

TERA

January 18, 1984

Mr. James W. Cook
Vice President
Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

Mr. J. G. Keppler
Administrator, Region III
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Mr. D. G. Eisenhut ✓
Director, Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

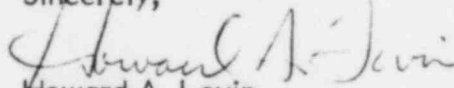
Re: Docket Nos. 50-329 OM, OL and 50-330 OM, OL
Midland Nuclear Plant - Units 1 and 2
Independent Design and Construction Verification (IDCV) Program
Transmittal of Resumes and Statements of Independence

Gentlemen:

In accordance with the Midland IDCVP protocol, the resumes and statements of independence for Myle Holley, David Segal, Paul Streeter, Howard Lambert, Jean-Lou Chameau and Greg Reimers are attached. The resumes should be inserted in the Midland Project Quality Assurance Program, Appendix C.

Please contact me if you should require clarification or further information.

Sincerely,


Howard A. Levin
Project Manager
Midland IDCVP Program

cc: L. Gibson, CPC
R. J. Erhardt, CPC
D. Quammy, CPC (site)
R. Whitaker, CPC (site)
J. Taylor, NRC, I&E HQ
D. Hood, NRC
T. Ankrum, NRC, I&E HQ
Midland IDCVP Service List

Attachments

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SERVICE LIST FOR MIDLAND INDEPENDENT DESIGN
AND CONSTRUCTION VERIFICATION PROGRAM

cc: Harold R. Denton, Director
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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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Atomic Safety & Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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Apt. B-125
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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Ron Callen
Michigan Public Service Commission
6545 Mercantile Way
P.O. Box 30221
Lansing, Michigan 48909

Mr. Paul Rau
Midland Daily News
124 McDonald Street
Midland, Michigan 48640

MYLE J. HOLLEY, JR.
Associate Principal Engineer

Education

S.M. Civil Engineering, Massachusetts Institute of Technology
S.B. Civil Engineering, Massachusetts Institute of Technology

Summary of Experience

Mr. Holley has over 35 years experience in structural engineering. He has served on the faculty of Massachusetts Institute of Technology until 1974, and for several years he was in charge of the Structural Division of the Civil Engineering Department. While on the faculty, he taught subjects in structural analysis and design, and supervised structural research projects. The latter included work in the fields of reinforced concrete structures, prestressed concrete, structural applications of granite, high-strength reinforced concrete beams, and the performance of thin arch concrete dams. Mr. Holley and his colleagues formed the consulting firm of Hansen, Holley and Biggs, Inc. and their work has been dedicated to complex problems of structural design and structural behavior. Their clients include both engineering firms and owners of major constructed facilities. A summary of the firm's experience is attached. A substantial fraction of their consulting practice has involved advice and assistance in the resolution of problems arising in the design and construction of nuclear power plants. Prior to his experience as a faculty member at MIT and as a principal at HHB, Inc., Mr. Holley was involved in the analysis and design of heavy machinery for the S. Morgan Smith Co., now a division of Allis-Chalmers.

Professional Affiliations and Registrations

Registered Professional Engineer, Massachusetts
Member, American Society of Civil Engineers
Member, American Concrete Institute
Member, American Society for Engineering Education

He has served on numerous professional committees. This has included several years on ACI 349 Concrete Nuclear Structures and ACI 359 Nuclear Reactor Components, and he currently is a consulting member of these committees.



Hansen, Holley and Biggs Inc. CONSULTING ENGINEERS

ROBERT J. HANSEN • MYLE J. HOLLEY, JR. • JOHN M. BIGGS Box 88, MIT Branch PO, Cambridge, Massachusetts 02139

April 1981

STATEMENT OF EXPERIENCE AND PERSONNEL DATA

Hansen, Holley and Biggs, Inc.

The professional corporation, Hansen, Holley and Biggs Inc., was formed in January 1975 by the partners of the consulting firm of Hansen, Holley and Biggs, namely Robert J. Hansen, Myle J. Holley, Jr., and John M. Biggs. Both the partnership, which was formed in 1955, and the professional corporation continue to be active, but the major part of the consulting services now offered are performed by the corporation.

The corporation as well as the partnership specialize in engineering problems of an unusual or complex nature. Current projects which are active include:

1. Preparation for lawsuits on window wall and structure, John Hancock Tower, Boston. (John Hancock Mutual Life Insurance Company).
2. Advice on windows and window wall and preparation for lawsuit, WCNB Tower, Worcester, Mass. (Nobility Hill Realty Corporation).
3. Preparation for lawsuit on structural, durability and construction problems of new municipal parking garage of City of Burlington, VT (City of Burlington, VT).
4. Advice on thermal fatigue cracking of power plant air duct stiffeners. (American Electric Power Service Corporation).
5. General advice on structural engineering problems associated with nuclear power plants and relationships with the Nuclear Regulatory Agency. (Stone and Webster Engineering Corporation).
6. Advice and guidance on design and construction deficiencies of Worcester Civic Center Arena and participation in arbitration proceedings. (City of Worcester, Massachusetts).
7. Preparation for lawsuit on headquarters building, Control Data Corporation, Minneapolis. (Control Data Corporation).
8. Advice re technical aspects on lawsuit re Hennepin County Courthouse, Minneapolis, Minnesota. (Hennipen County).
9. Advice and guidance concerning Building Facade problems and corrective measures thereto, brick construction. (University of Indiana).
10. Advice re basing problems re new U.S. Weapons System. (BDM Corp).

Prior experience of the partnership or the corporation has included a number of projects. A partial list of these projects follows.

- a) Structural design of micro-wave antennas including the development of certain novel structural forms. (Lincoln Laboratory, Craig Systems, Inc.)
- b) Structural feasibility studies and preliminary designs in connection with ground facilities for the ATLAS Project. (Ramo Wooldridge Corp.)
- c) Preparation of structural loadings and advice on methods of design in connection with TALOS and BOMARC ground facilities. (Hens and Roe).
- d) Design of radar towers. (Watson Elevator Co.)
- e) Study of feasibility of protective construction for housing anti-aircraft missile control systems. (Francis Associates).
- f) Review of design for large reinforced concrete oil reservoir. (T.W. Lambe).
- g) Economic study of foundations for large radio and television towers. (Stainless, Inc.)
- h) Investigations of structural failures including buildings, bridges, and miscellaneous structures. (U.S. Corps of Engineers, Commonwealth of Massachusetts, Liberty Mutual Insurance Co., Du Pont Co.)
- i) Study of "Air Blast Effects on Standard Aircraft Bulk Fuel Storage Underground Steel Tanks." (Armed Forces Special Weapons Project).
- j) Advice on design of floating roof system of largest oil reservoir in the world. (Creole Petroleum Corp.)
- k) Advice on design criteria for ground facilities for TITAN project. (Space Technology Laboratories).
- l) Design analysis of the Shell Roof Structure of the Providence Post Office. (Charles A. Maguire and Associates).
- m) Investigation of Adequacy of Design of a Major Multi-Story Building to Earthquake Effects. (John Hancock Mutual Life Insurance Co.)
- n) Advice on Structural Design of Minatorized Airborne Computer for Polaris. (Francis Associates).
- o) Advice to Department of Defense on Long-Range Research Program on Protective Construction. (Director of Defense Research and Engineering).
- p) Advice on Structural Design of Multi-Story Steel Frame Building. (William J. LeMessurier and Associates).

- q) Advice on Design of Nuclear Power Plants. (Stone and Webster, Inc.)

Rowe
Connecticut Yankee
City of Los Angeles
Maine Yankee
Long Island Lighting
Duquesne Power and Light

- r) Advice on Design and Construction of Nuclear Power Plant. (Rochester Gas and Electric Co.) Ginna Plant.

- s) Advice on some design aspects of Nuclear Power Plant. (Carolina Power and Light Co.) Robinson Plant.

- t) Advice on Design Aspects of Large Radio Telescope. (Stone and Webster, Inc.)

- u) Advice on Nuclear Test Plan for Nike-X. (ABM Omaha District Corps of Engineers).

- v) Advice on adequacy of design criteria, procedures, and results on major 100-story-high building, Hancock Center, Chicago. Advice on investigation and correction of construction defects. (John Hancock Mutual Life Insurance Co.)

- w) Advice on Design of a Protective Facility. (Arthur D. Little, Inc.)

- x) Advice on Design of Nuclear Power Plant. (United Engineers and Constructors).

Carolina Power and Light, Brunswick
Consolidated Edison, Indian Point II
Indian Point III

- y) Advice on Design of Nuclear Power Plant. (Gibbs and Hill).

ENEL

Aguirre, Unit No. 1

- z) Review of structural design and jacking system for multi-story buildings, factory prefabricated modules, erected by the push-up concept. (Stirling Homex Corporation).

- aa) Advice on design of nuclear fuels reprocessing plant. (Atlantic Richfield Hanford Co.).

- bb) Advice on design and construction of Nuclear Power Plant. (American Electric Power Corporation) Cook.

- cc) Advice on foundation problems for major conventional power plant. (American Electric Power Corp.)

- dd) Advice on causes of failure of large transmission line tower. (American Electric Power Corp.)
- ee) Advice on design of water intake structure of nuclear power plants. (Jackson and Moreland, Inc.) Aguirre, Unit No. 1.
- ff) Advice on design of world's tallest reinforced concrete building. (C.F. Murphy and Associates).
- gg) Advice on qualification testing of instrumentation panels for several nuclear power plants. (Mercury Company of Norwood).
- hh) Development of design standards for steel dolphins. (U.S. Navy).
- ii) Advice on cause of and corrective measures for stack vibration problems. (Anderson & Nichols).
- jj) Advice on structural failures and corrective measures for extremely large earth-moving equipment. (American Electric Power Service Corp.)
- kk) Advice on major redesign effort for containment system for a series of nuclear power plants. (American Electric Power Service Corp.)
- ll) Advice on design of large fixed and floating dry docks (Crandall Dry Dock Engineers, Inc.)
- mm) Membership on Mark III Containment Review Committee, Douglas Point Nuclear Generating Station (Potomac Electric Power Company).
- nn) Advice on Structural Engineering Problems, especially related to Nuclear Generating Station (United Engineers and Constructors, Inc.)
- oo) Advice on structural design of addition to Nuclear Power Plant. (Rochester Gas and Electric Co.)
- pp) Advice on wind environment problems around base of buildings in multi-building development. (Harrison and Abramowitz).
- qq) Advice and guidance on experimental program on developing missile protective walls. (Reynolds Metal Co.).
- rr) Advice on design and construction of precipitation chambers for power plants. (Envirotech Corp.).
- ss) Advice on design of steel stacks to minimize stack vibration problems. (Airtech Corp.)
- tt) Advice on design and construction of large inflated roofs. (Owens-Corning Co.)
- uu) Investigation of structural failures in electrical substation (H.K. Porter Co.)

- vv) Evaluation of earthquake criteria for fossil fuel electric plant in Iran. (Commonwealth Associates).
- ww) Participation in licensing process for Sterling Nuclear Unit No. 1. (Rochester Gas and Electric Company).
- xx) Advice on window wall and structural problems for office building. (Society for Savings).
- yy) Advice on failures of tempered glass skylights. (Sanders Campbell).
- zz) Advice on delamination of nuclear power plant containment dome. (Gilbert Associates).
- aaa) Advice on aspects of the structural design of Patriot EMS System. (Raytheon Co.)
- bbb) Advice on cause of structural collapse of portion of major cooling Tower. (United Engineers and Constructors).
- ccc) Advice and guidance on lawsuit concerning alleged damage to nearby building supposedly caused by the construction of an interceptor sewer line. (Metropolitan District Commission, Commonwealth of Massachusetts).
- ddd) Advice and guidance on construction of a major hospital. (Lahey Clinic Foundation).
- eee) Advice and guidance on curtain wall problems on three buildings in Canada. (Oxford Development Group, Ltd).
- fff) Participation in lawsuit relative to curtain wall problems for three buildings, College Life Insurance Co., Indianapolis. (College Park Corporation).
- ggg) Participation in review of certain structural performance characteristics under combat conditions of a new class of destroyer. (Gibbs and Cox).
- hhh) Advice on corrections to deficiencies in design of an operating nuclear power electric generation station and participation in public hearings, Trojan plant. (Portland General Electric Company).
- iii) Advice on corrections to structural deficiencies of a parking garage. (Zaldastani and Associates).
- jjj) Advice on design of curtain walls, major office building. (The Beacon Companies).
- kkk) Advice on ground wind environment re possible, major tall building. (The Beacon Companies).
- lll) Advice on possible vibration problems associated with rotating machinery in printing plant. (CETRA Co.).

DAVID SEGAL
Associate Civil/Structural Engineer

Education

B.S. Civil Engineering, Israel Institute of Technology
M.S. Civil Engineering, Israel Institute of Technology

Summary of Experience

Mr. Segal has over twenty years experience in the field of civil engineering. He has been responsible for the design, analysis and construction supervision of concrete and steel structures including earth work. He has been involved in such diverse projects as nuclear power plant analysis and design, nuclear power plant regulation, foundations for marine structures, shoring and dewatering of excavations, harbour construction, underpinning of existing buildings, construction of temporary bridges and underpinning of existing roads and railways.

- 1981 - Present Associate Civil/Structural Engineer, TERA Corporation.
- 1976-Present Head Structures and Systems Department, Israel Atomic Energy Commission, Licensing Division - Tel-Aviv, Israel. In charge of all Civil Engineering problems connected with the licensing of nuclear power plants.
- 1972 - 1976 Consulting Engineer, Consulting Engineers Ltd. - Tel-Aviv, Israel. Consultant to public authorities, engineers and contractors in relation to soil and foundation engineering, soil investigations and soil mechanics.
- 1970 - 1972 Resident Engineer, Civil and Marine Engineering Co. Ltd. - Haifa and Tel-Aviv, Israel. Responsible for the supervision of the construction of marine and other civil engineering structures in Haifa and Eilat harbours, including breakwaters and seawalls, quays and jetties.
- Head, Structural Department, Civil and Marine Engineering Co. Ltd. - Haifa and Tel-Aviv, Israel. Responsible for the design and analysis of foundations for marine structures, in particular piles subjected to complex loadings (static and dynamic) and anchored bulkheads.
- 1966 - 1970 Research Engineer, Emch and Berger - Consulting Engineers, Berne, Switzerland. Performed various tasks, including: feasibility studies and cost analysis of structural engineering problems (mostly reinforced, prestressed or precast concrete); static and dynamic analysis, damage and failure analysis and ultimate load determination of existing structures; study of literature, updating of existing analysis methods and adapting new analysis methods, for the regular use of the other departments of the company; and consulting to the other departments of the company as well as clients in the above mentioned subjects.



TERA CORPORATION

- 1962 - 1966 Design Engineer, W & J Rapp A.G. - Engineers and Contractors, Basle, Switzerland. Performed design, hydraulic analysis and static analysis of: sewage systems and treatment plants; subsoil structures for industrial and municipal facilities (pumping stations, tanks and tunnels); foundations for steel tanks and piping; and retaining walls.
- 1960 - 1962 Design Engineer, Dead Sea Works Ltd., Beer-Sheva and Sdom, Israel. Performed various tasks, including: design and supervision of the construction of industrial steel and reinforced concrete structures, foundations for industrial plants and components and industrial sewage systems; supervision of earthworks for the construction of dikes for evaporation pans.



PAUL L. STREETER
Associate Mechanical Engineer

Education

M.S. Engineering, California State University, Long Beach
B.S. Aerospace Engineering, California State Polytechnic, Pomona

Summary of Experience

Mr. Streeter has 15 years of experience in the field of stress analysis, primarily related to dynamic analysis of piping systems. His commercial nuclear power plant experience dates to the initial development stage of the seismic analysis of ASME Section III piping. He has personally performed the analysis on complex dynamic problems and has managed large-scale analysis efforts for several nuclear stations.

- 1983 - Present Associate Mechanical Engineer, TERA Corporation.
- 1980 - 1983 Project Engineer, ECHO. Provided technical direction for piping stress analysis and pipe support analysis for Control Rod Drive Hydraulic System (CRDHS) piping on the Grand Gulf and La Salle Nuclear Stations; for stress analysis of small bore pipe penetrations on the Perry Nuclear Power Plant; and for the generic small bore piping design handbook under contract to EPRI.
- 1976 - 1979 Section Manager, EDS Nuclear. Responsible for piping analysis for various systems on McGuire, Catawba, San Onofre, Quad Cities, Trojan and Grand Gulf nuclear plants, and technical direction at all piping inside containment for the South Texas Project.
- 1974 - 1976 Lead Mechanical Engineer, Stone and Webster. Responsible for mechanical systems for backfit projects on coal-fired power plants and for various piping analysis projects including Stone and Webster's standard plant design for Westinghouse NSSS and an HTGR project.
- 1972 - 1974 and 1979 Stress Group Supervisor, Bechtel Power. Directed and performed piping analysis for Vogtle, Blue Hills, and Rancho Seco nuclear stations. Prepared design guides for analysis and support design, wrote associated PSAR chapters, and developed control procedures.
- 1968 - 1971 Responsible Stress Analyst, McDonnell-Douglas. Provided technical direction for all hot air systems associated with the engines and all environmental systems on the DC-10.

Registrations

Registered Professional Engineer - Mechanical Engineering; California, Colorado, Oregon and South Dakota

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HOWARD E. LAMBERT
Principal Risk Assessment Engineer

Education

Ph.D.	Nuclear Engineering, University of California, Berkeley
M.E.	Nuclear Engineering, University of Florida
B.E.	Chemical Engineering, Youngstown State University
B.S.	Mathematics, Youngstown State University

Summary of Experience

Dr. Lambert has had more than ten years of experience in system safety and reliability analysis and probabilistic risk assessment. He has conducted numerous safety and security analyses of nuclear power plants and facilities in the nuclear fuel cycle. He was a fault tree analyst for the Reactor Safety Study. He has worked on chemical process control as it relates to safety and has conducted fire and explosions hazards evaluations. He has performed safety studies of liquefied natural gas (LNG) tankers in transit in Boston Harbor. He has published several technical articles in system safety, reliability and security analysis, including "Introduction to Fault Tree Analysis" with Prof. Richard Barlow. Dr. Lambert has lectured worldwide and has been given a commendation from the Ohio State legislature for his technical achievements. He is a registered professional engineer in the State of California in the areas of nuclear engineering and safety engineering.

1981 - Present Associate, TERA Corporation.

1978 - 1981 Principal Risk Assessment Engineer, TERA Corporation. Assisted Florida Power Corporation and Baltimore Gas and Electric Company in a peer review for work conducted for the U.S. NRC Interim Reliability Evaluation Program. Assisted Lawrence Livermore National Laboratory in the peer review of systems analysis for the NRC's Seismic Safety Margins Research Program. Developed, for the duPont Co., a quantitative fault tree analysis computer program for safety and reliability analysis of chemical processing systems. Developed for USC/DOT a directed graph-fault tree approach used for assessment of transportation accident risks.

1971 - 1978 Staff Nuclear Engineer, Lawrence Livermore National Laboratory. Worked as a fault tree analyst for the Reactor Safety Study. Performed analysis and wrote sections of the safety analysis reports (SAR) of the Super Kukla Reactor (SKR) and the Livermore Pool Type Reactor (LPTR). In the LPTR SAR, he wrote sections that included the effects and consequences of a loss of coolant accident. In the SKR SAR, he performed much of the analysis associated with the design basis accident. Worked with electrical engineers at LLL on an Air Force contract to determine the safety of an arming and fusing system. Worked on the NRC study "Advisability of a Seismic Trip System." Conducted a comparative risk assessment using fault tree analysis to determine if seismic trip systems enhance the safety of nuclear power plant operation. Worked on the NRC material control program and developed a procedure for security assessment using directed graph and fault tree analysis. Tested the procedure on a prototype nuclear fuel reprocessing facility and on an existing nuclear fuel scrap recovery plant.



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Private Consultant--(1) Worked with Prof. Richard Barlow for Cabot Corporation, Boston, on a study to determine the reduction of risk of an LNG tanker-ship collision in Boston Harbor when Special Coast Guard rules are in effect. (2) Performed an independent review for EPA of an assessment model for radioactive waste management options developed by Prof. S. Logan at University of New Mexico. (3) Conducted a hazard and fault tree analysis of the 2XIIIB fusion reactor fire protection system at Lawrence Livermore Laboratory.

Lecturer--Staff lecturer, George Washington University and Stat-A-Matrix (Rutgers University) Course, "Introduction to Fault Tree Analysis." Gave lectures on Reliability and Risk Analysis at Cambridge, England; NATO Conference, Urbino, Italy; and SINTEF in Trondheim, Norway. Lectured on nuclear materials safeguards and security analysis at the International Atomic Energy Agency in Vienna, Austria. Taught courses on risk assessment system safety and fault tree analysis to the following organizations:

- o Baltimore Gas and Electric Co.
- o E.I. duPont de Nemours & Co.
- o Lawrence Livermore National Laboratory
- o Savannah River Laboratory
- o Bechtel Power Corporation

Registrations

Professional Engineer - State of California



Selected Publications

- H. E. Lambert, "Quantitative Fault Tree Analysis," 1979 - ASQC Technical Conference Transactions, Houston, Texas.
- H. K. Hasegawa, H. E. Lambert, and G. P. Naanep, "Fire-Protection Study of the 2X11B Mirror-Fusion Facility", presented at the fourth international System Safety Conference, July 9-13, 1979, San Francisco, California.
- H. E. Lambert, "Comments on the Lapp-Powers "Computer-aided Synthesis of Fault Trees," IEEE Trans on Rel, April 1979.
- G. E. Cummings, J. E. Wells, and H. E. Lambert, "Assessment of Seismic Trip Systems for Commercial Power Reactors," Nuclear Safety, Sept.-Oct. 1978, Vol. 19, No. 5, pp. 590-601.
- F. M. Gilman, H. E. Lambert, and J. J. Lim, "The Results of a Directed Graph and Fault Tree Assessment of a MC&A System," presented at the Institute of Nuclear Materials Management Conference, June 27-29, 1978, Cincinnati, Ohio.
- H. E. Lambert, "Fault Trees for Location of Sensors in Chemical Processing Systems," Chemical Engineering Progress, August 1977, Vol. 73, No. 8, pp. 81-85.
- H. E. Lambert and J. J. Lim, "The Modeling of Adversary Action for Safeguards Effectiveness Assessment," presented at the Institute of Nuclear Materials Management Conference, June 29-July 1, 1977, Arlington, Virginia.
- H. E. Lambert and F. M. Gilman, The IMPORTANCE Computer Code, Lawrence Livermore Laboratory, Rept. UCRL-9269 (1977).
- H. E. Lambert and G. Yadigaroglu, "Fault Trees for Diagnosis of System Fault Conditions," Nuc. Sci. and Engr., Vol. 62, pp. 20-34 (1977).
- J. B. Fussell and H. E. Lambert, "Quantitative Evaluation of Nuclear System Reliability and Safety Characteristics," IEEE Trans. on Rel., Vol. R-25 (3) (1976).
- H. E. Lambert, Fault Trees for Decision-Making in Systems Analysis, Ph.D. thesis, Lawrence Livermore Laboratory Rept., UCRL-51829, (1975).
- H. E. Lambert, "Measures of Importance of Events and Cut Sets in Fault Trees," in Reliability and Fault Tree Analysis, R. E. Barlow, et. al., ed. (SIAM, 1975).
- R. E. Barlow and H. E. Lambert, "Introduction to Fault Tree Analysis," in Reliability and Fault Tree Analysis, R. E. Barlow, et. al., ed. (SIAM, 1975).
- H. E. Lambert, System Modeling for Reliability and Safety Evaluation in Chemical Processes, Lawrence Livermore Laboratory, Rept. UCRL-76186 (1974).
- H. E. Lambert, System Safety Analysis and Fault Tree Analysis, Lawrence Livermore Laboratory Rept., UCRL-16238 (1973).



JEAN-LOU A. CHAMEAU
Associate Civil Engineer

Education

Ph.D. Stanford University
M.S. Civil Engineering, Geotechnical Major, Stanford University
Troisieme Annee de License de Sciences Economiques, Sorbonne, Paris
Ingenieur de l'Ecole Nationale Supérieure d'Arts et Metiers, Paris, France

Summary of Experience

Teaching and Research

1980 - Present Assistant Professor, Civil Engineering, Purdue University.
1982 Visiting Assistant Professor, Civil Engineering, Stanford University.
1977 - 1980 Stanford University: Research Assistant, Soil Mechanics; Teaching Assistant, Earthquake Engineering and Soil Mechanics; Research Assistant, Soil Mechanics; Research Assistant, Earthquake Engineering; Teaching Assistant, Soil Mechanics.

Professional

1979 - 1984 Research Associate, TERA Corporation, Berkeley, California. Performed seismic hazard analysis of DOE facilities in Central and Eastern United States.
1976 Engineer Compagnie Industrielle de Montage, Paris, France. Developed computer programs for management purposes.
1974 - 1975 Engineering Assistant. Compagnie Industrielle de Montage, Paris France. Project assistant in design and construction of pipelines and ventilation systems.

In the area of consulting, Mr. Chameau has conducted the following studies:

1983 Dynamic Analysis of the Powerhouse Foundation for Lock No. 26 (St. Louis). Converse Consultants, Caldwell, New Jersey.
1983 Foundation Upgrade of Building 7 of Alcoa's Lafayette Works. Aluminum Company of America, Lafayette, Indiana.



- 1983 Behavior of an aspermix slurry wall subject to unbalanced lateral pressures. Slurry Systems, Gary, Indiana.
- 1982 Applications of Probabilistic Methods to Geotechnical Practice. U.S. Army Engineers Waterways Experiment Station, Vicksburg, Miss.
- 1981 Earthquake Emergency Planning at Diablo Canyon: Landslide and Liquefaction Potential of Evacuation Routes. TERA Corporation.
- 1981 Earthquake Risk Analysis for Land Use Planning. TERA Corporation, Berkeley and the Rice Research Center, Houston.
- 1981 Probabilistic Evaluation of Liquefaction Potential. Department of Civil Engineering, Stanford University.
- 1980 - 1981 Effects of the uncertainty in seismic zonation and attenuation relationship on the seismic hazard evaluation in the Eastern United States. TERA Corporation.
- 1979 Liquefaction Potential Evaluation of the Holly Sugar Property, Union City, California.
- 1978 Effects of vibratory sheetpile driving, San Francisco's Outfalls Sewer System.

Honors and Professional Society Memberships

American Society of Civil Engineering Geotechnical Engineering Division
 Soil Dynamics Committee
 Publications Committee
 North American Fuzzy Information Processing Society (NAFIP)
 Sigma Xi
 Medaille d'Argent, Ecole Nationale Supérieure d'Arts

Publications

- Chameau, J. L., Combier, A. and Cuny, B. 1976. "Programme de Calcul par Elements Finish des structures a plaques," These d'Ingenieur, Ecole National Supérieure d'Arts et Metiers, Paris, France.
- Chameau, J. L. and Shah, H. C. 1978. "Dynamic Testing of Gapec Isolators," The John A. Blume Earthquake Engineering Center, Stanford University.

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TERA CORPORATION

- Chameau, J. L., Clough, G. W., Kavazanjian, E. K. and Shah, H. C. 1980. "Risk Analysis for Pore Pressure Build-up During Earthquake Loading," Annual Meeting of the American Geophysical Union, Toronto, Canada.
- Chameau, J. L. 1980. "Probabilistic and Hazard Analysis for Pore Pressure Increase in Soils Due to Seismic Loading," Ph.D. Dissertation, Stanford University, Stanford, California.
- Clough, G. W. and Chameau, J. L. 1980. "Effects of Vibratory Sheetpile Driving," Journal of the Geotechnical Engineering Division, ASCE, Vol. 106, No. GT10.
- Goodman, M. J. and Chameau, J. L. 1981. "Prediction of Embankment Performance," Indiana Academy of Sciences, Wabash College.
- Kavazanjian, E. K. and Chameau, J. L. 1981. "Effective Stress Analysis of Seismically Induced Stability Problems," International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, St. Louis, Missouri.
- Chameau, J. L. 1982. "Seismic Hazard Evaluation for Pore Pressure Increase in Soils," International Conference on Soil Dynamics and Earthquake Engineering, Southampton, England.
- Chang, M. F., Harr, M. E. and Chameau, J. L. 1982. "Static and Seismic Lateral Pressures on Earth Retaining Structures," Civil Engineering Report, Purdue University, West Lafayette, Indiana.
- Chen, R. H. and Chameau, J. L. 1982. "Three-dimensional Slope Stability Analysis," 4th International Conference on Numerical Methods in Geomechanics, Edmonton, Canada.
- Chameau, J. L., Altschaeffl, A. G., Michael, H. L. and Yao, J. T. P., "Potential Application of Fuzzy Sets in Civil Engineering," Int. Journal of Man-Machine Studies, No. 19.
- Chameau, J. L. and Clough, G. W. 1983. "Probabilistic Pore Pressure for Seismic Loading," Journal of Geotechnical Engineering Division, ASCE, Vol. 109, No. 4.
- Chen, R. H. and Chameau, J. L. 1983. "Three-dimensional Limit Equilibrium Analysis of Slopes," Geotechnique 33, No. 1.
- Clough, G. W. and Chameau, J. L. 1983. "Seismic Response of San Francisco Waterfront Fills," Journal of the Geotechnical Engineering Division, ASCE, Vol. 109, No. 4.
- Marciano, E. A., Harr, M. E. and Chameau, J. L. 1983. "Seismic Design and Probability Analysis of Retaining Structures," Civil Engineering Report, Purdue University, West Lafayette, Indiana.



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- Goodman, M. J. and Chameau, J. L. 1984. "Reliability of Slopes Using Point Estimates Procedures," accepted for publication and presentation at the ASCE Specialty Conference on Probabilistic Mechanics and Structural Reliability, Berkeley, California.
- Gunaratne, M., Chameau, J. L. and Altschaeffl, A. G. 1984. "An Introduction to Fuzzy Sets in Pavement Evaluation," accepted for presentation at the Transportation Research Board Annual Meeting.



GREG A. REIMERS
Associate Electrical Engineer

Education

B.S. Electrical Engineering, Purdue University
GE BWR Simulator Training
Fundamentals Boiling Water Reactors
Westinghouse PWR Simulator Training

Summary of Experience

Mr. Reimers has extensive experience in the electric power industry in the areas of nuclear power plant operations and system design.

1983 - Present Associate Electrical Engineer, TERA Corporation.

1983 - Present Senior Engineer, Eigen Engineering, Inc. Provides expertise in system design and system implementation. Experienced in licensing processes associated with plant modification engineering.

1980 - 1983 Unit Supervisor in the Systems Design Group, Nutech Engineers. Oversaw and provided technical guidance for all electrical related work and served as Project Engineer for several projects. As a systems Project Engineer, responsibilities included electrical, mechanical interface, instrumentation and control, nuclear, and human factors engineering for the associated project. He coordinated efforts of other engineering departments.

Included among the many projects at NUTECH for which Mr. Reimers had served as Project Engineer were an FSAR functional control diagram update program for General Electric; equipment qualification justification for interim operation for Cincinnati Gas & Electric, and SRV blowdown control, combustible gas control, and fire protection modifications for Northern States Power. Other projects included suppression pool temperature monitoring, containment atmospheric monitoring, post-accident sampling, and electro-mechanical equipment seismic qualification evaluation.

1974 - 1980 Group Leader, Commonwealth Edison Company. Provided operating design support and implementation at Dresden Station for six years. Had lead technical responsibility for all work on Dresden Unit 1, which included the installation of a new emergency core cooling system, a new reactor protection system, a new offgas system, and a new diesel generator auxiliary power system. Served as member of the On-site Review Committee conducting safety reviews on modification designs and procedure changes for all three units. Also reviewed associated licensing documents.



STATEMENT OF INDEPENDENCE

AFFIDAVIT OF MYLE J. HOLLEY, JR

My name is MYLE J. HOLLEY, JR

I am currently assigned to the team which is conducting an independent design and construction verification at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Babcock and Wilcox Company relating to issues that I am reviewing. I have never been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox Company. I do not own any shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock. Mutual fund or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox.

Signed

MYLE J. HOLLEY, JR.

Sworn and Subscribed Before Me This 4 Day of ^{NOV}~~JULY~~ 1983

Wm. H. Hall, Jr.
Notary Public

My Commission Expires Oct. 1, 1987

My Commission Expires 11-1-1983

STATEMENT OF INDEPENDENCE

AFFIDAVIT OF David Segal

My name is David Segal.

I am currently assigned to the team which is conducting an independent design and construction verification at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Babcock and Wilcox Company relating to issues that I am reviewing. I have never been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox Company. I do not own any shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock. Mutual fund or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox.

Signed

David Segal

Sworn and Subscribed Before Me This 4th Day of NOVEMBER ~~July~~ 1983

Richard Lee Root
Notary Public

My Commission Expires My Commission Expires July 1, 1986

STATEMENT OF INDEPENDENCE

AFFIDAVIT OF PAUL LAWRENCE STREETER

My name is PAUL LAWRENCE STREETER

I am currently assigned to the team which is conducting an independent design and construction verification at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Babcock and Wilcox Company relating to issues that I am reviewing. I have never been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox Company. I do not own any shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock. Mutual fund or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox.

Signed

Paul Lawrence Stetter

Sworn and Subscribed Before Me This 18th Day of November, 1983.

Debbie J. Holter
Notary Public DEBBIE J. HOLTER

My Commission Expires August 6, 1984.



* I WAS EMPLOYED BY BECHTEL POWER CORP. NORWALK CALIF.
FROM 6/72 - 8/73 AND 6/79 - 7/80 WORKING ON
RANCHO SECO AND VOGTLE RESPECTIVELY; AND BY
BECHTEL POWER CORP, HOUSTON, TEXAS FROM 8/73 - 5/74
WORKING ON BLUE HILLS

STATEMENT OF INDEPENDENCE

AFFIDAVIT OF Howard Lambert

My name is Howard Edward Lambert.

I am currently assigned to the team which is conducting an independent design and construction verification at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Babcock and Wilcox Company relating to issues that I am reviewing. I have never been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox Company. I do not own any shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock. Mutual fund or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox.

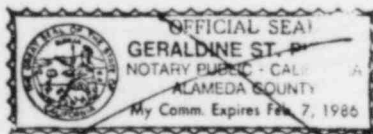
Signed

Howard E. Lambert

Sworn and Subscribed Before Me This 14 Day of December, 1983

Geraldine St. Pierre
Notary Public

My Commission Expires February 7, 1986



STATEMENT OF INDEPENDENCE

AFFIDAVIT OF Jean-Lou Chameau

My name is Jean-Lou Chameau. I am employed by TERA Corporation
(Research Associate)

I am currently assigned to the team which is conducting an independent design and construction verification at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Babcock and Wilcox Company relating to issues that I am reviewing. I have never been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox Company. I do not own any shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock. Mutual fund or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox.

Signed

Jean-Lou Chameau

Sworn and Subscribed Before Me This 9th Day of November 1983

Elnora Hoover
Notary Public

My Commission Expires MY COMMISSION EXPIRES FEBRUARY 13, 1984
ELNORA HOOVER, NOTARY PUBLIC
RESIDENT OF TIPPECANOE COUNTY, INDIANA

STATEMENT OF INDEPENDENCE

AFFIDAVIT OF Greg A. Reimers

My name is Greg A. Reimers. I am employed by TERA Corporation
as Associate Technical Reviewer.

I am currently assigned to the team which is conducting an independent design and construction verification at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Babcock and Wilcox Company relating to issues that I am reviewing. I have never been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox Company. I do not own any shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock. Mutual fund or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Babcock and Wilcox stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Babcock and Wilcox.

Signed

Greg A. Reimers

Sworn and Subscribed Before Me This 2nd Day of November 1983

Vickey M. Gonthier
Notary Public

My Commission Expires Aug. 13, 1984

