High mechanical performance of AREVA upgraded fuel assemblies for PWR

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The merger of the product portfolios of the former Siemens and Framatome fuel businesses gave rise to a new family of PWR products which combine the best features of the different technologies to enhance the main performance of each of the existing products.

In this way, the technology of each of the three main fuel assembly types usually delivered by AREVA, namely Mark-BW™, HTP™ and AFA 3G™ has been enriched by one or several components from the others which contributes to improve their robustness and to enhance their performance.

The combined experience of AREVA's products shows that the ROBUST FUELGUARD, ™ the HMP™ end grid, the MONOBLOC ™ guide tube, a welded structure, M5™ material for every Zirconium component and an upper QUICK-DISCONNECT™ are key features for boosting fuel assembly robustness.

The ROBUST FUELGUARD™ benefits from a broad experience demonstrating its high efficiency in stopping debris. In addition, its mechanical strength has been enhanced and the proven blade design homogenizes the downstream flow distribution to strongly reduce excitation of fuel rods. The resistance to rod-to-grid fretting resistance of AREVA’s new products is completed by the use of a lower HMP grid with 8 lines of contact to insure low wear.

The Monobloc™ guide tube with a diameter maximized to strengthen the fuel assembly stiffness, excludes through its uniform outer geometry any local condition which could weaken guide tube straightness. The application of a welded cage to all fuel assemblies of the new family of products in combination with stiffer guide tubes and optimized holddown assures each fuel assembly enhanced resistance to distortion. The combination of these features has been widely demonstrated as an effective method to reduce the risk of incomplete RCCA insertion and significantly reduce assembly distortion.

Thanks to its enhanced performance, M5 alloy insures that all fuel assemblies in the family maintain their performance in all operating environments, in high duty conditions and at extended burnups.

AREVA's new family of upgraded products is offered to our customers worldwide. After first LFA’s (Lead Fuel Assemblies) in Europe in 2006, LFA's in a US 15X15 reactor and a first reload in an other European 15x15 reactor will be loaded in 2007. This represents the supply of upgraded products to utilities, fully in line with their more demanding requirements. The well proven characteristics of all components and their combination bring proven robustness to the products of AREVA’s new family of fuel assemblies.