

March 30, 2005

MEMORANDUM TO: David M. Dancer, Project Engineer  
Engineering Section  
Technical Review Directorate  
Division of High-Level Waste Repository Safety, NMSS

FROM: Lawrence E. Kokajko, Deputy Director /RA/  
Division of High-Level Waste Repository Safety, NMSS

SUBJECT: CERTIFICATION OF TECHNICAL QUALIFICATIONS

I have determined, based on my review of your professional background, work experience, and education, that you are qualified to perform technical and regulatory reviews on high-level waste (HLW) disposal work at the U.S. Nuclear Regulatory Commission (NRC), and to perform licensing activities for the HLW repository.

My review of your professional background indicates that you have 14 years professional experience with NRC, including the following:

1. Fourteen years performing high-level waste pre-licensing reviews related to the U.S. Department of Energy's (DOE) high-level waste repository program, mainly in the area of heat transfer, atmospheric dispersion, accident analysis, numerical modeling, and project management.
2. Pre-licensing technical and activities focusing on the review of site selection for a high-level waste repository, environmental assessments, site characterization plan, topical reports and analyses involving testing and modeling.
3. Specific assignments in the high-level waste program have included: (a) serving as project manager for physical protection and materials control and accountability; (b) leading a technical exchange with the DOE on physical protection and materials control and accountability; (c) developing a Commission paper on policies for processing security

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clearances, for the State of Nevada and other interested parties for the proposed Yucca Mountain repository; (d) developing a final risk informal rule for the pre-closure design basis events to be considered in a License Application for a geologic repository for spent fuel; (e) participating in the development of a risk informal final rule for the disposal of high level waste at a geologic repository at Yucca Mountain; (f) analyzing the vulnerability of waste packages and other engineered barriers to accidents and acts of terrorism; (g) calculating the atmospheric dispersion of radionuclides released in accidents and acts of terrorism for deterministic and probabilistic scenarios; and (h) analyzing the heat transfer in radioactive waste containers placed in a geologic repository.

In addition, you have 23 years of extensive engineering experience at the Departments of Transportation and Defense prior to joining NRC, including the following: (a) analyzing the special routing of radioactive shipments to reduce transportation risks; (b) developing a computer program to predict the probabilistic performance of rail cars carrying spent fuel or hazardous chemicals in accident conditions; (c) training personnel on probabilistic risk assessment for transportation accident analysis; (d) training personnel on operation research techniques for the transportation of hazardous materials; (e) training personnel on fault tree methods; (f) developing four final risk-based rules to mitigate the vulnerability of rail cars carrying spent fuel and hazardous chemicals; (g) representing the Department of Transportation as an expert to legislative, intermodal, and professional technical committees; (h) calculating the air and water dispersion of chemicals and radionuclides released in accidents for probabilistic and deterministic scenarios; (i) developing emergency response guidelines for transportation accidents involving spent fuel or hazardous chemicals; (j) reviewing draft environmental impact statements for the transportation of hazardous materials; (k) managing a research study on the effectiveness of head shields and shelf-couplers in preventing or mitigating railroad accidents involving spent fuel or hazardous chemicals; (l) managing a research study on the effectiveness of thermal protection in mitigating railroad accidents involving spent fuel or hazardous chemicals; (m) managing a research study on the effectiveness of improved safety relief systems in mitigating railroad accidents involving hazardous chemicals; (n) managing a research study on the metallurgical properties of steels used for rail cars carrying spent fuel or hazardous chemicals; (o) reviewing the U.S. Coast Guard's Chemical Hazard Response Information System and recommended changes; (p) estimating the deaths and injuries from hypothetical transportation accidents and recommending safe evacuation distances for such accidents; (q) developing a computer program to calculate the temperatures in buildings subjected to nuclear weapon explosions; (r) conducting small scale and full scale pool fire tests to analyze the fire vulnerability of naval ordnance systems; (s) using fault trees to develop credible accident scenarios at naval munitions installations; (t) developing thermal protections for naval ordnance systems to mitigate the effects of onboard fires; and (u) developing and testing new explosives.

Your formal education includes an Masters of Science Degree in Chemical Engineering. You have been recognized by your peers in the profession because of your numerous publications in journals and conference proceedings. You are the author of Chapter 7, "Thermal Design Analysis," Handbook of Electronic Packaging Design.

You have continued your training throughout your career by completing several training courses related to high-level waste including: (a) Aircraft Fire and Explosion (Blazetech Corp.); (b) Overview of Hazard Identification Methods (ABS Consulting); (c) Reviewing Integrated Safety Analysis (Process Safety Institute); (d) Hazards Analysis for DOE Safety Analysis Reports and

Quantitative Risk Analyses, including Integrated Safety Analysis (course conducted by Conger & Elsea, Inc.); (e) External Events Course (P-204); (f) Fundamentals of Probabilistic Risk Assessment; (g) Introduction to Risk Assessment in NMSS (P-400); (h) Applied Statistics; (i) Performance Assessment Techniques for High-Level Waste; (j) NRC Regulatory Process; (k) Hazard Evaluation; (l) Qualitative and Quantitative Methods (Process Safety Institute); (m) High-Level Waste Repository Health Physics Course (H-403); (n) NRC Regulatory Process; (o) Yucca Mountain Project Team's Risk Performance Lectures or their equivalent training; (p) Nuclear Software Quality Assurance; and (q) Nuclear Reactor Concepts.

You have demonstrated knowledge and application of NRC requirements, policies, Management Directives, guidance and review procedures, and Office and Division procedures in your many technical and management reviews. Your formal education, together with your course work and your extensive work experience at NRC, provide me with substantial evidence of your capability to perform technical and regulatory reviews on HLW disposal work at NRC.

Thus, through an evaluation of your employment history and my observations of your work, I have concluded that you understand and have satisfied the training and qualification requirements described in NRC Inspection Manual Chapter 1246 (IMC 1246), "Formal Qualification Programs in the Nuclear Material Safety and Safeguards Program Area," April 14, 2003, and that you have the necessary skills and experience to perform assigned tasks related to High-Level Waste Repository Safety technical reviews and licensing activities to which you have been assigned. Therefore, you are hereby certified as qualified to perform technical and licensing reviews on HLW disposal.

Note that IMC 1246 requires post-qualification and periodic refresher training. Section XV, Appendix A, IMC 1246 states that refresher training will be conducted every three years following certification and will be determined on a case-by-case basis.

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\*See previous concurrence

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