non-sensitive or has a redacted version.

Karl  
415-3079

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**From:** Brady, Bennett  
**Sent:** Monday, March 04, 2013 5:19 PM  
**To:** Feintuch, Karl  
**Subject:** FW: DLR question re RES interest in Kewaunee samples - request by DORL PM

Thank you for your call.

FYI. Here is Rob Tregoning's reply when I contacted him and Amy Hull in RES about possible interest in materials from Kewaunee.

Bennett Brady

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**From:** Tregoning, Robert  
**Sent:** Monday, March 04, 2013 2:08 PM  
**To:** Hull, Amy; Brady, Bennett  
**Cc:** Rao, Appajosula; Oberson, Greg; Burke, John  
**Subject:** RE: DLR question re RES interest in Kewaunee samples - request by DORL PM

Amy/Bennett:

I'd say that we're definitely "interested" in possibly getting some internal's materials. However, we need to have a lot more information before we know how worthwhile that material is compared to other ex-plant material that we're getting. Also, in this era of declining budgets, we would need to partner with industry and possibly internationally because of the high cost of harvesting materials. As an agency, I could also see that we might have interest in a whole host of components such as containment samples, piping samples (especially DM welds), upper or bottom head penetrations, cabling/instrumentation, various active system components, vessel weld samples, etc. However, before we can really pursue we need to understand what Kewaunee might have that is particularly valuable.

The same question came up with Zion two years ago and at that time, Greg Oberson (I believe), coordinated the development of a list of active and passive components that we may be interested in now, and in the future. While this list is likely dated now, it's a good start for compiling a possible shopping list. I did a quick scan of my computer for this list and couldn't find it, but I hope that Greg still has it readily available.

By the way, the one component that we're definitely pursuing at this point is the surveillance capsule material.

Regards,  
Rob

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**From:** Hull, Amy  
**Sent:** Monday, March 04, 2013 1:18 PM  
**To:** Tregoning, Robert; Burke, John  
**Cc:** Brady, Bennett  
**Subject:** DLR question re RES interest in Kewaunee samples - request by DORL PM

Bennett just called and, if I got the message right, said she had a voice message from the Kewaunee PM in DORL who wanted to know if somebody in RES wanted to get samples (metallic, ?fuel cladding?) as it is decommissioned. The DORL PM wanted to have info from DLR re RES interest asap, in early March.

Is this something that we are interested in?

**Hearing Identifier:** NRR\_PMDA  
**Email Number:** 623

**Mail Envelope Properties** (Karl.Feintuch@nrc.gov20130307142800)

**Subject:** FW: DLR question re RES interest in Kewaunee samples - request by DORL PM  
**Sent Date:** 3/7/2013 2:28:08 PM  
**Received Date:** 3/7/2013 2:28:00 PM  
**From:** Feintuch, Karl

**Created By:** Karl.Feintuch@nrc.gov

**Recipients:**

"Tregoning, Robert" <Robert.Tregoning@nrc.gov>  
Tracking Status: None  
"Carlson, Robert" <Robert.Carlson@nrc.gov>  
Tracking Status: None  
"Craig D Sly" <craig.d.sly@dom.com>  
Tracking Status: None

**Post Office:**

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	5968	3/7/2013 2:28:00 PM
plant materials wish list 2013-03-07 .docx		36738

**Options**

**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

## Plant Materials Wish List

### Materials Proposed by RES, and Outline of Proposed Research

1. Reactor pressure vessel (RPV) stainless steel internal components (mainly from core shroud assembly; i.e., baffle plates, baffle-to-baffle bolts, baffle-to-former bolts)
2. RPV beltline weld, forgings/plates in beltline region.
3. RPV head nozzle(s) and J-groove welds
4. Bottom mounted instrumentation nozzles
5. Steam generator tubes
6. Piping, specifically dissimilar metal welds (DMWs)
7. Cast stainless steel (CASS) components, e.g., piping or elbows
8. Painted steel samples with all available coating types, e.g., pipe supports
9. Safety relief valves
10. Containment steel liner samples
11. Concrete samples
12. Neutron absorber materials from spent fuel pool
13. Electrical and I&C cables: 10 to 20 ft samples of every type of cable from inside containment
14. Electrical penetration modules
15. Small to medium size motors
16. Actuator assemblies, e.g., Limitorque
17. Limit switches, e.g., NAMCO
18. Solenoid valves, e.g., ASCO
19. Pressure transmitters, e.g., Rosemount

#### *Vessel*

1. Reactor pressure vessel (RPV) stainless steel internal components (mainly from core shroud assembly; i.e., baffle plates, baffle-to-baffle bolts, baffle-to-former bolts) [A. Rao]  
Vessel internals would be used to augment the cooperative research program with EPRI (and others) on degradation of properties of stainless steels in the RPV environment. Properties to be measured include tensile strength, fracture toughness, and stress corrosion cracking (SCC) properties including crack growth rate. Mechanical property tests would be augmented with microstructural characterization.
2. RPV beltline weld, forgings/plates in beltline region. [M. Kirk]  
Proposed research includes fracture toughness and other mechanical properties of material in the beltline region to assess RPV embrittlement.
3. RPV head nozzle(s) and J-groove welds [D. Dunn]  
The Zorita RPV head is believed to have Alloy 690 CRDM nozzles and presents a rare opportunity to harvest Alloy 690 that has been in service. Research on nozzle and weld samples would include fatigue and PWSCC crack growth rate tests.
4. Bottom mounted instrumentation nozzles [D. Dunn]  
Similarly to RPV head nozzles, BMI nozzles and welds would be tested to determine PWSCC resistance and mechanical properties.
5. Steam generator tubes [C. Harris]

NRC is interested in tube samples of the U-bend area of tubes, and sections cut at the expansion transition where the tubes emerge from the top of the tube sheet. Also, some pieces of the smallest radius u-bends are useful. Research would include structural integrity (burst and leak tests) and eddy current testing and destructive validation. Also, microstructural evaluation would be performed.

6. Piping, specifically dissimilar metal welds (DMWs) [D. Dunn / D. Rudland]  
Proposed tests include mechanical properties and PWSCC resistance. Weld residual stresses also could be measured, preferably before and after cutting of welds for removal of components from the plant, in order to validate computational models currently being developed.
7. Cast stainless steel (CASS) components, e.g., piping or elbows [W. Norris]  
Specimens would be used for mechanical property tests to assess aging-related degradation or embrittlement. Cast piping also would be used for validation of non-destructive examination techniques.
8. Painted steel samples with all available coating types, e.g., epoxy, inorganic zinc, alkyds, enamel. Potential samples may include pipe supports. [J. Burke]  
Samples would be used to assess the durability and aging performance of painted steel surfaces in the containment environment.
9. Safety relief valves [ ?? ]  
Target Rock 2- or 3-stage valves and Crosby valves are of interest. Proposed testing would be done to assess the temperature-dependent performance and failure modes under beyond design basis conditions.

#### *Containment*

10. Containment steel liner samples [D. Dunn]  
Samples from the containment steel liner would be assessed to determine the presence, and approximate population, of paint blisters. If only a few blisters are present, these could mark locations of degradation that would be important to evaluate. If blisters are very numerous, however, analysis would likely be cost prohibitive.
11. Concrete samples [H. Graves]  
If concrete core samples are available, they would be examined for evidence of carbonation or chloride ingress. If pore water is present, it would be sampled for chemical analysis. The objective is to assess the aging performance of concrete in a variety of locations and environments at the plant site.

#### *Spent Fuel Pool*

12. Neutron absorber materials from spent fuel pool [A. Pulvirenti]  
Specimens would be very valuable for research on the following aspects of neutron absorber degradation: degradation mechanisms, rates of degradation including induction periods, prediction of neutron absorber behavior based on initial material qualification, and assessment of whether pool samples are representative of in-service neutron absorber panels.

#### *Electrical Components*

13. Electrical and I&C cables: 10 to 20 ft samples of every type of cable from inside containment [T. Koshy / S. Ray]

*[This list was prepared for the Zion decommissioning and is a sample provided to Dominion Energy Kewaunee for discussion and adaptation – Karl Feintuch, USNRC, 7 March 2013]*

14. Electrical penetration modules [T. Koshy]
15. Small to medium size motors [T. Koshy]
16. Actuator assemblies, e.g., Limitorque [T. Koshy]
17. Limit switches, e.g., NAMCO [T. Koshy]
18. Solenoid valves, e.g., ASCO [T. Koshy]
19. Pressure transmitters, e.g., Rosemount [T. Koshy]

Electrical component samples would be valuable for assessing the degradation associated with temperature and radiation exposure. The plant's 34 years of natural aging would provide a baseline for evaluating extended life for the license renewal period. Necessary background information includes any obtainable details of the service environment, procurement and manufacturer's specification, and duty cycle (hours of service).