

## Key Technical Issues

- Unsaturated and saturated zone flow under isothermal conditions (USFIC)*  
USFIC covers six subissues: climate change; hydrologic effects of climate change; present-day shallow infiltration; deep percolation (post-thermal period); saturated zone ambient flow conditions and dilution processes; and matrix diffusion.
- Repository design and thermal mechanical effects (RDTME)*  
RDTME reviews the design, construction, and operations of geologic repository operations considering both preclosure and postclosure activities with four subissues: design control process; seismic design methodology; thermal-mechanical effects; and repository seals.
- Thermal effects on flow (TEF)*  
TEF is a process that could affect the performance of the repository which considers changes to flow paths of water in the unsaturated zone important to degradation of engineered barriers.
- Evolution of the near-field environment (ENFE)*  
ENFE covers five subissues which review the effects of coupled thermal-hydrologic-chemical (THC) processes on seepage and flow; waste package chemical environment; chemical environment for radionuclide release; radionuclide transport through engineered and natural barriers; and potential nuclear criticality.
- Container life and source term (CLST)*  
CLST deals with the containers and waste form as the primary engineered barriers, and the source term resulting from their degradation, as well as other design features including the drip shield.
- Radionuclide transport (RT)*  
RT evaluates processes controlling contaminant migration and covers four subissues: radionuclide transport through three rock types (porous rock, fractured rock, alluvium) and nuclear criticality in the far field.
- Structural deformation and seismicity (SDS)*  
SDS evaluates the geology in and around the candidate repository that results from tectonic activity, such as earthquakes, and covers four subissues: faulting; seismicity; fracturing and structural framework of the geologic setting; and tectonics and crustal conditions.
- Igneous activity (IA)*  
IA predicts the consequence and probability of igneous activity, such as volcanic eruptions or intrusions, potentially affecting the repository.
- Total system performance assessment and integration (TSPAI)*  
TSPAI describes an acceptable methodology for conducting assessments of repository performance and uses these assessments to demonstrate compliance with the overall performance objective and requirements for multiple barriers.

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