

# Importance of Passive Safety and Role of Monju for the Future SFRs

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## Case for Advanced Reactors

- Next generation nuclear energy systems under consideration aim for significant advances over existing technology in the areas of sustainability, economics, safety, reliability, and non-proliferation.
- Development of these systems is an international effort, involving collaborations under the framework of
  - Generation IV International Forum (GIF)
  - IAEA Fast Reactor Technical Working Group and INPRO
  - Various bilateral/trilateral agreements
- These programs highlight the importance of closed fuel cycle systems using fast-spectrum reactors to meet especially the sustainability goals through efficient resource utilization.



# Importance of SFRs

- Growing public concerns on the safety of nuclear power plants after the Fukushima accident can be best addressed through inherent and passive safety characteristics of advanced reactor designs like SFRs.
- SFR technologies are also critical for the reduced volume and radiotoxicity of high level waste for final disposal as part of a closed fuel cycle.
  - Fast reactors can extract  $\sim$  two orders of magnitude more energy from the same amount of fuel.
  - Potential for consuming nearly all long-lived heavy elements with a closed fuel cycle, greatly reducing the amount of repository space needed for waste isolation.



# Importance of SFR Passive Safety and U.S. Approach

- Importance of passive decay heat removal capability of advanced reactor designs has been emphasized in the aftermath of Fukushima accident.
- In the U.S., the potential of SFRs to survive severe accident initiators with no core damage has been demonstrated during extensive testing programs with EBR-II and the Fast Flux Test Facility (FFTF).
- U.S. approach is to rely on inherent and passive safety measures to reduce the likelihood of severe accidents to a level that they belong in residual risk category and can be handled with DiD considerations with adequate emergency planning.
  - Emphasis is on severe accident prevention, not mitigation.



## Importance of Monju

- Within the context of international efforts, restart of Monju will provide a significant momentum for strengthening our joint efforts on fast reactor technology development.
- As one of the few operating or operation-ready SFRs in the world, Monju plays an important role for SFR technology development.
  - In that regard, Monju is a unique and valuable asset not only for Japan but also for the world.

