



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 29, 2019

Mr. Pierre Aubry
AREVA NP
Tour AREVA 1 Place Jean Millier
92400 COURBEVOIE
FRANCE

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION REPORT OF
AREVA NP CREUSOT FORGE, NO. 99901381/2019-201

Dear Mr. Aubry:

From March 11 through March 15, 2019, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Creusot Forge site in Le Creusot, France. The purpose of this inspection was to follow-up on issues identified during the Multinational Design Evaluation Programme (MDEP) inspection of Creusot Forge in 2016, which is currently owned by Framatome and previously owned by AREVA NP. The NRC inspection team verified that the corrective actions initiated during the 2016 MDEP inspection related to forging activities were effectively implemented and met the applicable requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," and 10 CFR Part 21, "Reporting of Defects and Noncompliance," and other codes and standards, as applicable.

This technically focused inspection specifically evaluated the reconciliation of the manufacturing files for forgings with identified irregularities supplied by AREVA NP to U.S. operating nuclear power plants. Specifically, the NRC inspection team reviewed documentation to verify that forgings were properly fabricated, inspected, and tested in accordance with customer's design, regulatory, and code requirements. Framatome, under contract with AREVA NP, performed the reconciliation and evaluation of the irregularities in the manufacturing files and sent deviation notices to Westinghouse for their evaluation. Westinghouse will complete their review by the end of April 2019. The preliminary results indicate that Westinghouse has not identified any safety concerns within these deviation notices on the forged components provided by Creusot Forge, and that they will still perform their intended safety functions. Additionally, the NRC inspection team concluded that the Framatome evaluations provide reasonable assurance that these forgings meet the design requirements and can perform their intended safety functions. Currently, there are no forgings being manufactured for U.S. reactors. The enclosed report presents the results of the inspection.

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," the NRC will make available electronically for public inspection a copy of this letter and its enclosure through the NRC Public Document Room or from the

NRC's document system (ADAMS), which is accessible at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

/RA/

Kerri A. Kavanagh, Chief
Quality Assurance Vendor Inspection Branch
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

Docket No.: 99901381

EPID No.: I-2019-201-0037

Enclosure:
Inspection Report 99901381/2019-201
and Attachment

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION REPORT OF
AREVA NP CREUSOT FORGE, NO. 99901381/2019-201
Dated: April 29, 2019

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NRO-002

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DATE	04/29/19	04/29/19	04/29/19

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**U.S NUCLEAR REGULATORY COMMISSION OFFICE OF NUCLEAR REACTOR
REGULATION DIVISION OF INSPECTION AND REGIONAL SUPPORT
VENDOR INSPECTION REPORT**

Docket No.: 99901381

Report No.: 99901381/2019-201

Vendor: AREVA NP
Tour AREVA 1 Place Jean Millier
92400 COURBEVOIE
FRANCE

Vendor Contact: Mr. Pierre Aubry
E-mail: pierre.aubry@areva.com

Background: AREVA SA and Électricité de France (EDF) signed a binding agreement that provides exclusive control by EDF of AREVA NP, and combine AREVA Group's activities relating to the design and manufacturing of nuclear reactors and equipment, fuel assemblies and services to the nuclear industry. The contracts for the Evolutionary Power Reactor (EPR) Olkiluoto 3 project and the resources required to complete the project, as well as certain contracts relating to components forged in the Le Creusot site, will stay within AREVA NP, in AREVA SA's scope.

Inspection Dates: March 11-15, 2019

Inspection Team Leader: Jonathan Ortega-Luciano, NRR/DIRS/QVIB

Inspectors: Taylor Lamb, NRO/DLSE/CIPB
Sébastien Véziat, Autorité de Sûreté Nucléaire (ASN), Observer

Approved by: Kerri A. Kavanagh, Chief
Quality Assurance Vendor Inspection Branch
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

AREVA NP
99901381/2019-201

The U.S. Nuclear Regulatory Commission (NRC) conducted an inspection at the Creusot Forge site, previously owned by AREVA NP. This inspection was a follow-up to the multinational inspection that was conducted in accordance with the inspection protocol of the Multinational Design Evaluation Program (MDEP) in 2016. AREVA NP is the responsible entity for addressing findings from the MDEP inspection. The 2016 MDEP inspection was led by Autorité de Sûreté Nucléaire (ASN), in cooperation with representatives from the following regulatory bodies: Finland, Canada, China, United Kingdom, and United States. The NRC documented its participation in the MDEP inspection in a trip report available in Agencywide Documents Access and Management System (ADAMS) under Accession No. ML17052A119.

In May 2016, ASN stated that an ongoing quality audit at Creusot Forge site, which AREVA bought in 2006, had identified irregularities in the manufacturing files of plant components produced there since 1965. While AREVA NP was performing the evaluation of these irregularities, on December 2017, AREVA SA and Electricite de France (EDF) signed agreements that settled the terms of the sale of an interest conferring exclusive control by EDF of a subsidiary wholly owned by AREVA NP, referred to as 'New NP.' 'New NP' combines AREVA Group's activities relating to the design and manufacturing of nuclear reactors and equipment, fuel assemblies, and services. Not included in the sale are contracts for the Olkiluoto 3 EPR project in Finland and for resources required to complete that project, as well as some contracts relating to components forged in the Creusot Forge site. These functions will remain within AREVA NP. In response to the ASN requests, AREVA NP contracted Framatome, who own the Creusot Forge site, to perform the evaluation of the irregularities identified in the manufacturing files and provide a technical conclusion. As described in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," AREVA NP continues to be responsible for evaluation and reporting of any potential defects in components supplied to the U.S. nuclear fleet.

ASN participated in this follow-up inspection as observer and provided support to the NRC inspection team with regards to the corrective actions. ASN has acquired extensive knowledge related to the corrective actions at Creusot Forge as result of their leadership in closing out the 2016 MDEP inspection. Further, these observations foster the sharing of international experiences with the construction of new reactors and replacement of components for operating reactors, oversight of vendors, and modular construction techniques consistent with the objectives of the MDEP.

The following regulations served as the bases for this NRC inspection:

- Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities"
- 10 CFR Part 21, "Reporting of Defects and Noncompliance"

The NRC inspection team used Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," and IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance."

The information below summarizes the results of this inspection.

Part 21

The NRC inspection team verified that AREVA NP had a clear understanding of their obligations to comply with 10 CFR Part 21, which do not end when contractual services are completed. As part of their obligation if AREVA NP discovers a deviation from the contractual technical requirements after a service has been performed, then it must evaluate it or inform the purchaser of the deviation; and if the evaluation determined that a defect exists, then a notification is required.

The NRC inspection team was able to verify that, as part of the contractual agreement between AREVA NP and Framatome, Framatome evaluated the irregularities found in the manufacturing files for Part 21 applicability. For those deviations identified by Framatome in which they do not have the capability to determine or conclude a potential defect exists, they proceeded to forward those deviations to AREVA NP's customers for further evaluation. The NRC inspection team concluded that AREVA NP was in compliance with the regulatory requirements of 10 CFR Part 21. No findings of significance were identified.

Corrective Actions

In parallel to AREVA NP's and Framatome's reconciliation and evaluation of the manufacturing files, Framatome identified the underlying causes of the failures observed at its Creusot Forge site and implemented an improvement plan. On October 2017, Framatome informed ASN of its intention to resume forging of nuclear pressure equipment components for French nuclear facilities in its Creusot Forge site. ASN analyzed the steps taken by EDF and Framatome and carried out several inspections at the Creusot Forge site. Based on the results of those inspections, ASN considers that the steps taken by EDF and Framatome are adequate to meet the quality and regulatory requirements of the future production of French components by the Creusot Forge site.

To make a determination of the adequacy of the evaluations of the irregularities found in manufacturing files affecting forgings supplied to the U.S. operating reactors, the NRC inspection team recognized the work performed by ASN to close the findings of the 2016 MDEP inspection. ASN concluded that the corrective actions related to the quality assurance program and the manufacturing process are adequate and effective with certain conditions. For more information on these conditions please visit ASN website (<http://www.french-nuclear-safety.fr/Inspections/Supervision-of-the-EPR-reactor/Anomaly-affecting-the-Flamanville-EPR-reactor-vessel>). The NRC inspection team evaluated a sample of nonconformance reports generated by Framatome, to document their conclusion of their evaluation, and determined that Framatome's technical basis to disposition the irregularities were reasonable.

Based on this information and the evaluation of the corrective actions to address the irregularities identified in the manufacturing files, the NRC inspection team determined that reasonable assurance exists that the forgings provided to the U.S. operating reactors meet the applicable American Society of Mechanical Engineers (ASME) Code requirements and will be able to perform their intended safety function. No findings of significance were identified.

REPORT DETAILS

1. 10 CFR Part 21 Program

a. Inspection Scope

The NRC inspection team was not able to evaluate policies and procedure governing the implementation of 10 CFR Part 21, "Reporting of Defects and Noncompliance," because AREVA NP is no longer a supplier of forgings to the U.S. nuclear reactors. As part of the acquisition of AREVA by Électricité de France (EDF), EDF has control over the AREVA NP activities but the fabrication activities related to the Creusot Forge site were not part of this agreement. AREVA NP is still responsible for the forgings fabricated before the completion of the acquisition. For those manufacturing files that AREVA NP maintains responsibility for prior to the acquisition by EDF, the obligation to comply with 10 CFR Part 21 still exists.

AREVA NP contracted Framatome to reconcile and evaluate the irregularities identified in the manufacturing files. Framatome performed the evaluation of these irregularities and also evaluated for Part 21 applicability using Framatome's Part 21 procedure.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that AREVA NP's contractual arrangement with Framatome to perform evaluation of the irregularities identified in the manufacturing files satisfied the regulatory requirements of Part 21. No findings of significance were identified.

2. Corrective Action Program

a. Inspection Scope

The NRC inspection team was not able to evaluate AREVA NP's policies and implementing procedures that govern the corrective action program to verify compliance with the requirements of Criterion XVI, "Corrective Action," of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," (Appendix B to 10 CFR Part 50), because AREVA NP is no longer a supplier of forgings.

The NRC inspection team recognized that AREVA NP continues to be responsible for the manufacturing files of the forgings supplied to the U.S. nuclear reactors and as such must reconcile those files that were identified to contain irregularities. AREVA NP contracted Framatome to perform these evaluations and recommend corrective actions to disposition any irregularities identified during Framatome's reconciliation.

The NRC inspection team discussed the process that Framatome is using to evaluate AREVA NP's manufacturing files and how the dispositions of the deviations found in the

manufacturing files are going to be communicated to the affected customers. To reach a conclusion that the evaluations of the irregularities affecting forgings (i.e. “marked files”) supplied to the U.S. operating reactors are adequate, the NRC inspection team considered the ASN assessment and conclusions developed during the closeout of the 2016 MDEP multinational inspection. It was determined by ASN that the corrective actions related to the quality assurance program and the manufacturing process have been adequately implemented. The NRC inspection team sampled several nonconformance reports and supporting documentation to verify that the forgings were properly fabricated, inspected, and tested in accordance with the customer’s design specifications, as well as regulatory and code requirements. Based on ASN’s conclusions and the NRC inspection team’s evaluation of the corrective actions taken to address the irregularities identified in the manufacturing files, the NRC inspection team has reasonable assurance that there are no safety concerns with forgings provided to the U.S. operating reactors and the components will be able to perform their intended safety function. No findings of significance were identified.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that AREVA NP’s contractual arrangement with Framatome to perform reconciliation and evaluation of the irregularities identified in the manufacturing files satisfied the regulatory requirements of Criterion XVI of Appendix B to 10 CFR Part 50. No findings of significance were identified.

3. Entrance and Exit Meeting

On Monday, March 11, 2019, the NRC inspection team discussed the inspection scope during an entrance meeting with David HAGUET, Director of Framatome Le Creusot (FLC), and other members of Framatome and FLC’s management and technical staff. On Friday, March 15, 2019, the NRC inspection team presented the inspection results during an exit meeting with David EMOND, Senior Executive Vice President of the Component Manufacturing BU of Framatome, David HAGUET and other members of Framatome and FLC’s management and technical staff. The attachment to this report lists the attendees of the entrance and exit meetings, as well as those individuals whom the NRC inspection team interviewed.

ATTACHMENT

1. ENTRANCE/EXIT MEETING ATTENDEES

<u>Name</u>	<u>Title</u>	<u>Affiliation</u>	<u>Entrance</u>	<u>Exit</u>	<u>Interviewed</u>
Jonathan Ortega-Luciano	Inspector, Team Leader	NRC	X	X	
Taylor Lamb	Inspector	NRC	X	X	
Sébastien Véziat,	Observer	Autorité de Sûreté Nucléaire (ASN)	X	X	
Laure Monin	Observer	ASN	X		
François Colonna	Observer	ASN		X	
Jean-Pierre Labaste	Translator	Davron Translations	X	X	
Franck Charvieux	Technical Director	Framatome Le Creusot (FLC)	X		
Patrice Nogue	Director of Sales & Projects	FLC	X	X	
Thierry Berger	Technical & Regulatory Expert Manufacturing Component BU	Framatome	X	X	X
Pascale Convers	Quality and Safety Manager	FLC	X	X	
David Haguët	Director FLC	FLC	X	X	
Hugues Lecour	Conformance Project Manager	FLC	X	X	
Pascale Levivien	Safety, Quality & Operational Performance Component Manufacturing BU	Framatome		X	
David Emond	Senior Executive Vice President Component Manufacturing BU	Framatome		X	

2. INSPECTION PROCEDURES USED

Inspection Procedure (IP) 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated February 13, 2012. •

IP 43002, "Routine Inspections of Nuclear Vendors," dated January 27, 2017

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None.

4. DOCUMENTS REVIEWED

Deviation Notices

- 9032964
- 9036589
- 9032746
- 9032765
- 9036409
- 9036367
- 9036381
- 9036466
- 9008951
- 9008952
- 9023659
- 9021743
- 9022621
- 9036549
- 9036586
- 9036535
- 9035884
- 9031642
- 9023687
- 9036588
- 9033007
- 9036147
- 9036369
- 9032270
- 9036590
- 9036594
- 9036369
- 9036320
- 9037735

Customer Response Letters

- D02-TFPF-IN-18-2896
- D02-TFPF-IN-18-2915
- D02-TFPF-IN-18-3025
- ENSA_BGR_18_0808