**Integration Group for the Safety Case (IGSC) Symposium 2024**

*MOVING TOWARDS THE CONSTRUCTION OF A SAFE DGR - GETTING REAL*

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| **Author:**  Xinyue Tong, Tom Peake  U.S. EPA  [Tong.Xinyue@epa.gov](mailto:Tong.Xinyue@epa.gov) , [Peake.Tom@epa.gov](mailto:Peake.Tom@epa.gov) | |
| **Abstract Title:**  Performance Assessment based Sensitivity Calculation for WIPP Replacement Panels Planned Change Request – Sampling of Uncertain Parameters | |
| **Abstract (300-500 words):**  The Waste Isolation Pilot Plant (WIPP) is a geologic repository in bedded salt, located in southeastern New Mexico in the United States. WIPP has operated since 1999 to dispose of transuranic (TRU) waste from defense programs. The facility is operated by the U.S.  Department of Energy (DOE) and is certified for long-term performance by the U.S. Environmental Protection Agency (EPA). DOE is required to apply to EPA for recertification every five years. An issue for long-term repositories is maintaining the capability to address changes to the facilities in the safety assessments as technology changes. EPA staff are conducting a study to verify a change to DOE’s performance assessment computer system.    EPA received a Planned Change Request (PCR) from DOE to dispose of radioactive waste in two new panels to the west of the current repository footprint, which consists of 10 waste panels. Due to a radiological incident in 2014 that kept DOE from performing ground control on the salt, which creeps and contributes to roof instability, DOE lost the use of some waste disposal areas as portions of the repository were deemed a hazard to workers. The Replacement Panels Planned Change Request Performance Assessment (RPPCR PA) includes two replacement panels (panels 11-12, for equivalent disposal capacity lost) and additional potential future panels. However, DOE is asking for approval of just the two proposed panels. The RPPCR PA results are primarily compared to the results of the 2019 Compliance Recertification Application Performance Assessment (CRA-2019 PA) to assess repository performance in terms of the most recent PA for regulatory submittal.    Recently, to keep up to date with supported technology, Sandia National Laboratories migrated the WIPP PA codes from the Solaris cluster to the Linux cluster. The seeded random number generator used by previous PAs of Latin Hypercube Sampling (LHS) no longer produces the same random samples on the new CentOS platform. For the RPPCR PA, the LHS code reads a table containing the same values used in the CRA-2019 PA and the Additional Panels Performance Assessment (APPA) for a direct comparison of the RPPCR PA to these previous analyses. To assist EPA’s review of DOE’s PCR and to demonstrate compliance with EPA requirements (40 CFR 194.34(c)), we conducted an RPPCR PA base sensitivity calculation in which the LHS used a seeded random number generator instead of reading in a list of random numbers. We compare the values for sampled parameters for all vectors between this sensitivity calculation and the RPPCR PA to confirm that sampling occurred across the entire range of each parameter. We also compare the compliance release curves to confirm that the total normalized releases in the PRRCR PA continue to remain below regulatory limits with the seeded random number generator activated. | |
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