

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

**ATOMIC SAFETY AND LICENSING BOARD  
Before Administrative Judges:**

**09-892-HLW-CAB04  
Thomas S. Moore, Chairman  
Paul S. Ryerson  
Richard E. Wardwell**

In the Matter of:	)	December 7, 2009
	)	
U.S. Department of Energy	)	
	)	Docket No. 63-001
(High Level Waste Repository	)	
Construction Authorization Application)	)	
	)	

**U.S. DEPARTMENT OF ENERGY BRIEF ON  
CONTENTION NEV-SAFETY-171**

**I. Introduction**

In their May 11, 2009 “Memorandum and Order (Identifying Participants and Admitted Contentions),” Construction Authorization Boards (CAB) 01, 02 and 03 admitted as a legal issue contention Nevada Safety Contention 171, relating to the use of the Performance Margin Analysis (PMA) to validate or provide confidence in the U.S. Department of Energy’s (DOE or Department) Total System Performance Assessment (TSPA).<sup>1</sup>

In response to the September 30, 2009 Case Management Order #2 (issued by CAB 04), DOE and the State of Nevada agreed that this contention involves the following legal issue:

The legal issue presented is whether, under 10 C.F.R. §§ 63.113, 63.114, and Part 63 Subpart G, the PMA can be used to validate or

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<sup>1</sup> See *U.S. Dep’t of Energy* (High Level Waste Repository), LBP-09-06, 69 NRC \_\_ (slip. op at 138) (May 11, 2009).

provide confidence in the TSPA, if its data and models are not qualified under DOE's quality assurance program.<sup>2</sup>

CAB 04 approved this formulation of the legal issue.<sup>3</sup>

Nothing in 10 C.F.R. §§ 63.113, 63.114, or Part 63 Subpart G requires that the PMA be qualified under DOE's quality assurance (QA) program, or prohibits DOE from using the PMA to validate or provide additional confidence in the TSPA.

## II. **Background**

The PMA is a set of calculations that parallel those of the TSPA, but which focus on certain of the more risk-important conservatisms embedded in TSPA model components and submodels.<sup>4</sup> In its most basic terms, the PMA provides information in order to analyze postclosure performance over a set of modeling cases from which selected conservatisms used in the TSPA have been removed.<sup>5</sup>

The procedurally defined validation level for the *TSPA* model (not the PMA) requires using at least two post-TSPA development model validation activities.<sup>6</sup> The two activities undertaken by DOE were: (1) corroboration of TSPA model results (*i.e.*, outputs) by means of auxiliary analyses, one of which is the PMA, and (2) comparison of the TSPA model results with

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<sup>2</sup> U.S. Department of Energy, State of Nevada and Nuclear Energy Institute Joint Proposal Identifying Phase 1 Legal Issues for Briefing, Attachment 1 at 4 (Oct. 6, 2009).

<sup>3</sup> *See* CAB 04, Order (Identifying Phase 1 Legal Issues for Briefing) (Oct. 23, 2009) (unpublished). Nevada's contention references a number of other regulations. DOE and Nevada agreed that, while either party is free to discuss those or other regulations in their brief, the legal issue to be decided focuses exclusively on what is required to comply with 10 C.F.R. §§ 63.113, 63.114, and Part 63 Subpart G.

<sup>4</sup> Safety Analysis Report (SAR) § 2.4.2.3.2.3.2.4. SAR references in this brief are to SAR revision 1, dated February 19, 2009.

<sup>5</sup> *Id.* at 2.4-246 to -247.

<sup>6</sup> *See Id.* at 2.4-122; "Total System Performance Assessment Model/Analysis for the License Application," LSN# DEN001579005 at 7.1-9 (January 2008) (TSPA Report).

two independent mathematical models.<sup>7</sup> In addition to these activities, DOE conducted two other confidence-building activities to support the TSPA model.<sup>8</sup> The post-development validation activities complement several similar activities that DOE undertook during development of the TSPA, some of which DOE repeated after development to confirm the model's acceptability.<sup>9</sup> Thus, the TSPA model's validation relies on a broad set of activities, one of which is the PMA.

### III. Argument

#### A. *10 C.F.R. §§ 63.113, 63.114, and Part 63 Subpart G Do Not Impose QA Requirements On the PMA*

None of the regulations cited above specifies QA requirements applicable to the PMA or requires that validation of tools, such as the PMA, be subject to the QA provisions that apply to the TSPA. The QA requirements under Part 63 are in Subpart G, not in § 63.113 or § 63.114. Neither § 63.113 nor § 63.114 imposes requirements on qualification of data or models, nor any other form of QA requirements. Moreover, the PMA is not the performance assessment that is required by 10 C.F.R. § 63.113. Rather, the performance assessment used in the License Application to demonstrate compliance with § 63.113 is the TSPA. Accordingly, the PMA is not subject to the requirements specified in 10 C.F.R. § 63.114 because that regulation only applies to the performance assessment required under § 63.113.

Subpart G of Part 63, 10 C.F.R. §§ 63.142-63.144, specifies QA requirements that apply to activities that are important to waste isolation and important to safety functions of structures, systems and components (SSC), but does not include requirements that apply to validation tools

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<sup>7</sup> See SAR at 2.4-122; TSPA Report at 7.1-9.

<sup>8</sup> See SAR at 2.4-122; TSPA Report at 7.1-9.

<sup>9</sup> See SAR at 2.4-122; TSPA Report at 7.1-9.

such as the PMA. Indeed, 10 C.F.R. § 63.142(a) provides a list of activities for which the QA program applies, and that list does not include the PMA. In particular, § 63.142(a) states that DOE's QA program is to be applied to all SSCs important to safety, to design and characterization of barriers important to waste isolation, and to related activities, and that "[t]hese [related] activities include designing, purchasing, fabricating, handling, shipping, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, modifying, site characterization, performance confirmation, permanent closure, decontamination, and dismantling of surface facilities." Validation tools such as the PMA are simply not included in this enumeration of activities to which the QA program applies.

Additionally, the Quality Assurance Requirements and Description (QARD), which is the QA program description required by 10 C.F.R. §§ 63.21(c)(20) and 63.142(a), identifies *the TSPA* and *qualification of its inputs* as being within the category of "activities related to" SSCs important to safety and to barriers important to waste isolation.<sup>10</sup> Again, the QARD does not identify the PMA or in any way suggest that the PMA is an activity related to SSCs or barriers. Indeed, there is no requirement in the NRC regulations or guidance to perform a PMA or anything like it, and there is no requirement that the PMA be validated in accordance with the requirements applied to stand-alone models. The PMA does not evaluate TSPA *inputs*. Instead, as discussed above, PMA output is compared with certain TSPA *outputs*.

***B. Nothing in 10 C.F.R. §§ 63.113, 63.114, or Part 63 Subpart G Prohibits Use of the PMA to Validate Or Provide Confidence in the TSPA, If Its Data and Models Were Not Qualified Under DOE's QA Program***

The only regulatory restriction on the information DOE may include in its application is that all information submitted to the NRC must be complete and accurate in all material

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<sup>10</sup> "Quality Assurance Requirements and Description: DOE/RW-0333P, Rev. 20," LSN# DEN001574022, § 2.2.2.D (January 2008) (QARD).

respects.<sup>11</sup> Nothing in 10 C.F.R. §§ 63.113 and 63.114 or Subpart G of 10 C.F.R. Part 63 prohibits inclusion in the license application of an analysis such as the PMA for the purposes of validating or providing confidence in the TSPA whether or not all of the data and models used in that analysis were qualified under DOE's QA Program.

Finally, it should be noted that the PMA was developed in accordance with appropriate quality controls. The PMA, in fact, was developed by following the QA program as implemented in the Sandia National Laboratory SCI-PRO-006 procedure for model reports.<sup>12</sup> Consistent with SCI-PRO-006 provisions, which apply to a corroborative study, the PMA made limited use of unqualified software and data.<sup>13</sup> Thus, notwithstanding the fact that PMA development was not required under the QARD, it was governed by appropriate quality controls.

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<sup>11</sup> *See* 10 C.F.R. § 63.10(a).

<sup>12</sup> TSPA Report, App. C.

<sup>13</sup> *Id.*, App. C at C-8.

IV. **Conclusion**

No provisions of 10 C.F.R. §§ 63.113, 63.114, or Part 63, Subpart G require the PMA data or models to be qualified under DOE's QA program. Thus, there is no need to adjudicate whether the quality controls applied to development of the PMA were consistent with Subpart G of 10 C.F.R. Part 63 and the QARD. Accordingly, Nevada Safety Contention 171 should be dismissed as a matter of law.

Respectfully submitted,

*Signed electronically by Donald J. Silverman*

Donald J. Silverman  
Counsel for the U.S. Department of Energy  
Morgan, Lewis & Bockius LLP  
1111 Pennsylvania Avenue, N.W.  
Washington, DC 20004

James Bennett McRae  
Martha S. Crosland  
U.S. Department of Energy  
Office of the General Counsel  
1000 Independence Avenue, SW  
Washington, DC 20585

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this 7th day of December 2009