R. Ray Nachlinger, Ph.D.

Summary of Qualifications

Thirty-one years of consulting experience in advanced analysis and design. Experience includes both the design and analysis of offshore structures with an emphasis in Dynamics, Hydrodynamics, Ship Motions, Mooring Analysis, and Structural Analysis. Responsible for the development of over a dozen proprietary computer codes, which have become industry wide standards for the offshore industry.

Education

1968 Ph.D. in Engineering Mechanics
University of Texas at Austin, USA.

1967 MS in Engineering Mechanics.
University of Texas at Austin, USA.

1966 Bachelor of Engineering Science
University of Texas at Austin, USA.

Professional Experience

July 1978 - Present President, Ultramarine, Inc.

- ◇ Established Ultramarine, Inc. to provide consulting and analysis to the offshore industry. Responsible for management of all aspects of business development, technical quality and financial administration.
- ◇ Transportation analysis of 3 jackets on a single barge and 3 decks on a single barge being transported from the Gulf of Mexico to Angola.
- ◇ Developed Software Modules for Marine Advisory System consisting of Ballast and Mooring Algorithms, Mooring Line Interpolation Table Generation for Shell Oil Company's Auger TLP.
- ◇ Performed wet tow analysis with stress calculation of highway tunnels to be installed under Boston Harbor.
- ◇ Launch, transportation and upending analysis of a Tripod in 652 ft. water depth.
- ◇ Performed transportation and launch analysis of both parts of the Delta Tower for DORIS Engineering.
- ◇ Study to determine mooring system required to moor a 195 ft. floating dock in the Atchafalaya River with two 320 ft. cargo barges connected.

◇ Transportation analysis of Deaerator Skid for Chevron's TAKULA WIP.

◇ Developed MOSES, Multi-Operational Structural Engineering Simulator.

◇ Technical consulting services rendered in developing a complete, consistent theory manual for COSMOS for Shell Development Company.

◇ Modifications to the OSCAR and OTIS programs for Shell Oil Company.

◇ Developed OSCAR II.

◇ Consultant to Shell Oil Company to assess the loads on large plates during launch.

◇ Consultant to Shell Development to develop COSMOS, a computer program for the analysis of TLP's.

◇ Consultant to Kaiser Steel Corporation to analyze stresses and fatigue of Texaco's Harvest jacket during tow from Korea to offshore California.

◇ Consultant to Shell Oil Company to analyze launch of the Eureka jacket.

◇ Developed OTTO, a computer program to analyze stresses and fatigue in structures under tow.

◇ Developed ISAAC, a computer program to perform computations for loadouts.

◇ Consultant to Shell Offshore, Inc. on mooring problems in 1000 to 2500 ft. of water.

◇ Consultant to Proteca of Venezuela on the design of a floating bridge over the Orinoco River.

◇ Developed PLAD, a computer program to automatically design metal buildings.

◇ Consultant to Kaiser Steel Corporation to perform engineering analysis for loadout and tow of Shell Oil Company's Eureka jacket.

◇ Consultant to Chevron to modify their existing structural dynamics software.

◇ Designed PLAD, a computer program to design electro-static precipitator casings for the Lodge-Cottrell division of Dresser Industries.

◇ Consultant to Petro-Marine to simulate the dynamics of the Petrobras PCR-1 jacket during upending.

◇ Added three dimensional diffraction theory hydrodynamics to OSCAR, and developed OTIS, an interactive graphics program.

◇ Performed structural analysis of Richmond superstructure during lifting for Vemar.

◇ Consultant to Brown & Root to improve their computer software for jacket upending.

◇ Consultant to J. Ray McDermott. Analyzed loss of the Nomorado jacket in the North Sea while under tow. Testified on findings in court.

◇ Added mooring capabilities to OSCAR.

◇ Consultant to Raymond Technical Facilities. Designed and implemented a system to perform dynamic analysis of floating bridges. Analyzed the design of

the Hood Canal replacement bridge.

- ◇ Developed OSCAR for Chevron. OSCAR combined PLAP and MARVAN into one overall code.
- ◇ Developed MARVAN, a computer program to compute ship motions and hydrostatics.
- ◇ Developed PLAP, a computer program to simulate jacket launch and upending.

Feb 1968 - Jan 1979 University of Houston, Houston, Texas

Assistant and Associate Professor of Mechanical Engineering.

- ◇ Taught graduate and undergraduate courses in Engineering Mechanics and Applied Mathematics. Active in research in these areas.
- ◇ Consultant to Tennessee Gas Transmission Company. Developed PIPSYS, a computer program to analyze pipe stresses.
- ◇ Consultant to Shell Oil Company. Developed onboard computer program to assist in mating piles and jacket sections of the Cognac jacket.
- ◇ Consultant to Donhaiser, McClure & Associates. Assisted in the design of a semi-submersible and two mooring systems.
- ◇ Consultant to Brown & Root. Performed stress analysis of flotation tanks during installation of B.P. Forties Field jackets.

Additional Professional Activities

Registered Professional Engineer in the State of Texas

Publications

"On Approximate Constitutive Equations for Nonlinear Viscoelasticity", with H. H. Calvit, Acta Mechanica 7, 1969, pp. 768-778.

"The Bending of a Beam Made of a Fiber Reinforced Viscoelastic Material", with J. R. Leininger, AIAA Journal, Vol. 7, No. 10, 1969, pp. 2016-2017.

"A Constitutive Equation for Fiber Reinforced Viscoelastic Materials", with H. H. Calvit, Acta Mechanica 9, 1970, pp. 49-53.

"Speed of Propagation of Acceleration Waves in a Binary Non-Reacting Mixture", with J. R. Leininger, The Journal of the Acoustical Society of America, Vol. 49, No. 3, Part 2, March 1971, pp. 749-752.

"A note on Aging Materials", ZAMM, 51, 1971

"Some Results on a Fiber Reinforced Viscoelastic Beam", AIAA Journal, Vol. 9, No. 11, November 1971, pp. 2300-2301.

"On the Stability of a Viscoelastic Bar", with Carl Faust, ZAMM 52, 1972, pp. 179-181.

"On the Propagation of Acceleration Waves in a Binary, Non-Reacting Mixture", with J. R. Leininger, JASA, 53, No. 2, 1973.

"A Uniqueness Theorem for Rigid Heat Conductors with Memory", with L. T. Wheeler, Quarterly of Applied Mathematics, Vol. XXXI, No. 3, 1973.

"On Wave Propagation and Uniqueness in One-Dimensional Elastic Bodies", with L. T. Wheeler, Journal of Elasticity, Vol. 4, No. 1, 1974.

"A Theorem on the Uniqueness of Solutions in Nonlinear Heat Condition", with R. P. Herrmann, Quarterly of Applied Mathematics, October 1974.

"On the Determinacy of Motions for the Displacement Problem in the Dynamics of Elastic Bodies with Viscosity", with L. T. Wheeler, ZAMM, Vol. 24, 1973.

"Wave Propagation and Uniqueness", with L. T. Wheeler, Proceedings of the 10th Anniversary Meeting of the Society of Engineering Science.

"Wave Propagation and Uniqueness in One-Dimensional Simple Materials", with L. T. Wheeler, Journal of Mathematical Analysis and Applications, Vol. 48, No. 1, 1974.

"Uniqueness Theorems for Finite Elastodynamics", with L. T. Wheeler, Journal of Elasticity, Vol. 4, No. 1, 1974.

"A Uniqueness Theorem for the General Theory of Heat Conduction with Finite Wave Speeds", with R. P. Herrmann, International Journal of Engineering Science, Vol. 12, 1974.

"On Uniqueness and Wave Propagation in Nonlinear Heat Conductor with Memory", with R. P. Herrmann, Journal of Mathematical Analysis and Applications, Vol. 50, No. 3, 1975.

"A Uniqueness Theorem for Nonlinear Heat Conduction in Chemically Reacting Media", with J. W. Nunziato and P. Chen, Journal of Mathematical Analysis and Applications, Vol. 53, No. 1, January, 1976, pp. 137-144.

"Theorems on Wave Propagation and Uniqueness for a Class of Nonlinear Dissipative Materials", with J. Nunziato and L. Wheeler, Journal of Mathematical Analysis and Applications, Vol. 51, No. 2, August, 1975, pp. 449-460.

"Wave Propagations and Uniqueness Theorems for Elastic Materials with Internal State Variables", with J. Nunziato, International Journal of Engineering Science, Vol. 14, No. 2, January, 1976, pp. 31-38.

"On Thermal Instability in Rigid Heat Conductors with Non-linear Heat Generation", with P. J. Chen and J. Nunziato, to appear in Quarterly of Applied Mathematics.

"On the Domain of Attraction for Steady States in Heat Conduction", with C. O. Horgan, to appear in International Journal of Engineering Science.

"On Stability in the Linear Theory of Heat Conducting, Chemically Reacting Media", with J. Nunziato, Proceedings of the 12th Meeting of the Society of Engineering Science, October, 1975.

"Ship Motions in Shallow Water", with A. C. McClure, Proceedings of the Offshore Technology Conference, May, 1976.

"On the Motion of Coupled Bodies in a Seaway", with A. C. McClure, Proceedings of Inter-ocean, June 1976.

"Stability of Uniform Temperature Fields in Linear Heat Conductors with Memory", with J. Nunziato, International Journal of Engineering Science, 1977.

"Uniqueness and Stability in Adaptive Elasticity Theory", with S. C. Cowin, Journal of Elasticity.

"On the Directional Stability of Ships", International Shipbuilding Journal.

"Frequency Domain Analysis of Dynamic Response of Floating Bridges to Waves", with D. J. Engel, Ocean Structural Dynamics Symposium '82 Proceedings, Oregon State University.

Professional Memberships

Dr. Nachlinger is a member of numerous professional organizations and honorary societies.

April 5, 2002