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## Safety and Environmental Protection during Interim Storage of Spent Nuclear Fuel

Interim storage is a system for temporary storage of spent nuclear fuel for a period from initial removal from the reactor until reprocessing or direct ultimate waste disposition.

The causes of spent fuel degradation as fuel/cladding interaction, oxidation and hydration, thermo-mechanical properties and radiological source term will be discussed.

To minimize the oxidation rate of the uranium dioxide, the following measures will be considered: (a) establishing time limits for exposure of fuel pins, (b) using inert environments in leak tight containers to limit access of oxygen to the fuel, and (c) maintaining wet storage of fuel until sufficient decay to limit decay heat. Degraded fuel should be canned and stored within an inert environment that ensures fuel integrity and safety functions.

As a case study the radiological source term, gamma ray and neutron emission rates at high burn-up of VVER-1200 spent fuel assembly will be calculated and analyzed based on the safety limits and environmental protection during extended interim storage using SCALE/ORIGEN-ARP code.

**Primary author:** Prof. SHAAT, Mohamed (male)

**Presenter:** Prof. SHAAT, Mohamed (male)

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