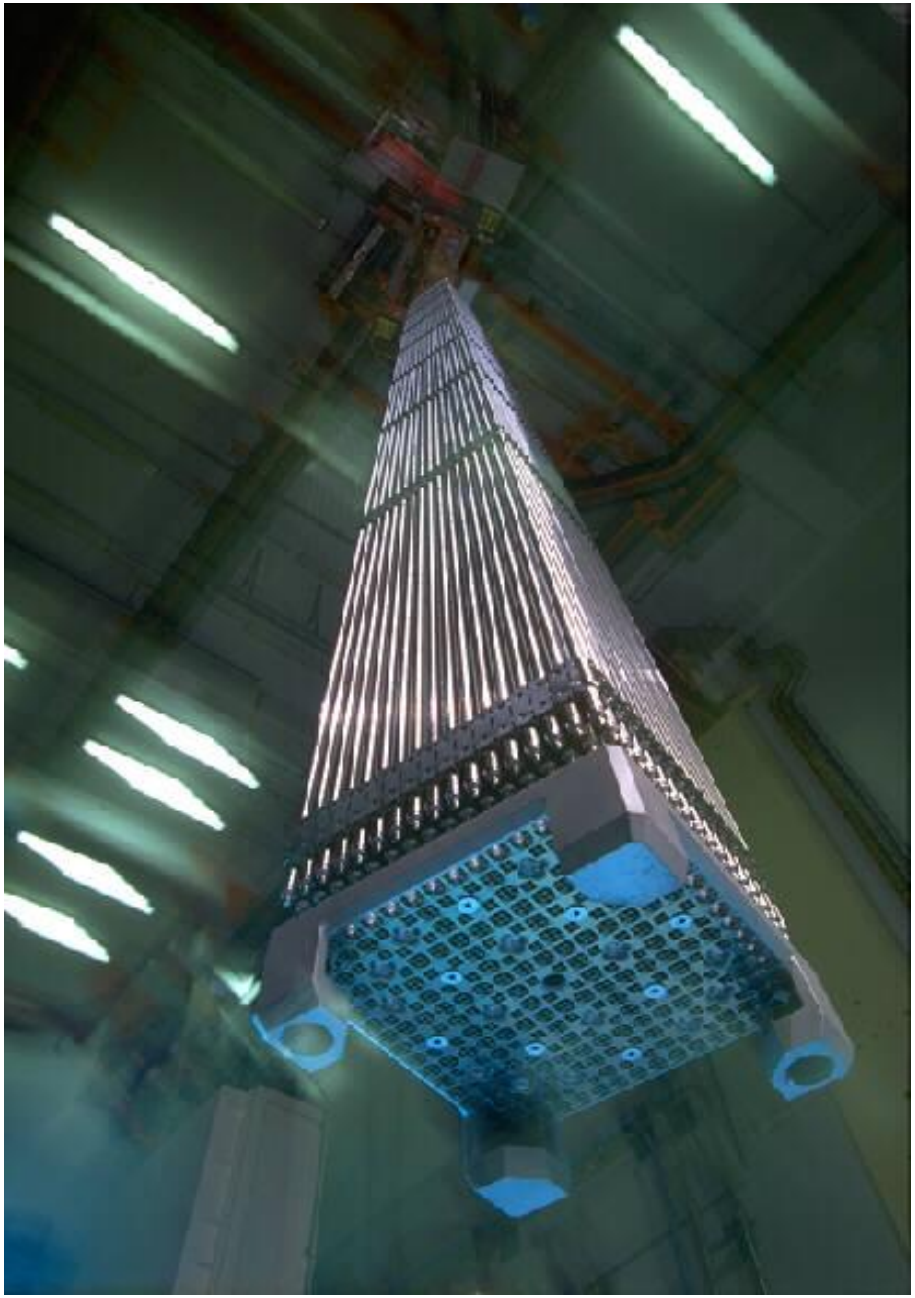


OECD/NEA Workshop on Accident Tolerant Fuels of LWRs

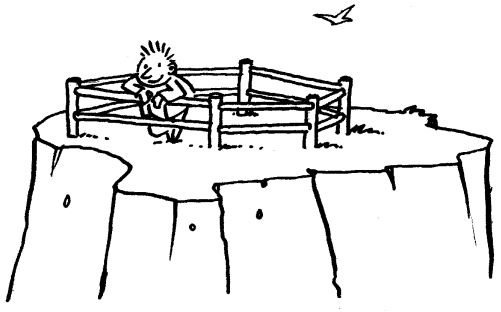
Breakout Session

Operation, R&D and technological issues

Main outcomes

- Developing an ATF is going to be a long, stepwise /iterative, approach
  - Consensus about the objectives
    1. ATF should be as good as current fuels during Normal Operation and for DBA
    2. ATF should exhibit higher performance during severe accident
- For normal operation and DBA, the qualification path is well known and should follow the regulatory requirement
  - Same as for an advanced fuel (properties characterization, justification tests regarding SAFDLs of SRP4.2, etc..),
  - Need to confirm though that the ATF candidate doesn't exhibit a specific behavior or damage mechanisms that may requier a specific justification (specific tests, specific SAFDL)
- For severe accident, the recurrent questions are : what is the target (in term of expected performance)? What is the criterion for success? What test to run to justify the new fuel?

Recommandations (1/3)



Identify the key factors or physical parameters that will really reduce the accident consequences

Calculate one BWR accidental scenario (3-F) and one PWR accidental scenario (TMI-2) with the appropriate simulation tools

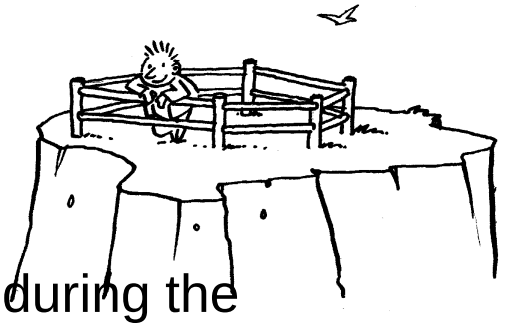
Run sensitivity calculation to scale the relative (beneficial) effect of various physical parameters (Thermal conductivity, oxidation kinetics, H2 production, exothermal reaction, FP retention, mechanical behavior, …)

Will help defining the minimum performance target for the ATF

Feed the models with the proper data

Define an appropriate set of experiments to generate those data

Recommandations (2/3)



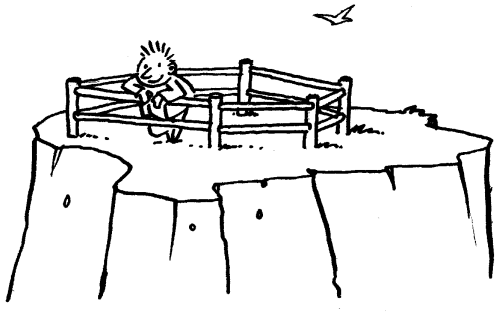
International cooperation is recommanded, especially during the feasibility phase

- No proprietary concern at this stage (patents will come later, on the manufacturing processes) and
- for a utility point of view, it is better if all fuel vendors propose an ATF(to ensure security of supply)
- All irradiation conditions are not the same : cross irradiation of ATF candidates (ATR, HRP, JHR) can accelerate the selection process, benefit from advanced capacities (instrumentation, PIEs, ..) and be cost effective

NEA is the right vehicle to streamline this collaboration (cross check tests, shared irradiation of coupons, etc..)
A follow-up NEA W-S meeting could be scheduled in one year from now

A good opportunity to discuss DOE's irradiation plans in ATR in 2014 : a selection of ATF candidates will be provided by DOE early summer 2013

Recommandations (3/3)



Discuss at the next ATF Workshop the comprehensive test matrix that is requested to develop, select and qualify an ATF

- DOE proposed to provide the group with such a « to do list-for what»
- The group will then identify those that are
  - Necessary with high priority
  - Necessary with lower priority
  - Nice to get
  - Waste of time
- promote parallel investigations