Lessons Learned from International Investigations of Burnup Credit Criticality

OEDC/NEA Working Party on Nuclear Criticality Safety
Expert Group on Burnup Credit Criticality (EGBUC)

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This summary report defines, discusses and makes recommendations related to the physics and analysis of burnup credit criticality on the basis of the combined experience of the OECD/NEA Expert Group on Burnup Credit Criticality (EGBUC) members over the past 15 years. The report emphasizes the relevance of EGBUC benchmark evaluations and comparisons in deriving these conclusions.   This report addresses systems containing irradiated Light Water Reactors (LWRs) including Pressurized Water Reactors (*PWRs),* Boiling Water Reactors (*BWRs)* and water-cooled, water-moderated energy reactors *VVER (Russia-design PWRs).* Studies for PWRs included the use of Mixed-Oxide (MOX) fuels.

The purpose of this presentation is to assess and document the conclusions of the EGBUC members and their experience regarding the importance of various parameters for the implementation of burnup credit as a criticality safety strategy in establishing the safety basis/argument for nuclear material storage, transportation and reprocessing of irradiated LWR (*PWR, BWR and MOX)* fuel. This report also attempts to establish practical rules and identify applicable tools when appropriate. Lessons learned regarding any inconvenience or problem encountered in the experience of performing the international comparison problems will be presented and discussed.

The presentation will summarize the activities of the EGBUC, highlight the current findings by reactor and fuel types and address the future goals of the group. Current studies directed at the evaluation of burnup credit in a geologic repository timeframe and environment will be described.