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Current Status of Next Generation Fast Reactor Core & Fuel Design and Related R&D in Japan

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The next generation fast reactor is being investigated in Japan, aiming at several targets such as “safety”, “reduction of environmental burden” and “economic competitiveness”. As for the safety aspect, FAIDUS (fuel assembly with inner duct structure) concept is adopted to avoid re-criticality in core destructive accidents. The uranium-plutonium mixed oxide (MOX) fuel, in which minor actinide (MA) elements are included, will be applied to reduce the amount and potential radio-toxicity of radioactive wastes. The high burn-up fuel is pursued to reduce fuel cycle cost. The candidate concept of the core and fuel design, which could satisfy various design criteria by design devisals, has been established. In addition, JAEA is investigating material properties and irradiation behavior of MA-MOX fuel. JAEA is developing the fuel design code especially for the fuel pin with annular pellets. Furthermore, JAEA is developing oxide dispersion strengthened (ODS) ferritic steel cladding for the high burnup fuel.

Country/Int. Organization

Japan/ Japan Atomic Energy Agency

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