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Enusa activities regarding Spent Fuel Management

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Spent Fuel management in Spain is open cycle. Nowadays the Spanish NPP (7 PWR and 2 BWR) have constructed or designed ISFSIs (Independent Spent Fuel Storage Installation), however a Centralized Storage Installation will be operating in the future. The first Spanish ISFSI was installed in Jose Cabrera NPP (14x14 PWR Fuel) due to the definitively cease of the NPP operation in 2006. At that time Enusa Industrias Avanzadas developed, and made available to its customers, its resources and capabilities applicable to all the phases of the management of the irradiated fuel. These capabilities and resources are especially focused on two major areas: engineering and on site fuel services. These paper will be focused on engineering developments in regard to Spent Fuel Management.

In engineering area, a Methodology for the classification (damage/ no damage) of fuel assemblies has been developed, considering characteristics as internal pressure, hoop stress, hydride lens in spalled oxide positions, stress corrosion cracking in the top nozzle-skeleton sleeves, etc. A detailed data base for each NPP has been designed and developed taking into account the most important fuel assembly characteristics. Different type of inspections (visual for integrity, In- can sipping and UT for fuel rod leaks detection, visual for oxide spalling ...) are performed to complete every fuel assembly characterization before classification.

With the objective of decrease the number of fuel assemblies classified as damaged, some developments have been performed: (1) design, licensing, manufacturing and installation of a device named ESPIGA to solve the handling problems for oldest fuel assemblies affected by intergranular stress corrosion cracking on top nozzle sleeves; (2) specific analysis to detect fuel assembly leaks; (3) methodology to assure the fuel rod integrity during transport considering hydride lens deep up to 40% of cladding width ; (4) methodology to calculate cladding hoop stress to assure the fulfilment of the regulation limit (90 MPa in Spain for low burnup fuel assemblies if storage temperature is above 400°C).

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Country or International Organization

Spain

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