TCP on Environmental, Safety and Economic Aspects of Fusion Power (ESEFP TCP)

The ESEFP TCP provides a platform for scientists and engineers to exchange information and further enhance the collaboration, co-ordinating international efforts to bridge the scientific and technical gaps between the International Thermonuclear Experimental Reactor (ITER) and DEMO*, and supporting governmental policies and raising awareness of fusion energy developments and potential to the general public.

Main areas of work

- In-vessel tritium source terms (Task 1)
- Activation products source terms (Task 3)
- Failure rate database (Task 5)
- Radioactive waste study (Task 6)
- Socio-economic aspects of fusion power (Task 7)
- Magnet safety (Task 8)

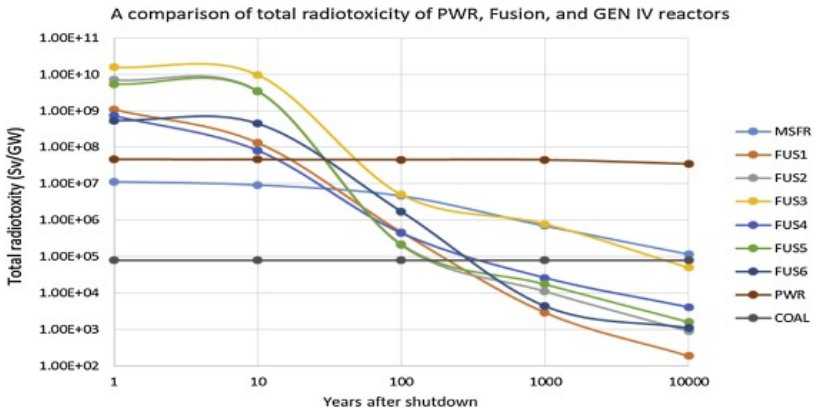
Key activities and accomplishments (2017-2018)

- Inventory and removal methods of hydrogen isotopes (Task 1)
- Development of the MELCOR fusion codes (Task 3)
- Data collection and analysis aimed toward failure rates and repair times (Task 5)
- Study of water leaks on the Fusion Neutron Source (Task 6)
- European survey to assess public attitude towards fusion; focus on public acceptance (Task 7)
- Design study for a post-large helical device (REBCO) (Task 8)

Priorities and projects (2019 – 2020)

- Dynamic tritium transport simulation development (Task 1)
- Ongoing assessment of safety impact of liquid metal plasma facing components (Task 3)
- Data collection and analysis aimed toward failure rates and repair times of individual components for support for RAMI (reliability, availability, maintainability and inspectability)(Task 5)
- Energy scenario evolutions explored by EUROfusion TIMES model (Task 7)

** DEMO is a proposed nuclear fusion power station that is intended to build upon the ITER experimental nuclear fusion reactor.*



A comparison of total radiotoxicity of PWR, Fusion, and GEN IV reactors. Radioactivity from coal-fired plant ashes are also included. All results are normalised to a 1000 MWe power electricity production (Zucchetti, Massimo, et al. "Fusion power plants, fission and conventional power plants. Radioactivity, radiotoxicity, radioactive waste." Fusion Engineering and Design 136 (2018): 1529-1533.)

Fusion Power

Multilateral collaborations

- It would be valuable to further co-ordinate internationally socio-economic studies relating to fusion power.
- Chairs of the ESEFP TCP and TCP on Nuclear Technology of Fusion Reactors (NTFR TCP) attend each other's meetings with a view to finding work areas of mutual interest.

Membership

Canada, China, Japan, Korea, Russia, United States, European Commission

Why should your organisation become a member of the ESEFP TCP?

Participants in the ESEFP TCP exchange expertise with a view to better understanding the environmental, safety and economic issues associated with fusion power. Broad stakeholder engagement, managing public opinion, and a positive media framing of fusion devices is key in dealing with the overall socio-economic impact of this technology. The work of the ESEFP TCP serves to bring fusion science closer to the public and thus contribute to greater social consensus.

TCP Chair: Keeman Kim, Korea (kkeeman@nfri.re.kr)
TCP primary contact: Hyun-Wook Kim (hwkim@nfri.re.kr)
IEA contact: Diana Louis (diana.louis@iea.org)

www.iea-esefp.net