

MELCOR 2.1 Software Quality Assurance Program

Larry L. Humphries, Ph.D.,

John Reynolds, and Randall O. Gauntt, Ph.D.

Severe Accident & Consequence Analysis Department

Sandia National Laboratories

P.O. Box 5800 Mail Stop 0748

Albuquerque, NM 87185-0748

llhumph@sandia.gov

The MELCOR code is developed at Sandia National Laboratories (SNL) for the US Nuclear Regulatory Commission (NRC). As part of our ongoing software development program, Software Quality Assurance (SQA) is an integral piece of the development process. SNL has adopted a SQA program that focuses on reducing code error, improving documentation of all processes, automation of procedures to minimize cost and improve consistency, improvements of code user training and communication, and continuous integration of procedures into daily work processes.

This paper discusses ongoing improvements to the MELCOR SQA program at Sandia National Laboratories. A review of internal processes such as requirements development and management, code design management, verification and validation, development and lifecycle support, configuration management, measurement and analysis, and integrated product and teaming will be presented.

In May 2004, the U.S. Department of Energy (DOE) published a gap analysis report (DOE-EH-4.2.1.3-MELCOR-Gap Analysis) outlining areas where MELCOR SQA should be improved to resolve issues identified in the Defense Nuclear Facilities Safety Board recommendation 2002-1. This paper presents key improvements that satisfy those concerns.