

## Workshop »Coatings for Energy Technologies«

### Framatome's PROtect Enhanced Accident Tolerant Fuel Development Program: Cr-coated M5<sub>Framatome</sub> cladding

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Following the Fukushima event, the global nuclear industry accelerated research into Enhanced Accident Tolerant Fuel (E-ATF), which drove the development of fuel with improved safety characteristics and added performance value for commercial light water nuclear reactors. Framatome's E-ATF strategy consists of the evolutionary PROtect Cr-Cr solution (chromium-coated M5<sub>Framatome</sub> cladding and Cr<sub>2</sub>O<sub>3</sub>-doped UO<sub>2</sub> fuel) and the breakthrough PROtect SiC solution. The evolutionary PROtect solution improves performance through the deposition of a protective chromium thin-film (10 - 20 µm) on the external surface of M5<sub>Framatome</sub> cladding tubes using physical vapor deposition. Framatome has performed extensive out-of-pile (laboratory-based) characterization of its Cr-coated cladding and has launched a series of irradiation programs in research and commercial reactors to develop an understanding of Cr-coated cladding's behavior during service. This presentation gives an overview of Framatome's Cr-coated M5<sub>Framatome</sub> nuclear fuel cladding and the path to its industrial implementation.