Dr. Dan M. Ghiocel

President & Chief of Engineering
Ghiocel Predictive Technologies, Inc.
Adjunct Professor with Case Western Reserve University

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BRIEF PROFESSIONAL PROFILE

Dr. Ghiocel is currently the President and Chief of Engineering with Ghiocel Predictive Technologies, Inc. with main office in Rochester NY. Ghiocel Predictive Technologies, Inc. (http://www.ghiocel-tech.com) is a small business corporation specialized in computational modeling and prediction for high-complexity of engineering problems. Before starting Ghiocel Predictive Technologies, Inc., Dr. Ghiocel had the position of Vice President of Advanced Engineering Applications at STI Technologies, Inc., Rochester, NY (http://www.sti-tech.com). Dr. Ghiocel has more than 25 years of extensive research lab, university research and consulting engineering experience in advanced computational structural/mechanical analysis for systems and components, structural dynamics, seismic soil-structure interaction (SSI), damage mechanics, probabilistic risk assessment and component life prediction. Dr. Ghiocel has accumulated a large experience on practical implementation and use of advanced engineering computational approaches by performing probabilistic risk assessment reviews for large, complex systems such as nuclear facilities, aircraft structure and jet engine systems. Dr. Ghiocel immigrated in United States from Romania in 1991. He is a US Citizen since 2001.

Nuclear Industry Consultant Experience

Over years, Dr. Ghiocel has performed many projects for nuclear facilities for power and defense industries. He has offered consulting services for structural analysis and design of reinforced concrete, steel and masonry structures, fragility (risk) analyses and risk assessment for nuclear power plant (NPP) structures, stochastic modeling of loads and material behavior, nonlinear finite element analyses, design optimization, dynamic soil-structure interaction. He started to work for nuclear industry since 1982, in Romania. In 1982, he was the technical lead engineer for an important nuclear project DCD study that investigated the seismic SSI behavior the CANDU 700 Mw NPP for soft soil conditions. He was involved in CANDU related projects until 1990. In 1986, he was appointed the Nuclear Division Manager of the Romanian Construction Industry Central Laboratory with focus on the QA aspects for the NPP Cernavoda Unit 1-5.

After he completed his Ph.D degree in Structural Engineering in 1993 in USA, he joined Stevenson & Associates, Inc. where he worked until 1997. Since 1995, as a close collaborator of Dr. John D. Stevenson, Consulting Engineer, he started to be involved in a number of independent reviews for the Defense Nuclear Facility Safety Board (DNFSB) for seismic SSI analyses of various nuclear defense facilities. During 1996-1997 he was the Principal Investigator of a NSF-funded research project on probabilistic seismic SSI and blast effects for underground hazardous facilities. Over years, he has developed several specialized engineering computer codes for nuclear industry, including the ACS SASSI code that advances significantly the engineering capabilities for performing accurate 3D, nonlinear, incoherent seismic SSI analysis of nuclear facility structures. The ACS SASSI code includes a suite of unique seismic SSI capabilities for the seismic design of the new advanced nuclear reactor facilities. The ACS SASSI code incoherent SSI approach was validated by EPRI (TR# 1013504 Dec 2006 and TR#1015111 Nov 2007) and it currently applied by Westinghouse to the AP1000 seismic design. Dr. Ghiocel is also a contributor to the development of the Bechtel SASSI code, and in early 1990s, he has been the developer of the S&A Super SASSI code.

Over years, Dr. Ghiocel has provided engineering services on seismic SSI analysis, specialized SSI software, or consulting support to many large nuclear corporations including Westinghouse Electric Company - Toshiba Co., Washington Group International, ARES Corporation, Bechtel Engineering, SGH, Sargent &

Lundy, AECL Canada, KOPEC Korea, BINE China, PBMR Ltd. South Africa, Electro-Nuclear Brasil, etc. and also to industry, government and international organizations, including EPRI, NSF, DNFSB, USNRC and IAEA. His past nuclear experience projects included consulting work on structural analysis, seismic SSI analysis, structural design and probabilistic risk assessment for NPP structures, piping systems and equipment. He performed: Probabilistic risk assessment performed for Fort Calhoun NPP Reactor Building; Seismic reevaluation and probabilistic risk assessment for the major site buildings, i.e., Reactor Building, Auxiliary Building, Intake structure and Diesel Generator Building, of Calvert Cliffs NPP; Probabilistic risk assessment studies for different structures of the V. C. Summer NPP, Beaver Valley NPP, Arkansas NPP, including also large diameter flat bottom steel tanks; Independent reviews and reevaluation of the seismic analysis and design of the Fuel Storage Area Rack Reconfiguration and the Canyon Building at the Savannah River facility; Review of seismic soil-structure interaction evaluation including the embedment effects for Pantex, Rocky Flats and Hanford nuclear facilities; Seismic soil-structure interaction evaluations of the Dodewaard Reactor Building founded on piles; Seismic PRA for Dodewaard NPP, including soil liquefaction effects; Determination of fragility curves for the fuel pool, drywell cavity, major equipment for Dodewaard Reactor Building; Evaluation of a fuel shipping cask behavior under an internal hydrogen deflagration; Soil-structure interaction evaluation for buried radioactive waste storage tanks; Structural evaluation and redesign of the Perry NPP Reactor Building internal platform, including the shield doors subjected to severe accident dynamic loads (safety relieve valve, LOCA, pool pressure, etc.) and earthquake motions, and many others.

Aerospace and Automotive Industry Researcher Experience

Over the last decade, he has been Principal Investigator of several large DOD multiyear research projects for new technology developments for the US OSD, US AFRL WPAFB, US Army TARDEC and US Navy NAVAIR for new technology developments in the areas on stochastic modeling for aircraft engines and vehicle system and components, including advanced finite element analysis, stochastic design optimization, component life prediction, low- and high-cycle fatigue modeling for vehicles, fans, risk-based cost-maintenance analysis for aircraft and vehicle systems, reliability of aircraft structural joints under corrosion-fatigue damage and aircraft fault diagnostics and prognostics and structural health management.

For the last ten years, between 1998 and 2008, he played a key technical role in the development of the large, multiyear USAF PRDA project entitled “HCF Blade Probabilistic Design” in which he had the responsibility of Technical Integrator of the industry efforts including as subcontractors GE Aviation and Pratt & Whitney. On these research projects he has been a close collaborator of GE Aviation, United Technologies – Pratt & Whitney, Allison/Rolls-Royce, AFRL Propulsion and Air Vehicle Directorates, NASA Glenn, Boeing – Phantom Works and Lockheed Martin Co.

In the above mentioned DOD new technology research projects, he has applied state-of-the-art and innovative non-deterministic techniques including advanced high-performance reliability approaches, reliability-based optimization algorithms, high-order stochastic field models, stochastic and fuzzy networks, hierarchical stochastic approximation models, combined with advanced stochastic simulation techniques, including Markov Chain Monte Carlo, and hybrid stochastic-neuro-fuzzy system inference for stochastic response approximation, data mining, information fusion and mechanical system health prognostics. During the DOD research projects, Dr. Ghiocel has developed various research collaboration with different top US universities, such as Carnegie Mellon, Cornell University, University of California at Berkeley, Case Western Reserve University, Virginia Tech, Vanderbilt University, University of Colorado at Boulder, John Hopkins University, Princeton University, Toledo University, University of Iowa, University of Wisconsin and Rochester Institute of Technology.

University Researcher Experience

As a basic technical background, Dr. Ghiocel received a Ph.D. in Structural Engineering from Case Western Reserve University, Cleveland, Ohio, in 1993, with a dissertation on Nonlinear Stochastic Dynamics and Structural Reliability with application to Nonlinear Systems subjected to Multiple Random Excitations, and two equivalent M.Sc graduate degrees in *Structural Engineering* (Engineering Diploma) from the Civil

Engineering Technical University of Bucharest, Romania, in 1980, and in *Applied Mathematics* (Post Graduate Certificate) from University of Bucharest, Romania, in 1982. Between 1987-1991 he was an Assistant Professor with University of Bucharest., and, then, after 2001, he became an Adjunct Professor with Case Western Reserve University, Cleveland, Ohio. Over years, Dr. Ghiocel has been university professor and graduate course instructor in Structural Analysis, Structural Dynamics and Seismic Design, Structural Reliability, Strength of Materials and Foundation Engineering. He also advised or co-advised graduate research work and final theses of 8 M.Sc. and 4 Ph.D. students in structural dynamics, seismic SSI and structural reliability engineering in Civil Engineering Technical University of Bucharest, Case Western Reserve University, Virginia Tech, Vanderbilt University and University of Toledo.

Professional Society Activity and Recognition

Dr. Ghiocel has published more than 80 papers in various journals and conference proceedings on structural dynamics, seismic SSI, random vibration, probabilistic modeling and structural reliability issues. He is an active member of several prestigious national technical committees, as AIAA-NDA, SAE-RMSL, ASME-IGTI, ASCE-EMD and ASQ-PNC. He has been for a number of years Vice Chair of AIAA Non-Deterministic Task Group 1999-2003, Chair of SAE Uncertainty and Reliability Quantification Committee, 2001-2004, and more recently nominated Chair of Probabilistic Applications Committee of ASQ.

In 1999 Dr. Ghiocel received the prestigious SAE International "Distinguished Probabilistic Methods Service Award". Since 2001 Dr. Ghiocel has been appointed as Adjunct Professor with Case Western Reserve University, Cleveland, Ohio. Also, since 2001 Dr. Ghiocel has been appointed as Fellow of the North American Academy of Sciences and Arts. He is an Editor-In-Chief for the CRC Press "*Engineering Design Reliability Handbook*" published December 2004, and "*Engineering Design Reliability Applications for the Aerospace, Automotive and Ship Industries*" published in September 2007.

Dan Mircea Ghiocel

RESUME

STATUS:

US Citizen, Married with Two Children

AREAS OF SPECIALIZATION:

- Structural system analysis & design, including extensive experience in seismic SSI analysis of NPP
- Computational stochastic mechanics, stochastic finite element techniques for nonlinear systems
- Probabilistic risk assessment for components/systems, risk-based design evaluation, risk management
- Stochastic modeling of loads, effects and material behavior, stochastic failure analysis for structures
- Risk-based health management of systems, including stochastic and AI neuro-fuzzy techniques for pattern classification and recognition, fault diagnostics-prognostics, with application to jet engines
- Probabilistic damage mechanics and fracture mechanics, including stochastic fatigue and creep life prediction of mechanical/structural components under random loading and temperature conditions
- Life-cycle risk-based cost analysis of mechanical systems, including maintenance activities

ACADEMIC BACKGROUND:

2001-Present Case Western Reserve University, Cleveland, Ohio, USA – Civil Engineering Department
Adjunct Professor of Structural Engineering
Seminars, Joint Research, Scientific Advisor

1991-1993 Case Western Reserve University, Cleveland, Ohio, USA – Civil Engineering Department
Ph. D. in Structural Engineering
Dissertation on Stochastic Dynamics and Structural Reliability of Nonlinear Systems
Application: 700ft Span Cable Dome Subjected to Wind Storm Pressure Fluctuations

1981-1982 University of Bucharest, Romania – Department of Mathematics and Statistics
M. Sc. in Applied Mathematics (Postgraduate Certificate)
Thesis on Computer Simulation of Random Processes using Monte-Carlo Techniques
Application: Simulation of Seismic Random Wave Motion at Ground Surface

1975-1980 Civil Engineering Technical University of Bucharest, Romania
M. Sc. in Structural Civil Engineering (Engineering Diploma)
Thesis on Seismic and Wind Structural Analyses of the A CN Tower
Application: Structural Analysis and Design of The 435 Meters Height Concrete CN Tower

PROFESIONAL EXPERIENCE:

2003-Present **President and Chief of Engineering, Ghiocel Predictive Technologies, Rochester NY**

Co-founder (with Dr. John D. Stevenson, Consulting Engineer) and majority owner of Ghiocel Predictive Technologies, Inc. with offices in Rochester NY (main office) and Cleveland OH.

Providing engineering consulting services on seismic SSI analysis and specialized SSI software development and support for many large nuclear corporations, including Westinghouse Electric

Company, Toshiba Co., Washington Group International, Bechtel Engineering, Sargent and Lundy, SGH, EPRI, ARES Co., AECL Canada, KOPEC and KAERI South Korea, SNERDI, CNPE/BINE China, PBMR Ltd. South Africa, Electronuclear Brasil and others, government organizations, including DNFSB and US NRC, and international agencies, including IAEA Vienna.

Managing and leading various research and consulting engineering projects for different DOD agencies and nuclear, aerospace and automotive industries. Principal Investigator of several large DOD multiyear research projects for new technology developments for the OSD, AFRL WPAFB, US Army TARDEC and US Navy NAVAIR for new technology developments in the areas on stochastic modeling for aircraft engines and vehicle system and components, including advanced finite element analysis, stochastic design optimization, component life prediction, low- and high-cycle fatigue modeling for vehicles, fans, risk-based cost-maintenance analysis for aircraft and vehicle systems, reliability of aircraft structural joints under corrosion-fatigue damage and aircraft fault diagnostics and prognostics and structural health management.

Leading DOD projects on probabilistic engineering applications with application to reliability and reliability-based optimization of military vehicles using high-performance distributed computing resources, parallel stochastic finite element for large computational mechanics models including vehicle and aircraft systems, stochastic optimization of vehicle systems using parallel computing, development of probabilistic design systems for engine systems, reliability-based maintenance and life-cycle cost analysis for aircraft systems.

Collaborations with Cornell, University of California Berkeley, University of Iowa, University of Wisconsin, Michigan University and industry collaborations with GE Aviation, United Technologies – Pratt & Whitney, Boeing and Lockheed-Martin Co. etc.

2000-2003 **Vice President of Advanced Engineering, STI Technologies, Rochester NY**

Leading projects on probabilistic modeling for advanced engineering applications. Principal Investigator of five large multiyear research projects for the USAF/AFRL and US Navy/NAVAIR on stochastic modeling for aircraft engines and components, including advanced finite element analysis, component life prediction, high cycle fatigue modeling for fans, turbine risk-based cost-maintenance analysis, corrosion-fatigue for fuselage lap and but joints and engine fault diagnostics and health management. On these research projects he is also collaborating closely with GEAE, United Technologies - Pratt & Whitney, Allison/Rolls-Royce, AFRL/PRTC and VASM, NASA Glenn and Marshall RC, Boeing –Phantom Works and Lockheed Martin Co. In these projects he is applying state-of-the-art non-deterministic techniques and is developing innovative stochastic field and hybrid stochastic-neuro-fuzzy approaches for jet engine performance-based and vibration-based diagnostics and prognostics.

1997-2000 **Principal Engineer, STI Technologies, Rochester NY**

Consulting services and applied research on probabilistic modeling and risk assessment for complex systems, structures and mechanical components under random operational environments. Focus on power, nuclear and aircraft systems. Developed many innovative stochastic modeling techniques. Extensive work for algorithm development on stochastic load modeling, probabilistic fracture and fatigue algorithms, fragility analysis, non-linear random vibration analysis and stochastic stability, including mistuning and flutter for engine blades.

Leading as a Principal Investigator research projects for the DOD agencies, especially USAF, on probabilistic life prediction and risk-based condition assessment including the HCF/LCF/creep interactive life for aircraft structure and engine components.

Principal co-investigator or co-investigator of projects for implementation on a real-time probabilistic failure risk evaluation system for component risk-based condition assessment using health- monitoring data and numerical gas-path-analysis models for turbine engines, including probabilistic models for pattern recognition and fault diagnosis for engine performance and vibration.

1993 - 1997 **Senior Engineering Specialist, Stevenson & Associates, Cleveland OH**

Consulting services for structural analysis and design of reinforced concrete, steel and masonry structures, fragility (risk) analyses and risk assessment for nuclear power plant (NPP) structures, stochastic modeling of loads and material behavior, nonlinear finite element analyses, design optimization, dynamic soil-structure interaction. Since 1995, involved in reviews for Defense Nuclear Facility Safety Board (DNFSB) for risk assessment and seismic soil-structure interaction analyses for nuclear defense facilities.

Principal Investigator of a NSF SBIR research project on probabilistic seismic soil-structure interaction and blast effects on underground hazardous facilities. Project manager/engineer for several consulting projects on structural analysis, design and probabilistic risk assessment for NPP structures, piping systems and equipment. Probabilistic risk assessment performed for Fort Calhoun NPP Reactor Building. Seismic reevaluation and probabilistic risk assessment for the major site buildings, i.e., reactor biuldmg, auxiliary building, intake structure and diesel generator building, of the Calvert Cliffs NPP. Probabilistic risk assessment studies for different structures of the V. C. Summer NPP, Beaver Valley NPP, Arkansas NPP, including also large diameter flat bottom steel tanks.

Independent reviews and reevaluation of the seismic analysis and design of the Fuel Storage Area Rack Reconfiguration and Canyon Building of the Savannah River Site Nuclear fragility. Review of seismic soil-structure interaction evaluation including embedment effects for Pantex, Rocky Flats and Hanford fragilities. Seismic soil-structure interaction evaluations for Dodewaard NPP founded on piles. Seismic PRA for Dodewaard NPP, including soil liquefaction. Determination of fragility curves for the fuel pool, drywell cavity, major equipment for Dodewaard Reactor Building. Evaluation of a fuel shipping cask behavior under an internal hydrogen deflagration. Blast evaluation of a multistory building. Seismic/wind risk analysis of the Dodewaard NPP Stack Tower. Soil-structure interaction evaluation for buried radioactive waste storage tanks. Structural evaluation and redesign of the Perry NPP Reactor Building internal platform, including the shield doors subjected to severe accident dynamic loads (safety relieve valve, LOCA, pool pressure, etc.) and earthquake motions.

Software Developer for Stochastic Finite Element Analyses: Developed structural analysis and reliability evaluation computer codes in conjunction with ANSYS.

Development of the S&A Super SASSI code released in 1994 for performing seismic 3D soil-structure interaction analysis.

1991-1993 **Research Assistant, Civil Engineering Department, Case Western Reserve University (CWRU), Cleveland OH**

Research on nonlinear stochastic dynamics and structural reliability, projects on behavior of the 680ft wide Florida Suncoast Cable Dome using wind tunnel experiments (NASA Lewis RC) and computational finite element models. Advanced courses in structural dynamics, structural reliability, finite element techniques, structural design, stochastic processes in engineering and random vibrations.

1987-1991 **Assistant Professor in Structural Engineering (part-time between 1982-1987)**
Technical University of Bucharest - Civil Engineering Institute (CEI), Romania

Principal Investigator for research/design projects in probabilistic/deterministic dynamics, seismic SSI and system reliability applied to seismic/wind structural design. Analysis of multiple supported structures subjected to correlated random seismic excitations probabilistic safety assessments for Cemavoda NPP and Transylvania NPP structures and equipment. Risk analyses for the new design probability-based design codes for NPP, i.e., calibration of load combination coefficients.

Teaching Instructor on Structural Analysis, Structural Dynamics and Seismic Design, Structural Reliability, Strength of Materials and Foundation Engineering including seismic SSI effects. Consultant of the National Commission for Safety Analysis of Cernavoda NPP , Ministry of Industrial Constructions, for safety analyses for NPP Cernavoda Units 3 and 5 and for the Institute of Power Studies and Design, Nuclear Power Plant Division, for Seismic and Probabilistic Risk Analyses for NPP Structures, expertises for Cemavoda NPP Unit 1-5 and Transylvania NPP.

1986 -1987 **Program Manager, Nuclear Power Plant (NPP) Division**
Central Laboratory of Ministry of Industrial Constructions, Bucharest, Romania

Project Leader/Principal Investigator of several projects on seismic/wind analyses and reliability assessment for NPP structures, large cooling towers using ANSYS, and reliability-based load combination calibration for design code development. Seismic SSI effects for and a multilevel subway concrete station (North Railway Station) in Bucharest using complex frequency domain analysis. Evaluation of non-conformities by walkdown and development of design solutions to solve them for Cernavoda NPP Unit 1-5.

1981-1986 **Structural Research/Design Engineer (PE since 1983)**
Central Laboratory of Ministry of Industrial Constructions, Bucharest, Romania

Principal Investigator of seismic SSI effects on NPP structures under extreme loads, reliability analyses for calibration of load combination coefficients for the new NPP design code for steel and concrete structures in Romania, structural design of different types of concrete, steel and masonry structures. Understand/use SIMQKE, LUSH, FLUSH, PLAXLY, PFLUSH, SASSI, ANSR, SAPIV and V, NONSAP, HONDO and ADINA codes for seismic analysis of NPP.

PROFESSIONAL COMMITTEES AND SOCIETIES:

2002-Present **North American Academy of Arts and Sciences**, *Fellow*

1998-Present **American Institute of Aeronautics and Astronautics** (AIAA), *Member, Vice Chair of* Non-deterministic Approaches Working Technical Group 1999-2004

1998-2005 **American Institute of Mechanical Engineers** (ASME), *Member* of International Gas Turbine Institute - Structural Dynamics and Probabilistics Committee,

1995-Present **American Society of Civil Engineers** (ASCE), *Member* of Probabilistic Methods Committee of the Engineering Mechanics Division

1993-Present **Society of Automotive Engineers** (SAE International), *Member, Chair* of Uncertainty & Reliability Quantification Committee of G11 Division 2001-2005

CONSULTANT:

1995- Present **Defense Nuclear Facility Safety Board (DNFSB)**, DOD, Washington D.C.
Perform review of seismic SSI analyses for DOE complex, collaboration with Dr. J. Stevenson

1995-1997 **Center for Design of Hazardous Facilities For Extreme Events,** Department of Civil Engineering, Case Western Reserve University, Cleveland, OH
Software Developer of Computer Codes on Blast Effects on Structures - Short-Course

1987-1990 **National Nuclear Safety Commission for Risk Assessment of Nuclear Facilities**, Romania Department of Industrial Facilities; Perform safety and seismic SSI reviews for the Reactor Buildings of Units 1 and 3 of Cernavoda NPP

HONORS AND AWARD:

2008 **SAE International Recognition Award,** Society of Automotive Engineers for Substantial contribution to the Technical Program of SAE 2008 World Congress

2007 **SAE International Recognition Award,** Society of Automotive Engineers for Substantial contribution to the Technical Program of SAE 2007 World Congress

2006 **SAE International Recognition Award,** Society of Automotive Engineers for Substantial contribution to the Technical Program of SAE 2006 World Congress

2005 **SAE International Recognition Award,** Society of Automotive Engineers for Substantial Contribution to the Technical Program of SAE 2005 World Congress

2004 **SAE International Recognition Award,** Society of Automotive Engineers for Substantial Contribution to the Technical Program of SAE 2006 World Congress

2003 **SAE International Recognition Award,** Society of Automotive Engineers for Substantial Contribution to the Technical Program of SAE 2006 World Congress

2000 **National Aviation and Space Exploration Wall of Honor,** National Air Museum, Smithsonian, Washington D.C.

1999 **Distinguished Probabilistic Methods Service Award** of the Society of Automotive Engineers (SAE) RMSL Division for "*Demonstrated Excellence in Dedication to the Growth and Success of the SAE Probabilistic Methods Committee Through Production of Technical Documents and Ceasless Assistance to Probabilistic Methods Community*"

1999 **Best Paper of the 1999 Year Award** of International Journal of Condition Monitoring and Diagnostic Engineering Management**,** for "A Probabilistic Approach to the Diagnosis of Gas Turbine Engine Faults", co-authored with Dr. M. Roemer

1998 **SAE International Recognition Award,** Society of Automotive Engineers (SAE), for leading the Probabilistic Methods session at the National SAE Reliability, Maintainability, Supportability and Logistic Workshop, Dallas.

1997 **SAE International Recognition Award,** Society of Automotive Engineers.(SAE), for leading the Probabilistic Methods session at the National SAE Reliability, Maintainability, Supportability and Logistic Workshop, Dallas.

1996 **SAE International Recognition Award,** Society of Automotive Engineers (SAE), for leading the probabilistic methods session at the National SAE RMSL Workshop, Dallas.

1993 **Craig Miller Memorial Award,** Case Institute of Technology, Case Western Reserve University, Cleveland, Ohio, for outstanding academic achievements.

1980 **Recognition Award** for the Student of the Year in Civil Engineering, Romania

EDITOR OF INTERNATIONAL JOURNALS AND BOOKS:

9/2007 **Taylor & Francis CRC Press**, Editor-In-Chief of "Engineering Design Reliability Applications: Aerospace, Automotive and Ship Industries, September, 2007
- "Reliability Analysis of Aircraft Structure Joints Under Corrosion and Fatigue Damage"
by D.M. Ghiocel and E. Tuegel

12/2004 **Taylor & Francis CRC Press**, Editor-In-Chief of "*Engineering Design Reliability Handbook"*and Author of three chapters:
- "Simulation Methods for Non-Deterministic Engineering Predictions"
by D.M. Ghiocel
- "Non-Deterministic Hybrid Architectures for Health Management of Turbomachinery"
by J. Altmann and D.M. Ghiocel
- "Reliability Analysis of Aircraft Structure Joints Under Corrosion and Fatigue Damage"
by D.M. Ghiocel and E. Tuegel

10/2001 **International Journal for Advanced Manufacturing Systems (IJAMS),** Editor-In-Chief for the special issue on *"Design and Manufacturing Under Uncertainties"*

SELECTED PUBLICATIONS RELATED TO:

SEISMIC SSI ANALYSIS TOPIC

Technical Publications in Engineering Journals and Conference Proceedings:

Proceedings of the OECD NEA/IAEA SSI Workshop, Ottawa, October 6-8, 2010

Ghiocel, D.M., Todorovski, L., Fuyama, H., "Seismic SSI Response of Reactor Building Structures", *Proceedings of the OECD NEA/IAEA SSI Workshop*, Ottawa, October 6-8, 2010

Ghiocel, D.M., Short, S. and Hardy, G. Seismic Motion Incoherency Effects for Nuclear Complex Structures On Different Soil Site Conditions", *Proceedings of the OECD NEA/IAEA SSI Workshop*, Ottawa, October 6-8, 2010

Ghiocel, D.M, Li, D., Brown, N. and Zhang, J.J. "EPRI AP1000 NI Model Studies on Seismic Structure-Soil-Structure Interaction (SSSI) Effects", *Proceedings of the OECD NEA SSI Workshop*, Ottawa, October 6-8, 2010

Ghiocel, D.M, Stoyanov, G., Adhikari, S. and Aziz, T.,"Seismic Motion Incoherency Effects for CANDU Reactor Building Structure", *Proceedings of the OECD NEA/IAEA SSI Workshop*, Ottawa, October 6-8, 2010

Ghiocel, D.M., Li.,D., Tunon-Sanjur, L.,"Seismic Motion Incoherency Effects for AP1000 Nuclear Island Complex", *The 20th Structure Mechanics in Reactor Technology, Proceedings of SMiRT20 Conference*, Paper 1852, Helsinki, August 10-14, 2009

Ghiocel, D.M., Short, S. and Hardy, G."Seismic Motion Incoherency Effects on SSI Response of Nuclear Islands with Significant Mass Eccentricities and Different Embedment Levels", *The 20th Structure Mechanics in Reactor Technology, Proceedings of SMiRT20 Conference*, Paper 1853, Helsinki, August 10-14, 2009

Ghiocel, D. M., "Seismic Motion Incoherency Effects on Soil-Structure Interaction (SSI) Response of Nuclear Power Plant Buildings", *The 10th International Conference in Structural Safety And Reliability Proceedings, ICOSSAR 2009 Conference,* Osaka, Japan, September 13-17, 2009

Ghiocel, D.M. "Stochastic and Deterministic Approaches for Incoherent Seismic SSI Analysis as Implemented in ACS SASSI Version 2.2, *Appendix C of the "Validation of CLASSI and SASSI to Treat Seismic Wave Incoherence in SSI Analysis of Nuclear Power Plant Structures"*, Electric Power Research Institute, Palo Alto, CA and US Department of Energy, Germantown, MD, Report No. TR-1015111, November 30, 2007

Ghiocel, D.M. "Seismic Ground Motion Incoherency Effects on Soil-Structure Interaction Response of NPP Building Structures", *The SMiRT 19 Conference Proceedings,* Division K, Paper K05/4, Toronto, August 2007
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Ghiocel, D.M. and Ostadan, F. "Seismic Motion Incoherency Effects on Seismic Motion Incoherency Effects on SSI Response of Industrial Structures SSI Response of Industrial Structures, *the 4th US-Japan Workshop on Soil-Structure Interaction*, Tsukuba International Center, Tokyo, March 28-30, 2007

Ghiocel, D.M., "Stochastic Simulation Methods for Engineering Predictions", *the Chapter 20 of the CRC Press "Engineering Design Reliability Handbook"*, Eds. Nikolaidis, Ghiocel and Singhal, CRC Press, December 2004

Ghiocel, D.M. and Wang L., "Seismic Motion Incoherency Effects on Structures", *Invited paper*, *Proceedings of the Third US-Japan Workshop on Seismic Soil-Structure Interaction,* Menlo Park, California, March 29-31, 2004.

Ghiocel, D.M. and Ghanem, R.G., "Stochastic Finite Element Analysis for Soil-Structure Interaction (SSI)", *Journal of Engineering Mechanics*, ASCE, Vol. 128, No.1, January 2002

Ghiocel, D.M. "Uncertainties of Seismic Soil-Structure Interaction (SSI) Analysis: Significance, Modeling and Examples", *Invited Paper, Proceedings of the Second US-Japan Workshop on Seismic Soil-Structure Interaction SSI*, Menlo Park, September 22-24, 1998

Ghiocel, D.M. et al., "Probabilistic Seismic Evaluation of An Eastern US NPP Including Soil-Structure Interaction (SSI) Effects", *Journal of Reliability Engineering and System Safety*, Vol. 62, Department of Quantum Engineering and Systems Science, University of Tokio, Japan, 1998

Ghiocel, D.M. and Ghanem, R.G., "Stochastic Seismic SSI Using Homogenous Chaos Expansion" *12th ASCE/EMD Conference,* May 17-20, 1998

Thomas, G.G. and Ghiocel, D.M. "Resolution of Flat Bottom Tank (IPEEE and A-46) Outlier Including SSI Efects*", Journal of Nuclear Engineering and Design*, September, 1997

Ghiocel, D.M. et al., "On Soil-Structure Interaction (SSI) Issues for Deep Foundation Structures", *6th Symposium on NPP Structures, Equipment and Piping, Raleigh*, North Carolina, December, 1996

Ghiocel, D.M et al., " Structural Fragility Analyses Using Finite Element Computational Models",*7th ASCE EMD/STD Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability*, Worcester, MA, August, 1996

Ghiocel, D.M. et al., "Seismic Motion Incoherency Effects on Dynamic Response", *7th ASCE EMD/STD Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability*, Worcester, MA, August, 1996

Ghiocel, D.M. et al., “Probabilistic Seismic Analysis Including Soil-Structure Interaction”, *7th ASCE EMD/STD Joint Speciality Conference on Probabilistic Mechanics and Structural Reliability,* Worcester, MA, August, 1996

Ghiocel, D.M.. “Effects of Random Field Modeling of Seismic Ground Motion on Structural Dynamic Response”, *37th AIAA/ASME/ASCE Conference on Structures, Structural Dynamics and Materials, Section on Probabilistic Applications*, Salt Lake City, April, 1996

Ghiocel, D.M., Wilson, P., Stevenson, J.D. "Evaluation of Structural Fragilities for An IPEEE Seismic Probabilistic Risk Assessment Study", *Proceedings of the 1995 Annual ASME PVP Conference,* Honolulu, July, 1995

Ghiocel, D.M., Wilson, P., Stevenson, J.D., "Seismic Soil-Structure Interaction Effects on Probabilistic Floor Response Spectra", *Proceedings of the 1995 Annual ASME PVP Conference,* Honolulu, July, 1995

Ghiocel, D.M., " On Accuracy of Coherency Spectrum Estimation for Broad and Narrow Band Stationary Processes", *the 7th International Conference on Applied Statistics and Probability*, Paris, July, 1995

Ghiocel, D.M., Wilson P., Stevenson, J.D., "Structural Fragility of A Nuclear Power Plant Reactor Vessel and Containment Using Finite Element Computational Models", *AIAA/ ASME/ASCE Conference on Structures, Structural Dynamics and Materials, Section on Probabilistic Applications*, New Orleans, April, 1995

Ghiocel, D.M., Wilson, P., Stevenson, J.D., "Evaluation of Probabilistic Seismic FRS Including SSI Effects" *the 13th International Conference on Structural Mechanics in Reactor Technology*, SMIRT 13, Invited Paper, Vol. M, July, Porto Alegre, 1995

Ghiocel, D.M., Wilson, P., Stevenson, J.D., "Probabilistic Finite Element Analysis for Structural Fragility Evaluation", *the 13th International Conference on Structural Mechanics in Reactor Technology, SMIRT 13, Vol. M, July, Porto Alegre*, 1995

Ghiocel, D.M, "Dynamic Coupling Effects for Tuned Structural Subsystems", *the 12th International Conference on Structural Mechanics in Reactor Technology*, SMIRT 12, Paper K14/6, Stuttgart, August, 1993

Ghiocel, D. M. et al., "Evaluation of Seismic Soil-Structure Interaction (SSI) by Different Approaches", *2nd International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics*, Vol. 3, St. Louis, Missouri-Rolla, March, 1991

Ghiocel, D. M., et al. .,"Seismic Soil-Structure Interaction Effects for Shearwall Buildings on Soft Clays", *10th European Conference on Earthquake Engineering*, ECEE, Moscow, September, 1990

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