



Draft Terms of Reference

Of the International Workshop on Prevention and Mitigation of Severe Accidents in Sodium-cooled Fast Reactors

11-13 June 2012, Fukui, Japan

Organized by the Japan Atomic Energy Agency in cooperation with the IAEA

Background: Based on the renewed interests on the nuclear energy option for the fulfillment of the present and future world energy demand, fast reactors in a closed fuel cycle are recognized as an efficient and effective energy resource. Especially, Sodium-cooled Fast Reactors (SFRs) play an important role to increase the sustainability of nuclear energy. SFR has a long history of development and operating experience, and in recent years SFRs have been safely deployed as follows: Monju and Joyo in Japan; BN-600 and BOR-60 in Russia; FBTR in India. Last year, CEFR, an experimental reactor in China, has been connected to the grid. Construction projects are currently underway for Russia's BN-800 and India's PFBR, and also innovative SFR programs are being conducted as follows: ASTRID in France; ESFR in Europe; a prototype reactor in the republic of Korea, and a small modular reactor in the USA. In addition to these national programs, considerable R&D efforts are being carried out at international level on the SFR developments - such as the Generation-IV International Forum (GIF), the IAEA International Technical Working Group on Fast Reactors (TWG-FR), and the IAEA/International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO).

After the accident at Fukushima Dai-ichi Nuclear Power Station (Fukushima NPS) last year, enhancing nuclear safety taking account of the lessons learned from this accident has become the highest and the most urgent priority worldwide. Light water reactors (LWRs), like the ones of the Fukushima NPS, use as a coolant pressurized water under moderated neutron energy spectrum, whereas SFRs use sodium at atmospheric pressure, under fast neutron energy spectrum. These fundamental differences between LWRs and SFRs result in important differences in the event of severe accidents as far as accident initiators, scenarios and consequences. Hence, the safety countermeasures to prevent and mitigate severe accidents of the SFR must be based on different approaches with respect to those applied to the LWRs.

As for the SFR systems, from the early stage of their development safety designs and assessments have been rigorously carried out taking into account, in particular, prevention and mitigation of the severe accidents. Furthermore, Generation IV SFR systems under development have as one of the main requirements the deployment of an advanced safety approach against severe accidents. As far as the existing SFRs, in light of the Fukushima NPS accident emergency measures have been recently implemented in order to greatly enhance the safety of Monju against earthquake and tsunami. The approaches and criteria for improving the safety of SFRs, including severe accident

countermeasures, have to be harmonized at international level through cooperation and collaboration with the common goal to enhance the safety of the future SFRs.

Workshop Theme and Objectives: The theme of the workshop is ‘Safety approaches to prevent and mitigate severe accidents in SFRs and specific countermeasures’. The objective of the workshop is to review the basic severe accident approach and specific countermeasures, based on the fundamental safety characteristics of the SFRs in comparison with the LWRs. During the workshop, key messages are expected to be delivered on 1) a view on SFR developments and deployments in terms of safety, 2) safety approaches and safety design criteria of the SFR system against severe accidents and 3) essential role of the existing SFRs for improving and enhancing the safety of future SFRs.

Participating Countries and Organizations (expected):

Countries with an active SFR development programme and International Organizations

Japan, US, France, Korea Republic of, China, Russian Federation, India, EURATOM, OECD/NEA, IAEA

Other countries participating in the IAEA/Technical Working Group on Fast Reactors

Argentina*, Belarus, Belgium*, Brazil, Germany, Italy, Kazakhstan, Netherlands, Spain*, Sweden*, Switzerland, UK, Ukraine

*observer

Number of Participants (expected):

Around 65 in total. Oversea representatives (including IAEA) - around 20.

Workshop organizer:

JAEA in cooperation with IAEA

Venue:

June 11, Monju technical tour

June 12-13, The Wakasa-wan Energy Research Center

Expected Outcomes

- ✓ Key messages on SFR safety features and worldwide roles of the existing reactors for future SFR safety.
- ✓ Conference report (jointly issued by IAEA and JAEA)
 - Workshop summary, compilation of presentation materials