


United States Nuclear Regulatory Commission Official Hearing Exhibit	
In the Matter of:	DOMINION VIRGINIA POWER (North Anna Power Station, Unit 3) Commission Mandatory Hearing
	Docket #: 05200017
	Exhibit #: DVP-012-MA-CM01
	Admitted: 03/23/2017
	Rejected:
	Other:
	Identified: 03/23/2017 Withdrawn: Stricken:

Exhibit DVP-012

Curriculum Vitae

Luben I. Todorovski, Ph.D. P.E.

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Summary of Engineering Expertise

Expertise in analysis and design of power plant facilities with focus on analysis, design, and licensing of commercial nuclear power plants and government nuclear facilities. Diverse technical expertise in structural dynamics, soil dynamics, soil-structure interaction (SSI) and vibration analysis, finite element (FE) modeling and analysis, rigid body stability analysis, and geo-centrifuge modeling. Experience related to nuclear industry includes:

- Technical consulting, preparation of technical reports and licensing documents, technical presentations in front of regulatory agencies and panels of technical experts as support for licensing applications for new nuclear power plants and other nuclear facilities.
- SSI, site response, structural, seismic stability analysis and evaluation of reinforced concrete and steel structures.
- Stress and seismic evaluations of pressure vessels, tanks and mechanical equipment.

Additional engineering experience includes vibration analysis of machine and turbo-generator foundations, structural and seismic evaluation of steam stacks, SSI analysis and structural evaluation of subway stations.

Education

- *Ph.D. in Civil Engineering*, Texas A&M University, College Station, Texas, Major: *Geotechnical Eng.* (98).
- *M.Sc. in Mechanical Eng.*, St. Cyril and Methodius University, Skopje, Macedonia, Mechanical Eng. Dept., Major: *Strength of Materials and Vibration Problems in Mechanical Eng.* (92).
- *Graduate Civil Engineer (B.Sc.)*, St. Cyril and Methodius University, Skopje, Macedonia, Civil Eng. Dept., Major: *Structural Eng.* (88).

Professional Registration: Professional Engineer California License # C73168

Professional Experience

Principal Engineer/Technologist (10/13 – Present)

GE Hitachi, Wilmington, NC.

ESBWR North Anna COLA - Technical lead responsible for seismic analysis, design, and related licensing support. Responsible for site-dependent SASSI SSI analyses and seismic evaluations of site-specific Category I structures, preparation of technical reports, RAI responses and COLA. Chief coordinator in discussing technical issues with clients, technical advisory groups and presentations to NRC.

UK ABWR General Design Assessment (GDA) - Seismic Specialty Team (SST) Member consulting on the U.S. regulations, standards and the best relevant practice relevant to general seismic analyses and design. Responsible for providing advice and support for resolving emerging technical issues, technical discussions with the UK Office for Nuclear Regulation (ONR), preparation and review of technical reports and responses to ONR technical queries related to seismic analyses and design of UK ABWR plant.

UK ABWR Wylfa Newydd Site-Specific Seismic Analysis and Design - Seismic Specialty Team (SST) Member consulting on the U.S. regulations, standards and the best relevant practice relevant to site-specific seismic analyses and design. Responsible for providing advice and support for preparation of seismic design criteria and resolving emerging technical issues.

Consulting Engineer (07/07 – 10/13)

URS, Princeton, NJ.

MHI US-APWR Comanche Peak and North Anna - Technical lead responsible for seismic analysis, design, and related licensing support. Lead on site-dependent SASSI SSI analyses, seismic evaluations and design of site-specific Category I structures, preparation of technical reports, RAI responses and COLAs Chapters 2 and 3. Chief coordinator in discussing technical issues with clients, technical advisory groups and presentations to NRC.

MHI US-APWR Standard Plant– Overall technical lead responsible for seismic analysis, design, and related licensing support. Lead on site-independent SSI analyses and seismic evaluations of Category I and II structures, preparation of technical reports, RAI responses and DCD Chapter 3. Chief coordinator in discussing technical issues with clients, technical advisory groups, and presentations to NRC.

Yucca Mountain Transition Project - Lead technical support on seismic analysis, design and licensing based on review and evaluation of calculations and technical documentation.

General Atomic, Next Generation Nuclear Power Plant and Hydrogen Production Facility - Technical consulting and development of standard seismic design basis including development of certified seismic design response spectra (CSDRS) and generic soil profiles.

KEPCO E&C, APR1400 US Design Control Document (DCD), Technical consulting on seismic, geotechnical and structural engineering aspects of the standard design application.

General Electric Hitachi. ESBWR DCD, Technical consulting on seismic stability evaluation analysis.

Senior Geotechnical Engineer (10/02 – 07/07)

Bechtel National, San Francisco, CA.

Hanford Vitrification Plant (WTP), Lead engineer responsible for development of finite element models and SASSI SSI analyses of nuclear waste processing and handling facilities. Performed evaluation studies on Equipment-Structure Interaction (ESI), effects of finite element mesh refinement, and reinforced concrete cracking on redistribution of design loads on shear walls. Development of soil springs for foundation design. Development of ANSYS FE models for seismic and ASME stress analyses and evaluation of pressure vessels and breakpots.

Yucca Mountain projects (YMP), SASSI SSI analyses of nuclear waste processing and handling facilities. QA validation of SASSI2000 and SAP2000 computer programs. Racking analysis of tunnels at the Nevada Test Site.

North Anna Dominion, Southern-Nuclear and Constellation ESP and COLA, Site response analyses to develop site amplification functions for development of site specific seismic design ground motion spectra.

Bay Area Rapid Transit (BART) Seismic Retrofit Project, SASSI SSI analysis, structural evaluation of underground stations, and evaluation of dynamic soil properties of cross bay tube.

Silicon Valley Rapid Transit (SVRT) Project, SSI analysis of excavation support structures.

Principal Structural Engineer (06/01 – 09/02)

Stone & Webster, Cherry Hill, NJ.

Lungman Nuclear Power Plant (Taiwan), Seismic analysis of Turbine Building steel structure and development of crane ISRS.

Entergy Nuclear Indian Point Unit 1, Structural evaluation of steel and reinforced concrete structures to support a feasibility study for dry storage of spent nuclear fuel in Fuel Building.

Coastal industrial Facility, Design and structural evaluation of cable tray supports and pipe galleries.

Senior Civil/Structural Analyst (01/99 – 06/01)

Holtec International, Marlton, NJ.

Susquehanna, Fermi, Kewaunee, Comanche Peak, Brown Ferry, and Nine Mile Point Wet Spent Fuel Storage Capacity Expansion Projects, evaluations of spent fuel pool reinforced concrete structures for increased re-racking loading. Structural stress evaluation of mechanical equipment used for spent fuel wet storage.

Columbia, Hatch, Diablo Canyon, and Fitzpatrick Dry Spent Fuel Storage Projects, Seismic

stability analysis and structural evaluation of civil engineering structures, spent fuel casks, transporters, and mechanical equipment. Structural analyses and design of outdoor Cask Transfer Facilities (CTF) including technical assistance during rock anchor installation, soil field testing, and construction.

Research Assistant (08/95 – 12/98)

Texas A&M University, College Station, TX.

Research on seismic behavior of gravity retaining wall structures (NSF sponsored research project). Study on uncertainties incorporated in mathematical models for earthquake resistant design of earth retaining structures. Development of a software package for processing, evaluation and analysis of centrifuge experiment data. Development of a statistical methodology to investigate the reliability of experimental data using measurement error analysis.

Research Assistant (09/93 – 08/95)

Tulane University, New Orleans, LA.

Development of a soil-rigid structure system for centrifuge testing (NSF sponsored research project) including the design of a new transducer for measurement of soil-structure interaction forces. Development of a multi-sensor probe for measurement of pore pressure in marine sediments for U.S. Navy.

Scientific Publications

Conference Papers

- Todorovski, L., Silva, W., Ghiocel, D., Lanham, K., “Generic Input For Standard Seismic Design of Nuclear Power Plants” to be presented at SMiRT 22, San Francisco, California, 2013.
- Todorovski, L., Khoncarly, M., Ghiocel, D., Donohoe, M., “Simplified Modeling of Effects of Concrete Cracking on Out-of-Plane Vibrations of Floors” to be presented at SMiRT 22, San Francisco, California, 2013.
- Ghiocel, D., Todorovski, L., “Fast Nonlinear Seismic Soil-Structure Interaction (SSI) Analysis of Nuclear Shear Wall Concrete Structures Subjected to Review Level Earthquake” to be presented at SMiRT 22, San Francisco, California, 2013.
- Lanham K., Khoncarly M., Todorovski L., “Alternative Method for Converting Seismic Response Spectra to Target Power Spectral Density” to be presented at SMiRT 22, San Francisco, California, 2013.
- Ghiocel, D.M, Todorovski, L., Fuyama, H. Mitsuzawa, D. “Seismic Incoherent Soil-Structure Analysis Of Reactor Building Complex On A Rock Site” presented at SMiRT 21, New Delhi, India (2011).
- Ghiocel, D.M, Todorovski, L., Fuyama, H. Mitsuzawa, D. “Seismic SSI Response of Reactor

Building Structures”, presented in OECD NEA SSI Workshop, Ottawa, Canada (2010)

- Todorovski L., Andersen, G.R., and Likos, W., “A new Approach to the Physical Modeling of Dynamic Soil-Structure Interaction,” presented at the 13th ASCE Engineering Mechanics Division Conference, Baltimore (1999).
- Kapsarov, H., and Todorovski L., “Boundary State Condition of Ring-like Reinforced Concrete Cross Sections,” presented at the 5th Conference of the Macedonian Construction Industry, Ohrid, (1993).

Journal Papers

- Andersen, G.R., Todorovski, L., Likos, W., and Whitman, R.V., “A Centrifuge-Modeled Rigid Structure to Investigate Dynamic Soil-Structure Interaction,” *Geotechnical Testing Journal*, ASTM, Vol. 20, No. 2, pp. 139-148 (1997).
- Andersen, G.R., Bennett, R.H., Barber, M.E., Todorovski, L., and Maynard, G.L.. “A Multi-Sensor Piezometer for Shallow Marine Sediments in Coastal Environments,” *Geotechnical Testing Journal*, ASTM, Vol. 19, No. 4, pp. 373-383 (1996).
(Received the Hogentogler award from the ASTM Committee D-18 on Soil and Rock, 1998).