

International Conference on Fast Reactors and Related Fuel Cycles: Next Generation Nuclear Systems for Sustainable Development (FR17)



Contribution ID: 77

Type: ORAL

Development of core and structural materials for fast reactors

Tuesday 27 June 2017 10:20 (20 minutes)

This paper summarizes ongoing efforts in Japan Atomic Energy Agency on the development of core and structural materials for sodium-cooled fast reactors. For core materials, oxide dispersion strengthened (ODS) steels and 11Cr ferritic steel (PNC-FMS) will be applied to fuel pin cladding and wrapper tube, respectively. As for ODS steel, 9Cr,11Cr-ODS steels have been extensively developed. Their laboratory scale manufacturing technology has been developed including reliability improvement in tube microstructure and strength homogeneity. Large scale manufacturing technology development and mechanical testing for codification of material strength standard are on-going. As for PNC-FMS wrapper tube, development of dissimilar joining technique with type 316 steel and properties evaluation of dissimilar welds have been carried out. For structural materials, 316FR stainless steel and Modified 9Cr-1Mo steel are being code qualified. Long-term data have been accumulated and the properties are analysed to establish a technical basis for 60-year design. Also described is the current status of codification of structural materials standards in the design code of fast breeder reactors published from the Japan Society of Mechanical Engineers.

Country/Int. Organization

Japan

Author: Dr ASAYAMA, Tai (Japan Atomic Energy Agency)

Co-author: Dr OHTSUKA, Satoshi (Japan Atomic Energy Agency)

Presenter: Dr ASAYAMA, Tai (Japan Atomic Energy Agency)

Session Classification: 5.3 Advanced Fast Reactor Cladding Development I

Track Classification: Track 5. Fast Reactor Materials (Fuels and Structures) and Technology