

Regulatory Updates

Nuclear safety...

Stress corrosion phenomenon affecting nuclear power reactors: ASN considers that EDF's inspection strategy is appropriate

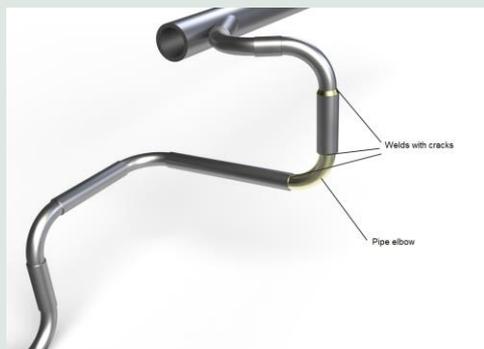
July 2022

On 26 July 2022, ASN issued a position statement on the inspection strategy proposed by EDF with regard to the stress corrosion (SC) phenomenon affecting its reactors.

ASN considers that EDF's strategy is appropriate in the light of the knowledge acquired concerning the phenomenon and the corresponding safety issues.

Since SC cracking was discovered on Civaux NPP reactor 1 at the end of 2021, EDF has carried out a considerable amount of work to more clearly understand the phenomenon and identify the zones concerned.

These investigations notably led to more than 70 assessments being conducted in the laboratory on welds sampled from eight reactors.



©ASN/Pipe elbow and adjacent welds which underwent a ten-yearly outage inspection (N4 plant series).

These assessments and the analyses carried out by EDF were essential in underpinning its inspection strategy.

They were able to identify the geometry of the pipes and the thermomechanical stresses to which they are subjected as being the main factors liable to influence the appearance of SC.

EDF identifies the following as being the most susceptible:

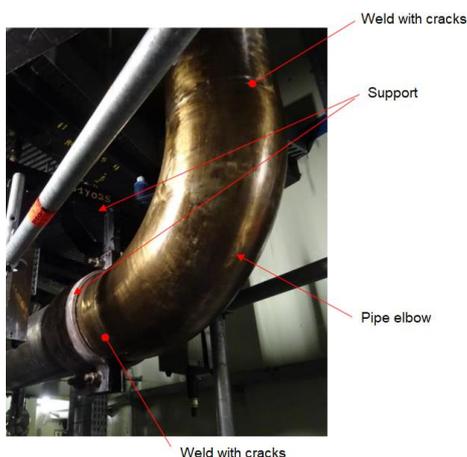
- the lines of the safety injection system (RIS) located on the cold leg [1] and the intake lines of the residual heat removal system (RRA) for the four reactors of the N4 [2] plant series,
- the lines of the RIS injection system located on the cold leg of the reactors of the P'4 plant series [3] .

Based on the available knowledge, it would appear that the susceptibility of the reactors of the P4 [4] and 900 MWe plant series to the SC phenomenon is low to very low.

EDF intends to inspect all of its reactors by 2025, prioritising inspection of these most susceptible zones of the N4 and P'4 reactors.

The inspections will be performed on the reactors using a new, non-destructive ultrasounds process. This process has been developed with the aim of providing reliable detection of SC cracks and being able to estimate their depth.

The results currently obtained by EDF, after six months of development, are encouraging and should enable this new inspection method to be deployed as of the second part of 2022.



©EDF/Photo showing the welds with cracks

ASN considers that this strategy meets the need to continue the inspections on the lines considered to be the most susceptible.

However, with regard to Belleville NPP reactor 2, ASN considers that inspection of this reactor - scheduled for 2024 - needs to be brought forward.

ASN considers that knowledge of the SC phenomenon will continue to develop and that the inspection programme will have to be adapted if the inspections or analyses bring any new evidence to light.

With the support of IRSN, ASN is continuing to review the data transmitted by EDF.

In September, the subject will be presented to the Advisory Committee for Nuclear Pressure Equipment.

[1] The cold legs are the pipes of the main primary system running from the reactor coolant pumps to the reactor pressure vessel.

[2] This concerns the four 1450 MWe reactors of the Chooz B and Civaux NPPs.

[3] This concerns the twelve 1300 MWe reactors of the Belleville, Cattenom, Golfech, Nogent-sur-Seine and Penly NPPs.

[4] This concerns the eight 1300 MWe reactors of the Paluel, Saint-Alban and Flamanville NPPs.

4th periodic safety review of the 900 MWe reactors: EDF issues the first report on the implementation of the generic resolution of ASN

August 2022

On 30 June 2022, EDF sent ASN the first report on the implementation of the ASN resolution of 23 February 2021 on the generic phase of the 4th periodic safety review of the 900 MWe reactors.

In its resolution 2021-DC-0706, ASN prescribed EDF to report annually on the actions implemented to meet the requirements and their deadlines, and also on the industrial capacity of both EDF and its outside contractors to complete the modifications of the facilities within the set time frames.

EDF has complied with all the requirements of this resolution, which were due to expire in 2021. ASN notes that EDF has not yet identified any alerts regarding compliance with the deadlines for future requirements. The ASN notes, however, that this report identifies several risk factors in the implementation of the planned actions, which will have to be closely monitored by EDF.



©ASN/Cahier de l'ASN #2 on 4th PSR

To find out more (only in French):

ASN Resolution 2021-DC-0706 on 23 February 2021 on the conditions for the continued operation of the 900 MWe reactors beyond 40 years

<https://www.asn.fr/l-asn-reglemente/bulletin-officiel-de-l-asn/installations-nucleaires/decisions-individuelles/decision-n-2021-dc-0706-de-l-asn-du-23-fevrier-2021>

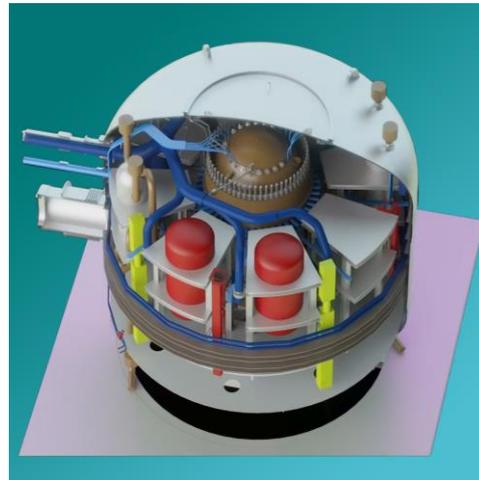
EDF Annual Report (2021) on the implementation of the ASN's requirements of the 4th periodic safety review of the 900 MWe reactors

<https://www.edf.fr/sites/groupe/files/2022-07/RP4-v5.pdf>

Development of small modular reactors: in collaboration with the safety regulators of Finland and the Czech Republic, ASN is initiating an unprecedented joint preliminary examination of the NUWARD™ reactor project

July 2022

On 10 June 2022, the French (ASN), Finnish (STUK) and Czech (SUJB) regulators, along with their respective technical support organisations^[1], began the preliminary examination of the main safety options of the NUWARD™ small modular reactor project sponsored by EDF^[2].



© EDF/ NUWARD™ SMR project

This tripartite initiative, launched by ASN in the first quarter of 2022, is a first in Europe.

It aims to carry out a joint assessment of the main safety options envisaged by EDF, notably the target safety objectives, the safety approach used in the design, the use of passive systems and the integration of two reactor modules within a single facility.

This initiative will also use a concrete case to identify the opportunities and the questions raised by small modular reactors in terms of safety and adaptation to the various national regulatory frameworks.

The experience and the conclusions of this multilateral examination of an advanced-design small modular reactor project will lead to tangible progress in the harmonisation and convergence of the licensing processes applicable to such reactors.

The experience and the conclusions of this multilateral examination of an advanced-design small modular reactor project will lead to tangible progress in the harmonisation and convergence of the licensing processes applicable to such reactors.

ASN, STUK and SUJB will in particular be sharing their experience and the conclusions of their joint assessment of the safety options with their European counterparts, under the community initiative on SMR development launched by the European Union in 2021.

[1] To carry out this work, ASN will draw on the expertise of IRSN (French Institute for Radiation Protection and Nuclear Safety).

[2] The NUWARD™ project is a power plant concept consisting of two pressurised water reactors of 170 MWe each. This project belongs to the category of small modular reactors, known internationally by the acronym SMR.

WENRA position on the safety situation of Zaporizhzhya NPP after reported shelling activities

August 2022

Given the worrying situation, WENRA (Western European Nuclear Regulators Association) has led a technical group to assess once again the safety level of ZNPP based on information reported to date to IAEA.

Read the WENRA position statement:

https://www.french-nuclear-safety.fr/content/download/184751/file/WENRA_ZNPP_shelling_paper_10_August_2022.pdf

Autorité de sûreté nucléaire

15, rue Louis Lejeune – CS 70013
92541 – Montrouge Cedex – France

Tel.: +33 1 46 16 40 00

Email: info@asn.fr

www.french-nuclear-safety.fr