April 2004

YUCCA MOUNTAIN

Persistent Quality Assurance Problems Could Delay Repository Licensing and Operation

GAO Accountability • Integrity • Reliability

Highlights

Highlights of GAO-04-460, a report to congressional requesters

Why GAO Did This Study

The Department of Energy (DOE) must obtain a license from the Nuclear Regulatory Commission (NRC) to construct a nuclear waste repository at Yucca Mountain, Nevada. In licensing, a quality assurance program helps ensure that the information used to demonstrate the safety of the repository is defensible and well documented. DOE developed a corrective action plan in 2002 to fix recurring problems with the accuracy of such information. This report assesses the status of corrective actions and the adequacy of DOE's plan to measure the effectiveness of actions taken.

What GAO Recommends

GAO recommends that DOE revise action plan goals and close the plan once sufficient evidence exists showing that the actions have succeeded. In commenting on the report, DOE disagreed with the findings and recommendations, stating, among other things, that GAO mischaracterized the action plan and the results of independent reviews. GAO disagrees—the report correctly describes the plan and the findings of the reviews. NRC agreed with GAO's conclusions but suggested that DOE be given the flexibility to choose alternative approaches to achieve and measure performance. GAO agrees, provided that any approach include objective measures and time frames to assess effectiveness.

www.gao.gov/cgi-bin/getrpt?GAO-04-460.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Robin M. Nazzaro at (202) 512-3841 or nazzaror@gao.gov.

What GAO Found

DOE has reportedly implemented most of the actions in its 2002 corrective action plan, but recent audits and assessments have identified lingering quality problems with data, models, and software and continuing management weaknesses. Audits revealed that some data sets could not be traced back to their sources, model development and validation procedures were not followed, and some processes for software development and validation were inadequate or not followed. DOE believes these problems have not affected the technical basis of the project; however, they could adversely affect the licensing process. Recent assessments identified continuing management weaknesses in the areas of roles and responsibilities, quality assurance policies and procedures, and a work environment that did not foster employee confidence in raising concerns without fear of reprisal. NRC has acknowledged DOE's effectiveness in identifying quality problems, but recently concluded that quality problems could delay the licensing process.

DOE cannot assess the effectiveness of its 2002 plan because the performance goals to assess management weaknesses lack objective measurements and time frames for determining success. The goals do not specify the amount of improvement expected, how quickly the improvement should be achieved, or how long the improvement should be sustained before the problems can be considered corrected. DOE recently developed a measurement tool that incorporates and revises some of the goals from the action plan, but most of the revised goals continue to lack the necessary time frames needed to determine whether the actions have corrected the recurring problems. A recently completed DOE review of the 2002 plan found that the corrective actions have been fully implemented. However, the review also noted the effectiveness of the actions could not be evaluated because many of the plan's goals lacked the level of objectivity and testing needed to measure effectiveness.

Quality Problems with Data, Models, and Software

Quality problems by type	Year 1998	2001	2003
Data			
Data sets could not be tracked back to original sources	●		●
Failure to comply with data management procedures	●		●
Data procedures not adequately defined	●		●
Unqualified data used to support models	●		●
Models			
Inadequate procedures for validating and controlling development of models	●	●	
Failure to implement procedures for model development and validation	●	●	●
Software			
Ineffective processes for ensuring performance of software to support models	●	●	●
Failure to comply with procedures for managing software		●	●

Source: GAO analysis of DOE documents.