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June 22, 2017

Ms. Merrilee Banic, Petition Manager (10 CFR 2.206)
U.S. Nuclear Regulatory Commission
Washington, DC 20555
By email: Merrilee.Banic@nrc.gov and James.Kim@nrc.gov

**CLARIFICATION AND ADDITIONAL DOCUMENTATION
to the June 16, 2017 Supplement to Emergency Enforcement Petition (10
CFR 2.206) dated January 24, 2017 by Beyond Nuclear, et al, for Listed U.S.
Reactors with Forged Components and Parts Manufactured at France's
Areva-Le Creusot Forge and Japan Casting and Forging Corporation**

Ms. Banic:

On behalf of the Petitioners, Beyond Nuclear is providing the following clarification and additional documentation to the June 16, 2017 supplement to the January 24, 2017 emergency enforcement petition (10 CFR 2.206).

Le Creusot replacement reactor pressure vessel head in Crystal River 3

The Petitioners' June 16, 2017 supplement requests additional enforcement action by the U.S. Nuclear Regulatory Commission (NRC) with the addition of the permanently closed Crystal River Unit 3 for destructive examination and materially testing.

Beyond Nuclear is submitting a clarification to the June 16, 2017 supplemental action request with regard to the Crystal River Unit 3 replacement reactor pressure vessel head. The Petitioners are aware that the Crystal River Unit 3 reactor pressure vessel head was finished at the Framatom Chalon/Saint Marcel industrial facility. To clarify, the Petitioners are requesting that the NRC confirm that the Crystal River Unit 3 pressure vessel head was forged at Le Creusot before being finished at the Chalon/Saint-Marcel facility. The Petitioners are

further requesting that the NRC confirm that the reactor pressure vessel head component as supplied to Crystal River Unit 3 included the quality assurance by Le Creusot Forge, and; secondly, to modify the Crystal River license to require material testing of harvested samples from the component for carbon segregation testing.

As referenced in the June 16, 2017 supplement, the 2003 S&P Global Platts trade journal story identifies that the Crystal River Unit 3 replacement reactor pressure vessel head was provided by the Framatom Chalon/Saint-Marcel industrial facility in France and scheduled for installation at the next refueling and maintenance outage.¹ To clarify, Areva's roots are in Framatom and included the transfer of its manufacturing facilities. The Areva website links the Creusot Forge to the Chalon/St-Marcel industrial facility stating, *"Creusot Forge is one of the very few forges in the world capable of making the sophisticated parts necessary for the manufacture of the primary components for the nuclear island. In its workshops are realized large carbon or stainless steel forgings as well as castings. These components are then assembled in the plants of Chalon/St-Marcel or JSPM to form the key components of nuclear reactors."*²

The Nuclear Institute's website further confirms that the Chalon/St-Marcel industrial facility is linked to the Le Creusot forge stating, *"Le Creusot forge specialises in the supply of big forgings and castings for the nuclear market. To date they have supplied over 2,800 parts for over 100 nuclear plants worldwide. They are one of the very few forges in the world capable of making the sophisticated parts necessary for the manufacture of the primary components for the nuclear island. The main type of components produced at Creusot forge are reactor pressure vessels, steam generators, pressurisers, primary pumps and*

¹ "Bill for pressure vessel heads could top \$1 billion," Power, S&P Global Platts, February 3, 2003, https://online.platts.com/PPS/P=m&s=1029337384756.1478827&e=1096494853343.2672017605169417981/?artnum=2PU004072A0N1mUD12N226_2

² Areva, Creusot Forge, <http://www.areva.com/EN/operations-2121/creusot-forge-and-creusot-mecaniquemanufacturer-of-large-forging-and-casting-components.html>

primary piping (hot and cold legs), which are then transferred down the road to Chalon/St-Marcel to be assembled.”³

Therefore, the Petitioners submit that the Creusot Forge was in the manufacturing and supply chain for the Crystal River Unit 3 reactor pressure vessel head as identified in the trade news publication and was scheduled for installation during the next refueling/maintenance outage which commenced with the power reactor’s coast down on October 3, 2003.⁴

Additional documentation for Flamanville Unit 3 and the carbon segregation issue for the installed reactor pressure vessel

Beyond Nuclear and co-petitioners are providing a link to the memo of Gérard Gary that is referenced in the June 16, 2017 supplement. The supplement included our English translation of an article published in the French news publication Capital, June 14, 2017, and translated headline, “Flamanville EPR: This Expert’s Note That Points Out the Danger of the Reactor Containment.”

The translation from the French text in the article, referencing the memo by expert Gérard Gary identifies that the material testing of sacrificial samples to investigate Unit 3 pressure vessel fracture resistance were “insufficient.”

“What does Gérard Gary say? ‘The measurements taken in the suspected zones revealed resilience values that are insufficient to satisfy the first level of defense vis à vis safety.’ In this case, it is about a resilience test, which measures the capacity of a material to absorb energy when it buckles (or bends etc) under shock and when the result is measured in Joules: the rule requires a result greater than 60 Joules. Now, the majority of the tests done on a sample piece similar to the lid of the EPR stood out at 52 Joules. The physicist also determined that on this piece, the expected resistance would be 220 Joules.”⁵

³ The Nuclear Institute, <http://www.nuclearinst.com/News/technical-visit-to-3-areva-facilities-in-france-on-22nd-and-23rd-oct-15-jointly-organised-by-ni-south-east-and-ni-london-branches>

⁴ Archive of Power Reactors Status Report, Region 2, U.S. NRC, October 3, 2003, <https://www.nrc.gov/reading-rm/doc-collections/event-status/reactor-status/2003/>

⁵ “EPR de Flamanville : cette note d’expert qui pointe le danger de la cuve,” Capital, 14/06/2017, <http://www.capital.fr/entreprises-marches/epr-de-flamanville-cette-note-d-expert-qui-pointe-le-danger-de->

This translated text is extracted from the original Gary memo as now provided by hyperlink, which reads,

“Les valeurs de résilience mesurées dans les zones suspectes jusqu’ici considérées (mais le rapporteur en a identifié d’autres) présentent une valeur moyenne de 52 Joules et une valeur minimale de 36 joules. Elles ne satisfont pas au niveau de 1 de sûreté nucléaire spécifiant une résilience minimale de 60 joules. De plus, elles sont très largement inférieures à ce qu’on aurait pu espérer du matériau s’il avait été conforme à la zone de recette (vue sur la figure 26) pour une résilience attendue de 220 joules.”⁶

Beyond Nuclear additionally provides a clarification pertaining to the Gary memo. Mr. Gary is not employed by Institute of Radiation Protection and Nuclear Safety (IRSN). He is the emeritus director of Centre National de la Recherche Scientifique (CNRS).⁷ IRSN published the Gary memo as a technical note.

Thank you,

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Paul Gunter
Director, Reactor Oversight Project
Beyond Nuclear

Cc: Co-petitioners

[la-cuve-1232494](#)

⁶ Sujet: Séance du 30 Septembre 2015 du Groupe Permanent d'Experts pour les équipements sous pression nucléaire, Auteur: Gérard Gary, Directeur de Recherche émérite - ex CNRS - gary.lms@orange.fr, @ p.4 of 8, http://www.anccli.org/wp-content/uploads/2017/04/Note-G_Gary_Flamanville.pdf

⁷ CNRC, <http://www.cnrs.fr/fr/organisme/presentation.htm>