

NextEra Energy Seabrook, LLC
(Seabrook Station, Unit 1)
License Renewal Application

**NRC Staff Answer to Motion for
Summary Disposition of Contention 4B**

ATTACHMENT 4B-N

RANDALL OWEN GAUNTT

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EMPLOYMENT HISTORY

Manager Severe Accident Analysis Department

2004 — Present

Sandia National Laboratories

- Perform diverse research activities for DOE and NRC including analyses of severe accident progression in commercial power plants
- Manage a team of researchers and code developers who develop and apply the MELCOR severe accident analysis code and the MACCS atmospheric transport and consequence assessment code

Temporary Assignment in U.S. Embassy in Tokyo supporting DOE Fukushima Support and Response

3/23/2011 — 4/27/2011

Sandia National Laboratories

- Provided in-country technical support and consultation to numerous stakeholders following the accidents at the Fukushima power plants, including support to the U.S. Military, U.S. NRC, DOS and DOE as well at Japanese organizations including TEPCO and the JNES.
- Supervised initial source term estimations for use in ongoing estimation of what releases from the accidents could have been
- Performed MELCOR analyses evaluating the potential damage states of each of the Fukushima reactors
- Performed MELCOR analyses focused on assessing potential for subsequent damage to the already crippled Fukushima cores in the event of strong seismic aftershocks to evaluate potential consequences of continued core damages

2003 — 2004

Distinguished Member of Technical Staff

Technical Leader of the MELCOR Code development project

1995 — 2004

- Led a team of engineers in the development of the MELCOR severe accident computer code for the U.S. Nuclear Regulatory Commission
- Performed expert analyses of severe accident behavior using MELCOR aimed at characterizing anticipated fission product releases from accidents from nuclear power plants
- Performed numerous code validation and assessment efforts aimed at developing and improving physical models of core melt progression and fission product release and transport behavior

Technical Leader of the Ex-Reactor Severe Accident Experiments Team

1991 — 1996

Sandia National Laboratories

- Led the design and construction of a test facility for performing high temperature melt progression experiments on BWR core structures
- Developed a novel and unique wire-fed melt furnace to provide high temperature core melt materials for simulating meltdown on Zircaloy cladding, channel box materials and BWR control blade materials
- Directed analysis support in the development of the MERIS porous media code for predicting BWR core degradation and melt progression behavior.

Technical Leader of the ACRR In-Pile “MP” Late Phase LWR Fuel Damage Experiments

1988 — 1994

Sandia National Laboratories

- Based on observations from the TMI-2 core examinations, developed a test program for characterizing “Late Phase” core melt progression behavior where fuel debris subsequently melts and thermally attacks underlying core blockages that formed earlier in the severe accident
- Performed in-pile experiments MP-1 and MP-2 producing phenomenological test data for modeling late phases of core degradation beginning with a degraded fuel debris bed overlying lower intact fuel rods and pre-formed core blockages using prototypic materials (enriched UO₂, ZrO₂ and control materials).
- Supervised neutronic analyses on MP experiments coupling with the neutron flux of the ACRR central irradiation cavity to ensure proper fission heating of the test package
- Tests were performed in the ACRR reactor using fission heating methods to simulate decay heat
- Prepared Safety Analysis Reports for the MP Experiments and presented to the ACRR Safety Review Board to assure QA and safe conduct of experiments capable of producing radiological releases
- Directed analysis support in the development of the DEBRIS porous media code for predicting late phase melt progression behavior.

Technical Leader of the ACRR In-Pile “DFR”(Damaged Fuel and Relocation) Early Phase LWR Fuel Damage Experiments

1984 — 1988

Sandia National Laboratories

- Motivated by the accident at TMI-2 and aimed at characterizing the phenomena involved in initial LWR core damage in a severe accident, including cladding oxidation and hydrogen generation, fuel liquefaction and relocation processes and transition from rod-like geometry to degraded core debris geometry
- Performed in-pile experiments DF-3 and DF-4 producing phenomenological test data for modeling early phases of core degradation beginning with a rod geometry in a small 9-rod test bundle. DF-3 included a Ag-In-Cd control rod and DF-4 was the first ever experiment to investigate a SS-B₄C BWR control blade element.
- Played supporting engineer role in the conduct of earlier DF-1 and DF-2 experiments and supervised test report and post test analyses.
- Supervised neutronic analyses on DFR experiments coupling with the neutron flux of the ACRR central irradiation cavity to ensure proper fission heating of the test package
- Tests were performed in the ACRR reactor using fission heating methods to simulate decay heat
- Prepared Safety Analysis Reports for the DF-3 and DF-4 Experiments and presented to the ACRR Safety Review Board to assure QA and safe conduct of experiments capable of producing radiological releases
- Directed analysis support in the development of the MELPROG code for predicting fuel heatup, uncover and damage progression phenomena.

Technical Leader of the TRAN-GAP Experiment Project

1982 — 1986

Sandia National Laboratories

- Motivated by safety issues raised concerning the Liquid Metal Fast Breeder Reactor (LMFBR) project to be built at Clinch River, these experiments were aimed at characterizing the behavior of reactor fuel that has melted during a Hypothetical Core Disruptive Accident (HCDA) and become ejected from the core region to the breeder blanket region. At question was whether the ejected fuel would freeze in the blanket region or if the accident would TRANSition to a renewed critical condition.
- Performed in-pile experiments GAP-1 and Gap-3 wherein more than 2 kg of enriched UO₂ was melted in a prompt pulse of neutrons from the ARCC central irradiation cavity and ejected under pressure into prototypic LMFBR blanket region structures.
- Played supporting engineer role in the conduct of earlier TRAN 1 - 4 experiments that explored molten fuel ejection into core fuel pin geometry

- Supervised neutronic and transient thermal analyses on TRAN experiments coupling with the neutron flux of the ACRR central irradiation cavity to ensure proper fission heating/melting of the fuel materials using neutrons from the ACRR operated in pulse mode at over 30,000MW per pulse.
- Prepared Safety Analysis Reports for the GAP-1 and GAP-2 Experiments and presented to the ACRR Safety Review Board to assure QA and safe conduct of experiments capable of producing radiological releases
- Directed analysis support in the development of the PLUGM code for predicting fuel fuel motion and freezing in fuel pin geometry.

ACTIVITIES AND AWARDS

- 2011 USDOE Secretarial Honors Award for Japan Earthquake and Tsunami Disaster Response Teams – this is the highest honor awarded to DOE Laboratory contractors, awarded for ongoing support of DOE and Japan during the Fukushima post-accident crisis management period.
- 2003 Promoted to the position of "Distinguished Member of Technical Staff," the highest level of recognition open to members of the Sandia Technical Staff
- Maintained Membership in American Nuclear Society (ANS) and American Society of Mechanical Engineers (ASME) and regularly supporting organization and reviews for technical conferences of the ANS and ASME, including ANS, NURETH and ICONE.

PUBLICATIONS
- See Attached List

Title	Reference	Author	Year
MELCOR Simulations of the Severe Accident at the Fukushima 1F3 Reactor	ANS Winter Meeting, Fukushima Embedded Topical, San Diego	Jeff Cardoni, Don Kalinich, Jeff Cardoni and Randall Gauntt	2012
MELCOR Simulations of the Severe Accident at the Fukushima 1F2 Reactor	ANS Winter Meeting, Fukushima Embedded Topical, San Diego	Jesse Phillips, Don Kalinich, Jeff Cardoni and Randall Gauntt	2012
MELCOR Simulations of the Severe Accident at the Fukushima 1F1 Reactor	ANS Winter Meeting, Fukushima Embedded Topical, San Diego	Randall O. Gauntt, Don Kalinich, Jeff Cardoni and Jesse Phillips	2012
Fukushima Daiichi Accident Study (Status as of April 2012)	SAND2012-6173	Randall Gauntt, et al.	2012
State of the Art Reactor Consequence Project, Volume 2, Surry Integrated Analyses	NUREG/CR 7110 Vol 2	Randall O. Gauntt, et al	2012
State of the Art Reactor Consequence Project, Volume 1, Peach Bottom Integrated Analyses	NUREG/CR 7110 Vol 1	Randall O. Gauntt, et al	2012
Accident Source Terms for Light-Water Nuclear Power Plants Using High-Burnup or MOX Fuel	SAND2011-0128	D.A. Powers, M.T. Leonard, R.O. Gauntt, R.Y. Lee, and M. Salay	2011
Assessment of Severe Accident Source Terms in Pressurized-Water Reactors with a 40% Mixed-Oxide and 60% Low-Enriched Uranium Core Using MELCOR 1.8.5	SAND2008-6665	Scott G. Ashbaugh, Kenneth C. Wagner, Pamela Longmire, Randall O. Gauntt, Andrew S. Goldmann, and Dana A. Powers	2010
Synthesis of VERCORS and Phebus Data in Severe Accident Codes and Applications	SAND2010-1633	Randall O. Gauntt	2010
MELCOR 1.8.5 Modeling Aspects of Fission Product Release, Transport and Deposition	SAND2010-1635	Randall O. Gauntt	2010
Analysis of Main Steam Isolation Valve Leakage in Design Basis Accidents Using MELCOR 1.8.6 and RADTRAD	SAND2008-6601	Randall O. Gauntt, Tracy Radel, Michael A. Salay, and Donald A. Kalinich	2008
A New Air Oxidation Model for Safety Analysis	SAND2007-0597P	K. C. Wagner, R. O. Gauntt, E. R. Lindgren, and S. Durbin	2007
Accident Source Terms for Boiling Water Reactors with High Burnup Cores Calculated Using MELCOR 1.8.5	SAND2007-7697	Mark T. Leonard, Randall O. Gauntt and Dana A. Powers	2007
NEW MODEL IMPROVEMENTS IN MELCOR 1.8.6 TO SIMULATE THE FORMATION AND BEHAVIOR OF MOLTEN POOLS IN SEVERE ACCIDENTS	The 11th International Topical Meeting on Nuclear Reactor Thermal-Hydraulics (NURETH-11) Popes' Palace	Larry L. Humphries, Randall O. Gauntt, Randall K. Cole, Jamie E. Cash	2005

	Conference Center, Avignon, France, October 2-6, 2005.		
AN UNCERTAINTY ANALYSIS FOR HYDROGEN GENERATION IN STATION BLACKOUT ACCIDENTS USING MELCOR 1.8.5	The 11th International Topical Meeting on Nuclear Reactor Thermal-Hydraulics (NURETH-11) Popes' Palace Conference Center, Avignon, France, October 2-6, 2005.	Randall O. Gauntt	2005
Severe accident analysis of a PWR station blackout with the MELCOR, MAAP4 and SCDAP/RELAP5 codes	Science Direct, Nuclear Engineering and Design	K. Vierow, Y. Liao, J. Johnson, M. Kenton, R. Gauntt	2004
MELCOR Computer Code Manuals, Vol. 3: Demonstration Problems, Version 1.8.5 May 2001	NUREG/CR-6119, Vol. 3, Rev. 0; SAND2001-0929P	R. O. Gauntt, R. K. Cole, C. M. Erickson, R. G. Gido, R. D. Gasser, S. B. Rodriguez, and M. F. Young, Scott Ashbaugh, Mark Leonard, and Adam Hill	2001
Recent MELCOR and VICTORIA Fission Product Research at the NRC	SAND99-0179C	N. E. Bixler, R K. Cole, M. F. Young, R. O. Gauntt, J.H. Schaperow	1999
MELCOR Computer Code Manuals, Primer and Users' Guides, Version 1.8.4 July 1997	NUREG/CR-6119, Vol 1, Rev. 1; SAND97-2398	R.O. Gauntt, R.K Cole, S.A. Hedge, S.B. Rodriguez, RL. Sanders, RC. Smith, D.S. Stuart, RM. Summers, M.F. Young	1997
MELCOR Computer Code Manuals, Reference Manuals, Version 1.8.4 July 1997	NUREG/CR-6119, Vol. 2, Rev. 1; SAND97-2398	R.O. Gauntt, R.K. Cole, S.A Hedge, S.B. Rodriguez, R.L. Sanders, RC. Smith, D.S. Stuart, RM. Summers, MF. Young	1997
NEW MODEL IMPROVEMENTS IN MELCOR 1.8.6 TO SIMULATE THE FORMATION AND BEHAVIOR OF MOLTEN POOLS IN SEVERE ACCIDENTS	NUREG/CR-6527; SAND97-1039	R. O. Gauntt, L. L. Humphries	1997
Thermal Radiation in Gas Core Nuclear Reactors for Space Propulsion	JOURNAL OF PROPULSION AND POWER, Vol. 10, No. 3, May-June 1994	Stephen A. Slutz, Randall O. Gauntt, and Gary A. Harms, Thomas Latham, Ward Roman, and Richard J. Rodgers	1994
IN-REACTOR TESTING OF THE CLOSED CYCLE GAS CORE REACTOR -THE NUCLEAR LIGHT BULB CONCEPT-	SAND92-1462C	Randall O. Gauntt, Stephen A. Slutz, and Gary A. Harms, Thomas S. Latham, Ward C. Roman, and Richard J.	1992

		Rodgers	
Thermal Radiative Transport in Gas Core Nuclear Reactors for Space Propulsion	SAND92-2193J	Stephen. A. Slutz, Randall. O. Gauntt, and Gary. A. Harms, Thomas Latham, Ward Roman, and Richard J. Rodgers	1992
THE DEBRIS MODULE: AN EFFECTIVE TOOL FOR THE ANALYSIS OF MELT PROGRESSION IN LWRs	SAND90-2712C	R.D. Gasser, S.S. Dosanjh, R.O. Gauntt	1990
RESULTSOF THE DF-4BWR CONTROLBLADE-CHANNELBOXTEST	SAND90-2716C	R. O. Gauntt and R.D. Gasser	1990
MELPPROG Debris Meltdown Model and Validation Experiments	SAND88-0263C	S.S. Dosanjh and R.O. Gauntt	1988
MELPROG Analysis of the Debris Formation Experiment DF-1	SAND87-2330C	T.J. Heames and R.O. Gauntt	1987
CONTRIBUTIONS FROM THE ACRR IN-PILE EXPERIMENTS TO THE UNDERSTANDING OF KEY PHENOMENA INFLUENCING UNPROTECTED LOSS OF FLOW ACCIDENT SIMULATIONS IN LMFBRs	Nuclear Engineering and Design 100 (1987) 387-408, North Holland, Amsterdam	P. ROYL, W. BREITUNG, E.A. FISCHER, G. SCHUMACHER, R.O. GAUNTT and S.A. WRIGHT	1986
Damaged Fuel Experiment DF-1, Results and Analyses	NUREG/CR-4668; SAND86-1030	R.D. Gasser, C.P. Fryer, R.O. Gauntt, A.C. Marshall, K.O. Reil, K.T. Stalker	1986
The DF-4 Fuel Damage Experiment in ACRR with a BWR Control Blade and Channel Box	NUREG/CR-4671; SAND86-1443	R.O. Gauntt, R.D. Gasser, L.J. Ott	1986