

# ROBERT L. SIELKEN JR.

## RESUME

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**I. Personal Information**

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**II. Academic Qualifications**

Ph.D. in Probability and Statistics, Florida State University, June 1971

M.S. in Probability and Statistics, Florida State University, March, 1968

B.A. Mathematics major, DePauw University, June 1966

NDEA Fellowship (3 yrs.), Biometry Traineeship,  
Rector Scholarship (Fellowship)

Phi Beta Kappa, Phi Kappa Phi

**III. Positions Held**

Assistant Professor: Institute of Statistics, Texas A&M University,  
January 1971 to September 1976.

Associate Professor: Institute of Statistics, Texas A&M University,  
September 1976 to September 1982.

Professor: Department of Statistics, Texas A&M University,  
September 1982 to September 1986.

Adjunct Professor: Department of Statistics, Texas A&M University,  
September 1986 to present.

Adjunct Professor of Statistics: Science Park - Research Division, The University of Texas,  
September 1993 to present.

President, Sielken Inc., March 1985 to December 2000.

Vice President, Jellinek, Schwartz & Connolly, Inc., November 1996 to  
December 2000.

President, Sielken & Associates Consulting, Inc., January 2001 to present.

**IV. Memberships in Societies**

The Mathematical Programming Society,

The Operations Research Society of America,

The Institute of Management Sciences,

Southeast Texas Chapter of the American Statistical Association,

The American Statistical Association,

The Biometric Society,

The Institute of Mathematical Statistics, and

International Society of Regulatory Toxicology and Pharmacology,

Society for Risk Analysis,

Lone Star Chapter of the Society for Risk Analysis

American Association for the Advancement of Science

Society of Environmental Toxicology and Chemistry, and

Society of Toxicology

**V. Publications**

1. Sielken, R.L. Jr. (1973). "Stopping Times for Stochastic Approximation Procedures," Zeitschrift für Wahrscheinlichkeitstheorie und Verwandte Gebiete, 26, 67-75.
2. Sielken, R.L. Jr. (1973). "Sequential Sampling and Maximum Likelihood Estimation," Communications in Statistics, 1, 567-568.
3. Sielken, R.L. Jr. and Hartley, H.O. (1973). "Two Linear Programming Algorithms for Unbiased Estimation of Linear Models," Journal of the American Statistical Association, 68, 638-641.
4. Hartley, H.O. and Sielken, R.L. Jr. (1975). "A 'Super-Population Viewpoint' for Finite Population Sampling," Biometrics, 31, 411-422.
5. Sielken, R.L. Jr., (1975). Book Review: Practical Linear Programming with Computer Applications, by Michael O. Locks. Technometrics, 17, 514.
6. Sielken, R.L. Jr. (1976). "Sequencing with Setup Costs by Zero-One Mixed Integer Linear Programming," AIIE Transactions, September, 369-371.
7. Hartley, H.O. and Sielken, R.L. Jr. (1977). "Estimation of 'Safe Doses' in Carcinogenic Experiments," Biometrics, 33, 1-30.
8. Sielken, R.L. Jr., Hartley, H.O. and Arseven, E. (1977). "Critical Path Analysis in Stochastic Networks: Statistical PERT." SCIMA 6, No. 3.
9. Hartley, H.O. and Sielken R.L. Jr. (1977). "Response to Prof. Mantel's Discussion of Presentation by Hartley and Sielken on the Estimation of 'Safe Doses' and Carcinogenic Experiments," Journal of Environmental Pathology and Toxicology, 1, 267-269.
10. Burdick, R.K. and Sielken, R.L. Jr. (1978). "Exact Confidence Limits for Linear Combinations of Variance Components in Nested Classifications," Journal of the American Statistical Association, 73, 632-635.
11. Burdick, R.K. and Sielken, R.L. Jr. (1979). "Variance Estimation Based on a Super-Population Model in Two-Stage Sampling," Journal of the American Statistical Association, 74, 438-440.

12. Sielken, R.L. Jr. and Hartley, H.O. (1979). "A New Statistical Approach to Project Scheduling," Decision Information, ed. by C.P. Toskos and R.M. Thrall, 153-184.
13. Baker, T.C. Jr. and Sielken, R.L. Jr. (1981). "On Estimating a Discrete Distribution Function with Some Jump Sizes Known," Communications in Statistics, B10(2), 109-128.
14. Baker, T.C. Jr. and Sielken, R.L. Jr. (1981). "Estimation of a Distribution Function by Extrapolating Upper and Lower Bounds," Communications in Statistics, B10(1), 77-93.
15. Hartley, H.O., Tolley, H.D., and Sielken, R.L. Jr. (1981). "The Product Form of the Hazard Rate Model in Carcinogenic Testing," Statistics and Related Topics, 185-200. M. Csorgo, D.A. Dawson, J.N.K. Rao, and A.K. Md. E. Saleh (eds.), North Holland, New York.
16. The SOT ED01 Task Force (1981). "Re-Examination of the ED01 Study: Risk Assessment Using Time," Fundamental and Applied Toxicology, 1, 88-123.
17. Sielken, R.L. Jr. (1982). "Which Options Provide the Quickest Solution," Evaluating Mathematical Programming Techniques, 135-145. Edited by John M. Mulvey. Volume 199 in Lecture Notes in Economics and Mathematical Systems, Springer-Verlag, New York.
18. Sielken, R.L. Jr. (1982). "Formaldehyde's Low Dose Cancer Risk Extrapolation Using the Multistage Model and GLOBAL 79," Formaldehyde: Review of Scientific Basis of EPA's Carcinogenic Risk Assessment, Hearing Before the Subcommittee on Investigations and Oversight of the Committee on Science and Technology U.S. House of Representatives Ninety-Seventh Congress Second Session, May 20, pp: 586-749.
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20. The SOT ED01 Task Force (1983). "The SOT Task Force Response to the NCTR Letter," Fundamental and Applied Toxicology, 3, 9-12.

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22. Sielken, R.L. Jr. and Gbur, E.E. (1984). "Multiyear, Through-the-Season Crop Acreage Estimation Using Estimated Acreage in Sample Segments," Communications in Statistics, 13, (23), 2961-2974.
23. Monroe, H.M. and Sielken, R.L. Jr. (1984). "Confidence Limits for Global Optima Based on Near-Optimal Solutions to Difficult Integer and Nonlinear Optimization Problems," American Journal of Mathematical and Management Sciences, 4, (1, 2), 139-167.
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26. Sielken, Robert L. Jr. (1985). "Some Capabilities, Limitations, and Pitfalls in the Quantitative Risk Assessment of Formaldehyde," Risk Analysis in the Chemical Industry, 74-122.
27. Sielken, R.L. Jr. (1986). "Implications of the Time-to-Response Information," Hazard Assessment of Ethylene Oxide, ed. by L. Golberg, 125-165. CRC Press, Inc., Boca Raton, Florida.
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49. Holland, Charles D. and Robert L. Sielken Jr. (1993) Quantitative Cancer Modeling and Risk Assessment, Prentice Hall, Englewood Cliffs, New Jersey.

50. Sielken, Robert L., Jr., Robert S. Bretzlaff, and Donald E. Stevenson (1994). Incorporating Additional Biological Phenomena Into Two-Stage Cancer Models, @ Receptor-Mediated Biological Processes Implications for Evaluating Carcinogenesis, pp. 237-260, ed. by Hugh L. Spitzer, Thomas J. Slaga, William F. Greenlee, and Michael McClain, Wiley-Liss, New York.
51. Sielken, Robert L., Jr. (1993) "Evaluation of Chloroform Risk to Humans," The Toxicology Forum, 1993 Annual Winter Meeting, February 15-17, 1993, The Capitol Hilton, Washington, D.C.
52. Sielken, Robert L., Jr. (1993) "Background Carcinogenicity Rates," The Toxicology Forum, 1993 Annual Summer Meeting, July 12-16, 1993, Given Institute of Pathology, Aspen, Colorado.
53. Evans, John S., John D. Graham, George M. Gray, and Robert L. Sielken Jr. (1994) "A Distributional Approach to Characterizing Low-Dose Cancer Risk," Risk Analysis, Vol. 14, No. 1, pp. 25-34.
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69. Sielken, Robert L., Jr., and Ciriaco Valdez-Flores (1995) "Comprehensive Realism's Use of Trees and Distributions to Reflect Uncertainty and Variability and to Overcome the Limitations of Default Assumptions," Special Issue of the Journal of Energy Engineering on: New Methods to Deal with Uncertainty and Applications in Assessing Energy Systems, ed. by Paolo F. Ricci. (to appear)
70. Soden, Kevin J., Jonathan Amsel, Robert L. Sielken Jr., and Ciriaco Valdez-Flores (1996) "Carboxyhemoglobin Levels in Workers Exposed to Methylene Chloride as Compared to a PBPK Model," (submitted).
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## VI. Computer Algorithms Implemented

1. Optimal Investment Strategies in Shrimp Fishing
2. Linear Programming Algorithms
  - a. Revised Simplex Standard Form I and II
  - b. Dual Simplex Method
  - c. Primal-Dual Method
  - d. Primal-Dual Transportation Algorithm
  - e. Decomposition Algorithm

3. Unbiased Estimation of Linear Models by Minimizing the Sum of the Absolute Residuals or Minimizing the Maximum Absolute Residual
  - a. MRS. A
  - b. MR. A
4. Analysis of Univariate Time Series Data Using the Methods of Box and Jenkins
  - a. Identification
  - b. Estimation, Diagnostic Checking, and Froecasting
  - c. Time Series Generator
  - d. Theoretical Autocorrelation and Partial Autocorrelation Determination
5. Solving Transportation Problems Involving Source-Location Optimization
6. Confidence Limits for Global Optima
7. All-Integer Programming Algorithms
  - a. Balas' Procedure
  - b. New Procedure (SLIP)
8. Mixed Integer Programming Algorithms
  - a. Dakin's Procedure
  - b. Davis-Kendrick-Weitzmann Procedure
  - c. Tomlin-Gomory Procedure
  - d. Geoffrion's Method of Surrogate Constraints
  - e. New Procedure (BABAT)
9. Statistical PERT Algorithms
  - a. Deterministic Project Scheduling
  - b. Stochastic Project Scheduling
10. Quadratic Programming Algorithm
11. Unconstrained Optimization Algorithm
  - a. Univariate Search
  - b. Grid - Pattern Search
  - c. Powell's Method
  - d. Steepest Ascent
  - e. Fletcher-Powell Method
12. Determination of Sample Sized to Meet Variance Restrictions (NASA).

13. Determination of Crop Acreages from Multiyear Satellite Sampling (NASA).
14. Statistical Methodology for Toxicological Research
  - a. MRS. T
  - b. MRS. T81
  - c. MRS. T81B
15. A *GENeral Tool* for incorporating dose-response modeling and extrapolation techniques into quantitative cancer and noncancer risk assessments. Includes essentially all current dose-response models for high-to-low-dose extrapolation and benchmark dose determination. Can reflect response-frequency data, time-to-response data, user-specified target site doses (delivered, PBPK, and biologically effective doses), age-dependent doses and model parameters, cell proliferation, species and route extrapolations, and individual variability in background doses and susceptibility.  
GEN.T
16. An epidemiological tool similar to GEN.T but with the added capability of handling observed data with each individual having his own distinctive age-dependent exposure pattern.  
EPID.T
17. Physiologically-based pharmacokinetic modeler of the time-dependent delivered doses corresponding to user-specified parameterizations of a flow-limited, multicompartiment body undergoing inhalation, intravenous, or oral exposure.  
PBPK Modeler
18. Utilizes a historical data base, compares animal-based predictions with human data, and generates empirical weights for weight-of-evidence analyses.  
EXTRACT
19. Quantitative cancer risks and contaminant standards for multipathway and multimedia exposures.  
OFFSITE

20. Distributional characterizations of the cancer risks and contaminant standards for populations and subpopulations exposed via multiple pathways to a single medium.  
ONSITE
21. Monte Carlo simulator (using Latin-Hypercube sampling) of the probability distribution corresponding to a user-specified FORTRAN function of user-specified random variables.  
DistGEN
22. Fits any of twelve common types of probability distributions to any user-specified sample data. There are eleven possible fitting criteria, such as least squares, maximum likelihood, etc. Sample data can be in the form of censored or uncensored observations or in the form of percentiles. Empirical distributions from *DistGEN* can be imported.  
DistFIT
23. Determines a distributional characterization of the added cancer risk at user-specified dose levels and explicitly incorporates weights on the relative plausibility of competing alternatives in a weight-of-evidence analysis of the current state of knowledge concerning the carcinogenic effects of a specified substance.  
UNRAVEL
24. Determines a distributional characterization of the reference dose (RfD) or reference concentration (RfC) for the noncancer health effects of a specific substance. Facilitates a weight-of-evidence analysis of the competing indicator doses and uncertainty factor characterizations and helps determine a probability distribution characterization of the RfD or RfC that explicitly incorporates the user-specified weights indicating the relative plausibility of the competing alternatives.  
UNRAVELN
25. Two-stage growth model of carcinogenesis incorporating the effects of dose, time, and the relative sensitivity of subtissues. Implementation of the solutions to the Kolmogorov-Fokker-Planck equation which is an expression of the Moolgavkar/Venzon/Knudson model for independent subpopulations of cells and time-dependent (step-function) growth parameters.  
MVK/KFP Modeler
26. Monte Carlo simulator of the two-stage growth process of carcinogenesis. Implementation of Monte Carlo simulation of cell division, death or

differentiation, and mutation for tissues or organs in which the opportunities for cellular events (birth, death, mutation) are periodic.

2SGM/MC Simulator

27. **PRO**abilistic **M**ethodology for **I**mproving **S**olvent **E**xposure Assessment is the interface that assists the user in organizing the input data and that subsequently activates the Sielken, Inc., DistGEN software in order to determine how the distributions of measured and assumed input values affect the resulting uptake distributions for particular populations and subpopulations. DistGEN utilizes Monte Carlo simulation in order to determine the uptake distributions.

PROMISE

28. **Maximum Likelihood Imputation Procedure** for Imputing Single-Serving Residue Concentration Distributions from Composite Samples. MaxLIP is a two-step procedure that uses maximum likelihood estimation techniques and Monte Carlo simulation to estimate the distribution of residue concentrations in single units from a database of composite residue concentration values.

MaxLIP

## VII. Teaching Experience

Department of Statistics, Texas A&M University, 1971 - 1986

Areas:

- a. Mathematical Programming: linear, nonlinear, and integer programming
- b. Undergraduate and graduate introduction to probability and statistics
- c. Probability
- d. Limit Theory
- e. Statistical Inference
- f. Decision Theory
- g. Sequential Analysis
- h. Time Series Analysis

Specific Courses:

Stat. 211 Principles of Statistics I. (Spring 1976 - 2 sections, Spring 1980, Fall 1980, Spring 1981, Fall 1982, Fall 1983, Fall 1984)

Stat. 302 Statistical Methods. (Fall 1976)

Stat. 410	Optimization. (Fall 1974, Spring 1976, 1977, 1979, 1981, 1983, 1985)
Stat. 414	Mathematical Statistics. (Spring 1971, Fall 1978)
Stat. 601	Statistical Analysis. (Summer 1973, Fall 1973, Spring 1974, Fall 1974, Fall 1981, Spring 1983)
Stat. 602	Statistical Analysis. (Fall 1971 - 2 sections, Fall 1972, Spring 1973)
Stat. 610	Theory of Statistics I. (Fall 1977)
Stat. 611	Theory of Statistics II. (Spring 1975)
Stat. 614	Advanced Theory of Statistics. (Spring 1977, 1978, 1979, 1980)
Stat. 621	Advanced Topics in Statistical Theory. (Summer 1971)
Stat. 626	Statistical Methods of Process Control and Optimization. (Summer 1976, 1978, 1980)
Stat. 628	Mathematical Programming I. (Spring 1972, 1973, 1974, 1975, 1976, Fall 1976, 1977, 1980, 1982, 1983, 1984)
Stat. 629	Mathematical Programming I. (Spring 1972, 1973, 1974, 1975, 1977, 1979, 1981, 1983)
Stat. 632	Statistical Decision Theory. (Fall 1972, 1975)
Stat. 651	Statistics in Research I. (Spring 1982, Summer 1982, Spring 1985)

### VIII. Contract Activities

1. National Center for Toxicological Research (NCTR) and Food and Drug Administration (FDA)

Participation: 2 years

General Area: Estimation of the carcinogenic risk based on animal experiments

Technical Reports:

- #1 "A Parametric Model for 'Safety' Testing of Carcinogenic Agents" by H.O. Hartley and R.L. Sielken Jr.
- #2 "A 'Non-Parametric' Model for 'Safety' Testing of Carcinogenic Agents" by H.O. Hartley and R.L. Sielken Jr.
- #3 "The General 'Product Model' for Time to Tumor Distributions" by H.O. Hartley
- #4 "Computational Experience in 'Safety' Testing of Carcinogenic Agents" by R.L. Sielken Jr.

2. Sea Grant

Participation: 1 year

General Area: Application of mathematical programming techniques to management problems in the shrimp fishing industry.

Procedures: Nonlinear programming, ANOVA, variance components, sampling design, partial identification.

Technical Report:

"Extended Results on Optimal Investment Strategies in Shrimp Fishing" by R.L. Sielken Jr., R.G. Thompson, R.R. Wilson, December, 1972.

3. NASA

Participation: 7 years

Principal Investigator: 4 years

General Area: Application of statistical and operations research techniques to satellite based estimation of crop acreages.

Procedures: Nonlinear programming, ANOVA, variance components, sampling design, partial identification.

Technical Reports:

- #17 "A Computer Implementation of the Multicrop Sampling Strategy" by H.O. Hartley, T.H. Hughes, R.L. Sielken Jr., May 1979.
- #18 "Optimal Rotation Designs for Multiyear Estimation, I. Unweighted Estimation," by E.E. Gbur and R.L. Sielken Jr., December 1980.
- #19 "Optimal Rotation Designs for Multiyear Estimation, II. Weighted Estimation," by E.E. Gbur and R.L. Sielken Jr., December 1980.
- #20 "Multiyear Estimation of the At Harvest Crop Acreage Proportion: Methodology and Implementation," by Robert L. Sielken Jr. and Paul F. Dahm, March 1981.
- #21 "Incorporating Partially Identified Sample Segments Into Acreage Estimation Procedures: Estimates Using Only Observations From the Current Year," by Robert L. Sielken Jr., December 1981.
- #22 "Missing Observations in Multiyear Rotation Sampling Designs," by E.E. Gbur and R.L. Sielken Jr., December 1981.

4. Office of Naval Research (ONR)

Participation: 10 years

Principal Investigator: 1 1/2 years

General Area: The interface between operations research, management science, and statistics -- particularly optimization techniques.

Technical Reports:

- #41 August 1972 UNBIASEDNESS IN LINEAR MODEL ESTIMATION  
R.L. Sielken Jr. and H.O. Hartley
- #42 August 1972 A TRANSPORTATION PROBLEM INVOLVING  
SOURCE-LOCATION OPTIMIZATION  
R.L. Sielken Jr.

- #43 August 1973 CONFIDENCE REGIONS FOR GLOBAL OPTIMA IN NON-LINEAR PROGRAMMING  
T.L. Liau, H.O. Hartley and R.L. Sielken Jr.
- #44 September 1973 THE ITERATIVE ALGORITHM FOR SOLVING  
“A TRANSPORTATION PROBLEM INVOLVING SOURCE-LOCATION OPTIMIZATION”  
R.L. Sielken Jr.
- #48 November 1974 STATISTICAL CRITICAL PATH ANALYSIS IN ACYCLIC STOCHASTIC NETWORKS:  
STATISTICAL PERT  
R.L. Sielken Jr., L.J. Ringer, H.O. Hartley and E. Arseven.
- #50 January 1976 STATISTICAL PERT: DECOMPOSING A PROJECT NETWORK  
R.L. Sielken Jr. and Norman E. Fisher
- #51 January 1976 STATISTICAL PERT: AN IMPROVED SUBNETWORK ANALYSIS PROCEDURE  
R.L. Sielken Jr., H.O. Hartley and R.K. Spoeri
- #52 November 1975 INCORPORATING PROJECT COST CONSIDERATIONS INTO STOCHASTIC PERT  
P.P. Biemer and R.L. Sielken Jr.
- #53 April 1976 A STATISTICAL PROCEDURE FOR OPTIMIZATION OF PERT NETWORK SCHEDULING SYSTEMS  
R.K. Spoeri, L.J. Ringer and R.L. Sielken Jr.
- #55 February 1977 STATISTICAL PERT: AN IMPROVED PROJECT SCHEDULING ALGORITHM  
C.S. Dunn and R.L. Sielken Jr.
- #56 December 1977 A NEW STATISTICAL APPROACH TO PROJECT SCHEDULING  
R.L. Sielken Jr. and H.O. Hartley

- #57 August 1978 A USER'S GUIDE TO THE COMPUTER IMPLEMENTATION OF THE NEW PROJECT SCHEDULING PROCEDURE: STATISTICAL PERT  
T.C. Baker Jr. and Robert L. Sielken Jr.
- #58 August 1978 STATISTICAL PERT: IMPROVEMENTS IN THE DETERMINATION OF THE PROJECT COMPLETION TIME DISTRIBUTION  
Thomas C. Baker Jr. and Robert L. Sielken Jr.
- #59 September 1980 MULTIVARIATE EDGEWORTH AND GRAM-CHARLIER EXPANSIONS AND THEIR APPLICATIONS TO STATISTICAL PERT  
Christian C. Robieux, H.O. Hartley, Frederic C. Lam, R.L. Sielken Jr.
- #60 September 1980 STATISTICAL PERT: THE PRECISION OF THE ESTIMATED PROJECT COMPLETION TIME DISTRIBUTION  
Christian C. Robieux, H.O. Hartley, Frederic C. Lam, R.L. Sielken Jr.
- #61 September 1980 PROJECT SCHEDULING WITH DISCONTINUOUS PIECEWISE CONVEX ACTIVITY COST FUNCTIONS  
Christian C. Robieux and Robert L. Sielken Jr.
- #62 May 1980 HOW NEAR IS A NEAR-OPTIMAL SOLUTION: CONFIDENCE LIMITS FOR THE GLOBAL OPTIMUM  
Robert L. Sielken Jr. and Howard M. Monroe
- #63 May 1980 EVALUATION OF PRECEDENCE CRITERIA FOR PROJECT SCHEDULING UNDER RESOURCE CONSTRAINTS  
Shi Min Chang and Robert L. Sielken Jr.
- #64 June 1980 UNBIASED L1 ESTIMATORS AND THEIR COVARIANCES  
D. Book, J. Booker, H.O. Hartley and R.L. Sielken Jr.

- #65 June 1980                    RESTRICTED L1 ESTIMATORS AND THEIR COVARIANCES  
D. Book, J. Booker, H.O. Hartley and R.L. Sielken Jr.
- #66 September 1980            SMOOTH NONPARAMETRIC REGRESSION BY QUADRATIC PROGRAMMING  
H.O. Hartley and R.L. Sielken Jr.
- #67 September 1980            A COMPARATIVE STUDY OF SPLINE REGRESSION  
A. Nougues and R.L. Sielken Jr.
- #68 September 1980            ESTIMATING THE DISTRIBUTION FUNCTION OF A TRANSFORMED RANDOM VECTOR  
T.C. Baker Jr. and R.L. Sielken Jr.
- #69 September 1980            ESTIMATION OF A DISTRIBUTION FUNTION BY EXTRAPOLATING UPPER AND LOWER BOUNDS  
T.C. Baker Jr. and R.L. Sielken Jr.

5. NIH Biomedical Research Support Grant

Participation: 1 year

Principal Investigator: 1 year

General Area: Extensions of time to response based low dose cancer risk extrapolation and characterizations.

Procedures: Restricted maximum likelihood estimation, confidence limit procedures, sensitivity analyses, and alternative methods of summarizing risk.

6. Department of Health and Human Services: Public Health Service: NIH NIEHS Superfund Research Program

Principal Investigator: Stephen H. Safe

Participation: Ongoing

General Area: Procedures to assess the hazard of a superfund site.

Procedures: Quantitative risk characterization,  
Information-analysis-based risk assessment

7. Great Lakes Protection Fund: Great Lakes Fish Advisory Task Force

Principal Investigator: Thomas F. Long

Participation: 2 Years

General Area: A Weight of Evidence Approach for the Development of  
Fish Consumption Advisory Criteria

Procedures: Quantitative risk characterization, Information-analysis-  
based risk assessment

8. American Industrial Health Council: President and Fellows of Harvard  
College

Principal Investigator: John D. Graham

Participation: 1 Year

General Area: Comprehensive Methodology: An Example of a  
Distributional Characterization of Cancer Risk:  
Formaldehyde

Procedures: Quantitative risk characterization, Information-analysis-  
based risk assessment, Probability trees, Incorporating  
expert judgements

9. American Industrial Health Council: President and Fellows of Harvard  
College

Principal Investigator: John D. Graham

Participation: 1 Year

General Area: Comprehensive Methodology: An Example of a  
Distributional Characterization of Cancer Risk:  
Chloroform

Procedures: Quantitative risk characterization, Information-analysis-based risk assessment, Probability trees, Soliciting and incorporating expert judgements

10. Dermigen, Inc.

Principal Investigator: Robert L. Sielken Jr.

Participation: 1 Year

General Area: Biologically based dose-response model for carcinogenesis

Procedures: Monte Carlo simulation of the behavior of the two-stage model under varying biological conditions

11. Derimigen, Inc.

Participation: Ongoing

General Area: Tumor promoting activity of dieldrin

Procedures: Experiments and dose-response models elucidating the carcinogenic mechanisms of dieldrin as well as interspecies differences

## IX. Participation in Professional Organizations

Operations Research Society of America National Meetings  
May, 1971; November, 1975; June, 1979; May, 1980; May, 1981;  
May, 1991

The Institute of Management Science International Meetings  
April, 1972; July, 1982

SREB Summer Conference in Statistics  
June, 1972; June, 1975; June, 1978

International Symposium on Mathematical Programming at  
Stanford University, August, 1973

Joint Meetings of the IMS, ENAR, and ASA

March, 1974; March, 1976; March, 1979; August, 1980; March, 1981;  
March, 1982; August, 1982; March, 1985; March, 1987

Southeast Texas Chapter of American Statistical Association.

November, 1975

Conference on the Status of Predictive Tools in Application to Safety

Evaluation: Present and Future, Sponsored by National Center for  
Toxicological

Research and National Institutes of Health:

November, 1976; October, 1977

Discrete Optimization 77

International Symposium on Integer Programming at University of British  
Columbia, August, 1977

Co-Chairman for ENAR (Biometric Society) 1980 Regional Meeting

Annual Technical Conference of ASQC and ASA:

October, 1980; October, 1981

Mathematical Programming Society's Committee on Algorithms (COAL):

Conference on Developing, Testing and Validating Software, January,  
1981

Society of Toxicology: Annual Meetings:

March, 1981; March, 1986; February, 1989; February, 1990; February,  
1991; March, 1993

Conference on Risk Assessment in Regulating Health and Safety, Brookings

Institution, May, 1981

Workshop on Biological and Statistical Implications of the ED01 Study and

Related Data Bases. September, 1981

Texas Conference of Statisticians: April, 1982; April, 1994

Joint Conference on Occupational Health, American Academy of Occupational

Medicine, American Academy of Industrial Hygiene, September, 1982;  
November, 1983

ASA/EPA Conference on the Current Assessment of Combined Toxicant Effects.  
Washington, D.C. May 5-6, 1986

Conference for Food Protection: August, 1986

Society for Risk Analysis:

November, 1986; November, 1987; December, 1988; October, 1989;  
October, 1990; December, 1994; December, 1995; December, 1996;  
December, 1997

Society for Risk Analysis Course on Carcinogen Risk Assessment.  
Washington, D.C. April, 1987

1987 Annual Summer Toxicology Forum. Aspen, Colorado. July, 1987

Human Cancer Risk Assessment Based on Experimental Data.  
Wrightsville Beach, North Carolina. May 1 - 4, 1988

Dichloromethane Science Advisory Panel.  
Syracuse, New York. October 4 - 5, 1988

International Society of Regulatory Toxicology and Pharmacology.  
Baltimore, Maryland. October 17 - 8, 1988  
Washington, D.C. October 2 - 3, 1989

ACT/SRA Co-Sponsored Workshop: Inferring Carcinogenic Effects in One  
Species from Data on a Different Species.  
Baltimore, Maryland. October 29 - 30, 1988

Mouse Liver Carcinogenesis Conference: Mechanisms & Species Comparisons.  
Austin, Texas. November 30 - December 3, 1988

Workshop on Carcinogen Risk Assessment.  
Virginia Beach, Virginia. January 11 - 13, 1989

Symposium on Regulatory Management of Carcinogenic Chemical Risks.  
Wrightsville Beach, North Carolina. May 2 - 5, 1989

Societal Institute of the Mathematical Sciences (SIMS):  
Conference on Scientific Issues in Quantitative Cancer Risk Assessment:  
Snowbird, Utah. June 18 - 22, 1989

Regional Risk Assessment Workshops: Workshop 2, Southern & Gulf States  
Atlanta, Georgia. November 28 - December 1, 1989

Regional Risk Assessment Workshops: Workshop 3, Prairie & Mountain States  
Austin, Texas. September 10 - 13, 1990

Regional Risk Assessment Workshops: Workshop 4, Far West States  
San Francisco, California. March 25 - 28, 1991

Regional Risk Assessment Workshops: Workshop 5, Northeast States  
Boston, Massachusetts. April 20 - 23, 1992

Chemically Induced Cell Proliferation: Implications for Risk Assessment  
Barton Creek Conference, Austin, Texas. December, 1991

Committee on Risk Assessment Methodology (NAS CRAM):  
Washington, D.C. May, 1990; September, 1990; November, 1990

Technical Workshop for Addressing Human Health Risks Associated with  
Fisheries Contaminated by Oil Spills. National Oceanic and Atmospheric  
Administration (NOAA). Aspen Institute, Wye Island, Maryland.  
August 14 - 15, 1990

International Symposium on Toxicology 1990 Beijing.  
Beijing, P.R. China. October 1990

Relevance of Animal Studies to Evaluate Human Cancer Risk.  
Austin, Texas. December, 1990

American Statistical Association Winter Conference:  
New Orleans. January, 1991

Workshop to Peer Review the OMB Report on Risk Assessment and  
Management. Center for Risk Analysis, Harvard School of Public Health.  
Boston, Massachusetts. March 6 - 7, 1991

Chloroform Workshop. Belmont Conference Center.  
Elkridge, Maryland. April 12 - 14, 1992

ILSI Risk Science Institute: Cancer Dose-Response Working Group:  
Ramada Renaissance Hotel, Herndon, Virginia.  
Workshop #1, September 19 - 20, 1991; Workshop #2, December 5 - 6,  
1991; Workshop #3, March 23 - 24, 1992

First International Conference on the Safety of Water Disinfection: Balancing Chemical and Microbial Risks. Washington, D.C. August 31 - September 3, 1992.

Receptor Mediated Biological Processes.  
Barton Creek Conference, Austin, Texas. December, 1992

The Toxicology Forum.  
Annual Winter Meeting: February, 1993  
Annual Summer Meeting: July, 1993  
Annual Winter Meeting: February, 1997  
Annual Summer Meeting: July, 1997

EPA-UVA Workshop on "When and How Can You Specify a Probability Distribution When You Don't Know Much?". University of Virginia, Charlottesville, Virginia. April 19 - 21, 1993

FDA sponsored Conference on Chemical Contaminants in Seafood.  
Washington, D.C. April 21 - 22, 1993

First Annual HERL Symposium: Biological Mechanisms and Quantitative Risk Assessment. EPA Health Effects Research Laboratory, Research Triangle Park, North Carolina. November 1 - 4, 1993

State of Texas Environmental Priorities Project (STEPP)  
Texas Natural Resources Conservation Commission,  
September, 1993, to present.

7th International Conference on Carcinogenesis and Risk Assessment:  
Growth Factors and Tumor Promotion: Implications for Risk Assessment.  
Barton Creek Conference, Austin, Texas. December, 1993

ASA sponsored Workshop on Ethical Issues in Statistical Expert Testimony.  
Washington, D.C. January 14 - 15, 1994

Association of State Drinking Water Administrators.  
Las Vegas, Nevada. October, 1994

Society of Environmental Toxicology and Chemistry  
Denver, Colorado October 30 - November 3, 1994

Air and Waste Management Association.  
San Antonio, Texas. June 20, 1995.

- Evaluation of Butadiene & Isoprene Health Risks.  
Inn at Semi-Ah-Moo, Blaine, Washington, June 27 - 29, 1995.
- Workshop: From Cancer Hazard to Cancer Risk.  
Wurzburg, Germany. September 25-26, 1995.
- Society of Risk Analysis / EPA: Residential Exposure Assessment Project,  
Chapter XI: Qualitative and Quantitative Uncertainty Analysis, Fall, 1995.
- Butadiene Annual Research Review Meeting,  
Santa Fe, New Mexico, October 16, 1996
- Belle Conference,  
NIEHS, Research Triangle Park, North Carolina, November 12 - 14,  
1996.
- American Industrial Hygiene Association Conference & Exposition,  
Dallas, Texas, May 21, 1997.
- IBC Conference on Ecological Risk Assessment,  
Boston, Massachusetts, July 16, 1997.
- Water Quality Commission Meeting,  
Topeka, Kansas, October 14, 1997.
- Workshop: Monte Carlo and Probabilistic Risk Assessment: Numerical  
Examples and Guiding Principles Using the Case Study on Atrazine and  
Simazine, Arlington, Virginia, November 6, 1997.
- Society for Risk Analysis Lone Star Chapter,  
San Antonio, Texas, November 15, 1997.
- ILSI. Risk Science Institute. Aggregate Exposure Assessment Workshop.  
Arlington, Virginia, February 9-10, 1998
- Joint Statistical Meeting,  
Dallas, Texas, August 9 - 13, 1998.

**X. Consulting Activities**

Ebon Research Systems  
Enviro-Control Inc.  
Rohm and Haas Co.  
U.S. Soil Inc., Bio-Systems Research  
Society of Toxicology  
American Industrial Health Council  
Shell Oil Company  
Formaldehyde Institute  
Chemical Industry Institute of Toxicology  
Ciba-Geigy  
Calorie Control Council  
Georgia Pacific  
Life Systems, Inc.  
Olin  
Ethylene Oxide Council, Chemical Manufacturers Association  
Velsicol  
Exxon  
Chemical Manufacturers Association  
Syntex  
Hoechst-Celanese  
Battelle Memorial Institute  
Travenol  
Procter & Gamble  
McCormick & Company, Inc.  
Monsanto Company  
Kodak  
ChemRisk  
U.S. Environmental Protection Agency  
Cleary, Gottlieb, Steen & Hamilton  
Holmes, Roberts, & Owen  
Woodard, Hall, & Primm Inc.  
Hunton & Williams

National Agricultural Chemical Association  
DOW Chemical Company  
American Cyanamid  
Owens / Corning Fiberglas  
Covington & Burling  
ETU Task Force  
Sedgwick, Detert, Moran, & Arnold  
Chem-Tox Consulting  
Texas Institute for Advancement of Chemical Technology, Inc.  
Dermigen, Inc.  
Goodwin, Procter, & Hoar  
Texas Industrial Services  
The Goodyear Tire & Rubber Company  
RRC, Inc.  
Armstrong, Teasdale, Schlafly & Davis  
Industrial Compliance  
Haight, Brown & Bonesteel  
Kirkland & Ellis  
Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.  
Howrey & Simon  
CANTOX, Wireless Technology Research  
Olefins Panel, Chemical Manufacturers Association  
OXO Process TRTG, Chemical Manufacturers Association  
Novartis Crop Protection  
Syngenta Crop Protection, Inc.  
Lyondell Chemical Company

## **XI. Presentations**

### Invited Presentations

1. Estimation of "Safe Doses" in Carcinogenic Experiments. Conference on the Status of Predictive Tools in Application to Safety Evaluation: Present and Future. National Center for

- Toxicological Research, Food and Drug Administration, and National Institutes of Health. November, 1976. (with H.O. Hartley).
2. Stochastic Models for Carcinogenic Processes and Risk Assessment. Meeting of Southeast Texas Chapter of ASA. October, 1978.
  3. Stochastic Models for Carcinogenic Processes and Risk Assessment. Joint Meeting of The Biometric Society, ASA, and IMS. April, 1979.
  4. Estimating the Russian Grain Production. University of South Carolina. March, 1980.
  5. How Near is a Near-Optimal Solution. Joint meeting of ORSA and TIMS. May, 1980.
  6. Carcinogenic Risk Assessment: Response Models and Experimental Designs. Rohm and Haas Company. June, 1980.
  7. Which Options Provide the Quickest Solution. Conference on Mathematical Programming: Testing and Validating Algorithms and Software. Committee on Algorithms (COAL), Mathematical Programming Society, U.S. National Bureau of Standards, and U.S. Department of Energy. January, 1981.
  8. Risk Assessment Using Time. American Industrial Health Council, Quantitative Risk Assessment Subcommittee Meeting. February, 1981.
  9. Re-Examination of ED01 Study: Risk Assessment Using Time. Meeting of the Society of Toxicology. March, 1981.
  10. Risk Assessment Based on Time to Response. Joint Meetings of the Biometric Society and ASA. March, 1981.
  11. Conference on Risk Assessment in Regulating Health and Safety. Brookings Institution, Carnegie-Mellon University, and American Petroleum Institute. May, 1981.
  12. Alternative Answers to How Near is a Near-Optimal Solution. Joint Meetings of ORSA, TIMS, and CORS. May, 1981.

13. Risk Assessment Using Time. Shell Oil Company. June, 1981.
14. Formaldehyde Risk Assessment. Joint Meeting of the EPA and the Formaldehyde Institute. August, 1981.
15. Quantitative Risk Assessment Using Time. Chemical Industry Institute of Toxicology. August, 1981.
16. Workshop on Biological and Statistical Implications of the ED01 Study and Related Data Bases. National Center for Toxicological Research, American Industrial Health Council, Society of Toxicology. September 1981.
17. Involving Time in Risk Assessment. Meeting of the Drug Safety Subsection of the Pharmaceutical Manufacturers Association. October, 1981.
18. Failure Time Assessments Based on Varying Durations of Accelerated Stress. 25th Annual Technical Conference. ASQC and ASA. October, 1981.
19. A Re-Examination of the ED01 Study - Cancer Risk Assessment Using Time and the Hartley-Sielken Model. Meeting of the Ottawa Chapter of Statistical Society of Canada, American Statistical Association, and Health and Welfare Canada. January, 1982.
20. Characterizing Carcinogenic Risk: A Sensitivity Analysis. Joint Meetings of the Biometric Society, ASA, the American Public Health Association, and IMS. March, 1982.
21. Empirical Behavior of Low-Dose Extrapolation Procedures Used in Cancer Risk Assessment. Conference for Texas Statisticians, Baylor University, Waco, Texas. April, 1982.
22. Confidence Limits for Global Optima based on Near-Optimal Solutions to Large Integer and Nonlinear Optimization Problems. Fifth European Congress on Operations Research and 25th Meeting of the Institute of Management Sciences. Lausanne, Switzerland. July, 1982.

23. Multiyear, Through-the-Season Crop Acreage Estimation Using Estimated Acreage in Sample Segments. Joint Meetings of ASA and the Biometric Society. August, 1982.
24. Incorporating Partially Classified Sample Segments into NASA Acreage Estimation Procedures. Joint Meetings of ASA and the Biometric Society. August, 1982.
25. AAIH Seminar on Risk Assessment. Joint Conference on Occupational Health; American Academy of Occupational Medicine, American Academy of Industrial Hygiene. September, 1982.
26. Some Capabilities and Limitations of Low Dose Extrapolation Within the Experimental Species using Procedures based on the Multistage Model and its Extensions. Workshop on Carcinogen Identification Policy, Department of Health Services, Health and Welfare Agency, State of California. December, 1982.
27. Cancer Dose-Response Models. Symposium III, Recent Approaches to the Problems of Dose-Response of Genotoxic Carcinogenicity, Third International Congress on Toxicology. San Diego, August, 1983.
28. Risk Estimation and Characterization. Risk Assessment Seminar, Gulf Coast Community Exposure Study, Texas Air Control Board. Houston, September, 1983.
29. Risk Estimation Panel, Consensus Workshop on Formaldehyde. Little Rock, October, 1983.
30. AAIH Seminar on Risk Assessment. Joint Conference on Occupational Health; American Academy of Occupational Medicine, American Academy of Industrial Hygiene. New Orleans, November, 1983.
31. Modeling & Extrapolating. American Industrial Hygiene Conference. Detroit, May, 1984.
32. Modeling and Extrapolating. Symposium on Risk Analysis and Error Propagation. Chemical Manufacturers Association. Washington, D.C., June 1984.

33. Pitfalls and Problems of Risk Assessment. Exxon Chemicals Worldwide Medicine and Environmental Affairs Meeting. Houston, Texas, October, 1984.
34. The Pitfalls of Risk Assessment. CMA Chemical Regulations Advisory Committee's TSCA Informational Meeting. Washington, D.C., December, 1984.
35. The Proper Basis for Model Selection: A Review of the Advantages and Limitations of Various Models. American Petroleum Institute Toxicology Committee Roundtable Discussion, Phoenix, Arizona, January, 1985.
36. Quantitative Risk Assessment. Haskell Laboratory for Toxicology and Industrial Medicine, DuPont, February 1985.
37. Quantitative Risk Assessment. Miami Valley Laboratories, Procter & Gamble Company, Cincinnati, Ohio, April, 1985.
38. The Capabilities, Sensitivity, Pitfalls, and Future of Quantitative Risk Assessment. Symposium on Environmental Health Risks: Assessment and Management. Institute for Risk Research, University of Waterloo, Ontario, Canada. May 29-31, 1985.
39. Some Capabilities, Limitations, and Pitfalls in the Quantitative Risk Assessment of Formaldehyde. CMA Symposium: Risk Analysis in the Chemical Industry; September, 1985.
40. Some Issues in the Quantitative Modeling Portion of Cancer Risk Assessment. CMA Symposium: Risk Analysis in the Chemical Industry; September, 1985.
41. Risk Assessment. Quarterly Meeting, Environmental Health Committee, Texas Chemical Council; October, 1985.
42. Quantitative Methodology for Cancer Risk Assessment. Continuing Education Course (Chairman and Speaker), Society of Toxicology. New Orleans, Louisiana. March 3, 1986.
43. The Capabilities, Pitfalls, and Future of the Quantitative Modeling Portion of Cancer Risk Assessment. National Risk Assessment Workshop. San Antonio, Texas. March 31 - April 2, 1986.

44. An Individualized Response Model for Quantitative Cancer Risk Assessment. Joint meeting sponsored by the Chemical Manufacturers Association and the American Industrial Health Council. Washington, D.C.; June 27, 1986.
45. The Forthcoming Merger in Quantitative Risk Assessment. Department of Statistics, Stanford University. Stanford, California. July 21, 1986.
46. The Forthcoming Merger in Quantitative Risk Assessment. Conference for Food Protection. Ann Arbor, Michigan. August 17 - 20, 1986.
47. Statistical Evaluations Reflecting the Skewness in the Distribution of TCDD Levels in Human Adipose Tissue. DIOXIN 86: 6th International Symposium on Chlorinated Dioxins and Related Compounds. Fukuoka, Japan. September 16 - 19, 1986.
48. The Forthcoming Merger in Quantitative Cancer Risk Assessment. Workshop on New Approaches to Risk Assessment, sponsored by Procter & Gamble Company. October 3, 1986.
49. Benzene and Leukemia: Opposed to the Shortcomings in the Current Regulatory Process. Workshop on Grappling with Risk Assessment: On the Frontier of Science and Law. Sponsored by: UC Toxic Substances Research & Teaching Program, UC Division of Agriculture and Natural Resources, California Department of Health Services, U.S. Forest Service. Granlibakken, Lake Tahoe, California. October 6 - 8, 1986.
50. Incorporating More Science into Cancer Dose - Response Extrapolations. Dept. of Biostatistics, Medical College of Virginia, Virginia Commonwealth University. Richmond, Virginia. November 13, 1986.
51. Incorporating More Science into Cancer Dose-Response Extrapolations. Dept. of Statistics, Texas A&M University. College Station, Texas. December 1, 1986
52. Incorporating More Science into Quantitative Risk Extrapolation Methodologies. Society for Risk Analysis, Texas Chapter, Symposium: Setting Air Toxics Standards. Houston, Texas. January 22, 1987.

53. Putting More Toxicology in Risk Assessments. Environmental Toxicology Seminar Program. College of Veterinary Medicine, Texas A&M University, College Station, Texas. January 26, 1987.
54. Upper and Lower Bounds in Mathematical Risk Assessment Models. Conference and Workshop on Reducing Uncertainty in Risk Assessment, Center for Environmental Toxicology, Michigan State University. May 17, 1987.
55. Cell Turnover Rates and Cancer Dose-Response Modeling. 1987 Annual Summer Toxicology Forum, Aspen, Colorado. July 16, 1987.
56. Combining Physiology, Carcinogenic Mechanism, and Interindividual Variation in Cancer Dose-Response Extrapolations. 1987 Annual meeting of Society for Risk Analysis, Houston, Texas. November 2, 1987.
57. Combining Physiology, Carcinogenic Mechanism, and Interindividual Variation in Cancer Dose-Response Extrapolations. Joint meeting of Southwest Environmental Mutagen Society and the Gulf Coast Society of Toxicology, Houston, Texas. November 20, 1987.
58. Recent Advances in Modeling -- Combining Physiology, Carcinogenic Mechanism, and Interindividual Variation in Cancer Dose-Response Extrapolations. Region III ASSE and Texas Sections of AIHA 16th Annual Professional Conference, College Station, Texas. February 1, 1988.
59. Quantitative Cancer Risk Assessment: Dose-Response Extrapolations. Fourth Dave Hager Conference: Risk Assessment and Risk Management - The Scientific Perspective. Western New York Local Section of American Industrial Hygiene Association. Rochester, New York, June 15, 1988.
60. Pitfalls of Needlessly Conservative Aspects of Cancer Risk Quantifications and Avoiding Them. 1989 Annual meeting of the American Association for the Advancement of Science. San Francisco, California. January 15, 1989.

61. An Information Analysis Approach to Quantitative Risk Assessment. The 1989 Washington Conference on Risk Assessment. Sponsored by The Center for Energy and Environmental Management (CEEM). Arlington, Virginia, September 26 - 27, 1989.
62. New Approaches and Tools for Quantitative Cancer Risk Assessment. Society for Risk Analysis 1989 Annual Meeting. San Francisco, California. October 29 - November 1, 1989.
63. Quantitative Risk Assessment - National Perspective. Conference on Louisiana's Environment in the 1990's. Baton Rouge, Louisiana. November 14 - 16, 1989.
64. Incorporating Cell Proliferation into Quantitative Cancer Risk Assessment. Poster Session. Conference on Chemically Induced Cell Proliferation: Implications for Risk Assessment. Austin, Texas. November 29 - December 2, 1989.
65. Information Analysis: A Weight-of-Evidence Methodology for Quantitative Cancer Risk Assessment. Mini-Workshop. Regional Risk Assessment Workshop 2. Atlanta, Georgia. November 28 - December 1, 1989.
66. EXTRACT: A Tool for Information-Analysis-Based Risk Characterization. AIHC Risk Assessment Subcommittee. February 28, 1990.
67. Information-Analysis-Based Risk Characterization: Combining Information on Human Exposures with Information on Health Effects from Animal Experimental Data and Human Data including Epidemiological Data: An Illustration based on Dieldrin. Workshop on the Human and Animal Data on Dieldrin. Washington, D.C. April 10, 1990.
68. Weight of Evidence: Risk Analysis. Fish Advisory Task Force Meeting, Council of Great Lakes Governors. Toledo, Ohio. May 8, 1990.
69. Information-Analysis-Based Quantitative Risk Characterization. AIHC Meeting on Alternatives to the Linearized Multistage Model. Washington, D.C. June 18 - 19, 1990.

70. A Weight-of-Evidence Approach to Quantitative Cancer Risk Assessment: Information Analysis. Satellite Symposium on Risk Assessment in Chemical Carcinogenesis. Heidelberg, Germany. August 24 - 25, 1990.
71. Information Analysis: A Weight-of-Evidence Methodology for Quantitative Cancer Risk Assessment. Regional Risk Assessment Workshop 3: Prairie & Mountain States. Austin, Texas. September 10 - 13, 1990.
72. Decision Analysis. 1990 Washington Conference on Risk Assessment. Sponsored by Center for Energy and Environmental Management (CEEM). Alexandria, Virginia. September 25 - 26, 1990.
73. Information-Analysis-Based Exposure Characterization. Society for Risk Analysis 1990 Annual Meeting. New Orleans. October 7 - 10, 1990.
74. Weight-of-Evidence Approach to Quantitative Risk Assessment. International Symposium on Toxicology 1990 Beijing. Beijing, P.R. China. October 16 - 19, 1990.
75. Discussant: Two-Stage Clonal Expansion Model of Carcinogenesis, Presenter: Suresh Moolgavkar. Workshop on Two-Stage Models of Carcinogenesis: Applications and Implications in Risk Assessment. Committee on Risk Assessment Methodology (CRAM). Washington, D.C. November 8, 1990.
76. A Weight-of-Evidence Approach to Quantitative Risk Assessment. Asphalt Institute Environmental Committees. Alexandria, Virginia. November 27, 1990.
77. A Methodology for Using Human Health Data in Quantitative Risk Assessment. (with Donald E. Stevenson). Epidemiology Subcommittee of AIHC. Washington, D.C. November 29, 1990.
78. Differences in Carcinogenic Response to Dieldrin in Mice and Humans. (with Donald E. Stevenson). Relevance of Animal Studies to Evaluate Human Cancer Risk. Barton Creek Conference Resort. Austin, Texas. December 5 - 8, 1990.

79. Information-Analysis-Based Cancer Risk Characterization. 1991 American Statistical Association Winter Conference: Statistics and the Environment. New Orleans, Louisiana. January 3 - 5, 1991.
80. Information-Analysis-Based Quantitative Cancer Risk Assessment. Interagency Risk Assessment Group: Texas Air Control Board, Texas Water Commission, Texas Department of Agriculture, Texas Department of Health. Austin, Texas. January 8, 1991.
81. State of Texas Workshop on Quantitative Cancer Dose-Response Modeling Software. Interagency Risk Assessment Group: Texas Air Control Board, Texas Water Commission, Texas Department of Agriculture, Texas Department of Health. Austin, Texas. February 14, 1991.
82. Information Analysis: A Weight-of-Evidence Methodology for Quantitative Cancer Risk Assessment. Regional Risk Assessment Workshop 4: Far West States. San Francisco, California. March 25 - 28, 1991.
83. Information-Analysis-Based Risk Characterization of Mixtures. The Second International Congress on Toxic Combustion By-Products: Formation and Control. University of Utah. Salt Lake City, Utah. March 26 - 29, 1991.
84. A Weight-of-Evidence Approach to Quantitative Cancer Risk Assessment: Information Analysis. Environmental Health Committee, Texas Chemical Council. Houston, Texas. April 23, 1991.
85. Using Decision Analysis Techniques in Quantitative Cancer Risk Assessment. ORSA/TIMS National Meeting. Nashville, Tennessee. May 15, 1991.
86. A Case Study on Formaldehyde: Communication between Risk Assessors and Risk Managers. (with John D. Graham). A Workshop to Explore and Develop the Concept of Risk Characterization. Co-Sponsors: AIHC, Resources for the Future, and U.S. EPA. Washington, D.C. September 26 - 27, 1991.

87. Information Analysis: A Weight-of-Evidence Methodology for Quantitative Cancer Risk Assessment. Regional Risk Assessment Workshop 5: Northeast States. Boston, Massachusetts. April 20 - 23, 1992.
88. The Likelihood of Alternative Carcinogenic Potencies: Uncertainty Analysis of Chloroform. Poster Session. First International Conference on the Safety of Water Disinfection: Balancing Chemical & Microbial Risks. Washington, D.C. August 31 - September 3, 1992.
89. Quantitative Implications of Emerging Stochastic Biologically Based Cancer Models. University of Texas, M.D. Anderson Cancer Center, Science Park-Research Division. Smithville, Texas. November 16, 1992.
90. Incorporating Additional Biological Phenomena into Two-Stage Cancer Models. 6th International Conference on Carcinogenesis and Risk Assessment: Receptor Mediated Biological Processes: Implications for Evaluating Risk. Barton Creek Conference Resort. Austin, Texas. December 8 - 11, 1992.
91. Illustrations of Distributional Risk Characterizations Incorporating Uncertainty and Expert Judgements: Chloroform and Formaldehyde. (with John D. Graham). Seminar at U.S. EPA Auditorium. Washington, D.C. February 10, 1993.
92. Evaluation of Chloroform Risk to Humans. The Toxicology Forum: 1993 Annual Winter Meeting. Washington, D.C. February 15, 1993.
93. Risk Assessment Issues. Conference on Chemical Contaminants in Seafood. Washington, D.C. April 22, 1993.
94. Background Carcinogenicity Rates. The Toxicology Forum: 1993 Annual Summer Meeting. Aspen, Colorado. July 16, 1993.
95. A Weight-of-Evidence Approach to Quantitative Risk Assessment. Exxon Biomedical Services, Inc. East Millstone, New Jersey. March 24, 1994.
96. A Weight-of-Evidence Approach to Quantitative Risk Assessment. American Industrial Health Council. April 27, 1994.

97. A Weight-of-Evidence Approach to Quantitative Risk Assessment. Texas Conference of Statisticians. April 29, 1994.
98. Software to Make Better Quantitative Risk Assessments Easier. ASDWA. Las Vegas, Nevada. October 5, 1994
99. How to Use Both Human and Animal Data in Quantitative Risk Assessment. Federal Focus. Washington, D.C. October 13-14, 1994.
100. Use of Co-Located Distributions Method to Estimate Biota Tissue Concentrations at the Rocky Mountain Arsenal. (with Ciriaco Valdez-Flores, Phil A. Clifford, Marcy I Banton, and J. Scott Klingensmith) SETAC. November 3, 1994.
101. Comprehensive Realism: The Next Tier in Risk Assessment (with Ciriaco Valdez-Flores) Society for Risk Analysis. Baltimore, Maryland. December 4, 1994.
102. More Realistic Exposure Durations for More Realistic People. Society for Risk Analysis. Baltimore, Maryland. December 6, 1994.
103. More Realistic Exposure for More Realistic People. Air & Waste Management Association. San Antonio, Texas. June 20, 1995.
104. Quantitative Cancer Risk Assessment of Butadiene. Evaluation of Butadiene & Isoprene Health Risks. Inn at Semi-Ah-Moo. Blaine, Washington. June 27 - 29, 1995.
105. Limitations of Default Assumptions Stimulate Comprehensive Realism as a New Tier in Quantitative Cancer Risk Assessment. Workshop: From Cancer Hazard to Cancer Risk. Wurzburg, Germany. September 25 - 26, 1995.
106. Weight-of-Evidence Approach to Quantitative Risk Assessment and Uncertainty Characterization. RIVM. Netherlands. September 27, 1995.

107. Comprehensive Realism's Weight-of-Evidence Based Distributional Dose-Response Characterization. (Given by Ciriaco Valdez-Flores) Health Canada. Uncertainty in Toxicological Risk Assessment Workshop. Ottawa, Ontario. October 18 - 19, 1995.
108. Comprehensive Realism's Weight-of-Evidence Based Distributional Risk Characterizations for Cancer and Noncancer Health Effects. Society for Risk Analysis. Honolulu, Hawaii. December 4, 1995.
109. Collection, Use, and Impact of Site-Specific Distributional Exposure Duration Data as an Alternative to Default Assumptions. Society for Risk Analysis. Honolulu, Hawaii. December 4, 1995.
110. Implementation of Probabilistic Risk Assessment. Written presentation for the Commission on Risk Assessment and Risk Management. Oral presentations on November 17, 1995, and January 17, 1996, cancelled due to federal government shutdown.
111. Comprehensive Realism: Industry's Emerging Approach to Risk Assessment and Managing Environmental Compliance. ASSE / AIHA / NREP Environmental Symposium. Risk vs. Resource Allocation: Environmental Decision Making. Orlando, Florida. February 5, 1996.
112. Probabilistic Risk Assessment, Triazine Herbicides: Risk Assessment, Mammalian Toxicology and Human Risk Assessment Symposium, 211th American Chemical Society National Meeting, New Orleans, Louisiana, March 24 - 28, 1996.
113. Uncertainty Analyses of the Quantitative Dose-Response Modeling of Synthetic Rubber Producers: Butadiene and Leukemia, Annual Research Review Meeting, Santa Fe, New Mexico, October 16, 1996.
114. Toxicological Defense Mechanisms and the Shape of Dose-Response Relationships, Third Belle Conference, NIEHS, Research Triangle Park, North Carolina, November 12 - 14, 1996.
115. A Margin-of-Exposure Assessment for Atrazine and Simazine, Annual Meeting, Society for Risk Analysis and International Society of Exposure Analysis, New Orleans, Louisiana, December 10, 1996.

116. Dose-Response Assessment of Ethylene Oxide Based on Animal and Human Data, The Toxicology Forum 22<sup>nd</sup> Annual Winter Meeting, February 27, 1997.
117. The Assessment of Worker Exposure and Risk: Probabilistic Risk Assessment, American Industrial Hygiene Association Conference & Exposition, Dallas, Texas, May 21, 1997.
118. Approaches to Cancer Risk Assessment of Butadiene Based on Animal and Human Studies, 1997 Summer Toxicology Forum, Aspen, Colorado, July 10, 1997.
119. Estimating Ecological Risks to Terrestrial Organisms at Rocky Mountain Arsenal, IBC Conference on Ecological Risk Assessment, Boston, Massachusetts, July 16, 1997.
120. The Assessment of Atrazine Exposure and Risk, Water Quality Commission Meeting, Topeka, Kansas, October 14, 1997.
121. Monte Carlo and Probabilistic Risk Assessment: Numerical Examples and Guiding Principles Using the Case Study on Atrazine and Simazine, Arlington, Virginia, November 6, 1997.
122. New Approaches to Aggregate Exposure and Risk Assessment, Society for Risk Analysis Lone Star Chapter, San Antonio, Texas, November 15, 1997.
123. Cancer Dose-Response Assessment of Ethylene Oxide Based on Animal and Human Data, Session: Recent Ethylene Oxide Research and its Implications for Risk Assessment, Society for Risk Analysis, Annual Meeting and Exposition, Capital Hilton, Washington, D.C., December 8, 1997.
124. More Realistic Aggregate Pesticide Exposure Assessments with Less Compounding of Multiple Conservatisms, Session: Probabilistic Methods for Exposure Assessment for Pesticide Residues, Society for Risk Analysis, Annual Meeting and Exposition, Capital Hilton, Washington, D.C., December 8, 1997.
125. Increasing Use of Probabilistic Techniques in Human Health Risk Assessments, Joint Statistical Meeting 98, Dallas, Texas, August 9 - 13, 1998.

126. Biologically-Based Modeling for Chemicals/Radiation: Some Implications for Quantitative Risk Assessment if Hormesis Exists. Conference on Societal Implications of Hormesis. Research Triangle Park, NC, October 5 – 6, 1998.
127. The Interim Nature of the EPA Draft Cancer Risk Characterization for 1,3 Butadiene Based on Human Epidemiological Data. Symposium: Multi-Disciplinary Issues in Cancer Risk Assessment: 1,3 Butadiene Case Study. Society for Risk Analysis Annual Meeting, Phoenix, AZ, December 7, 1998.
128. A Perspective on Quantitative Methods for Aggregate Risk Assessments under the Food Quality Protection Act. Symposium: Aggregate Exposure Assessment for Pesticides: Implementing FQPA. Society for Risk Analysis Annual Meeting, Phoenix, AZ, December 7, 1998.
129. Integration of Residential Exposure with Dietary and Drinking Water Exposures: Aggregate and Cumulative Exposure Assessment and Risk Analysis Under FQPA. Symposium: Implementation of the Food Quality Protection Act of 1996: Development and Validation of Advanced Methods for Assessing Potential Residential Exposures – Part 2. Society for Risk Analysis Annual Meeting, Phoenix, AZ, December 8, 1998.
130. Cumulative Risk Assessment. The FQPA: A Challenge for Science Policy and Pesticide Regulation. Oral Presentation. The International Society of Regulatory Toxicology and Pharmacology and The Council for Agricultural Science and Technology. Fairfax, VA. March 23-24, 1999.
131. Statistical Inferences about the Mechanism of Action in Carcinogenicity Studies. International Symposium on Agricultural Exposures and Cancer. Green College, Oxford, England, November 19 – 22, 2002.
132. Sample Size and Statistical Power in Human Safety Studies: The Substantial Power of Human Study Data to Contribute to the Characterization of NOELs for Cholinesterase Inhibition in Humans: A Statistical Analysis of Recent Studies. National Academy of Sciences. January 8, 2003.

Contributed Presentations:

1. Some Recent Advances in Quantitative Cancer Risk Assessment. The Biometric Society (ENAR) joint meeting with the Institute of Mathematical Statistics and the American Statistical Association. March 12, 1984. Orlando, Florida.
2. How Near is Near Optimal: An Example of the Operations Research - Statistics Interface. The TAMU ORSA Student Chapter. June 19, 1984.
3. Quantitative Cancer Risk Assessment. Environmental Toxicology Seminar. Texas A&M University, February, 1985.
4. Bounds for "Safe" Doses in Quantitative Risk Assessment. The Biometric Society (ENAR) joint meeting with the American Statistical Association. March 25, 1985. Raleigh, North Carolina.
5. Issues in Assessing the Carcinogenic Hazards of Ethylene Oxide. Proceedings of the Third Rocky Mountain Conference on Medical Applications of Statistics. University of Colorado School of Medicine. May 31, 1985. Presented by S. G. Austin.
6. Alternative Approaches to Mathematically Analyzing the Bioassay Data for 2,3,7,8, - TCDD. Society of Toxicology. New Orleans, Louisiana. March 3 - 7, 1986.
7. Incorporating More Science into Cancer Dose-Response Extrapolations. Society for Risk Analysis. Boston, Mass. November 10, 1986.
8. Utilizing More Science in Cancer Dose-Response Extrapolations. Joint Meetings of the Biometric Society, American Statistical Association, and Institute of Mathematical Statistics. March 23, 1987.
9. Risk Assessment: State-of-the-Art. New York State Department of Environmental Conservation, Albany, New York, September 30, 1987.
10. Risk Assessment: State-of-the-Art. New York State Department of Health, Albany, New York, February 11, 1988.

11. Useful Tools for Evaluating and Presenting More Science in Quantitative Cancer Risk Assessments. EPA, Washington, D.C. October 28, 1988.
12. Quantitative Cancer Dose-Response Modeling for All Ages. 1988 Annual Conference of the Society for Risk Analysis. Washington, D.C. November 1, 1988.
13. Technical Workshop for Addressing Human Health Risks Associated with Fisheries Contaminated by Oil Spills. National Oceanic and Atmospheric Administration (NOAA). Aspen Institute, Wye Island, Maryland. August 14-15, 1990.
14. Independent Review Panel on Statistical Aspects of Cancer Risk Estimation for Ethylene Thiourea. National Center for Toxicological Research. Jefferson, Arkansas. November 19, 1990.
15. State of Illinois Workshop on Quantitative Cancer Risk Assessment. St. Louis, Missouri. December 13-14, 1990.
16. NiPERA's Research Planning Workshop. Research Triangle Park, North Carolina. December 17, 1990.
17. Workshop to Peer Review the OMB Report on Risk Assessment and Management. Center for Risk Analysis, Harvard School of Public Health. Boston, Massachusetts. March 6-7, 1991.
18. A Co-Located Distributions Approach to Estimating the Bioaccumulation Factor for Ecological Risk Assessment. Poster Session. Society of Toxicology: 1993 Annual Meeting. New Orleans, Louisiana. March 17, 1993. Received the Award for Outstanding Presentation from the Risk Assessment Specialty Section.
19. Background Carcinogenicity Rates: Another Flaw in the Linearized Multistage Model Upper Bounds on Human Cancer Potency. Poster Session. The First Annual HERL Symposium: Biological Mechanisms and Quantitative Risk Assessment. EPA Health Effects Research Laboratory, Research Triangle Park, North Carolina. November 1 - 4, 1993.
20. Application of Geographical Information Systems (GIS) to Ecological Management Decision Support. Poster Session (with P.

- A. Clifford, D.E. Barchers, D.F. Ludwig, J.S. Klingensmith, R.V. Graham, and M.I. Banton). SETAC: 1993 Annual Meeting. Houston, Texas. November 14 - 18, 1993.
21. Quantifying Tumor Probabilities in Two-Stage Growth Models and Exploring Their Dependence on the Combination of Parameter Magnitudes, How Dose and Time Affect Parameter Magnitudes, and Cell Subpopulations with Different Parameter Magnitudes: Computer Programs and Graphical Results. Poster Session (with Robert S. Bretzlaff). 7th International Conference on Carcinogenesis and Risk Assessment: Growth Factors and Tumor Promotion: Implications for Risk Assessment. Barton Creek Conference Center, Austin, Texas. December 1 - 4, 1993.
  22. More Biologically Based Dose-Response Modeling by Incorporating Invaders and Defenders into the Biologically Effective Dose. Poster Session. 7th International Conference on Carcinogenesis and Risk Assessment: Growth Factors and Tumor Promotion: Implications for Risk Assessment. Barton Creek Conference Center, Austin, Texas. December 1 - 4, 1993.
  23. DistGEN (Probability Distribution Generator): Monte Carlo Simulation Software for Environmental Phenomena and Statistical Methodology. Poster Session with Ciriaco Valdez-Flores. Society of Environmental Toxicology and Chemistry. Denver, Colorado. October 31, 1994.
  24. DistFIT (Probability Distribution Fitting): A Software System for Fitting Parametric Distributions to Environmental Data. Poster Session with Ciriaco Valdez-Flores. Society of Environmental Toxicology and Chemistry. Denver, Colorado. October 31, 1994.
  25. Designing Field Sampling Programs for Prey Species: Rocky Mountain Case Study. Poster Session with Ciriaco Valdez-Flores, J. S. Klingensmith, and M. I. Banton. Society of Environmental Toxicology and Chemistry. Denver, Colorado. November 3, 1994.
  26. Overcoming Statistical Pitfalls in Ecological Risk Assessment. Poster Session with Ciriaco Valdez-Flores, J. S. Klingensmith, and M. I. Banton. Society of Environmental Toxicology and Chemistry. Denver, Colorado. November 3, 1994.

27. Use of Probabilistic Expert Judgment in Uncertainty Analysis of Carcinogenic Potency. Oral Presentation with Gray, George M., S. John Evans, Andrew E. Smith, Ciriaco Valdez-Flores, and John D. Graham. Society for Risk Analysis: Annual Meeting. Baltimore, Maryland. December 5, 1994.
28. Estimating Cancer Risks from Dermal Exposure to Benzo[A]pyrene. Poster presentation with L. E. Tonner-Navarro, N. C. Halmes, R. C. James, and S. M. Roberts. Society of Toxicology, 37<sup>th</sup> Annual Meeting. Seattle, WA. March 1-5. 1998.
28. Development of Inhalation and Oral Benchmark Doses for Trichloroethylene Based on Carcinogenicity in Mice. Poster presentation with C. J. Saranko, P. S. Guzelian, R. C. James, and S. M. Roberts. Society of Toxicology, 38<sup>th</sup> Annual Meeting. New Orleans, LA. March 14-18, 1999.
29. Dose-Response Implications of the University of Alabama Study of Lymphohematopoietic Cancer Among Workers Exposed to 1,3-Butadiene, Styrene, and Dimethyldithiocarbamate in the Synthetic Rubber Industry. Oral Presentation with Ciriaco Valdez-Flores. International Symposium: Evaluation of Butadiene, Isoprene & Chloroprene Health Risks. London, UK. September 12-14, 2000.
30. Maximum Likelihood Estimation of Single-Unit Residue Concentration Distributions from Composite Data. Oral presentation with Larry R. Holden and Ciriaco Valdez-Flores. Fourth International Conference on Environmetrics and Chemometrics. Las Vegas, NV. September 18-20. 2000.
31. Non-Linear Mixed Effects Models for Cholinesterase Activity in Rats Exposed to Aldicarb. Poster presentation with C. A. Clayton, T. B. Starr, A. J. Tobia, and P. G. Pontal. Society of Toxicology, 40<sup>th</sup> Annual Meeting. San Francisco, CA. March 25-29. 2001.
32. Mechanisms Underlying the Occurrence of Mammary Adenocarcinomas and Fibroadenomas in Female Sprague-Dawley Rats Exposed to Atrazine: A Statistical Evaluation of Risk Factors. Poster presentation with C. B. Breckenridge, J. T. Stevens, J. W. Simpkins, J. C. Eldridge, L. Tirey, and C. Valdez-Flores. Society of Toxicology, 40<sup>th</sup> Annual Meeting. San Francisco, CA. March 25-29. 2001.

33. Time-to-Tumor Analyses of Liver Tumors in Mice Exposed to Thiamethoxam. Poster presentation with C. Valdez-Flores, L. Holden, T. Pastoor, and J. T. Stevens. Society of Toxicology, 40<sup>th</sup> Annual Meeting. San Francisco, CA. March 25-29. 2001.

## **XII. Training Sessions:**

1. A Weight-of-Evidence Approach for the Development of Fish Consumption Advisory Criteria: Training Sessions: Advisories Based on Cancer Risks:
  - Springfield, Illinois August 16 - 17, 1993
  - Lansing, Michigan September 2 - 3, 1993
  - Minneapolis, Minnesota September 7 - 8, 1993
  - Columbus, Ohio September 20 - 21, 1993
  - Albany, New York September 28 - 29, 1993
  - Harrisburg, Pennsylvania October 1 & 4, 1993
  - Indianapolis, Indiana October 7 - 8, 1993
  - Madison, Wisconsin October 14 - 15, 1993
2. A Weight-of-Evidence Approach for the Development of Fish Consumption Advisory Criteria: Training Sessions: Advisories Based on Noncancer Risks:
  - Albany, New York January 19 - 20, 1994
  - Harrisburg, Pennsylvania January 24 - 25, 1994
  - Columbus, Ohio January 27 - 28, 1994
  - Indianapolis, Indiana February 1 - 2, 1994
  - Lansing, Michigan February 7 - 8, 1994
  - Madison, Wisconsin February 10 - 11, 1994
  - Minneapolis, Minnesota February 14 - 15, 1994
  - Springfield, Illinois February 17 - 18, 1994
3. Comprehensive Realism: The Next Tier in Risk Assessment. Workshop at the Society for Risk Analysis annual meeting in Baltimore, Maryland, December 4, 1994.
4. Workshop on Probabilistic Exposure and Risk Assessment. Sophia Antipolis Cedex, France, July 5 – 7, 1999.
5. Training on Probabilistic Pesticide Exposure and Risk Assessment. Brussels, Belgium, May 20 – 22, 2003.

### **XIII. Exhibits**

Society of Toxicology: 1990 Annual Meeting.  
Miami Beach, Florida. February 11 - 15, 1990.

Society of Toxicology: 1991 Annual Meeting.  
Dallas, Texas. February 26 - 28, 1991.

Society for Risk Analysis: 1992 Annual Meeting.  
San Diego, California. December 7 - 9, 1992.

Society of Toxicology: 1993 Annual Meeting.  
New Orleans, Louisiana. March 14 - 18, 1993.

Society for Risk Analysis: 1994 Annual Meeting.  
Baltimore, Maryland. December 5 - 7, 1994.

### **XIV. Litigation Support**

#### Depositions:

No. 729586: Dennis Armstrong, et al. vs. Dow Chemical Company, et al. October 16, 1982. (DBCP litigation.)

No. CA79-M-5128-NE: James Cloud, et al. vs. Olin Corporation.  
December 10, 1982. (DDT litigation.)

No. CV-83-C-5021-NE, CV-83-C-5670-NE, CV-83-C-5917-NE:  
Floyd Wilhoite et al. vs. Olin Corporation; Floyd Wilhoite et al. vs. Tennessee Valley Authority; Ray Hagood et al. vs. Olin Corporation, etc. November 26, 1985. (DDT litigation.)

No. 920428: In The Superior Court of the State of California in and for the County of San Francisco

Tulare County Water Company, Incorporated individually and dba Central Valley Water Company, Plaintiff, vs. Shell Oil Company, et al., Defendants. May 21, 1991. (DBCP litigation)

No. 775865: In The Superior Court of the State of California in and for the County of San Francisco

City of Kingsburg, City of Sanger, and Del Rey Community Services District, Plaintiff, vs. Interlink Agriculture Chemical Co., et al., Defendants. April 6, 1992. (DBCP litigation)

No. 914400: In The Superior Court of the State of California in and for the County of San Francisco. Re: Consolidated DBCP Cases. Fresno Action. July 26, 1994. (DBCP litigation)

Cause No. CIV 91-525 TUC ROS: In the United States District Court, District of Arizona  
Mary H. Yslava, et al. vs. Hughes Aircraft Company Hughes Aircraft Company vs. City of Tucson, et al. November 14, 1995

Arbitration:

Anderson vs. PG&E, Los Angeles, California  
Haight, Brown & Bonesteel  
Santa Monica, California  
February 14 - 15, 1995

Affidavit and Testimony:

Harold A. Andre et al. v. Syntex Agribusiness, Inc., et al.,  
Cause No. 832-05432, Division No.4  
Michael Jos. Hart  
Judge of the Circuit Court  
Twenty-Second Judicial Court of Missouri  
St. Louis, Missouri

**LITIGATION DEPOSITION AND TESTIMONY GIVEN SINCE JANUARY 1, 1995**

1. Anderson vs. PG&E, Los Angeles, California  
Haight, Brown & Bonesteel  
Santa Monica, California  
February 14-15, 1995  
(Arbitration)
2. Yslava et al. vs. Hughes Aircraft Company and Consolidated Cases  
Lanier et al. vs. Hughes Aircraft Company  
July 6, 1995  
(Declaration)
3. Cause No. CIV 91-525 TUC ROS: In the United States District Court, District  
of Arizona,  
Mary H. Yslava, et al. vs. Hughes Aircraft Company  
Hughes Aircraft Company vs. City of Tucson, et al.  
November 14, 1995  
(Deposition)
4. Master File No. 96-5584-MRP: United States District Court, Central District  
of California, Southern Division  
Burbank Environmental Litigation  
March 3, 1997  
(Declaration)
5. Diane Lofgren, et al., vs. Motorola, Inc., et al.  
October 8, 1997  
(Declaration)
6. Case No: 251-96-493-CIV: In the Circuit Court of the First Judicial District  
of Hinds County, Mississippi  
Bogalusa Chemical Release  
December 4, 1997  
(Affidavit)
7. Master File No. 96-5584-MRP (ANx): United States District Court, Central  
District of California  
Burbank Environmental Litigation  
February 2, 1998  
(Declaration)

8. C. A. No. C-96-516: In the United States District Court for the Southern District of Texas, Corpus Christi Division  
Gilbert Adame, Jr., et al., vs. Koch Pipeline Company, L.L.P., et al.  
February 12, 1998  
(Deposition)
9. Cordova et al. vs. Hughes Aircraft Company  
April 28, 1998  
(Declaration)
10. Abel et al. vs. Lockheed Martin Corporation, et al.; Case No. EC 021023 in the Superior Court of the State of California for the County of Los Angeles North Central District  
August 30-31, 1999  
November 12, 1999  
(Deposition)
11. Abel et al. vs. Lockheed Martin Corporation, et al.; Case No. EC 021023 in the Superior Court of the State of California for the County of Los Angeles North Central District  
April 7, 2000  
(Declaration)
12. Linda Akee, et al. v. The Dow Chemical Company, et al.; U.S. D.C., Hawaii District Court Action No. CV00-00382 BMK  
May 19, 2003  
(Declaration)
13. Horton v. United States; Case No. 00-MK-2126 in U.S. Federal Court, District of Colorado  
August 28, 2003  
(Report)