



Technical meeting on the management of spent fuel at shutdown reactor sites including those to be shutdown prematurely

France

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- French Law n° 2015-992 17 august 2015 on Energy Transition for Green Growth.
- 215 Articles.
 - Action plan to diversify energy mix and enhance actions regarding climate changes
 - Cap the total output from nuclear power at 63.2 GW (currently installed power) and reduce France's reliance on nuclear power from 75% to 50% by 2030.
- On the short term, the startup of a new plant would require the shutdown of reactors.



Fuel management during operation

- Standardized nuclear Fleet (PWR 900, 1300, 1450 MWe)
- Standardized fuel management by group of reactors
 - Standardized fuel reload
 - Standardized operating cycle duration
 - Standardized safety demonstration
- Still in some cases optimizing fuel management is possible
 - Variation of the duration of cycle duration (+/- few days)
 - Variation of the number of assembly in the reload (+/- X assembly)
 - Optimisation of reloading pattern



Fuel management before plant shutdown

- According to fuel management, assembly can be used from 3 to 5 operating cycles
- Optimization of reloading pattern may require that some assembly may not be used during the next operating cycle and stored to optimized a futur reload.

In the case of a nuclear plant shutdown, previous operating cycles can be optimized to limit or avoid the use of fresh fuel

(using stored assembly, optimizing reloading pattern)



Fuel management before plant shutdown

- Current safety demonstration regarding fuel criteria for designs basis accident
 - Differences with standardized safety demonstration may appear according to the number of optimized operating cycles
- Fuel and pellet cladding interaction safety demonstration
- ...

Such optimization may limit the amount of full fuel reloads before shutdown, limiting by such the amount of nuclear waste and the late overload of spent fuel pool.

Compare of practices would be profitable.