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Enhancement the safety of the Jordan research and training reactor (JRTR)

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Khalifeh AbuSaleem (1,2)

1) Jordan Atomic Energy Commission (JAEC)
P.O.Box 70
Amman 11934- Jordan

2) Department of Physics
The University of Jordan
Amman 11942- Jordan

Email: khalifeh.AbuSaleem@JAEC.GOV.JO

The JRTR is a multipurpose reactor designed and constructed to be used for education and training, research and radioisotope production. All safety aspects of the JRTR fall under the category of SC-3 according to the ANSI/ANS 51.1 classification system of nuclear reactors. For example, the Reactor Structure Assembly (RSA), Primary Cooling System (PCS), CRDM/SSDM, Reactor Protection System (RPS), Confinement Isolation Dampers, Siphon Breaking Valves and UPS are classified as SC-3 components.

However, in the wake of Fukushima-Daicci accident, and learning the lessons of the accident and following the recommendations, the safety measures of the JRTR have been extensively investigated to enhance the safety of the reactor. Therefore, design changes of systems and equipment due to the reinforced international safety norm after Fukushima disaster, addition, expansion and modification of facilities to accommodate the design changes have been implemented. As a result investigation, several aspects of the JRTR safety have been improved. As examples of these, the quality class has been upgraded for several components such as Process Instrumentation and Control System (PICS), Radiation Monitoring System (RMS), Information processing System (IPS) and Operator WorkStation (OWS). Additionally, expansion and modification of facilities to accommodate systems and equipment have been applied. The seismic monitoring system has been improved by upgrading quality class and by adding a function generating the automatic seismic trip signal when a seismic motion exceeds Operating Basis Earthquake (OBE). Pool Liner Integrity has been enhanced by improving the welder qualification process and by enhancing the weld quality. Furthermore, the emergency conditions have attracted special attention. The emergency water storage capacity has been increased, and two mobile diesel generators have been placed in a building of seismic category I.

This paper describes the safety aspects of the JRTR and the improvements after the Fukushima-Daicci accident.

Primary author: KHALIFEH, AbuSaleem (JAED and The University of Jordan, Department of Physics)

Presenter: KHALIFEH, AbuSaleem (JAED and The University of Jordan, Department of Physics)

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