

Fitness-for-Service Assessment

Ad-hoc and 24/7 available support to secure continued plant operation in case of unexpected NDT indications

Framatome supports plant operators in nuclear and non-nuclear industries in challenging situations

Challenge

Challenging market conditions require plant operation as much as possible. However, unexpected non-acceptable Non-destructive Testing (NDT) indications (e.g., from applying new UT technologies or operationally caused failure modes) may threaten plant systems to be stopped, while it can be uncertain if sufficient resources and materials are available for a timely restart. Also, indications found prior to restart may prevent the plant systems from getting back to operation.

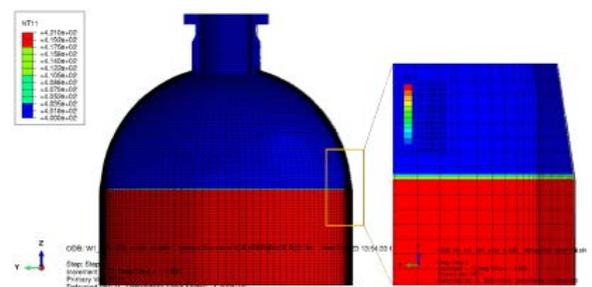
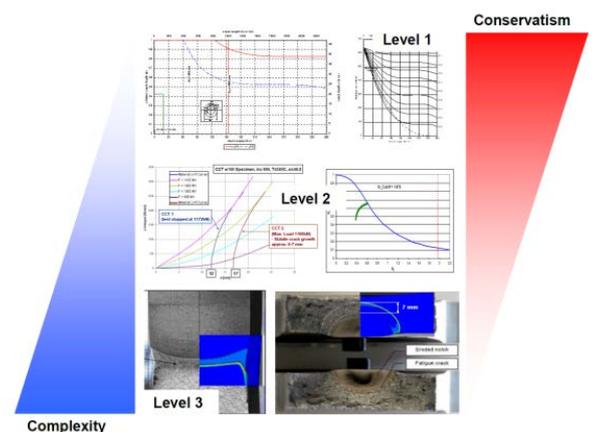
Solution

Framatome's ad-hoc and 24/7 available Fitness-for-Service assessments support plant operators in case of acutely occurring problems in their production facilities. This service can prevent a plant systems from an unnecessarily long shutdown.

We evaluate equipment that degrades while in-service, including flaws caused by in-service degradation or from original fabrication (that may have been only found during subsequent inspections). In the frame of a Fitness-for-Service methodology according ASME FFS-1 / API 579-1 we additionally support customers through:

- Verifying original design data and documentation
- Reducing conservatisms by applying, e.g., Finite Element Analysis (FEA)
- Determining loading based on operational experience
- Generating actual input data with on-site and in-situ material assessment

The resulting Fitness-for-Service assessments provides justifications, under which conditions a continued operation should be granted while assuring safe operation. Based on our experience working with authorities, Framatome's reports are geared towards supporting its customers all the way through up to their authority bodies, and specific additional justification support is available.



Customer benefits

- Increased availability thanks to ad-hoc and 24/7 service availability
- Secure plant production continuation where possible
- Minimize shut-down time and expensive replacements through pragmatic solutions supporting justification of safe operation for plant system restart and/or limited operation
- Rely on dependable results thanks to our long expertise in materials and process applications
- Profit from our global experience in working with authorities

Your performance
is **our everyday commitment**

Technical information

Performance example of an ad-hoc Fitness-for-Service activity. The task is to demonstrate the safe continued operation under difficult boundary conditions:

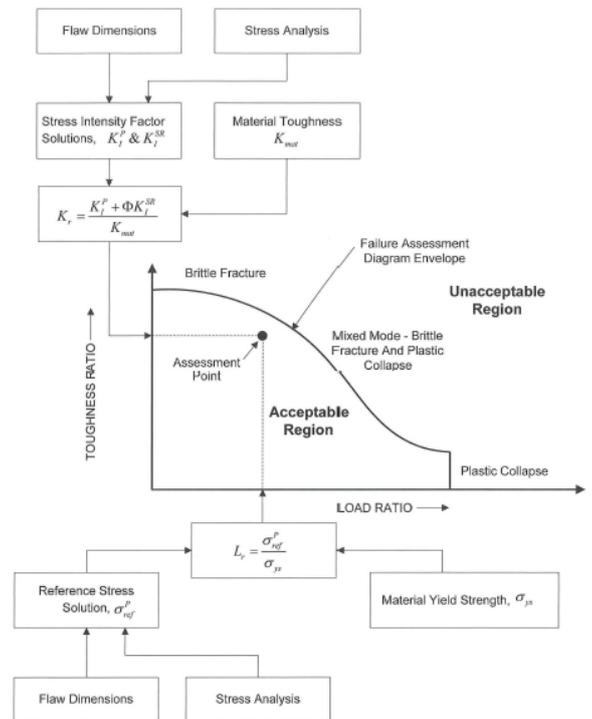
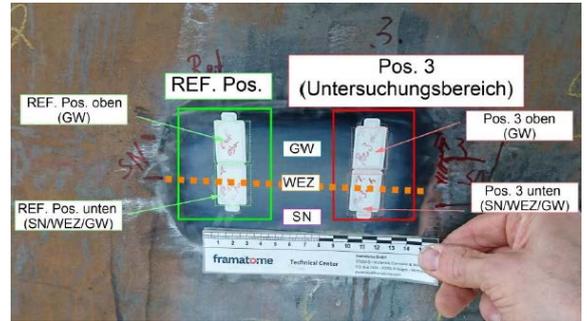
- Unexpected non-acceptable NDT indications (e.g., new UT technology or operationally caused failure modes)
- Replacement of the component would result in long system shutdown and high costs
- Authority approval required
- Short processing time (a few weeks)
- Load situation not specified

Framatome approach:

- Application of ASME FFS-1 / API 579-1
- Preparation of enveloping loads for the future operation
- Application of FEA for stress and temperature calculation
- Identification of possible damage mechanisms (hydrogen and temper embrittlement)
- On-site material assessment to define material condition for verification of boundary conditions used in the analysis
- Demonstration of safe continued operation: Pressure limitation curve for protection against brittle fracture; flaw evaluation to determine the admissibility of the detected NDT indications
- Performance of verification calculations for a positive assessment by the authority

Achieved customer benefits:

- No need to replace the component, continued operation justified
- Long shutdown was avoided due to fast processing time



References

- Nuclear Power Plants
- Petro-chemistry industries
- Nuclear manufacturing sites
- Refinery reactors
- International R&D projects
- Refinery transfer pipes

Contact : materials@framatome.com
www.framatome.com

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