

EPR: COMPARATIVE APPROACH OF THE FRENCH AND FINNISH INSTRUCTIONS AND OPTIMIZATION OF RADIATION PROTECTION AT THE DESIGN PHASE

**Hakim Gourram*¹, Olivier Couasnon*¹, Veli Riihiluoma², Yannick Beneteau³,
Jean-luc Foret³ and Jean-Michel Evrard¹**

¹*Institut de Radioprotection et de Sûreté Nucléaire (IRSN)
BP 17, 92262 Fontenay-aux-Roses Cedex, France*

²*Radiation and Nuclear Safety Authority (STUK)
Laippatie 4, P.O. Box 14, FIN-00881 Helsinki, Finland*

³*Electricité De France-CNEN (EDF)
165, avenue Pierre Brossolette - BP 900 - 92542 Montrouge Cedex, France*

Abstract

Taking the opportunity of evaluating the preliminary safety report concerning EPR (the French advanced PWR) in France, the IRSN proposes to make a point focusing on the radiation-protection aspects.

The overall picture drawn in this occasion is dedicated:

➤ To remind the history of EPR (from the decision to implement studies in the 90's to the French and German cooperation and finally to the construction of a unit in Finland and another one in France) ;

➤ To compare French and Finnish safety evaluation systems: in France, the safety authority in charge of the authorization process is not directly linked to its technical support which leads the technical instruction. In Finland, the safety authority is in charge of the evaluation of safety analysis. In this process Technical Support Organizations (TSO) can be requested for example in some comparative calculations.

➤ To present the dose targets (calculated reference doses) planned by the nuclear operators in the design phase as well as the global radiation-protection optimization process. In France, for example, EDF performed a detailed optimization analysis on selected tasks known to have a major contribution to the annual average collective dose (thermal insulation, logistics, valve-maintenance, opening/closing of the vessel, preparation and checks of steam generators, on-site spent fuel management and waste management). The optimization process is set in France on an iterative method. In Finland the optimization of annual collective dose has to be described in a separate topical report. In every phase of system descriptions the RP aspects have to be taken in account to meet the requirement stated in specific regulatory guides.

➤ To draw a comparison between the EPR collective dose target and doses received on other pressurized water reactors that are close to the EPR design (Konvoi of German design, "best French units", ...).

This synthesis is realized in association with the French operator (EDF), the French expert body (IRSN), and the authority of nuclear safety in Finland (STUK). It allows to summarize 15 years of partnership and studies, focusing on radiation-protection, in the design phase of the EPR.

KEYWORDS: *EPR, Radiation-protection, optimization.*

* Presenting authors, E-mail: olivier.couasnon@irsn.fr, hakim.gourram@irsn.fr.