Recommendation 381
Implementation of Artificial Intelligence and Machine Learning Program Model for Decommissioning Process Enhancement

Background

The Savannah River Site has a long and distinguished history, and its mission includes the important task of decommissioning and environmental restoration. As stakeholders deeply invested in the success of the site, we recognize the challenges associated with the current decommissioning process, which is labor-intensive and relies on manual decision-making for selecting decommissioning models and conducting Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) evaluations.

The development of a proprietary DOE exclusive AI and ML program model for the decommissioning process at the Savannah River Site is a strategic move that will not only expedite critical projects but also contribute to the site's reputation as a leader in environmental restoration and innovation. We are confident that this recommendation aligns with the Department of Energy's goals and the future success of the Savannah River Site.

Key Components of the Artificial Intelligence (AI) and Machine Learning (ML) Program Model include Decommissioning Model Selection, CERCLA Evaluation, DBP Model and ISO Integration. Additional models such as DNB may be added. The AI and ML system will be designed to automate the selection of decommissioning models, using historical data, risk assessments, real-time environmental conditions, and existing processes utilized by SRS for decision-making. The program model will incorporate the necessary features to meet CERCLA evaluation requirements, ensuring compliance with environmental regulations and providing a systematic and efficient approach to site restoration. The program model will be developed in adherence to SRS Security Protocols. Integration of the DBP model and adhering to ISO to facilitate data-driven insights and continuous improvement. Additional applications may be derived from this program model. The implementation of this program promises to be cost-effective, as the benefits significantly surpass the costs involved. Furthermore, it allows for the allocation of existing resources toward the development of this program.

Recommendation

The Savannah River Site CAB recommends that the DOE

1. Create a dedicated task force to oversee the development and implementation of this AI and ML program model. This task force should consist of SRNL, experts in AI, ML, environmental science and site management; and,
2. Implement an advanced Artificial Intelligence (AI) and Machine Learning (ML) program model to streamline and optimize the decommissioning process at the Savannah River Site.