

EDF Septen

Component fatigue and surface condition

The goal of the action carried out at Septen EDF by Cetim engineers was to determine the impact of machining conditions on fatigue behaviour of components and improve knowledge of surface condition.



D.R.

OUR CUSTOMER

Corporate name
EDF Septen (Service d'étude et projets thermique et nucléaire)

Activity
EDF Septen is a central unit of EDF which depends on the direction "Production engineering". EDF Septen is in charge of the engineering for nuclear plants

Workforce
500 people

3 04L stainless steel is much used in industry, especially in the nuclear sector. It can be found in the pipings of primary and secondary circuits, in thermal barriers flanges, etc.

Knowledge acquisition

Concerned about the influence of surface quality on the fatigue behaviour of pipings in various nuclear plants, EDF Septen relied on Cetim to carry out an evaluation study for this material. *"The purpose of this very specialized study, which will have lasted several*

years in total, was to increase our knowledge on this topic, explains Claude Amzallag, engineer at EDF Septen. We relied on Cetim's engineers because they are skilled in machining, residual stress measurements and fatigue tests."

Results

With this important experimental work the main parameters implied in the fatigue behaviour 304L steel could be highlighted and it was proved that the residual stresses have no impact on fatigue strength. Roughness (for the concerned field) has no effect on endurance limit, except when geometrical discontinuities (changes of sections, slimmings, etc.) are implied. Work hardening appears to be the factor which controls fatigue strength, as shown by the significant improvement obtained by shot-peening prestressing. *"This study contributed to the constitution of files on the equipments behaviour and the development of manufacturing specifications for 304L stainless steel components", concludes Claude Amzallag.*

Cetim's asset

Cetim brings companies its multiple skills in materials behaviour to help them understand the phenomena and develop solutions. Its engineers intervene in a periodic or permanent way (i.e.: management of large and complex projects with many actors implied).

