

EXHIBIT 1

RESUME OF DR. KRISHNA P. SINGH

RESUME

**KRISHNA P. SINGH, Ph.D.
PRESIDENT & CEO**

EDUCATION

University of Pennsylvania
Ph.D. in Mechanical Engineering (1972)

University of Pennsylvania
M.S. in Mechanical Engineering (1969)

B.I.T. Sindri, Ranchi University
B.S. in Mechanical Engineering (1967)

PROFESSIONAL EXPERIENCE

HOLTEC INTERNATIONAL
Marlton, New Jersey

1986 - Present President and CEO

JOSEPH OAT CORPORATION
Camden, New Jersey

1979 - 1986 Vice President of Engineering

1974 - 1979 Chief Engineer

1971 - 1974 Principal Engineer

R.I.T. ALLAHABAD
India

1967 - 1968 Assistant Professor of Applied Mechanics

LICENSES

Registered Professional Engineer - Pennsylvania (1974 - present)

Registered Professional Engineer - Michigan (1980 - present)

PROFESSIONAL MEMBERSHIPS/ACTIVITIES

Fellow of the ASME; Member ANS; Chairman, TEMA Vibration Committee (1979 - 1986); Chairman, PVP Committee Of the ASME, Nuclear Engineering Division (1988-92); Member, ASME O&M Committee (1991 to present); Member ASCE (1977-83), Member, Heat Exchange Institute (1976-86).

PATENTS

"Heat Exchanger for Withstanding Cycle Changes in Temperature" (with M. Holtz and A. Soler), Patent No. 4,207,944 (1980).

"Radioactive Fuel Cell Storage Rack" (with M. Holtz), U.S. Patent No. 4,382,060 (May, 1983).

BOOKS AND ARCHIVAL VOLUMES (authored or edited):

1. "Mechanical Design of Heat Exchangers and Pressure Vessel Components", (with A. I. Soler), Arcturus Publishers, Cherry Hill, New Jersey, 1100 pages, hardbound (1984).
2. "Theory and Practice of Heat Exchanger Design", Arcturus Publishers (c. 1995).
3. "Feedwater Heater Workshop Proceedings", with Tom Libs, EPRI 78-123 (1979).
4. "Feedwater Heater Technology: State-of-the-Art", EPRI - cs - 4155 (1985).
5. "Analytical Correlations of Fluid Drag of Fuel Drag of Fuel Assemblies in Fuel Rack Storage Locations", EPRI Project RP-2124.
6. "Thermal/Mechanical Heat Exchanger Design", ASME, PVP - Vol. 118 (1986).
7. "Time Dependent and Steady State Characterization of the CAES Recuperator", EPRI TR-104224 (July 1994).
8. "Pressure Vessels, Heat Exchangers and Piping", Proc. ASME, IEEE Joint Power Generation Conference, NE-14 (1994).

EXPERT WITNESS AND TECHNOLOGY APPRAISAL SERVICES

1. Pacific Gas & Electric Company vs. National Sierra Club (1986-87).
2. Florida Power & Light Company vs. Stuart Intervenor Group (1990).
3. Duquesne Light Company vs. Westinghouse (1993-).
4. Portland General Electric vs. Westinghouse (1993-).
5. Houston Light and Power (1994-).
6. Pacific Northwest Laboratories, Rockwell International, and U.S. DOE vs. RSI (1994-).

ACADEMIC ACTIVITIES

Chair, Advisory Committee On Mechanical Engineering and Mechanics, University of Pennsylvania (1993-)

**Professor (Adjunct) in Mechanical Engineering and Mechanics, University of Pennsylvania (1986-92),
Graduate and Undergraduate Courses in Heat Transfer Equipment**

CONTINUING EDUCATION COURSES OFFERED ON HEAT EXCHANGE AND STEAM GENERATION

1. I.I.T. Bombay, One Week Course on Heat Exchanger Design (1979).
2. Duke Power Company, Charlotte, NC (1982, 1983, 1986, 1990) - In-house Course on Heat Exchanger Design and Testing.
3. National Italian Reactor Authority, Genoa, Italy - On Condensers, Steam Generators, and Moisture Separator Reheaters (1985).
4. Mississippi Power & Light Company, In-House Course on Moisture Separator Reheaters and Surface Condensers (1987).
5. Center for Professional Advancement (1988, New Brunswick, NJ; 1990, Caracas, Venezuela; 1991, Houston, Texas; 1992, Amsterdam, Holland).

CONSULTING

Consultant to Electric Power Research Institute (EPRI); Pressure Vessel Research Council (PVRC); Tubular Exchanger Manufacturers Association (TEMA); Department of Energy (DOE) (Idaho Operations); Department of Energy (DOE) (Chicago Operations); American Electric Power Corporation; Baltimore Gas and Electric; Carolina Power & Light; Commonwealth Edison Company; Detroit Edison Company; Duke Power Company; Entergy Operations; GPU Nuclear; Iowa Electric Light and Power; New York Power Authority; Niagara Mohawk Power Corporation; North Atlantic Energy Services; Northeast Utilities; Northeast Nuclear Energy; Pacific Gas and Electric Company; PECO Energy; Southern Nuclear Operating Company; Tennessee Valley Authority.

PUBLICATIONS

1. "A Method for Solving Ill-Posed Integral Equations of the First Kind", (with B. Paul), Computer Methods in Applied Mechanics and Engineering 2 (1973) 339-348.
2. "Numerical Solutions of Non-Hertzian Elastic Contact Problems", (with B. Paul), Journal of Applied Mechanics, Vol. 41, No. 2, 484-490, June, 1974.
3. "On the Inadequacy of Hertzian Solution of Two Dimensional Line Contact Problems", Journal of the Franklin Institute, Vol, 298, No. 2, 139-141 (1974).
4. "How to Locate Impingement Plates in Tubular Heat Exchangers", Hydrocarbon Processing, Vol. 10, 147-149 (1974).
5. "Stress Concentration in Crowned Rollers", (with B. Paul), Journal of Engineering for Industry, Trans. ASME, Vol. 97, Series B, No. 3, 990-994 (1975).
6. "Application of Spiral Wound Gaskets for Leak Tight Joints", Journal of Pressure Vessel Technology, Trans. ASME, Vol. 97, Series J, No. 1, 91-93 (1975).

7. "Contact Stresses for Multiply-Connected Regions - The Case of Pitted Spheres:", with B. Paul and W. S. Woodward, Proceedings of the IUTAM Symposium on Contact Stresses, August 1974, Holland, Delft University Press, 264-281, (1976).
8. "Design of Skirt-Mounted Supports:", Hydrocarbon Processing, Vol. 4, 199-203, April 1976.
9. "Predicting Flow Induced Vibration in U-Bend Regions of Heat Exchangers - An Engineering Solution". Journal of the Franklin Institute, Vol. 302, No. 2, 195-205, August 1976.
10. "A Method to Design Shell-side Pressure Drop Constrained Tubular Heat Exchangers", with Mr. Holtz, Journal of Engineering for Power, Trans. of the ASME, Vol. 99, No. 3 July 1977, pp 441-448.
11. "An Efficient Design Method for Obround Pressure Vessels and Their End Closures", International Journal of Pressure Vessel and Piping, Vol. 5, 1977, pp 309-320.
12. "Analysis of Vertically mounted Through-Tube Heat Exchangers", Journal of Engineering for Power, Trans. ASME, Vol. 100, No. 2, April, 1978, pp 380-390.
13. "Study of Bolted Joint Integrity and Inter-Tube-Pass Leakage in U-Tube Heat Exchangers: Part I - Analysis", Journal of Engineering for Power, Trans. ASME, Vol. 101, No. 1, pp 9-15 (1979).
14. "Study of bolted Joint Integrity and Inter-Tube-Pass Leakage in U-Tube Heat Exchangers, Part II - Applications", Journal of Engineering for Power, Trans. ASME, Vol. 101, No. 1, pp 16-22 (1979).
15. "On Thermal Expansion Induced Stresses in U-Bends of Shell-and-Tube Heat Exchangers", (with Maurice Holtz); Trans. ASME, Journal of Engineering for Power, Vol. 101, No. 4, October, 1979, pp. 634-639.
16. "Heat Transfer Characteristics of a Generalized Divided Flow Heat Exchanger", Proceedings of the Conference on Industrial Energy Conservation Technology, Houston, Texas, pp 88-97 (1979).
17. "An Approximate Analysis of Foundation Stresses in Horizontal Pressure Vessels", (with Vincent Luk), Paper No. 79-NE-1, Trans. ASME, Journal of Engineering for Power, Vol. 102, No. 3, pp 555-557, July, 1980.
18. "Generalization of the Split Flow Heat Exchanger Geometry for Enhanced Heat Transfer", (with Michael Holtz), AIChE. Symposium Series 189, Vol. 75, pp 219-226 (1979).
19. "Analysis of Temperature Induced Stresses in the Body Bolts of Single Pass Heat Exchangers", ASME Winter Annual Meeting, Paper No. 79 QA/NE-7, New York, NY, 1979.
20. "Optimization of Two-Stage Evaporators for Minimizing Rad-Waste Entrainment", (with Maurice Holtz), Journal of Mechanical Design, Trans. of the ASME, Vol. 102, No. 4, pp 804-806 (1980).

21. "A Comparison of Thermal Performance of Two and Four Tube Pass Designs for Split Flow Shells", (with M. J. Holtz), *Journal of Heat Transfer, Trans. of the ASME*, Vol. 103, No. 1, pp 169-172, February, 1981.
22. "A Method for Maximizing Support Leg Stress in a Pressure Vessel Mounted on Four Legs Subject to Moment and Lateral Loadings". *International Journal of Pressure Vessels and Piping*, Vol. 9, No. 1, pp 11-25 (1981).
23. "Design, Stress Analysis and Operating Experience in Feedwater Heaters", (with Tom Libs), *Proceedings of the Conference on Industrial Energy Conservation Technology*, Houston, pp 113-118 (1980).
24. "On the Necessary Criteria for Stream Symmetric Tubular Heat Exchanger Geometries", *Heat Transfer Engineering*, Vol. 3, No. 1 (1981).
25. "Some Fundamental Relationships for Tubular Heat Exchanger Thermal Performance", *Trans. ASME, Journal of Heat Transfer*, Vol. 103, pp 573-578 (1981).
26. "Transient Swelling of Liquid Level During Pool Boiling in an Emergency Condenser", (with J. P. Gupta). *Letters in Heat and Mass Transfer*, Vol. 8, No. 1, pp 25-33, Jan/Feb., 1981.
27. "An Approximate Method for Evaluating the Temperature Field in Tubesheet Ligaments Under Steady State Conditions", (with M. Holtz), *Journal of Engineering for Power, Trans. ASME*, Vol. 104, pp 895-900 (1982).
28. "Feasibility Study of A Multi-Purpose Computer Program to Optimize Power Cycles for Operative Plants", (with Y. Menuchin and N. Hirota), *Proceedings of the Conference on Industrial Energy Conservation Technology*, Houston, (1981).
29. "Design Parameters Affecting Bolt Load in Ring Type Gasketed Joints", (with A. I. Soler), *Trans. ASME, Journal of Pressure Vessel Technology*, Vol 105, pp 11-13 (1983).
30. "A Design Concept for Minimizing Tubesheet Stress and Tubejoint Load in Fixed Tubesheet Heat Exchangers", (with A. I. Soler), *Trans. ASME (C)*, 1982).
31. "Dynamic Coupling in a Closely Spaced Two-Body System Vibrating in Liquid Medium: The Case of Fuel Racks", (with A. I. Soler), *Proceedings of the Third International Conference on "Vibration in Nuclear Plant"*, Keswick, England, May, 1982, pp. 815-834.
32. "Effect of Nonuniform Inlet Air Flow on Air Cooled Heat Exchanger Performance", (with A. I. Soler and Lee Ng), *Proceedings of the Joint ASME-JSME Heat Transfer Conference*, 1983, pp. 537-542.
33. "Seismic Response of Free Standing Fuel Rack Constructions to 3-D Motions", (with A. I. Soler), *Nuclear Engineering and Design*, Vol. 80, (1984), pp. 315-329.
34. "A Method for Computing Maximum Water Temperature in a Fuel Pool Containing Spent Nuclear Fuel", *Heat Transfer Engineering, Hemisphere*, Dec. (1986).

35. "On Minimization of Radwaste Carry-Over in a N-stage Evaporator", (with Maurice Holtz and Vincent Luk), Heat Transfer Engineering, pp. 68-73, Vol. 5, No. 1-1 (1984).
36. "Feedwater Heater Procurement Guidelines - Some New Performance Criteria", Symposium on State-of-the-art Feedwater Heater Technology, EPRI (c. 1984).
37. "Method for Quantifying Heat Duty Derating due to Inter-Pass Leakage in Bolted Flat Cover Heat Exchangers", Heat Transfer Engineering, pp. 19-23, Vol. 4, No. 3-4 (1983).
38. "On Some Performance Parameters for Closed Feedwater Heaters, Journal of Pressure Vessel Technology, Trans. ASME (1987).
39. "A Design Procedure for Evaluating the Tube Axial Load Due to Thermal Effects in Multi-Pass Fixed Tubesheet Heat Exchangers", (with A. I. Soler), Journal of Pressure Vessel Technology, Trans. ASME (1987).
40. "An Elastic-Plastic Analysis of the Integral Tubesheet in U-Tube Heat Exchangers - Towards an ASME Code Oriented Approach", Int. Journal of Vessel and Piping (c. 1987).
41. "Feedwater Heaters", Heat Transfer Equipment Design, R. Shal et. al (editor), Hemisphere (c. 1988).
42. "Surface Condensers", Heat Transfer Equipment Design, R. Shal et. al (editor), Hemisphere (c. 1988).
43. "Flow Induced Vibration", Heat Transfer Equipment Design, R. Shal et. al (editor), Hemisphere (c. 1988).
44. "Mechanical Design of Heat Exchangers", Heat Transfer Equipment Design, R. Shal et. al (editor), Hemisphere (c. 1988).
45. "A Rational Method for Analyzing Expansion Joints": (with A. Soler), ASME, Journal of Pressure Vessel Technology (c. 1988).
46. "An Analysis of the Improvement in the Thermal Performance of Surface Condenser Equipped with Tweener Supports", ASME Joint Power Generation Conference, Miami (Oct. 1987).
47. "Pressure Vessels - Design & Operation", Chemical Engineering, pp 62-70, Chemical Engineering, July 1990, McGraw Hill, N.Y.
48. "Spent Fuel Storage Options: A Critical Appraisal", Power Generation Technology, pp 137-140, Sterling Publications, U.K. (1990-91).
49. "Design Strength of Primary Structural Welds in Free-Standing Structures", with A.I. Soler and S. Bhattacharya, Journal of Pressure Vessel Technology, Trans. ASME (c' 1991).
50. "Seismic Qualification of Free-Standing Nuclear Fuel Storage Modules - The Chin Shan Experience", Nuclear Engineering International, U.K. (March, 1991).

51. **"Transient Response of Large Inertia Cross Flow Heat Exchangers", with Y. Wang, A.I. Soler and K. Iulianetti, ASME 91-JPGC-NE-27 (1991).**
52. **"Some Results from Simultaneous Seismic Simulations of All Racks in a Fuel Pool", with A.I. I. Soler, INNМ Spent Fuel Management Seminar X, Washington, D.C., January, 1993.**
53. **"A Case for Wet Storage", INNМ Spent Fuel Management Seminar X, Washington, D.C., January, 1993.**
54. **"Application of Transient Analysis Methodology to Heat Exchanger Performance Testing" with I. Rampall and Benjamin H. Scott, ASME Joint Power Generation Conference, October, 1994.**
55. **"Predicting Thermal Performance of Heat Exchangers Using In-Situ Testing and Statistical Correlation", with K. Iulianetti and Benjamin H. Scott, ASME Joint Power Generation Conference (1994).**
56. **"Shellside Boiling in Narrow Crevices", with I. Rampall (to be submitted for publication, Heat Transfer Engineering (ca. 1996)).**