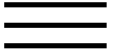


Computational environment and software configuration management of the 1996 performance assessment for the Waste Isolation Pilot Plant.

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Volume 69, Issues 1–3, September 2000, Pages 429-436

Computational environment and software configuration management of the 1996 performance assessment for the Waste Isolation Pilot Plant

G.K. Froehlich ^a ... H.C. Ogden ^c

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[https://doi.org/10.1016/S0951-8320\(00\)00018-1](https://doi.org/10.1016/S0951-8320(00)00018-1)

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Abstract

The US Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP), located in southeast New Mexico, is a deep geologic repository for the permanent disposal of transuranic waste generated by DOE defense-related activities. Sandia National Laboratories (SNL), in its role as scientific advisor to the DOE, is responsible for evaluating the long-term performance of the WIPP. This risk-based Performance Assessment (PA) is accomplished in part through the use of numerous scientific modeling codes, which rely for some of their inputs on data gathered during characterization of the site. The PA is subject to formal requirements set forth in federal

regulations. In particular, the components of the calculation fall under the configuration management and software quality assurance aegis of the American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA) requirements. This paper describes SNL's implementation of the NQA requirements regarding configuration management. The complexity of the PA calculation is described, and the rationale for developing a flexible, robust run-control process is discussed. The run-control implementation is described, and its integration with the configuration-management system is then explained, to show how a calculation requiring 37,000 CPU-hours, and involving 225,000 output files totaling 95 GB, was accomplished in 5 months by two individuals, with full traceability and reproducibility.



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Keywords

Configuration management; Run control; Run management; Traceability; Reproducibility; Quality assurance; Performance assessment; Waste Isolation Pilot Plant; Transuranic waste; Radioactive waste

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¹ At the time the work was performed, this was Digital Equipment Corporation (DEC).

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