

BNS Conference « Long Term operation of Nuclear Power Plants : Life beyond 40 years » - Doel, October 27, 2011

Summary and Conclusions

Long Term Operation (LTO) is becoming more and more a routine process in nuclear countries and it is expected that the life of a vast majority of nuclear power plants will be extended. Regulatory framework, guidelines and processes are converging more and more, but still with peculiarities by country: Environmental Impact Assessment, Research & Development evaluation, Design Upgrade, Competences & Knowledge management.

As presented by Frederik Van Wonterghem from the Federal Agency for Nuclear Control (FANC), Belgian Authority clearly defined the Regulatory Framework and its expectations, what helped Electrabel, the nuclear power plants operator, to understand what he had to do to build its Safety Case. Geert Backaert of Electrabel explained the comprehensive approach and methodology that was set up to structurally address FANC requirements and expectations, and how it is foreseen to be documented soon, including the proposed Design Upgrade plan.

Entering more the technical domain, we explored the reactor vessel embrittlement issue, and were shown by Rachid Chaouadi how SCK-CEN Research & Development has helped to better understand actual mechanisms and influencing parameters, to refine modeling techniques and to enhance surveillance strategy. Conclusion is that irradiation embrittlement is now well mastered and that life extension of reactor vessel to 50 or 60 years is perfectly feasible and safe.

We then were informed by Michel De Smet of Tractebel Engineering about Time Limited Ageing Analysis, and specifically about metal fatigue. One important change has been introduced recently in the US applicable regulation, namely environmental effect, why in general it appears that actual number of transients is most of the time lower than predicted at design stage. This new rule challenges older calculations, requiring to refine modeling and calculation techniques. However, relevance of consideration of this environmental effect is still under discussion.

Finally, André de Jong, from the Borssele NPP in the Netherlands, gave us a presentation of their journey to 60 years of operation, as well as of their Safety Case, which is quite close to the Belgian one, but with some specific additions. Same technical issues challenging life extension were generally identified.

As a conclusion, we may say that although more and more a well known process, LTO is still far from being harmonized. In general, there are no major technical concerns identified that could impair life extension. Also, significant design upgrades and investment might be required. One thing for sure is that such a Safety Case requires a major effort from the licensees. Let's hope it will not be useless in Belgium.

Jean Van Vyve – Conference Chairman