

Public Abstract

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Graduation Term:SP 2015

Department:Engineering

Degree:MS

Title:FUEL HANDLING ACCIDENT ANALYSIS FOR THE UNIVERSITY OF MISSOURI RESEARCH REACTORS HIGH ENRICHED URANIUM TO LOW ENRICHED URANIUM FUEL CONVERSION INITIATIVE

Engineers from Argonne National Lab's Global Threat Reduction Initiative program and engineers from the MU Research Reactor are working together to convert the MU Research Reactor from using high-enriched uranium fuel to low-enriched uranium fuel. To reduce the security risk of proliferation at test and research reactors, the United States Congress in 1986 instructed the Nuclear Regulatory Commission, the NRC, to change all of its current and future licensees from high to low-enriched uranium once an acceptable fuel is available. The MU Research Reactor is the largest research reactor in the US, and maintains a high performance reactor that produces radio-isotopes for medical use in hospitals all across the US. Recently, Argonne National Lab has proposed a new fuel that will not degrade the MU Research Reactor's performance once it converts.

Currently the MU Research Reactor is in phase II of the conversion process. The two teams of engineers are to propose a Safety Analysis Report to the NRC. A part of this report is the maximum hypothetical accident and the fuel handling accident analyses. The analyses were completed by following the NRC's guidelines and regulations for calculating the dose from radiation to operation personnel. The guidelines and regulations assume very conservative assumptions that provides the maximum possible dose that is multiple times greater than a dose from any realistic accident, if one were to occur. These conservative doses were found to be within the NRC's annual dose limits, excluding the fact that the dose from accidents are allowed to exceed the annual dose limit. With the Safety Analysis Report complete, it now pending NRC's approval before phase III of the conversion process begins.