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Integration of decommissioning and RW management operations in Spain

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The radioactive waste produced during decommissioning operations have to be characterized, treated, conditioned and store on site under the Decommissioning License, and they must to meet the requirements established in the:

• Transport Regulations
• Disposal Acceptance Criteria and Package specifications Site (El Cabril repository)

Decommissioning and radioactive waste management operations in a decommissioning site are very much affected by the waste requirements in the disposal site. So, decommissioning and waste management are very much interdependent and an integrated approach is required

Additionally, it is generally required by the regulator to reduce the production of radioactive waste as low as reasonably achievable, so in activity as in volume, through the application of adequate measures of design, operation practices and decommissioning, including the recycle and reuse of materials.
The planning and implementation of decommissioning strategies require the support of a radiological inventory. One of first activities in a decommissioning project is the estimation of a radiological and physical inventory of the material, including soils.

Once the Radiological Inventory has been estimated, and taking into account the acceptance criteria and waste packages of the repository and clearance criteria of material and site, it is obtained a classification in material' s streams and packages.

According to these material streams, the waste management routes are established and, in application of the principle of volume reduction, the following waste management issues are studied:

o Large components cutting
o New containers for large and highly activated/contaminated components
o Capacity of LILW & VLLW repositories and GTCC storage
o Waste sorting in situ, according to defined streams
o Waste Radiological characterization and clearance processes
o Waste volume reduction techniques (mechanical cutting, more efficient packaging/conditioning, use of new containers, compaction and shredding, etc.) and decontamination techniques (chemical decontamination and blasting of metals and soil washing)

Some changes in the decommissioning and waste management process could require design modifications in the decommissioning license and in the waste disposal site license, such as:
• Commission new waste management facilities at the decommissioning site
• Commission new disposal units in the waste disposal site

The main conclusions and lessons learned that ENRESA has derived from an integrated approach of decommissioning and radioactive waste management may be summarized as follows:
• Detailed characterization and management plans should be established for the different waste streams in order to ensure a fast and smooth logistic of materials.
• Segregate "in situ"as much material as possible to minimize quantities of radioactive waste.
• Clearance contributes to the minimization of wastes, resulting from dismantling and remediation, and allows recycling of materials. The material clearance process should be performed at industrial scale with large size containers and should be well-tested and integrated with the decommissioning operations.
• Very low level waste disposal is complementary to clearance and allows disposal of wastes with activities 10 to 100 times the clearance levels.
• Volume reduction/decontamination techniques play a significant role in reducing the amount of waste to be disposed and contribute to a more efficient and sustainable waste management system.
• Segmentation of activated components should be performed by mechanical cutting in order to minimize secondary wastes
• Conditioning/storage of highly activated/contaminated wastes will require a specific auxiliary facility. This facility replicates the conditioning process of disposal units (CE-2a) in El Cabril

• Large containers should be used for highly activated/contaminated components in order to reduce segmentation costs and operator doses. The removal and management of major components in large pieces or in one piece should be considered for future projects
• Reactor internals (non-LILW) need to be stored together with the spent fuel at a dry storage facility
• Site remediation generates large volumes of material to be monitored and large amounts of very low level waste to be disposed.

Country or International Organization

Spain

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