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Spent Fuel Monitor

The *Spent Fuel Monitor* systems are based on over 20 years experience at reprocessing facilities and reactor sites. The specification is driven by the need both to operate safely and efficiently and to satisfy the requirements of the regulatory authorities.

The detection system is mounted onto the side of the storage pool in a fixed orientation. Fuel assemblies are delivered to the monitoring position with standard handling equipment.

The High Resolution Gamma Spectroscopy system is designed to be in contact with the fuel during the measurement ensuring positional accuracy.

A gamma collimator, enclosed in the housing, defines a fixed field of view for the fuel, enabling good repeatability with short assay times.



Features

- Independent of reactor operations data.
- Effective for any commercial uranium oxide fuels; PWR, BWR and SGHWR.
- Operates in wet or dry conditions.
- The detector deployment system is built to allow fixing to virtually every storage pool design with very little modification.
- All special equipment required to measure and analyze the fuel data is provided.
- Stainless steel used for structural materials provides corrosion protection and ease of decontamination.
- Accessibility to all serviceable components eliminates contact with potential sources of contamination, i.e. the pool water, and minimizes movement or disturbance of the major structural components.

Applications

- ☑ Characterization of spent nuclear fuel
- ☑ Measurement of burnup and cooling time
- ☑ Measurement of axial burnup profile
- ☑ Burnup credit
- ☑ Cost savings in spent fuel storage, transport and disposal

Benefits

- The plant operator only needs to provide crane support and fuel movements etc.
- Rapid on-site set-up in less than one day.
- Reduces or eliminates the need for expensive neutron absorbing materials.
- Allows greater fuel packing densities in new cask and storage rack configurations.
- Fewer cask journeys when transporting spent fuel e.g. to interim storage or repository.

Specifications

Detector	High purity germanium (HPGe) gamma detector. Optional neutron detector.
Service	Burnup and cooling time verification for spent nuclear fuel
Measurement conditions	In pool or dry storage options available
Construction materials	Stainless steel for ease of decontamination
Software	Custom data acquisition and analysis. Can be programmed into the system to display compliance with the loading schedule
Prerequisites	An engineering validation is carried out a few weeks before measurements begin which consists of a one day plant visit.

Performance

Fuel Types	PWR, BWR, SGHWR fuel, enrichments up to 4% w/%, up to 30 years cooled
Burnup	Uncertainty better than +/- 4%
Cooling Time	Cooling time (depending on age of fuel) : better than +/- 5%



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