February 24, 2009

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
SOUTHERN NUCLEAR OPERATING CO.	)	Docket No. 52-011-ESP
	)	
(Early Site Permit for Vogtle ESP Site)	)	

NRC STAFF MOTION TO SUBSTITUTE EXPERT WITNESS

As stated in the NRC Staff ("Staff") letter dated February 19, 2009, due to a family medical situation, one of the Staff's witnesses, Ms. Jill S. Caverly, will be unable to attend the upcoming contested hearing in Augusta, Georgia, during the week of March 16, 2009. Ms. Caverly's testimony on technical matters is jointly sponsored by Mr. Lance W. Vail, who will be available at the contested hearing to sponsor that testimony. However, the Staff has also identified another expert witness who is available to serve as a witness in Ms. Caverly's stead and who has previous personal experience reviewing the Vogtle early site permit application.

Dr. Christopher B. Cook was a technical reviewer on the Vogtle ESP application and helped to develop portions of the Draft Environmental Impact Statement relating to hydrology. He provided an affidavit earlier in this proceeding in connection with the Staff's Answer to the Applicant's Motion for Summary Disposition on Environmental Contention 1.2. Dr. Cook has reviewed the prefiled direct and prefiled rebuttal testimony previously proffered by Ms. Caverly, and he has agreed to adopt Ms. Caverly's testimony on technical matters as his own. An affidavit from Dr. Cook to this effect is attached, as is a statement of Dr. Cook's professional qualifications. Consequently, the Staff hereby moves the Board to permit the substitution of Dr. Cook for Ms. Caverly as an expert witness for the contested hearing and to permit him to

sponsor the prefiled direct and rebuttal testimony previously proffered by Ms. Caverly on all technical matters.

If the Board grants this motion, the Staff will refile its prefiled direct and rebuttal testimony within one business day of the Board's ruling to reflect the substitution of Dr. Cook for Ms. Caverly. Other than revising those responses specific to Ms. Caverly's biographical information and role in the Staff review to accurately reflect Dr. Cook's participation, and making one correction identified by Dr. Cook, this substitution will not involve changes to the substance of the Staff testimony.[1] The Staff has contacted both the Applicant and Joint Intervenors regarding this motion and neither party objects to the witness substitution. Joint Intervenors indicate that they reserve the right to object to any changes to the Staff testimony not directly related to the substitution of the witness, if the Board allows Staff testimony to be refiled.

Respectfully submitted,

/signed (electronically) by/
Patrick A. Moulding
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Dated at Rockville, Maryland
this 24th day of February, 2009

[1] As identified by Dr. Cook, a portion of one sentence in Answer 37 of the Staff's EC 1.2 direct testimony appears to have been inadvertently omitted and will be corrected. The Staff would also take this opportunity to revise its exhibit numbering in the Staff's prefiled direct testimony per the format requested by the Board.

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CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF MOTION TO SUBSTITUTE EXPERT WITNESS," with attachments, have been served upon the following persons by Electronic Information Exchange this 24th day of February, 2009:

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AFFIDAVIT OF CHRISTOPHER B. COOK CONCERNING NRC STAFF DIRECT TESTIMONY ON ENVIRONMENTAL CONTENTIONS EC 1.2, EC 1.3, AND EC 6.0 AND REBUTTAL TESTIMONY ON ENVIRONMENTAL CONTENTION 1.2

I, Christopher B. Cook, attest that I am prepared to serve as an expert witness on behalf of the NRC Staff ("Staff") in this contested proceeding. I previously worked as a technical reviewer on the Staff's review of the Vogtle early site permit application at issue in this proceeding, and in that capacity I was responsible for preparing portions of the Draft Environmental Impact Statement relating to hydrology. A statement of my professional qualifications is attached to this affidavit. I previously provided an affidavit in this proceeding in connection with the Staff's Answer to the Applicant's Motion for Summary Disposition on Environmental Contention 1.2.

I have reviewed and, with one correction, am prepared to adopt as my own all portions of testimony on technical matters sponsored by Jill S. Caverly in "*NRC Staff Testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.2*" (as re-filed Feb. 2, 2009), in "*NRC Staff Testimony of Dr. Michael T. Masnik, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.3*" (as re-filed Feb. 2, 2009), in *NRC Staff Testimony of Mark D. Notich, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC*

6.0 (as re-filed Feb. 2, 2009), and in *"NRC Staff Rebuttal Testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.2"* (Feb. 6, 2009) (including to the extent it modifies the testimony of Ms. Caverly in the Staff's prefiled direct testimony on EC 1.2). The correction I have identified pertains to a portion of one sentence in Answer 37 of the Staff's EC 1.2 direct testimony that appears to have been inadvertently omitted.

I declare under penalty of perjury that the statements above, as well as those in my attached statement of professional qualifications, are true and correct to the best of my knowledge, information, and belief.

Executed in Accord with
10 C.F.R. § 2.304(d)

_____
Christopher B. Cook

Executed at Rockville, Maryland
This 24th day of February, 2009

Christopher Bruce Cook
STATEMENT OF PROFESSIONAL QUALIFICATIONS

Current Position

Senior Hydrologist
Hydrologic Engineering Branch
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission

Education

Ph.D., Civil and Environmental Engineering, University of California at Davis, 2000
M.S., Civil and Environmental Engineering, University of California at Davis, 1993
B.S., Civil Engineering, Colorado State University, 1991

Professional Experience

Dr. Cook joined the U.S. Nuclear Regulatory Commission in 2007. Prior to joining the NRC, he was employed as a Senior Research Engineer at the Pacific Northwest National Laboratory (PNNL) for over seven years. Dr. Cook's professional experience covers a diverse set of hydrology-related areas including basic and applied research and regulatory compliance assessments. Past research areas have focused on the use of multi-dimensional hydrodynamic and water-quality modeling of surface water systems, including simulation of complex density-driven flows in stratified environments, and field instrumentation relevant to environmental fluid mechanics.

NRC Experience

Hydrologic Reviews for New Plant Applications. Dr. Cook's duties include support of NRC reviews associated with early site permits and combined license applications. Dr. Cook is currently the lead hydrologist for the Bell Bend, Bellefonte, Grand Gulf, and North Anna combined license applications. Responsibilities associated with these reviews include preparation of hydrology-related sections of the Safety Evaluation Report (SER) and Environmental Impact Statement (EIS). Safety-related assessments include a broad range of surface water and groundwater site hazard assessments. Responsibilities on the EIS reviews include assessment of water-use and water-quality impacts to the environment from construction and operation of the proposed nuclear reactor, as well as evaluation of alternatives to the proposed action.

IAEA Safety Standard Development. Dr. Cook is currently assisting with the development of hydrology-related sections of the new International Atomic Energy Agency (IAEA) Safety Guide DS417, "Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations." This new guide will both update and combine Safety Guide NS-G-3.5 "Flood Hazard for Nuclear Power Plants on Coastal and River Sites" and Safety Guide NS-G-3.4 "Meteorological Events in Site Evaluation for Nuclear Power Plants."

Private Sector Experience

Hydrologic Site Safety Reviews for Early Site Permits. PNNL Task Manager. Dr. Cook prepared surface water hydrology (Section 2.4) sections of the Safety Evaluation Reports (SERs) associated with the North Anna (NUREG-1835), Clinton (NUREG-1844), and Grand Gulf (NUREG-1840) early site permit applications. Assessments included a broad range of site hazards, including flooding from extreme storm events and cascade-failure of upstream dams.

Hydrology-Related Environmental Reviews for Early Site Permits. PNNL Task Manager. Dr. Cook provided assessments for the hydrology-related sections of the Environmental Impact Statements associated with the North Anna (NUREG-1811), Clinton (NUREG-1815), Grand Gulf (NUREG-1817), and Vogtle (NUREG-1872; draft) early site permit applications. Assessments include a broad range of water-use and water-quality impacts to the environment from both construction and operation of the proposed nuclear reactors.

Field Assessment and Simulation of Temperature Fluctuations in the Lower Snake River. PNNL Principal Investigator and Project Manager. Dr. Cook lead a multi-year project to monitor and model temperature fluctuations in the lower Snake River (contract totaling over $1 million per year). He applied three-dimensional numerical models to simulate transient density currents at the confluence of the Clearwater and Snake rivers, and a two-dimensional laterally-averaged model to simulate temperature variations throughout the 140 river mile reach downstream to the confluence of the Snake and Columbia rivers. *In situ* measurements in the confluence region focused on density gradients and their impacts on juvenile Chinook salmon migration, and included the use of a wide range of field instrumentation.

Analysis and Simulation of 3-D Free-Surface Hydrodynamics near Hydroelectric Dams. PNNL Principal Investigator and Project Manager. Dr. Cook participated in and managed several free-surface computational fluid dynamics (CFD) modeling projects to compute water velocities, turbulence intensities, and pressure variations (including hydraulic loads) to assist with designing various hydraulic structures at several hydroelectric dams. Typical examples are an analysis of the spillway and tailrace conditions at The Dalles Dam (Columbia River) and simulation of entrance conditions at the Bonneville Second Powerhouse Ice and Trash Sluiceway (Columbia River).

Three-Dimensional Hydrodynamic and Water Quality Simulation of a Terminal Basin Lake. UC Davis Post-Graduate Research Engineer. While at the University of California at Davis, Dr. Cook modified and applied the multi-dimensional finite element model RMA10 to the Salton Sea, California. To calibrate and verify the model, a team lead by Dr. Cook implemented a year-long field data monitoring program to obtain *in situ* water current (ADCP) and quality (e.g. temperature, salinity, pH, and dissolved oxygen) information. Applications of the computational model focused on management alternatives to restore the Salton Sea's degrading saline environment.

Selected Publications and Technical Reports

Cook, C. B., M. C. Richmond, and J. A. Serkowski. (2007). "Observations of Velocity Conditions near a Hydroelectric Turbine Draft Tube Exit using ADCP Measurements." *Journal of Flow Measurement and Instrumentation*, 18(3):148-155.

Cook, C. B., G. A. McMichael, J. A. Vucelick, B. Dibrani, E. E. Hockersmith, C. A. Duberstein, I. D. Welch, B. J. Bellgraph, C. A. McKinstry, P. S. Titzler, D. A. Ogden, B. P. Sandford, R. K. Kirkham, and M. D. Bleich. (2007). "Lower Monumental Reservoir Juvenile Fall Chinook Salmon Behavior Studies." *Battelle–Pacific Northwest Division*, PNWD-3800, Richland, Washington, July.

Cook, C. B., B. Dibrani, J. A. Serkowski, M. C. Richmond, P. S. Titzler, and G. W. Dennis. (2006). "Acoustic Doppler Current Profiler Measurements in the Tailrace at John Day Dam." *Pacific Northwest National Laboratory*, PNNL-15627, Richland, Washington, January.

Cook, C. B., B. Dibrani, M. C. Richmond, M. D. Bleich, S. P. Titzler, and T. Fu. (2006). "Hydraulic Characteristics of the Lower Snake River during Periods of Juvenile Fall Chinook Salmon Migration." *Pacific Northwest National Laboratory*, PNNL-15532, Richland, Washington, January.

Johnson, G. E., M. E. Hanks, F. Khan, C. B. Cook, J. Hedgepeth, R. P. Mueller, C. L. Rakowski, M. C. Richmond, S. L. Sargeant, J. A. Serkowski, and J. R. Skalski. (2005). "Hydroacoustic Evaluation of Juvenile Salmonid Passage at The Dalles Dam in 2004." *Pacific Northwest National Laboratory*, PNNL-15180, Richland, Washington.

Johnson, R. L., M. A. Simmons, C. A. McKinstry, C. S. Simmons, C. B. Cook, R. S. Brown, D. K. Tano, S. L. Thorsten, R. LeCaire, and S. Francis. (2005). "Strobe Light Deterrent Efficacy Test and Fish Behavior Determination at Grand Coulee Dam Third Powerplant Forebay." *Pacific Northwest National Laboratory*, PNNL-15007, Richland, Washington, February.

Cook, C. B., L. W. Vail, and D. L. Ward. (2005). "Report on the North Anna Early Site Permit Water Budget Model (LakeWBT) for Lake Anna." *Pacific Northwest National Laboratory*, PNNL-14944, Richland, Washington, January.

Cook, C. B. and M. C. Richmond. (2004). "Simulating the Flow Field Upstream of the Dworshak Dam Regulating Outlets." *Pacific Northwest National Laboratory*, PNNL-14591, Richland, Washington, March.

Cook, C. B. and M. C. Richmond. (2004). "Monitoring and Simulating 3-D Density Currents at the Confluence of the Snake and Clearwater Rivers", in *Critical Transitions in Water and Environmental Resources Management*, eds. G. Sehike, D. Hayes and D. Stevens, American Society of Civil Engineering Press, 2004.

Cook, C. B., C. L. Rakowski, M. C. Richmond, S. P. Titzler, A. M. Coleman, and M. D. Bleich. (2003). "Numerically Simulating the Hydrodynamic and Water Quality Environment for Migrating Salmon in the Lower Snake River." *Pacific Northwest National Laboratory*, PNNL-14297, Richland, Washington.

Cook, C. B., G. T. Orlob, and D. W. Huston. (2002). "Simulation of Wind-Driven Circulation in the Salton Sea: Implications for Indigenous Ecosystems." *Hydrobiologia*, 473: 59-75.

Cook, C. B., and M. C. Richmond. (2001). "Simulation of Tailrace Hydrodynamics using Computational Fluid Dynamics (CFD) Models." *Pacific Northwest National Laboratory*, PNNL-13467**,** Richland, Washington.

Cook, C.B. (2000). "Internal Dynamics of a Terminal Basin Lake: A Numerical Model for Management of the Salton Sea." Ph.D. dissertation, Department of Civil and Environmental Engineering, University of California, Davis.

Cook, C.B. (1993). "A One-Dimensional Model to Simulate Water Infiltration and Redistribution in Soils." M.S. thesis, Department of Civil and Environmental Engineering, University of California, Davis.

Abt, S. R., C. B. Cook, K. Staker, and D. Johns. (1991). "Small Parshall Flume Rating Corrections." *Journal of Hydraulic Engineering,* American Society of Civil Engineering, 118(5): 798-802.

Selected Conference Proceedings

Cook, C. B., G. A. McMichael, J. A. Vucelick, and B. Dibrani (2007). "Interactions between underflow conditions in a reservoir and emigration of juvenile fall Chinook salmon", *American Fisheries Society Annual Meeting*, San Francisco, September.

Prasad, R., L. W. Vail, C. B. Cook, and G. Bagchi. (2005). "Establishment of Safety-Related Site Characteristics Based on Consideration of External Sources of Flooding at Nuclear Power Plant Sites in the United States of America." In *Proceedings of International Workshop on External Flooding Hazards at Nuclear Power Plant Sites*, Kalpakkam, India, August.

Cook, C. B., M. C. Richmond, J. A. Serkowski, and L. L. Ebner. (2002). "Free-Surface Computational Fluid Dynamics Modeling of a Spillway and Tailrace: Case Study of The Dalles Project." *Hydrovision 2002*, Portland, Oregon, July.

Cook, C. B., D. W. Huston, M. R. Jensen, G. T. Orlob, and S. G. Schladow. (1998). "Internal Dynamics of a Large Saline Lake: Field Investigation and Monitoring of the Salton Sea, California." *1998 Ocean Sciences Meeting*, AGU and ASLO, San Diego, February.

Professional Affiliations

American Society of Civil Engineers
American Geophysical Union