Contribution ID: **522** Type: **ORAL**

Lessons and strategies from PFBR to Future Fast Breeder Reactors

Monday, 26 June 2017 15:50 (20 minutes)

BHAVINI, a public sector unit under Department of Atomic Energy, is responsible for construction, commissioning and operation of fast reactors in India. Prototype Fast Breeder Reactor (PFBR) which is in advanced stage of commissioning is the forerunner for the second stage of India's three stage nuclear programme. PFBR is a 1250 MWt (500 MWe), MOX fuelled, sodium cooled, pool type fast reactor. It is a first of its kind reactor with total indigenous technology.

Starting from civil construction, manufacturing of over-dimensional & precision machined components, installation, integration, till commissioning and operation of all the mechanical, electrical and control & instrumentation systems, there were many challenges and surprises which have been addressed one by one in a systematic manner.

The experiences gained during various phases of PFBR project have enriched the scientists and technologists to fine tune the specific aspects in design, sizing of layout, manufacturing & transportation methodologies, sequence of installation and commissioning of the plant and equipment. It is clear that special attention is needed for achieving leak-tightness, making provisions for pre-service and in-service inspections, appropriate routing of power & instrumentation cables and protecting nuclear & process instrumentations. The project management for the future fast breeder reactors, twin units of 2 x 600 MWe will be well established based on the feedback from PFBR. Concept of twin units will be beneficial for both economy and time schedule.

The site assembly shop can cater the need for fabrication of individual components of reactor assembly meeting the stringent tolerance limits and appropriate integration, so that handling and erection of the assembly will be cost effective and time beneficial. Advance planning is required for achieving leak-tightness of integrated assemblies. The well planned sequence of layout of sodium and associated piping, their interfaces with the equipment, provision of redundant heaters, thermocouples, and leak detectors will play key role in project schedule.

This paper details out the experiences gained and lessons learnt from PFBR and the strategies to be adopted for future fast reactors towards safety, economy and time schedule.

Country/Int. Organization

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Session Classification: 1.2 SFR DESIGN & DEVELOPMENT - 2

Track Classification: Track 1. Innovative Fast Reactor Designs