

DOUGLAS G. ELLIOT

CURRENT POSITION: SENIOR ADVISOR

PROFESSIONAL EXPERIENCE: 50 YEARS

- Offshore production/processing facilities
- Process design and development associated with natural gas processing plants with emphasis on cryogenic processes
- Alternate energy development
- Sundry oil and gas projects including cryogenic turboexpander, propane refrigeration, dewaxing facilities and condensate stabilization. Several cryogenic plants included fractionation and gas and liquid treating facilities.
- Development of GPA process design procedures including: "Thermophysical Property Prediction Methods" and "Equilibrium K-Value Correlations"
- Consultancy on thermo-physical property correlation and data on cryogenic hydrocarbon mixtures
- Expert Testimony and Consultant to oil and gas operating companies

ACADEMIC QUALIFICATIONS

B.S.Ch.E., Oregon State University

M.S.Ch.E., University of Houston

Ph.D., University of Houston

Post Doctorate, Fellow, Rice University

Adjunct Professor of Chemical Engineering, Rice University

Advisory Board, Center for Chemical Processing Technology, Rice University

Industrial Advisory Committee, Oklahoma State University

Advisory Board, Petroleum Extension Service (PETEX), University of Texas

Member, E&C Forum Steering Council, Rice University

PROFESSIONAL ACTIVITIES, AWARDS AND LISTINGS

- Editorial Board and Associate Editor "Journal of Natural Gas Science and Engineering", Elsevier Publisher.
- Bechtel Fellow (elected 1997)
- Fellow Member of the AIChE
- Member, New York Academy of Sciences
- Citation for Service awarded by the Gas Processors Association for dedicated service and outstanding leadership in the natural gas and gas processing industries (1998)

DOUGLAS G. ELLIOT
PROFESSIONAL ACTIVITIES, AWARDS AND LISTINGS (Continued)

- Recipient of the Outstanding Technical Papers Award, Bechtel Corporation, 1999, 2003 and 2007 (Third paper)
- Program Committee and Session Chairman at 78th Annual Gas Processors Association National Convention, Nashville, Tennessee, 1999
- Session Chairman for 3rd Geopressured Geothermal Energy Conference, November 1977 and for 83rd National AIChE Exposition, March 1977
- Technical Program Chairman for 86th National AIChE Meeting 1979
- Program Committee Member, Gas Processors Association, Tulsa, Oklahoma
- Chairman for Texas Solar Energy Society Industrial Committee
- Member of Texas Solar Energy Society Executive Committee
- Member of Gas Processors Association K-Value Steering Committee since 1972
- Member of Texas Energy Council Advisory Committee
- South Texas Chapter of AIChE (past Chairman, Secretary, etc.)
- Citation for Professional Achievement in Chemical Engineering, Davy McKee International, 1983
- Recipient of the Outstanding Achievement Award, 1976, from Texas Society of Professional Engineers
- Centers of Excellence Review Panel, Oklahoma Center for the Advancement of Science and Technology, 1989-1997
- Editorial Review Board, Energy Progress Magazine
- Chairman, Applied Research Review Panel, Oklahoma Center for the Advancement of Science and Technology, 1989, 1990 and 1997
- Cited in Marquis Who's Who in the South and Southwest, Who's Who in Finance and Industry, Who's Who in the World, and Who's Who in Science and Engineering
- Bechtel Award of Merit, 1991, 1992, 1997
- Cited in the Greater Houston Honor Roll, Who's Who in Houston, 1990
- Gas Research Institute Review Committee
- Member Society of Petroleum Engineers
- Director of the Fuels and Petrochemicals Division of the AIChE
- Chairman of the GPSA Data Book Committee on Physical Properties
- Secretary of the Houston Chapter of the Gas Processors Association

PROFESSIONAL EXPERIENCE

<u>PERIOD</u>	<u>COMPANY, POSITION AND ACTIVITIES</u>
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1998 - Present	IPSI LLC (formerly International Process Services, Inc.) PRESIDENT AND CHIEF OPERATING OFFICER
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Responsible for the operations of a process engineering consulting company partially owned by Bechtel Corporation. Responsibilities include business development, proposal preparation, contract negotiation, home office administration, project management, technology development and membership on the Board of Directors.

- Served as Corporate Technical Sponsor/Study Manager for:
 - Kuwait Oil Company – Technical services related to crude oil vapor recovery (dispute resolution)
 - Nexant Ltd. – Feasibility study of LNG liquefaction facilities in Venezuela
 - ExxonMobil, Alabama – Technical services related to upgrade of Big Escambia Creek Plant (dispute resolution)
 - Nexant Ltd., Turkmenistan – Study related to Turkmenistan Petrochemical Complex NGL Recovery Plant
 - BP Amoco Corporation, Denver – Evaluation of commercially available processes to remove H₂S, or both H₂S and COS, in the NGL product at the Hugoton N₂ rejection, He and NGL recovery plant to enable the NGL product to meet a No. 1 Copper Strip Test. (Kansas)
 - BP Amoco Corporation, Houston – Developed a process design package for an NGL facility in Egypt, utilizing IPSI's Enhanced NGL Recovery Process. An alternate option performed was a process study identifying integration opportunities of the NGL facilities with an LNG plant.
 - ADNOC – CO₂ Recovery (turbine exhaust, boiler flue gas and SRU incinerator) for EOR in the BAB Oil Field (Abu Dhabi)
 - ADNOC – CO₂ Recovery from associated gas for EOR in the BAB oil field (Abu Dhabi)
 - Gulf Indonesia Resources – Process selection study for 50% CO₂-containing gas stream (50 mmscfd). Selexol technology was recommended. (South Sumatra)
 - Esso Australia – Expert testimony related to Longford Gas Plant Explosion (Melbourne, Australia)

DOUGLAS G. ELLIOT
PROFESSIONAL EXPERIENCE (Continued)

- Amoco Production Company Hugoton Plant. Prepared FEED package for 550 mmscfd cryogenic plant including NRU, He recovery and NGL recovery (Kansas)
- Maxus Energy Sunray Gas Plant. Prepared process bid package for 200 mmscfd cryogenic plant including N₂ rejection, He recovery, NGL recovery, inlet treating and sulfur recovery (Texas)
- Mesa Inc. Fain Plant. Provided FEED package plus project services for 40 mmscfd cryogenic expansion of existing plant with N₂ rejection, He recovery, treating, and NGL recovery (Texas)
- Mesa Inc. Satanta Plant. Prepared FEED package plus project services for 250 mmscfd cryogenic plant including N₂ rejection, He recovery and NGL recovery (Kansas)
- Colorado Interstate Gas Company Lakin Plant. Provided FEED package for 70 mmscfd cryogenic plant including N₂ rejection, He recovery, treating and NGL recovery (Kansas)
- AID, Manager of Russian Flare Gas Study
- Consultant to Abu Dhabi National Oil Company (ADNOC) on the Thammama Onshore Gas Development Project (1.9 billion scf/d). Facilities include selective gas treating, 3000 T/D sulfur recovery, propane plus NGL recovery, fractionation, product treating, condensate stabilization and pipelines.
- Trident NGL, Inc. Process and Utility Study. Manager of a study for modifying the existing Jayhawk plant in Ulysses, Kansas. The study developed a lean oil absorption scheme with a new cold box for high propane, helium recovery and nitrogen rejection. The study also proposed a high efficiency expander plant and maximized the utilization of existing equipment for low capital investment.
- Asamera Oil Company Gas Plant Study. Manager of a study for a conceptual gas plant in South Sumatra, Indonesia. The plant treats 490 MMscfd of high CO₂ content feed gas producing sweet sales gas and recovers LPG and condensate. The study investigated several current gas treating technologies and selected a combination of CO₂ removal with membranes and MDEA for the final design and cost estimate.
- Mesa, Inc. Performed "Expert Testimony" in litigation related to the development and operation of gas processing facilities (NRU) located near the Panhandle West Gas Field, Amarillo, Texas
- Warren Petroleum Company, Como Plant. Expert testimony related to the operation of the NRU (East Texas)

DOUGLAS G. ELLIOT
PROFESSIONAL EXPERIENCE (Continued)

- SANTOS Ltd. Process selection and FEED package for ethane treating and compression plant (Moomba, Australia)

1985 - 1986 D. G. ELLIOT AND ASSOCIATES, INC.
PRESIDENT AND GENERAL MANAGER

Responsible for the entire operations of the company and technical marketing worldwide.

- Norsk Hydro. State of the art N₂ production for injection into the Ekofisk Field for pressure maintenance (North Sea)
- Management Consultant to Norsk Hydro
- Helped develop the project procedures for the Oseberg Field Development project for Norsk Hydro

1978 - 1985 DAVY MCKEE
From 1983 VICE PRESIDENT, OIL AND GAS
1982 - 1983 MANAGER, PROCESS ENGINEERING

Responsible for the supervision of a forty-man Process Engineering Department. Also responsible for the direction and coordination of process design and development related to the following technologies:

- Oil and Gas (Worldwide Technical Center)
- Chemicals and Petrochemicals
- Refining
- Polymers

1978 - 1982 PROCESS ENGINEERING MANAGER, OIL AND GAS

Process design and development of a variety of projects including:

- Asamera, Ramba/Tanjung Laban, South Sumatra, Indonesia. Front end engineering package and optimization studies for 20,000 BPD crude production, transportation and gas injection systems
- H₂S removal, crude stabilization, gas treating, and offsites for offshore production facilities, Lake Maracaibo, Venezuela

DOUGLAS G. ELLIOT
PROFESSIONAL EXPERIENCE (Continued)

- Cooper Basin Liquids Project for SANTOS Ltd. in South Australia. 900 MMscfd expander plant for ethane and LPG recovery including front-end gas treating, product fractionation, product treating and crude stabilization (served as corporate technical sponsor for project). Ethane was employed as a miscible injectant for EOR.
- Modification for increased ethane recovery of an existing 850 MMscfd cascade refrigeration gas plant owned by Tennessee Gas Pipeline Company
- Coalinga Nose Gas Processing Plant designed for 94% propane recovery, including modification of existing depropanizer, debutanizer and liquid product treating facilities. Plant owner is Union Oil of California.
- Conversion of the Ten Section Field into peak shaving gas storage facilities. Project involved gas gathering system, wellhead facilities, liquid extraction plant, crude oil stabilization and waste water treating. Also included 20,000 BHP gas turbine-driven injection facilities with waste heat cogeneration. Southern California Gas at Bakersfield, California.
- Study to change propane refrigeration plant into an expander plant, including the addition of LPG fractionation facilities. Santa Clara Gas Plant, Union Oil of California.
- Port Hudson Nitrogen Rejection Study for Amoco Production Company. A 60 MMscfd nitrogen rejection plant (turboexpander) was designed. The nitrogen content in the inlet gas varied from 3% to 85% as a result of an enhanced oil recovery (EOR) project. The process will handle the entire variation in nitrogen content for either LPG recovery or no LPG recovery cases.
- Gas Processing Seminars. Managed and conducted training courses in South America for Meneven, Intevp, Corpoven and Maraven. These seminars developed into paid studies related to EOR and sulfur treating/recovery. Further, Davy McKee was contracted by Amoco Production Company to organize and conduct in-house training programs for advanced gas process engineering.

1970 - 1978

MCDERMOTT HUDSON ENGINEERING, HOUSTON, TEXAS
SECTION LEADER OF PROCESS DEVELOPMENT GROUP

Responsible for eight engineers and a lab technician. Duties included supervision of process development and alternate energy development programs in addition to conventional process design and project management duties for both onshore and offshore projects. Supervised the design of onshore and offshore hydrocarbon production and processing systems for:

- Gulf of Suez gas lifting facilities for Amoco International
- Jebel Ali Gas Plant for Dubai Natural Gas Company

11/11/2008

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PROFESSIONAL EXPERIENCE (Continued)

- Safaniya offshore gas gathering and compression complex for ARAMCO Udang "A" production platform for Conoco Indonesia
- Eugene Island Block 333B oil production platform for Mobil Oil Corporation
- Hondo Platform in the Santa Barbara Channel utilized for oil/gas production for Exxon USA
- MMscfd turboexpander plant with propane refrigeration, dewaxing and condensate stabilization for Kerr McGee Corporation in Canadian, Texas
- Ethane recovery facilities for Superior Oil Company in South Louisiana. Included modification of existing 300 MMscfd oil absorption plant and addition of a 30 MMscfd turboexpander plant. Cryogenic plant included a deethanizer and MEA treating facilities.
- Responsible for development and evaluation of thermophysical property prediction methods for McDermott Hudson's process design procedures

1970 – 1971 CONSULTANT AND POST DOCTORAL FELLOW
RICE UNIVERSITY

- Revised "Equilibrium K-Value" section of the NGPSA Data Book for the Natural Gas Processors Association (1972 edition).
- Acted as consultant on thermophysical property correlations and data on hydrocarbon mixtures for McDermott Hudson Engineering
- Developed the computer program to predict K-Values from the 1972 edition of the NGPSA Data Book. This program is now distributed by the Gas Processors Association.

1964 - 1966 HUMBLE OIL REFINING COMPANY
PRODUCTION/RESERVOIR ENGINEER

Responsible to District Manager for design of well completion processes initiating pumping and gas lift. Experience in production, drilling operations, workover, and secondary recovery, especially waterflood.

PATENTS

- "Enhanced NGL Recovery Processes", J. Yao, J. J. Chen, D. G. Elliot, U.S. Patent Number 5,992,175, November 30, 1999.

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PATENTS (Continued)

- "Process for Separating Selected Components From Multi-Component Natural Gas Streams", D. G. Elliot and J. J. Chen. U. S. Patent Number 5,660,603, August 26, 1997.
- "Method and Apparatus for the Purification of High CO₂ Content Gas", J. Yao, J. Chen, and D. G. Elliot. U. S. Patent Number 4,563,202, January 7, 1986.
- "Method and Apparatus for the Purification of High N₂ Content Gas", J. Yao, J. J. Chen, and D. G. Elliot. U.S. Patent Number 4,588,427, May 13, 1986.
- "Propane Recovery Methods", D. G. Elliot, J. Yao, J. J. Chen, R. J. Lee. U. S. Patent Number 6,116,050, September 12, 2000.
- "Flexible Reflux Process for High NGL Recovery", D. G. Elliot, J. Yao, J. J. Chen, R. J. Lee, P. Jain. U.S. Patent 6,453,698 B2, September 24, 2002.
- "Lean Reflux Process for High Recovery of Ethane and Heavier Components", R. J. Lee, J. Yao, J. Chen, D. G. Elliot. U. S. Patent Number 6,244,070, June 12, 2001.
- "Enhanced NGL Recovery Using Refrigeration and Reflux From LNG Plants", D. G. Elliot, J. Yao, J. J. Chen, R. J. Lee. U. S. Patent Number 6,401,486 B1, June 11, 2002.
- "Split Feed Compression for High Recovery of Ethane and Heavier Components", D. G. Elliot, P. Jain, R. J. Lee, R. Chen and J. Yao., U. S. Patent No. 6,354,105 B1, March 12, 2002.
- "Mixed Refrigerant for Gas Turbine Inlet Air Cooling", R. J. Lee, J. J. Chen, P. Jain, J. Yao and D. G. Elliot. Patent Pending, Application No. 60/251,928 (2000).
- "Hybrid Refrigeration Cycle for Combustion Turbine Inlet Air Cooling", Lee, R. J., Chen, J. J., Jain, P., Yao, J. and Elliot, D. G. U.S. Patent No. 6,457,315 B1, October 1, 2002.
- "LNG Facility with Integrated NGL Extraction Technology for Enhanced NGL Recovery and Product Flexibility", W. Qualls, W. L. Ransbarger, S. S. Huang, J. Yao, D. G. Elliot, J. J. Chen, and R. J. Lee. U.S. Patent Application No. 11/426,026 and Foreign Equivalents Thereof filed June 23, 2006.
- "Internal Refrigeration for Enhanced NGL Recovery", R. J. Lee, Y. Zhang, J. Yao, J. J. Chen, D. G. Elliot. U.S. Patent No. 7,257,966 B2, August 21, 2007.
- Wei Yan, Jame Yao, Douglas G. Elliot, Shawn S. Huang, Bobby Kassamali, Mark Elkins, "Fractionation of Hydrogen Sulfide Rich Sour Gas and Methods of use". New U.S. Patent Application Serial No. 12/958,909, December 2, 2010.

MONOGRAPH

- "LNG: Basics of Liquefied Natural Gas", Stanley Huang, Chen-Hwa Chiu, Doug Elliot. Published by The University of Texas, Continuing Education, Petroleum Extension Service, Austin, Texas, 2007.
- "Plant Processing of Natural Gas", Doug Elliot, J.C. Kuo, Pervaiz Nasir. Published by The University of Texas, Continuing Education, Petroleum Extension Service, Austin, Texas, 2008.

PUBLICATIONS

- "A Cell for Measuring the Influence of Magnetic Fields on the Thermal Conductivity of Polyatomic Gases", D. G. Elliot, J. Vevai and W. I. Honeywell. Review of Scientific Instruments
- "Large Magnetic Field Effect on Oxygen Gas Thermal Conductivity at 77°K", D. G. Elliot, J. E. Vevai and W. I. Honeywell. Physics Letters, Volume 38A, No. 4, February 1972.
- "Resistance Thermometry in Magnetic Fields: I. Thermistors and Platinum Resistance Thermometers at 77°K", D. G. Elliot, J. Vevai and W. I. Honeywell. Cryogenics, June 1972.
- "A Discussion of the 1972 NGPSA Convergence Pressure K-Value Charts: Methane, Ethane, and Propane", D. G. Elliot and Warren E. White. Proceedings of the Fifty-Second Annual Convention, Gas Processors Association, Dallas, Texas, March 1973.
- "Thermal Conductivity Measurements on N₂, CO, CH₄ and NO from 77K-310K---The Senftleben-Beenakker Effect", D. G. Elliot, J. E. Vevai and W. I. Honeywell. Proceedings of the Sixth Symposium on Thermophysical Properties, American Society of Mechanical Engineers, Atlanta, Georgia, 1973.
- "Vapor Liquid Equilibria in the Neighborhood of the Critical Point in Methane-n-Hydrocarbon Systems", D. G. Elliot, N. F. Carnahan, J. J. Chen, P. S. Chappellear, R. Kobayashi. Presented to UIPAP, Van der Waals Centennial Conference on Statistical Mechanics, Amsterdam, The Netherlands, August 1973.
- "Documentation for VLE Data in 1972 Engineering Data Book", D. G. Elliot, J. S. Smithies and E. Perry. Gas Processors Association, July 1974.
- "Vapor-Liquid Equilibrium of Methane-n-Butane System at Low Temperatures and High Pressures", D. G. Elliot, J. J. Chen, P. S. Chappellear, and R. Kobayashi. J. Chem Engineering Data 19, (1974) pg. 71.

DOUGLAS G. ELLIOT
PUBLICATIONS (Continued)

- "Benefits of GPA-Sponsored Research: A Contractor's View", D. G. Elliot, W. E. White and R. L. McKee. Proceedings of the Fifty-Fifth Annual GPA Convention, Gas Processors Association, San Antonio, Texas, March 1976.
- "Performance Comparison Between Flat Plate and Moderately Concentrating Solar Energy Collectors", R. B. Bannerot, J. R. Howell, D. G. Elliot and J. M. Reber. Proceedings of the American Institute of Aeronautics and Astronautics 11th Thermophysics Conference, San Diego, California, July 1976.
- "K-Values for the Methane-n-Butane, Methane-n-Pentane, and Methane-n-Hexane Systems", D. G. Elliot, Y. N. Lin, T. C. Chu, P. S. Chappellear and R. Kobayashi. Gas Processors Association Research Report No. RR-20, September 1976.
- "Thermophysical Properties: Their Effect on Cryogenic Gas Processing", D. G. Elliot, J. J. Chen, R. S. Chappellear and R. L. McKee. Presented at the Engineering Foundation Conference on the Estimation and Correlation of Phase Equilibria and Fluid Properties in the Chemical Industry, Pacific Grove, California, January 1977.
- "An Evaluation of Thermophysical Property Correlations Distributed by the GPA", P. S. Chappellear, J. J. Chen and D. G. Elliot. Proceedings of the Fifty-Sixth Annual Convention, Gas Processors Association, Dallas, Texas, March 1977.
- "The Design and Operation of McDermott Hudson's Solar Heated Office Building", D. G. Elliot. Presented to the Houston Solar Energy Society, Houston, Texas, December 1976.
- "Pick K Correlations Carefully", P. S. Chappellear, J. J. Chen and D. G. Elliot. Hydrocarbon Processing, September 1977.
- "Solar Heating and Cooling for Commercial Buildings in Houston". Presented at the "The Sun and You" Conference, Houston, Texas, June 1977. Sponsored by the Energy Institute at the University of Houston and the Houston Solar Energy Society.
- "A Solar Assisted Heat Pump System for Commercial Buildings". Presented at the Regional Meeting of the American Society of Heating and Air Conditioning Engineers, Houston, Texas, May 1977.
- "Low Temperature Thermal Conductivity Measurements with a Superconducting Magnet", D. G. Elliot, J. Vevai and W. I. Honeywell, University of Houston. Presented at the March 1970 Meeting of the American Physical Society in Dallas, Texas.
- "Numerical Computer Solutions of Two Dimensional Bounded Heat Conduction Problems by the Relaxation Method". Presented to the 1963 Regional Meeting for the AIChE Student Chapters at the University of Idaho, Moscow, Idaho.

DOUGLAS G. ELLIOT
PUBLICATIONS (Continued)

- "Thermal Conductivity Measurements on Polyatomic Gases in Magnetic Fields", D. G. Elliot, J. Vevai and W. I. Honeywell, University of Houston. Presented at the 68th National AIChE Meeting, Houston, Texas, February 1971.
- "The Energy Crisis, Can the Various Forms of Solar Contribute?" Presented to the School of Ocean Engineering, Texas A&M University, March 2, 1977.
- "Annual Solar Insulation Data for Houston, Texas", D. G. Elliot, G. Way and J. Howell. Published by the University of Houston Energy Institute.
- "Solar Energy". Presented to the district meeting of Phi Theta Kappa, San Jacinto College, Houston, Texas, November 1977.
- "The Prediction of Cryogenic CO₂ Solubility in Light Hydrocarbon Mixtures", J. J. Chen, V. W. Liaw and D. G. Elliot. Presented at the 86th National AIChE Meeting, Houston, Texas, April 1979. Presented at the 1979 Cryogenic Engineering Conference, University of Wisconsin, Madison, Wisconsin, August 1979.
- "Data Requirements in Gas and Liquid Treating", R. K. Goel, J. J. Chen and D. G. Elliot. Proceedings of the 61st Annual Convention, Gas Processors Association, Dallas, Texas, March 1982.
- "Treatment of Gaseous and Liquid Hydrocarbons: State of the Art", D. G. Elliot, R. K. Goel and J. J. Chen. Presented at the 2nd Brazilian Petroleum Congress, Rio de Janeiro, Brazil, October 1982.
- "Prediction of CO₂ Solubility in Light Hydrocarbon Mixtures at Low Temperature", J. J. Chen, V. W. Liaw, D. G. Elliot, Adv. Cryog. Eng 25 (1980) pg. 620.
- "Proyecto de Liquido de Santos en la Cuenca Cooper", D. G. Elliot, K. Paull and D. Mushin. Presented at the First Gas Technical Sessions, Gas Processors Association - Venezuela Chapter, San Tome, Venezuela, February 1983.
- "Phase-Equilibrium Data Requirements for EOR Process Plant Design", D. G. Elliot, J. Yao, S. Golikeri, J. J. Chen. Presented at the AIChE Spring National Meeting and Petro Expo '83, Houston, Texas, March 1983.
- "Select a CO₂ Recovery Process for EOR", R. Goel, J. J. Chen and D. G. Elliot. Presented at the AIChE Summer National Meeting, Denver, Colorado, August 1983.
- "Phase-Equilibrium Data Requirements for Cryogenic CO₂ Recovery Plant Design", J. Yao, S. Golikeri, J. J. Chen and D. G. Elliot, Energy Progress, Vol. 3, 1983, pg. 197.

DOUGLAS G. ELLIOT
PUBLICATIONS (Continued)

- "Contribution of Microcomputers to the Design and Operation of Chemical Plants", J. Erbar (Oklahoma State University), A. Wilson (Norsk-Hydro) and D. G. Elliot. Presented at the 3rd Congress International "Informatique et Genie Chimique", Paris, April 1983.
- "Numerical Computer Solutions of Two Dimensional Bounded Heat Conduction Problems by the Relaxation Method". Presented to the 1963 Regional Meeting for the AIChE Student Chapters at the University of Idaho, Moscow, Idaho.
- "Low Temperature Thermal Conductivity Measurements with a Superconducting Magnet", D. G. Elliot, J. Vevai and W. I. Honeywell, University of Houston. Presented at the March 1970 Meeting of the American Physical Society in Dallas, Texas.
- "Thermal Conductivity Measurements on Polyatomic Gases in Magnetic Fields", D. G. Elliot, J. Vevai and W. I. Honeywell, University of Houston. Presented at the 68th National AIChE Meeting, Houston, Texas, February 1971.
- "The Energy Crisis, Can the Various Forms of Solar Contribute?" Presented to the School of Ocean Engineering, Texas A&M University, March 2, 1977.
- "Overview of EOR and Related Gas Processing", D. G. Elliot and F. E. Self. Presented to the Society of Professional Engineers, Tulsa, Oklahoma, November 1983.
- "An Evaluation of Sources of CO₂ for EOR in Venezuela", G. J. Aldana (Intevep, S.A.), R. Arai and D. G. Elliot. Proceedings of the 63rd Annual GPA Convention, March 1984 in New Orleans, Louisiana, pg. 74. Also published in Gulf Publication, "Acid and Sour Gas Treating Processes", S. Newman, Editor, pg. 164 (1985).
- "Data Requirements for the Synthesis and Design of EOR Processes", J. Yao, J. J. Chen, D. G. Elliot, R. Kobayashi and J. H. Hong. Proceedings of the 63rd Annual GPA Convention, March 1984, in New Orleans, Louisiana, pg. 1.
- "Design and Operation of the Cooper Basin Liquids Project in Australia", D. T. White-Stevens, S. V. Golikeri, J. J. Chen and D. G. Elliot. Proceedings of the 63rd Annual GPA Convention, March 1984, in New Orleans, Louisiana, pg. 111.
- "Trends in NGL Recovery from Natural and Associated Gases", C. Collins, J. J. Chen and D. G. Elliot. Gastech '84 proceedings, Amsterdam, November 1984.
- "Cryogenic Fractionation: An Alternate to Conventional Gas Conditioning for Enhanced Oil Recovery", J. Yao, S. V. Golikeri, J. J. Chen and D. G. Elliot. Presented at AIChE Annual Meeting, November 1984, San Francisco, California.

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PUBLICATIONS (Continued)

- "Cryogenic Fractionation: An Alternative for CO₂ Removal in Enhanced Oil Recovery", Energy Progress (5), (1985).
- "Hydrate Prevention, Importance of GPA Research to the North Sea", A. Wilson, E. Stange, A. Goethe and D. G. Elliot. Proceedings of the 64th Annual GPA Convention, March 1985, Houston, Texas.
- "Cooper Basin Liquids Project Design and Startup", D. T. White- Stevens and D. G. Elliot. Gastech '85 proceedings, Nice, France; published in Oil & Gas Journal, January 20, 1986.
- "Impact of Physical Properties on Nitrogen Enhanced Oil Recovery Process Design", C. Root, J. J. Chen, D. G. Elliot. Proceedings of the 66th Annual GPA Convention, March 1987, Denver, Colorado.
- "Trends in Low Temperature Gas Processing", D. G. Elliot. Plenary Presentation at the VIII Jornadas de la GPA Capitulo de Venezuela, May 1990.
- "Numerical Computer Solutions of Two Dimensional Bounded Heat Conduction Problems by the Relaxation Method". Presented to the 1963 Regional Meeting for the AIChE Student Chapters at the University of Idaho, Moscow, Idaho.
- "Low Temperature Thermal Conductivity Measurements with a Superconducting Magnet", D. G. Elliot, J. Vevai and W. I. Honeywell, University of Houston. Presented at the March 1970 Meeting of the American Physical Society in Dallas, Texas.
- "Thermal Conductivity Measurements on Polyatomic Gases in Magnetic Fields", D. G. Elliot, J. Vevai and W. I. Honeywell, University of Houston. Presented at the 68th National AIChE Meeting, Houston, Texas, February 1971.
- "The Economic Impact of Fluid Properties Data on Expander Plants". D. G. Elliot, J. J. Chen (IPS, Inc.), Trent Brown, Art Kidnay and Dendy Sloan (Colorado School of Mines). Proceedings of the 70th Annual GPA Convention, March 1991, San Antonio, Texas.
- "Impact of Research on Acid Gas Treating". D. G. Elliot, A. M. Ward, J. J. Chen (IPS, Inc.), J. C. Dingman. Proceedings of the 73rd Annual GPA Convention, March 1994, New Orleans, Louisiana.
- "The Economic Impact of Fluid Properties Research on Expander Plants". D. G. Elliot, J. J. Chen, T. S. Brown (IPS, Inc.), E. D. Sloan, A. J. Kidnay (Colorado School of Mines). Presented to Seventh International Conference on Fluid Properties & Phase Equilibria for Chemical Process Design, June 1995, Snow Mass, Colorado. Published in Fluid Phase Equilibria, 1996.

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PUBLICATIONS (Continued)

- “Impact of Thermodynamic Property Research at Rice University on the Gas Processing Industry”, D. G. Elliot and J. J. Chen. Presented at Rice University, June 1995.
- “Technical Committee Guides Plant Design”, D. G. Elliot. Gas Processing Perspective, a supplement to the Oil & Gas Journal, March 4, 1996, p. 37.
- “New Method of Temperature-Ramping, Isobaric Experiments to Study the Hydrate Formation and Decomposition”, G. Besnard, J. J. Chen, D. G. Elliot (IPSI), J. W. Hightower, R. Kobayashi, K. Y. Song (Rice University).
- “Deepwater Production Drives Design of New Gulf Gas Plant,” Rod A. Nielsen, Luther Petty, Douglas Elliot and Roger Chen. Oil & Gas Journal, March 16, 1998, p. 87.
- “Pascagoula Plant Comes On-Line”, Rod A. Nielsen, Luther Petty, Roger Chen and Douglas Elliot. Proceedings of the 78th Annual GPA Convention, March 1999, Nashville, Tennessee.
- “Enhanced NGL Recovery”, D. G. Elliot. Presented at Seminaire Techniques Puits, Hassi Messaoud, Algeria, April 24-26, 1999.
- “Flexibility Efficiency to Characterize Gas Processing Technologies”, R. J. Lee, J. Yao and D. G. Elliot. Special Issue, “Petroleum in the 21st Century”, Oil & Gas Journal, December 13, 1999, pg. 90.
- “World’s Largest N₂-Generation Plant Starts up for Cantarell Reservoir Pressure Maintenance”, J. C. Kuo, D. G. Elliot, Oil & Gas Journal, March 12, 2001, pg. 41-47.
- “Solubility Measurements for CO₂-CH₄ in Water and Aqueous Electrolyte Solutions near Hydrate Conditions”, Zhang, Y., Jain, P., Chen, R., Elliot, D., Song, K., Chapman, W., Kobayashi, R., and Ng, H. J. Advances in the Gas Hydrates Studies, New York, Marcel Dekker, 2004. One of 16 papers to receive the Bechtel Outstanding Technical Paper Award for 2003.
- “Enhanced NGL Recovery Process Selected for Neptune Gas Plant Expansion”, Pervaiz Nasir (Enterprise Products Operating LP), Welby Sweet (Marathon Oil Co.), Douglas Elliot, Roger Chen, R. J. Lee (IPSI LLC). Presented at the Gas Processors Association 82nd Annual Convention, San Antonio, Texas, March 9-12, 2003. Also published in the Oil & Gas Journal, July 21, 2003. One of 16 papers to receive the Bechtel Outstanding Technical Paper Award for 2003.

DOUGLAS G. ELLIOT
PUBLICATIONS (Continued)

- “Benefits of Integrating NGL Extraction and LNG Liquefaction Technology”, Wesley R. Qualls, (ConocoPhillips Company), Shawn Huang (ConocoPhillips Company), Doug Elliot, J. J. Chen, Jame Yao, R. J. Lee, Ying Zhang (IPSI LLC®). Published in the proceedings of the AIChE 2005 Spring National Meeting, 5th Topical Conference on Natural Gas Utilization, April 10-14, 2005, Atlanta, Georgia.
 - “Processes for High C₂ Recovery from LNG – Part I: Schemes Based on Refluxed Demethanizer”, Stanley Huang (Chevron Energy Technology Company), Dennis Cook, Jame Yao, Douglas Elliot (IPSI LLC). Published in the proceedings of the AIChE 2006 Spring National Meeting, 6th Topical Conference on Natural Gas Utilization, April 23-27, 2006, Orlando, Florida.
- “Processes for High C₂ Recovery from LNG – Part II: Schemes Based on Expander Technology”, Stanley Huang (Chevron Energy Technology Company), Roger Chen, Jame Yao, Douglas Elliot (IPSI LLC). Published in the proceedings of the AIChE 2006 Spring National Meeting, 6th Topical Conference on Natural Gas Utilization, April 23-27, 2006, Orlando, Florida. One of 13 papers to receive the Bechtel Corporation Outstanding Technical Paper Award for 2006.
- “Processes for High C₂ Recovery from LNG – Part III: SIMAR Applied to Gas Processing”, Stanley Huang (Chevron Energy Technology Company), Roger Chen, Dennis Cook, Douglas Elliot (IPSI LLC). Published in the proceedings of the AIChE 2006 Spring National Meeting, 6th Topical Conference on Natural Gas Utilization, April 23-27, 2006, Orlando, Florida
 - “Retrofit for NGL Recovery Performance Using a Novel Stripping Gas Refrigeration Scheme”, Lily Bai, Roger Chen, Jame Yao and Doug Elliot. Presented at the 85th Annual Gas Processors Association Convention, March 5-8, 2006, Grapevine, Texas, and published in Proceedings. . One of 13 papers to receive the Bechtel Corporation Outstanding Technical Paper Award for 2006.
 - “Optimum Design of Turbo Expander Process”, Wei Yan, Lily Bai, Jame Yao, Roger Chen, Doug Elliot IPSI, LLC. And Stanley Huang (Chevron Energy Technology company). Proceeding of the 86th Annual GPA Convention, March 11-14, 2007 San Antonio Texas. Winner of the Bechtel Outstanding Paper Award for 2007.