

Final Declaration of MOLTEN SALT REACTOR Technology Identification Workshop  
3 - 4 December 2017

**FINAL DECLARATION**

Many countries and private companies worldwide conduct R&D studies on Molten Salt Reactors. France, China, Japan, India and many other countries allocate considerable human and financial resources for the R&D studies in order to acquire this technology that has not yet been commercialized for electricity/heat generation. Turkey also needs to start R&D studies to attain to the technology on this emerging reactor technology. Molten salt reactors has multiple design options in terms of the fuel used (solid/liquid), open or closed fuel cycle, neutron spectrum (thermal/epithermal/fast spectrum), breeder or non-breeder types, etc. In this respect, the participants of the workshop have agreed that the identification of the reactor type depends on many parameters and it would be useful to conduct a preliminary study, as well as modeling studies. Even though "inherent safety" is one of the most positive aspects of ETRs, it is important to develop materials that are resistant against the impact of molten salt at high temperatures and therefore corrosion and neutron effect and R&D studies should be initiated in this field. Moreover, it was emphasized in the Workshop that:

- It is important to notify IAEA of the studies on radioactive materials, fuel materials, recycling and certain isotopes (e.g. Li-7) and of the existing inventory for "Safeguard" purposes;
- MSRs offer significant advantages especially in fast spectrum due to production of small amounts of minor actinides compared to the other reactor types; however, chemical processes could cause difficulties in terms of licensing; and therefore it is important for the specialists to work together with the decision-making authorities (e.g. TAEK: Turkish Atomic Energy Authority) for the preparation of relevant legislation and licensing process as a result of discussion over the example of India,
- Eventhough the commercial plant deployment of MSRs is a long-term target, it is the most suitable solution for the energy problem; and the use of Thorium in such reactors is advantageous with regards to sustainability,

- If the MSR is preferred to be a breeder type, it should run on fast neutron spectrum; and the online and offline processes need to be evaluated in terms of efficiency and cost (resource saving),
- It's important to note the factors such as duration of the construction and cost of the reactor to decide on the power of the MSR; that the trend in the world indicate that low, medium and high power reactors entered to the market gradually in the course of time; that there may be a market demand for low power (e.g. 10 MWth) reactors, too; that the final decision on the reactor power needs to be made after modeling and benchmarking studies; and that following the studies in other countries, especially the European MSR is of high importance,
- The international cooperation is important; and the Science Board of TUBITAK has approved GIF membership application,
- Turkey has a considerable human resource need for attaining the MSR technology.

As a result of the exchange of views;

**The idea to establish a thorium-based, low power, breeder type fast spectrum prototype MSR in TUBITAK was favored.**



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