



Official

CONTACT RECORD			
<b>Unique Document ID and Revision No:</b>	ONR-NR-CR-16-803 Revision 0	<b>Trim Ref:</b>	2016/491806
<b>Visit Reference Number</b> (International visits only)	Business Case 2016/057		
<b>Title / Topic:</b> <i>(include level 1, 2, 3 or 4 if applicable)</i>	Multinational Design Evaluation Programme (MDEP); Multi National Vendor Inspection of AREVA NP at Creusot Forge, France.		
<b>Date of Contact:</b>	27 <sup>th</sup> November to 2 <sup>nd</sup> December 2016		
<b>Date Issued:</b>	16 <sup>th</sup> December 2016		
<b>Completed / Compiled By:</b> <i>(name, programme)</i>	[REDACTED], ONR Inspector		
<b>Type of Contact:</b> <i>(*delete not applicable)</i>	Site inspection.		
<b>Contact With:</b> <i>(names, position, organisation)</i>	AREVA NP and Creusot Forge Management and Operational Staff including:  [REDACTED] Director of Creusot Forge Site [REDACTED], Director of AREVA NP Business Unit [REDACTED] Site Quality Manager [REDACTED] Safety Authority Lead [REDACTED], Head of AREVA NP, Safety & Quality [REDACTED] Head of Quality, Areva		
<b>MDEP Team</b> <i>(names, regulator, country)</i>	[REDACTED], ASN, France [REDACTED] ASN, France [REDACTED] ASN, France [REDACTED], CNSC, Canada [REDACTED], NNSA, China [REDACTED] NNSA, China [REDACTED] NRC, USA [REDACTED] NRC, USA [REDACTED], STUK, Finland [REDACTED] ONR, UK [REDACTED] ONR, UK		

Official

## Official

### Summary / Key Points:

#### 1 INTRODUCTION

The objective of this Multi-national Vendor Inspection was to evaluate AREVA NP's capability to deliver forgings from its Creusot Forge (CF) plant which comply with customer requirements. The inspection was carried out in accordance with MDEP Vendor Inspection Protocol.

The Inspection Plan (see TRIM 2016/484863) was agreed in advance with AREVA NP. The inspection was led by the French Nuclear Regulator, ASN with inspection team representation from six national regulators, including ONR.

ASN will produce the formal inspection report as lead regulator within 21 days of the inspection and a copy will be made available to ONR and other participant regulators. A summary of the inspection findings was provided to the facility management at the end of the inspection and agreed in advance with the inspection team. This Contact Record represents a summary of the key findings of the Multi-national Inspection in advance of the formal report.

AREVA NP's CF facility is a key supplier of nuclear safety related forgings to the international nuclear industry. They have supplied parts for Sizewell 'B' and have produced forgings for Hinkley Point 'C' (HPC) in the UK.

Non-conformances and performance shortfalls have been identified in historic CF operations by ASN and Areva and are currently being investigated, these include:

- Carbon segregation issue in large forgings;
- Falsifications found in historic quality records;
- Shortcomings in mechanical and chemical test activities and associated results.

#### 2 FINDINGS

At the time of the inspection CF were in the process of deploying their improvement plan aimed at improving constancy of product and restoring stakeholder confidence in CF.

As part of the plan, AREVA NP had implemented organisational changes at CF in order to address the causes of the quality failures e.g.:

- There had been a reorganisation within CF with most of the top Management having been replaced.
- The CF quality function had been enhanced by the recruitment of a new CF Quality Manager and the Quality Department made more organisationally independent.
- There was a greater Quality Control presence on the shop floor.
- The Test Laboratory was now under the control of the Quality Manager
- CF intended to achieve certification by COFRAC (NAMAS equivalent in France) of the Test Laboratory in 2017.
- Technical Support Engineers had been recruited to provide shop floor support and oversight.
- Two inspectors from AREVA NP's central 2<sup>nd</sup> Party Inspection Agency, EIRA, had been assigned to, and are based at, CF to carry out independent oversight of operations and inspections. At the time of the inspection they had not completed induction training which

Official

## Official

restricted their unaccompanied access to site areas.

ASN led the MDEP Multi-national Inspection Team in accordance with the inspection plan (see TRIM 2016/484863). Their preparation, including pre-meeting with Areva staff at the recent MDEP Vendor Inspection Cooperation Working Group enabled an effective inspection. The scope of the inspection was extensive and included: presentations from senior personnel; interviews with personnel from board level to shop floor, examination of deficient record files and observations of forging and quenching operations.

The Team found that CF's preparations for the inspection were effective which, in conjunction with the openness of personnel involved, helped the MDEP Team achieve its objective.

The Team's key findings could be summarised as follows:

### 2.1 Continued shortfalls in Nuclear Safety Culture

- An example was identified, dated September 2016, where CF personnel had amended a manufacturing record in an uncontrolled manner. The product was produced after the deployment of process improvements contained in the CF improvement plan. The example included two uncontrolled amendments to key product parameters. The completed product record had been endorsed by CF's quality control, Areva's EIRA the Independent third party organisation and the EDF CEIDRE inspectors, all without comment.
- CF prohibited the use of correctional fluid at the works. However, the new Quality Manager identified that she routinely searched for correctional fluid in operational workstations. The Team found evidence of its continued use in the operational control room associated with current attendance sheets.
- CF had not taken any systematic actions, such as a staff survey, to ascertain the extant nuclear safety culture at the works.

### 2.2 Effectiveness of the CF Improvement Programme

- It was not clear how the deployment of the CF Improvement Plan would be adequately resourced, prioritised and its implementation monitored until the changes were demonstrated as sustained.
- It was not clear how the existing improvement programme would be integrated with further improvement activities under development by Areva corporate and Areva EIRA.
- There was no evidence of effective risk assessment to consider the implications of the organisational changes and implementation of the change programmes in addition to other organisational commitments.
- CF had not determined why inspection, audit and other assurance activities carried out in past decades had not found and addressed the falsification activities.
- There was a lack of understanding of the nature and causes of the recent quality failings on the part of workers, supervisors and inspectors (including EIRA).
- Although CF had established and deployed a procedure for the review of 6000 manufacturing files (approximately two million documents) they had yet to formalise how they would communicate any findings to customers and other stakeholders.

Official

**Official**

**2.3 Control of Manufacturing**

- A programme of manufacturing ‘Failure Mode and Effect Analysis’ (FMEA) had been carried out for forging, quenching and heat treatment but had not been carried out for ingot casting (the origin of carbon segregation), machining, NDT, preservation and protection.
- Personnel who did not work on a particular manufacturing activity / process but worked on subsequent production stages were not involved in FMEA for that process / activity.
- FMEA did not fully consider human factor issues.

**3 CONCLUSIONS**

- 3.1 The nuclear safety culture at CF fell short of that expected by the regulators for a major supplier of nuclear safety related plant. The improvement measures deployed to date had yet to be effective.
- 3.2 The MDEP Team were not confident that the improvement programmes and associated remedial actions initiated by AREVA NP were sufficiently resourced, prioritised and integrated in order to bring about sustained improvements in manufacturing performance and Nuclear Safety Culture.
- 3.3 ONR should consider the adequacy of EDF NNB HPC’s oversight and assurance arrangements for Areva as a key supplier to the HPC project, given the performance shortfalls at CF and the associated risks to NSSS components manufacture.

**4 BENEFIT TO ONR**

- 4.1 Participating in the ASN led MDEP Multi-national Inspection, aligned to MDEP protocols, enabled ONR to conduct an effective intervention of this high risk sub supplier to EDF NNB HPC outwith the UK. Collaborating with the host nation’s regulator enabled ONR to consider the adequacy of this high risk strategic supplier’s improvement activities.
- 4.2 It would have proved challenging to achieve a similar outcome by relying on information derived solely from EDF NNB HPC assurance and inspection activities. Similarly, it would have been difficult for ONR to realise the benefits of this joint inspection by carrying out an intervention, organised and supported by the Licensee.

**5 ISSUES**

**5.1 Issues Raised**

No	Issue Title	Category	Issue Level	Licensee/Duty Holder Role	Owner (Inspector)	Completion /Review Date

**5.2 Issues Closed**

**Official**

