

## **NRR-PMDAPem Resource**

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**From:** Paul Gunter <paul@beyondnuclear.org>  
**Sent:** Friday, June 16, 2017 6:48 PM  
**To:** Banic, Merrilee; Kim, James  
**Cc:** Alan Muller; Burton/ Nancy; calta/ paxus; Day/Elena; Faye and Jerry Rosenthal; george crocker; Gray / Erica; Kraft/ Dave; Portzline/ Scott; Price / Scott; Tim Judson; Kamps/ Kevin; Gunter/Linda  
**Subject:** [External\_Sender] Supplement to the January 24, 2017 Emergency Enforcement Petition re: Le Creusot Forge  
**Attachments:** creu\_2206\_sup\_06162017.pdf

Ms. Banic,

As our NRC petition manager, I am providing you with a supplemental request for emergency enforcement action (10 CFR 2.206) and new information as regards U.S. reactors with at-risk safety-related components from the Areva-Le Creusot Forge in Charlon-St. Marcel, France.

Thank you,

Paul Gunter, Director  
Reactor Oversight Project  
Beyond Nuclear  
6930 Carroll Avenue Suite 400  
Takoma Park, MD 20912  
Tel. 301 270 2209  
[www.beyondnuclear.org](http://www.beyondnuclear.org)

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Petition re: Le Creusot Forge  
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**From:** Paul Gunter

**Created By:** paul@beyondnuclear.org

**Recipients:**

"Alan Muller" <amuller@dca.net>  
Tracking Status: None  
"Burton/ Nancy" <NancyBurtonCT@aol.com>  
Tracking Status: None  
"calta/ paxus" <paxus.calta@gmail.com>  
Tracking Status: None  
"Day/Elena" <elena.day@gmail.com>  
Tracking Status: None  
"Faye and Jerry Rosenthal" <zipsbiz@gmail.com>  
Tracking Status: None  
"george crocker" <gwillc@nawo.org>  
Tracking Status: None  
"Gray / Erica" <veggielady@yahoo.com>  
Tracking Status: None  
"Kraft/ Dave" <neis@neis.org>  
Tracking Status: None  
"Portzline/ Scott" <sdportzline1@verizon.net>  
Tracking Status: None  
"Price / Scott" <sprice@apvonline.org>  
Tracking Status: None  
"Tim Judson" <timj@nirs.org>  
Tracking Status: None  
"Kamps/ Kevin" <kevin@beyondnuclear.org>  
Tracking Status: None  
"Gunter/Linda" <linda@beyondnuclear.org>  
Tracking Status: None  
"Banic, Merrilee" <Merrilee.Banic@nrc.gov>  
Tracking Status: None  
"Kim, James" <James.Kim@nrc.gov>  
Tracking Status: None

**Post Office:** mail.gmail.com

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## **Beyond Nuclear**

6930 Carroll Avenue

Suite 400

Takoma Park, MD 20912

Email: [paul@beyondnuclear.org](mailto:paul@beyondnuclear.org)

Tel. 301.270.2209

[www.beyondnuclear.org](http://www.beyondnuclear.org)

June 16, 2017

Ms. Merrilee Banic, Petition Manager (10 CFR 2.206)

U.S. Nuclear Regulatory Commission

Washington, DC 20555

By email: [Merrilee.Banic@nrc.gov](mailto:Merrilee.Banic@nrc.gov) and [James.Kim@nrc.gov](mailto:James.Kim@nrc.gov)

**Supplement to Emergency Enforcement Petition (10 CFR 2.206)  
January 24, 2017 filed 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**

**As now also pertains to requested action for the  
Crystal River Unit 3 nuclear power station and new information on the  
Flamanville Unit 3 Reactor Pressure Vessel integrity**

Ms. Banic:

On behalf of Petitioners identified in the January 24, 2017 emergency enforcement petition (10 CFR 2.206), Beyond Nuclear is providing the following new information and an additional request for enforcement action.

As you are already aware, the January 2017 emergency enforcement petition has requested the U.S. Nuclear Regulatory Commission (NRC):

1) to suspend operations at seventeen (17) U.S. reactors listed by the NRC as relying upon at-risk safety-related Le Creusot Forge components pending full inspection and materially testing for carbon macrosegregation. With a test finding that exceeds the technical specification for the carbon contamination, (a) the component is to be replaced with quality certified parts or; (b) for any operator seeking to remain in operation with the at-risk component(s) that they make application for a license amendment to demonstrate that a revised design basis is reliably safe;

2) that should the NRC decline the Petitioners' request for immediate suspension of operations pending inspection and materially testing, the agency should modify the operating license to require the requested enforcement actions at the next scheduled outage;

3) and to “take other action as may be appropriate” by issuing a 10 CFR 50.54(f) letter to all licensees to reply under oath and affirmation specifying how operators are reliably monitoring contractors and subcontractors for the potential carbon segmentation anomaly in their supply chain and the reliability of quality assurance certification. <sup>1</sup>

### **Additional Requested Enforcement Action**

The Petitioners are now supplementing their petition with an additional enforcement action request;

4) As regards the permanently closed Crystal River Unit 3 nuclear power station in Crystal River, Florida and the licensee Duke Energy;

A. The Petitioners request that the NRC confirm the sale, delivery, quality control and quality assurance certification and installation of the replacement reactor pressure vessel head as supplied to Crystal River Unit 3 by then Framatom and now Areva-Le Creusot Forge industrial facility in Charlon-St. Marcel, France and;

B. With completion and confirmation, the Petitioners further request the modification of Duke Energy’s current license for the permanently closed Crystal River Unit 3 nuclear power station in Crystal River, Florida to inspect and conduct the appropriate material test(s) for carbon macrosegregation on sufficient samples harvested from the installed and now service irradiated Le Creusot Forge reactor pressure vessel head. The Petitioners assert that the appropriate material testing includes Optical Emissions Spectrometry (OES).

### Background and Supporting Statement

Crystal River Unit 3 was permanently closed on February 20, 2013 and is undergoing decommissioning by the SAFSTOR process under a possession only license currently held by Duke Energy.

According to the S&P Global Platts publication Power, February 3, 2003, Crystal River Unit 3 was supplied and installed a quality certified reactor pressure vessel head from Le Creusot Forge industrial facility in Charlon-St. Marcel, France.<sup>2</sup>

The S&P Global Platts article reads,

“For its Crystal River 3 plant in Florida, Progress Energy Corp. (Raleigh, N.C.) contracted Framatom ANP (U.S. office: Lynchburg, VA) to manufacture a new vessel head. Framatom has also been awarded a follow-on contract to full

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<sup>1</sup> Beyond Nuclear et al Emergency Enforcement Petition for Areva-Creusot Forge Components in U.S. Reactors, January 24, 2017, [http://www.beyondnuclear.org/storage/areva-le-creusot/2206\\_le-creusot\\_us\\_01242017\\_fnl.pdf](http://www.beyondnuclear.org/storage/areva-le-creusot/2206_le-creusot_us_01242017_fnl.pdf)

<sup>2</sup> “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](https://online.platts.com/PPS/P=m&s=1029337384756.1478827&e=1096494853343.-2672017605169417981/?artnum=2PU004072A0N1mUD12N226_2)

installation services at Crystal River. The new vessel head and associated control rod drive mechanism forgings have been completed, and the next steps in the manufacturing process are underway at Framatom's Charlon-St. Marcel manufacturing facility. The components are scheduled for delivery to Crystal River this summer, to be installed during the plant's next scheduled refueling outage."<sup>3</sup>

The Petitioners are aware that Areva has its roots in Framatom along with which came the transfer of the one and the same Le Creusot Forge Charlon-St. Marcel industrial facility. The Crystal River Unit 3 pressure vessel head is therefore a prime candidate for harvesting, carbon macrosegregation material testing and aiding in the quality control/assurance verification for U.S. operating reactors from a facility in the decommissioning process.

To date, Areva and the NRC have only publicly identified the operational U.S. nuclear power stations that have been supplied and installed with the at-risk Areva-Le Creusot components.

Crystal River operated for nearly a decade after the replacement pressure vessel head was installed before closing in 2013 and prior to the Areva-Le Creusot carbon macrosegregation controversy disclosure in 2016.

The Petitioners contend that the harvesting of base metal samples from suspect areas for material testing would provide a valuable asset in verifying and validating the quality assurance of the Areva-Le Creusot Forge manufacturing process for components marketed abroad. Testing conducted on harvested samples from the Crystal River pressure vessel head would provide potentially valuable information and insight for the seventeen U.S. nuclear power stations that remain in operation with the at-risk forged components.

The NRC staff has already identified in its "Strategic Approach for Obtaining Material and Component Aging Information" that decommissioning activity in U.S. reactors "provides a unique opportunity to plan harvesting to address the highest priority technical and regulatory issues." The NRC strategic approach further identifies, "As decommissioning plants announce their plans, there is a clear list of SSC (systems, structures, components) and their characteristics (metallurgy, temperature, fluence, etc.) that would be desired to address the data need."<sup>4</sup>

The Petitioners argue that materially testing pressure vessel head samples from Crystal River is consistent with the same strategic regulatory activity as conducted in France to identify the carbon macrosegregation anomaly in reactors

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<sup>3</sup> Ibid, S&P Global Platts

<sup>4</sup> "Strategic Approach for Obtaining Material and Component Aging Information," U.S. Nuclear Regulatory Commission, Nuclear Reactor Research, Industry/NRC Materials Programs Technical Information Exchange Meeting, Nuclear Regulatory Commission Headquarters June 2-4, 2015, [http://www.beyondnuclear.org/storage/decommissioning/decom\\_nrc\\_harvesting\\_opportunities\\_2015%20.pdf](http://www.beyondnuclear.org/storage/decommissioning/decom_nrc_harvesting_opportunities_2015%20.pdf)

there. The NRC should therefore support the requested enforcement action to investigate if Areva-Le Creusot Forge supplied substandard parts and falsified quality assurance documents to the U.S. reactor that is in decommissioning.

### **New Information relating to the integrity of the Flamanville Unit 3's Areva / Le Creusot Forge Reactor Pressure Vessel head and carbon segregation**

The Petitioners are providing new information only recently published by the French news service, Capital, that pertains to our January 24, 2017 emergency enforcement petition requesting that the NRC undertake an investigation of both potentially substandard components and potentially falsified quality assurance documents supplied by Areva-Le Creusot Forge to U.S., French and other foreign reactors.

The Petitioners' January 24, 2017 request for enforcement action is supported in part by the developments and findings relating to the stalled Flamanville Unit 3 construction project in France. The Flamanville reactor pressure vessel component was manufactured and supplied by Areva-Le Creusot Forge and installed before the discovery of the carbon macrosegregation safety issue and the concern for how the excess carbon contamination incorporated during a poorly controlled forging process weakens safety-related reactor components.

Were it not for the 10 CFR 2.206 process, in our view, the NRC would be taking a "wait and see" approach to the regulatory and legal proceedings surrounding the Le Creusot controversy in France before considering enforcement action for affected reactors in the United States.

Therefore, new information from the French oversight of the Flamanville Unit 3 disclosure is relevant to our request for enforcement action at U.S. reactors with the at-risk forged components. The supplemental information presented by the recent French news article identifies documents from the Institute of Radioprotection and Nuclear Safety (IRSN) that show the Areva-Le Creusot Forge component installed in Flamanville Unit 3 represents an undue public safety threat if subjected to operating conditions.

The Petitioners are providing our translation of the French Capital news article (link provided only to French version) "Flamanville EPR: This Expert's Note That Points Out the Danger of the Reactor Containment" dated June 14, 2017, which reads as follows.<sup>5</sup>

*Documents from the Institute of Radioprotection and Nuclear Safety (IRSN) show that the containment of the EPR does not pass a mechanical resistance test. It*

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<sup>5</sup> 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-la-cuve-1232494>

*would not therefore conform to regulations, contrary to what is being said today.*

*Areva and EDF are playing with a substantial portion of their economic future this month. First up: as reported by les Echos (newspaper) the High Committee for transparency and information on nuclear security meets to work on the safety of the containment of the EPR type nuclear reactor built by Areva on behalf of EDF at Flamanville. At the end of June, it will be for the permanent Group of Experts on Equipment under Nuclear Pressure (GPESPN) to work on. It will examine the conclusions of another entity: the Institute of Radioprotection and Nuclear Security (IRSN), the technical expert of the Association of Nuclear Security (ASN).*

*Will the all-powerful ASN, which won't render its definitive verdict until September, validate the EPR containment. Recent leaks in the press would seem to indicate yes. Yet, a technical memo published by the IRSN itself, last April, yet until now going totally unnoticed, show that this containment does not conform to the regulation for nuclear equipment under pressure. And it posed a major safety problem. Buried in a mass of on-line documents, it dates from September 2015, and is signed by Gérard Gary, nuclear physicist, emeritus director of research of CNRS, attached to the solid mechanics laboratory of the Polytechnic School.*

*What does Gérard Gary say? "The measurements taken in the suspected zones (Note: Beyond Nuclear translates from the French terminology here to literally mean the "sacrificial piece" from the sampled zone) 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.*

*Translation: In the case of violent shock, the foundations of the EPR containment could break. Currently, this risk of rupture is strictly prohibited by the regulation: the rupture could lead to the loss of coolant, uncovering the core and leading to a serious nuclear accident. For Monique Sené, a renowned physicist, co-founder and president of the Scientific Group for Information on Nuclear Energy (GSIEN) who edits the Nuclear Gazette and is a member of the group of experts at ASN, this negative result on tests of resilience should logically lead the ASN to forbid the EPR containment.*

*EDF has already spent 10.5 billion euros on this reactor*

*In his memo, Gérard Gary goes further in explaining how Areva tries to convince the experts at GPESPN to overlook these negative tests. "I noted that ASN is*



*very alert to these attempts by Areva to bypass the rules. . . I did not observe, during the course of the meeting, similar vigilance on the part of most of the experts (NDLR: of GPESN) during a discussion that focused on technical issues.”*

*One can deduce that Areva and its boss, EDF, are doing everything possible to obtain the approval of ASN. Brussels has made a condition for its green light the recapitalization of 4.5 billion Euros of Areva. And EDF has already spent 10.5 billion Euros on the construction of the reactor.*

*Asked by Capital, Areva explained that it had provided ASN with the results of a program of complimentary tests conducted at the end of 2015. “The tests were conducted on the lids and bottoms of a containment equivalent to that of the Flamanville 3 EPR reactor. Three sacrificial lids were used and more than 1,700 samples were taken. The characteristics of the resilience measured in the sacrificial pieces met the expectations in the ASN letter sent in December 2015; they are within the high range of that which was anticipated by the Areva experts.”*

The Petitioners therefore contend that the referenced IRSN memo supports our emergency enforcement petition request for material testing at U.S. reactors that rely upon the safety-related Le Creusot at-risk components.

Beyond Nuclear will endeavor to provide the NRC with a copy of the IRSN memo(s) as referenced in the Capital news story in a follow-up supplement.

On behalf of the Petitioners,

-----/signed by/-----

Paul Gunter, Director  
Reactor Oversight Project  
Beyond Nuclear  
6930 Carroll Avenue, Suite 400  
Takoma Park, MD 20912  
Tel. 301.270.2209  
[paul@beyondnuclear.org](mailto:paul@beyondnuclear.org)  
[www.BeyondNuclear.org](http://www.BeyondNuclear.org)

cc: Co-Petitioners