

September 29, 2011 (2:00 p.m.)

OFFICE OF SECRETARY  
 RULEMAKINGS AND  
 ADJUDICATIONS STAFF  
 Docket No. 70-3098-MLA

APP000003  
 Submitted Sept. 29, 2011

## SVEN O. BADER

### EDUCATION

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Ph.D., Nuclear Engineering, Minor: Mathematics, N. C. State University, 1996

M.N.E., Nuclear Engineering, Minor: Mechanical Engineering, N.C. State University, 1991

B.S., Nuclear Engineering, N.C. State University, 1988

### PROFESSIONAL EXPERIENCE

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8/09 - Present AREVA Federal Services LLC (AFS) Charlotte, NC

*Advisory Engineer*

Member of the Strategic Programs group performing licensing and safety activities in support of AREVA recycling/reprocessing projects in the U.S. and overseas.

Continue to support the safety assessment (as described below) and licensing of the chemical processing units for the MOX Fuel Fabrication Facility (MFFF) at Savannah River Site (SRS).

Member of Nuclear Energy Institute (NEI) task force for "Closing the Fuel Cycle" which has been working to support the NRC with the revamping of regulations for recycling facilities (e.g., SECY-09-0082).

Member of NEI task force for "Extended Storage and Transportation" which has been working to support industry and the NRC with issues associated with long-term storage and transportation of used nuclear fuel (UNF).

Support Integrated Safety Analysis (ISA) activities for AREVA recycling/reprocessing projects, specifically those activities related to chemical safety, for both domestic (MFFF) and foreign projects.

Support Department of Energy (DOE) Indefinite Duration Indefinite Quantity (IDIQ) contract activities related to recycling, specifically supporting the Separations, Waste, and UNF Disposition campaigns under the DOE Office of Nuclear Energy.

10/06 - 8/09 AREVA NP

Charlotte, NC

*Advisory Engineer*

Member of the New Plants Fluence and Radiological Engineering group:

- o Performed radiation analyses for the U.S. EPR™ reactor using MCNP4C, ORIGEN2, and ELISA-2 under normal and abnormal operations.
- o Produced Process Control Programs for U.S. EPR™ reactor applicants (stand-alone licensing documents making up part of the license applications for each reactor site, describing solid waste treatment processes).
- o Updated and reviewed Chapter 11 of the U.S. EPR™ Final Safety Analysis Report (FSAR) and wrote responses to NRC requests for addition information (RAIs).
- o Modeled the response of the U.S. EPR™ Excure Source Range Radiation Detectors, assessed the radioactive activity of various U.S. EPR™ core components (e.g., control rods and

TEMPLATE = SECY-028

SECY-02

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aeroballs), and produced Radiological Zone Drawings for the U.S. EPR™ fuel, auxiliary, safeguards, and radwaste buildings.

Supported Global Nuclear Energy Partnership (GNEP) activities related to regulatory/ licensing and safety for a potential commercial recycling facility for the U.S.

Continued to support safety assessment (as described below) and licensing of the chemical processing units for the MFFF.

11/03 – 10/06 AREVA NP (formerly Framatome ANP)

Charlotte, NC

*Engineering Supervisor*

Leader of a team of 11 safety engineers and analysts on the MFFF project to establish and document the safety bases and Items Relied on for Safety (IROFS) for the aqueous polishing (AP) process of the MFFF and aid in the production of an NRC License Application and ISA Summary. Tasks supervised to meet this objective include:

- Hazard and Operability Analyses (HazOps) for nuclear-chemical processing units
- writing NSEs for explosion and loss of confinement events
- supporting technical tasks required to establish chemical safety basis information for explosion events such as radiolysis, Red Oil and Hydroxylamine Nitrate (HAN)
- reviewing engineering documents (e.g., Piping and Instrumentation Drawings, P&IDs) to ensure implementation of safety principals
- performing radiological dose and chemical exposure consequence analyses
- performing Failure Mode and Effects Analysis (FMEAs) on IROFS
- writing and reviewing portions of the ISA Summary and License Application

1996 - 2003 Framatome ANP (formerly Duke Engineering & Services) Charlotte, NC

*Senior Engineer*

Performed HazOps and dose calculations and effluent release calculations for accidents and normal operations for the MFFF project. 2001-03

Performed criticality calculations ( $k_{eff}$ ) for the Pit Disassembly and Conversion Facility (Jacobs Engineering) using MCNP. 2002

Performed control room dose assessment for UNF drops for Oconee and Catawba Nuclear Stations using standard and “alternative” NRC source terms and LOCADose. 2001

Performed and reviewed criticality safety calculations for the MFFF and wrote the “Nuclear Criticality Safety Methods Manual” for the MFFF project. 1999-2001

Analyzed design basis events (DBE), established accident release fractions for commercial UNF, and performed dose analysis for DOE UNF and plutonium wastes planned for delivery to the Yucca Mountain Project (YMP). 1998-2001

Performed fault tree analysis of single failure-proof cranes for Hanford K-basins and YMP. 1999-2000

Reviewed thermal and shielding safety analyses for 10 CFR 72 and 10 CFR 71 SAR submittals by cask vendors. 1998

Analyzed DBEs for the Centralized Interim Storage Facility, CISF (Topical Safety Analysis Report issued for DOE which provided the initial design bases for the Goshutes Skull Valley nuclear storage site). 1996-1999

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1989 - 1996 North Carolina State University Raleigh, NC

*Course Instructor & Computer System Administrator*

Instructor of various courses and nuclear laboratories in the Nuclear Engineering Dept.

Computer system administrator for WorkStations and mainframes.

1990 - 1992 Contractor to Carolina Power & Light (now Progress Energy) New Bern, NC

*Course Instructor and Tutor*

Instructor of nuclear related courses for a degree program offered through the Univ. MD.

## ADDITIONAL PROFESSIONAL ACTIVITIES

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Nuclear Power Probabilistic Risk Assessment (PRA): Improve Nuclear Power Plant Safety through Application of a Highly Structured Analysis, EUCI, Washington, DC, March 2010.

ELISA-2 (Evaluation of Licensing and Severe Accidents at LWRs based on Classical and Alternate Source Term Methodologies), ENTECH Engineering, March 2007.

Layer of Protection Analysis (LOPA), ABS Consulting, January 2005.

Introduction to MCNP (Criticality, Shielding & Dose Analysis Code), LANL, May 1999.

10 CFR 50.59 (10 CFR 72.48) Evaluation Training (Unreviewed Safety Questions, USQs), Catawba Nuclear Station, August, 1997.

Methods for Reviewing Safety Analysis Reports for Packagings (SARP) and Performing Confirmatory Analysis, U.S. DOE, LLNL, May 1997.

Duke Power General Employee Training (GET) and Radiation Protection (RP) Training, McGuire Nuclear Station, April, 1997.

SCALE Criticality Training Course, CSAS and KENO V Training, ORNL, October 1996.

M&O Quality Assurance Program (QA) Indoctrination, part of U.S. DOE's OCRWM QA Program, Charlotte, May 1996.

## PROFESSIONAL MEMBERSHIPS

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Professional Engineer, Nuclear Engineering, North Carolina, since 1999

American Nuclear Society (ANS)

- Member of new standard committee ANS 8.29 (proposed criticality standard for reprocessing facilities), 2011
- NC State Univ. Chapter President, 1987-1988

International Standards Organization (ISO) Working Group 8, Criticality Safety, 1999

## AWARDS RECEIVED

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Engineer of the Year, Federal Operations, AREVA, 2005

Teaching Fellowship, N.C. State University, Raleigh, NC

Industry of Nuclear Power Operations (INPO) Scholarship, N.C. State University, Raleigh, NC

International Baccalaureate in English, International Schule Hamburg, Hamburg, Germany

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## PUBLICATIONS & PRESENTATIONS

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S. Bader "Sustainable Fuel Cycle: Regulatory Framework to Support Options to Address Used Fuel in the U.S." NRC Fuel Cycle Information Exchange (FCIX), Rockville, MD, June 2011.

Panel Member "Future of the Nuclear Fuel Cycle and Waste Management." ANS Annual Meeting, Hollywood, FL, June 2011.

S. Bader and P. Murray "Potential Impact of U.S. NRC & EPA Regulations to Waste Streams from Recycling Facilities." DOE Separations/Waste Forms Working Group Meeting, Las Vegas, NV, March 2011.

J. Byard, P.B. Perez, and S.O. Bader, "EPR<sup>TM</sup> Heavy Reflector Reduction of the Neutron Fluence on the Reactor Pressure Vessel." International Congress on Advances in Nuclear Power Plants, San Diego, CA. June 2010.

P. Murray, S. Bader, D. Davidson, R. Bera, "Implementation of Transformational Technology in a Future Recycling Facility." Pacific Northwest International Conference on Global Nuclear Security, Portland, OR, April 2010.

G.H. Senentz, H. Delvallez, P. Paviet-Hartmann, and S.O. Bader, "Red Oil: Defense in Depth in the AREVA NC Plant Design." Global 2009, Paris, France. September 2009.

Sven O. Bader, Robert G. Foster, Mathias Lein, and Keyes A. Niemer, "MOX Fuel Fabrication Facility Nuclear Criticality Validation Approach." ANS Nuclear Criticality Safety Division 2001 Topical Meeting, Practical Implementation of Nuclear Criticality Safety, Reno, NV. November 2001.

S. S. Tsai, G. H. Kaplan, S. O. Bader, D. A. Kalinich, R. P. Morissette, and T. D. Dunn, "Preliminary Analyses of Monitored Geologic Repository Design Basis Events for DOE and Navy Spent Nuclear Fuel and Plutonium Disposition Waste Forms." ANS 4th Embedded Topical Meeting on DOE Spent Nuclear Fuel and Fissile Material Management, San Diego, CA. June 2000.

Bader, S.O. and Doster, J.M., "Modeling of the Free Molecular Flow Regime for Heat Pipes at Low Vapour Pressures." Proceedings of the IX International Heat Pipe Conference, Albuquerque, NM. LA-UR-97-1500, May 1995.