BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop a Risk-Based Decision-Making Framework to Evaluate Safety and Reliability Improvements and Revise the General Rate Case Plan for Energy Utilities	Rulemaking 13-11-006 (Filed November 14, 2013)

NOTICE OF INTENT TO CLAIM INTERVENOR COMPENSATION AND, IF REQUESTED (and [x] checked), ADMINISTRATIVE LAW JUDGE'S RULING ON JOHN LATHROP'S SHOWING OF SIGNIFICANT FINANCIAL HARDSHIP

PUBLIC VERSION

Customer: John Fargo Lathrop, Ph.D.		
Assigned Commissioner: Michael R. Peevey		Assigned ALJ: John S. Wong
I hereby certify that the information I have set forth in Parts I, II, III and IV of this Notice of Intent (NOI) is true to my best knowledge, information and belief. I further certify that, in conformance with the Rules of Practice and Procedure, this NOI and has been served this day upon all required persons (as set forth in the Certificate of Service attached as Attachment 1).		
	Signature:	/s/ John Fargo Lathrop
Date: May 26, 2014	Printed Name:	John Fargo Lathrop

PART I: PROCEDURAL ISSUES

A. Status as "customer" (*see* Pub. Util. Code § 1802(b)): The party claims "customer" status because the party is (check one):	**Applies (check)**
1. A **Category 1** customer that is an actual customer whose self-interest in the proceeding arises primarily from his/her role as a customer of the utility and, at the same time, the customer must represent the broader interests of at least some other customers. In addition to describing your own interest in the proceeding you must show how your participation goes beyond just your own self-interest and will benefit other customers. See, for example, discussion in D.08-07-019 at 5-10.	**X**
2. A **Category 2** customer that is a representative who has been authorized by actual customers to represent them. Category 2 involves a more formal arrangement where a customer or a group of customers selects a more skilled person to represent the customer's views in a proceeding. A customer or group of customers may also form or authorize a group to represent them, and the group, in turn, may authorize a representative such as an attorney to represent the group. A representative authorized by a customer must identify the residential customer(s) being represented and provide authorization from at least one customer (D.98-04-059 at 30).	

3. A **Category 3** customer that is a formally organized group authorized, by its articles of incorporation or bylaws to represent the interests of residential customers or small commercial customers receiving bundled electric service from an electrical corporation. Certain environmental groups that represent residential customers with concerns for the environment may also qualify as Category 3 customers, even if the above requirement is not specifically met in the articles or bylaws.	
4. The party's explanation of its customer status must include the percentage of the intervenors members who are residential ratepayers or the percentage of the intervenors members who are customers receiving bundled electric service from an electrical corporation, and must include supporting documentation: (i.e., articles of incorporation or bylaws).	
Identify all attached documents in Part IV. As a Category 1 customer, I have only to establish that I represent a broader interest of at least some other customers and etc. as presented in I.A(1) above. I demonstrate that in II.A. below. Attachment 2 is an excerpted version of my curriculum vitae, which establishes my credentials to serve as an expert, as I present in II.A. below.	
• Do you have any direct economic interest in outcomes of the proceeding?[1] If so, explain: I am simply a residential customer of PG&E. That is the extent of my interest.	

B. Conflict of Interest (§ 1802.3)	**Check**
1. Is the customer a representative of a group representing the interests of small commercial customers who receive bundled electric service from an electrical corporation?	____Yes __X__ No
2. If the answer to the above question is "Yes", does the customer have a conflict arising from prior representation before the commission?	____Yes ____ No

C. Timely Filing of Notice of Intent (NOI) (§ 1804(a)(1)):	**Check**
1. Is the party's NOI filed within 30 days after a Prehearing Conference? (Note: ALJ Wong approved John Lathrop as a party at the April 29, 2014 PHC.) Date of Prehearing Conference: April 29, 2014	__X__ Yes ____ No
2. Is the party's NOI filed at another time (for example, because no Prehearing Conference was held, the proceeding will take less than 30 days, the schedule did not reasonably allow parties to identify issues within the timeframe normally permitted, or new issues have emerged)?	____Yes ____ No
2a. The party's description of the reasons for filing its NOI at this other time:	
2b. The party's information on the proceeding number, date, and decision number for any Commission decision, Commissioner ruling, ALJ ruling, or other document authorizing the filing of NOI at that other time:	

[1] See Rule 17.1(e).

PART II: SCOPE OF ANTICIPATED PARTICIPATION

A. Planned Participation (§ 1804(a)(2)(A)(i)):

- The party's statement of the issues on which it plans to participate.

I will act as a source of independent Third Party Review, applying my expertise (see my curriculum vitae in Attachment 2) to the four issues specified in the Scoping Memo and Ruling on R.13-11-066 dated May 15, 2014 (pp 4-5). In that participation, I will:

- comment, critique and raise suggestions on the four issues, aggressively taking a pro-active, critical, objective, neutral, fair and independent perspective at a high level of analytic expertise in risk assessment/analysis/management, based on extensive and broad experience in those areas (see Attachment 2);
- emphasize not only methodological correctness, but also transparency and presentation formats to facilitate informed/effective participation by non-technical intervenors and CPUC oversight;
- specifically focus on how the CPUC should best manage multiple competing advocacy risk management analyses;
- take a systems analysis, requirements-based approach, specifically developing clearly stated and enforceable requirements for supporting analyses and how they are to be incorporated into CPUC processes.
- specifically address the challenges I have listed in my presentation as a panelist at the March 19-21 workshop, and in my Redline of the Straw Man (attached): effective oversight by the CPUC, effective participation by intervenors, verification and validation, lack of data, fairness, completeness, unanticipated scenarios, managing five very different types of risk (in particular operational risks vs. legacy infrastructure risks), incentives (e.g. utility incentives favoring capital-based risk reduction measures), blending analytic and policy processes, and the cultural changes required.

- The party's explanation of how it plans to avoid duplication of effort with other parties.

As best as I can determine from my participation as panelist at the March 19-21 Workshop, and reviewing other parties' redlines and comments, I am equipped to take a uniquely qualified perspective. Simply put and with all due respect, I have not discovered other parties with expertise equivalent to mine, in the narrow scope of expertise I claim (again, Attachment 2).

To the degree the utilities may have in-house expertise at some level equivalent to mine, or may hire such expertise, then my participation will still not represent duplication of effort, since as I've emphasized in my panelist participation and my redline, a crucial part of the process proposed in the OIR is to include high-horsepower advocacy Third Party analysis, to counter the anticipated high-horsepower advocacy analysis from the utilities.

All that said, in addition I will pursue best efforts to pursue coordination with other parties.

- The party's description of the nature and extent of the party's planned participation.

I will participate in both rounds of comments as specified in the Scoping Memo, dates June 13, July 15 and August 22. I will also participate in both rounds of comments in response to the planned September decision on first-round issues, and both rounds of comments in response to the planned November decision on second-round issues.

If the opportunity presents itself to review any GRC or other submissions where my review could have value for this OIR, I will conduct that review.

B. The party's itemized estimate of the compensation that the party expects to request, based on the anticipated duration of the proceeding (§ 1804(a)(2)(A)(ii)):				
Item	**Hours**	**Rate $**	**Total $**	**#**
ATTORNEY, EXPERT, AND ADVOCATE FEES				
John Lathrop, party and expert	500	265	$132,500	
			Subtotal: **$132,500**	
COSTS				
Misc expenses (copying, supplies, etc.)			$500	
			Subtotal: **$500**	
			TOTAL ESTIMATE: $133,000	

Estimated Budget by Issues:

With all due respect, the four issues listed in the Scoping Memo are entirely conflated from the point of view of the nature of my planned participation as described in II.A above. So therefore the estimated budget allocated by issues is simply 25% to each of the four issues. Within each issue, I anticipate:
- Review of other's work, related analysis, drafting comments, preparing reports, preparing testimony: 90% of time
- Attending hearings, meetings, workshops: 10% of time.

Comments/Elaboration: The above time estimates reflect my reasonable estimate of the amount of time required for me to effectively participate in this proceeding. The amount of any future Request for Compensation will depend upon the resources that I find I can effectively allocate to this proceeding going forward. The reasonableness of my hourly rate will be addressed in my Request for Compensation.

PART III: SHOWING OF SIGNIFICANT FINANCIAL HARDSHIP

(To be completed by party ("customer") intending to claim intervenor compensation; see Instructions for options for providing this information)

A. The party claims "significant financial hardship" for its Intervenor Compensation Claim in this proceeding on the following basis:	Applies (check)
1. "[T]he customer cannot afford, without undue hardship, to pay the costs of effective participation, including advocate's fees, expert witness fees, and other reasonable costs of participation" (§ 1802(g)); or	X
2. "[I]n the case of a group or organization, the economic interest of the Individual members of the group or organization is small in comparison to the costs of effective participation in the proceeding" (§ 1802(g)).	
3. A § 1802(g) finding of significant financial hardship in another proceeding, made within one year prior to the commencement of this proceeding, created a rebuttable presumption in this proceeding (§ 1804(b)(1)).	
ALJ ruling (or CPUC decision) issued in proceeding number: Date of ALJ ruling (or CPUC decision):	

B. The party's explanation of the factual basis for its claim of "significant financial hardship" (§ 1802(g)) (necessary documentation, if warranted, is attached to the NOI):
Exhibit A (redacted in the Public Version) presents a very summary depiction of my personal financial information. I make my living as an independent consultant. It is effectively a full time job, in that any hour I am not billing, I am marketing, writing proposals, etc.. Therefore every hour spent on participating in these proceedings, as described in II.A above, is an hour I cannot spend earning my normal income. Frankly, my current financial situation is such that I cannot afford to forego any hour of my normal consulting business without significant financial hardship.

PART IV: ATTACHMENTS DOCUMENTING SPECIFIC ASSERTIONS MADE IN THIS NOTICE

(The party ("customer") intending to claim intervenor compensation identifies and attaches documents; add rows as necessary)

Attachment No.	Description
1 (pp. 7 - 15)	Certificate of Service, and associated Service List
2 (pp. 16 - 25)	Curriculum Vitae, excerpted, of the party, John Fargo Lathrop, Ph.D.
Exhibit A (p. 26)	Party's Personal Financial Information (redacted in Public Version)

ADMINISTRATIVE LAW JUDGE RULING[2]

(ALJ completes)

1. The Notice of Intent (NOI) is rejected for the following reasons:	
a. The NOI has not demonstrated the party's status as a "customer" for the following reason(s):	
b. The NOI has not demonstrated that the NOI was timely filed (Part I(B)) for the following reason(s):	
c. The NOI has not adequately described the scope of anticipated participation (Part II, above) for the following reason(s):	
2. The NOI has demonstrated significant financial hardship for the reasons set forth in Part III of the NOI (above).	
3. The NOI has not demonstrated significant financial hardship for the following reasons.	
4. The ALJ provides the following additional guidance (see § 1804(b)(2)):	

IT IS RULED that:

1. The Notice of Intent is rejected.	
2. Additional guidance is provided to the customer as set forth above.	
3. The customer has satisfied the eligibility requirements of Pub. Util. Code § 1804(a).	
4. The customer has shown significant financial hardship.	
5. The customer is preliminarily determined to be eligible for intervenor compensation in this proceeding. However, a finding of significant financial hardship in no way ensures compensation.	

Dated _____, at San Francisco, California.

_____

Administrative Law Judge

[2] An ALJ Ruling needs not be issued unless: (a) the NOI is deficient; (b) the ALJ desires to address specific issues raised by the NOI (to point out similar positions, areas of potential duplication in showings, unrealistic expectations for compensation, or other matters that may affect the customer's Intervenor Compensation Claim); or (c) the NOI has included a claim of "significant financial hardship" that requires a finding under § 1802(g).

Attachment 1:
Certificate of Service by Customer

I hereby certify that I have this day served a copy of the foregoing **NOTICE OF INTENT TO CLAIM INTERVENOR COMPENSATION** by (check as appropriate):

[ ] hand delivery;
[ ] first-class mail; and/or
[**X**] electronic mail

to the following persons appearing on the official Service List:

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COMMISSION
DIVISION OF ADMINISTRATIVE LAW JUDGES
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LYNN MARSHALL
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Executed this 26th day of May, 2014, at Mountain View, California.

/s/ John Fargo Lathrop, Ph.D.
[Signature]

John Fargo Lathrop, Ph.D.
1905 Milano Way
Mountain View, CA 94040

Attachment 2:
Curriculum Vitae, Excerpted, of John Fargo Lathrop, Ph.D.

- **Education**

  Ph.D., Dual: Economics and Experimental Psychology, University of Michigan, 1979
  M.A., Experimental Psychology, University of Michigan, 1972
  B.S., Physics, Harvey Mudd College, 1970

- **Areas of Expertise**

  Risk Assessment, Risk Assessment in the Political Process, Risk Management, Risk Evaluation
  Planning and Preparedness for Terrorism and Rare Events, Incident Management
  Terrorism Risk Assessment and Risk Management Countering Adaptive Adversaries
  Stakeholder Preferences, Expert Judgment and Executive Values in Strategic Decisions, Policy Choice
  Decision Analysis, Energy Utility Technology Choice, Siting, Transmission Routing

- **Positions**

  2010 - on Innovative Decisions, Inc., Executive Principal Analyst
  2004 - 10 Lawrence Livermore National Laboratory, Decision Analyst, Principal Investigator
  1985 - on Independent consultant, Decision Strategies, LLC (concurrent with both future positions)
  1981 - 85 Woodward Clyde Consultants, Director, Decision Analysis Group 1983-85
  1979 - 81 International Institute for Applied Systems Analysis, Austria, Scholar
  1977 - 79 Lawrence Livermore National Laboratory, Decision Analyst, Task Leader
  1974 - 77 Fellow, Institute for Environmental Quality, University of Michigan

- **Experience, Posts, Publications**

  Experience in broad range of public- and private-sector decisions. Over 65 projects, over 40 clients: over 12 corporations, 8 utilities, 16 government agencies, 2 national laboratories, ITE and IEEE.
  Upcoming President-Elect, Risk Management Specialty Group, Society for Risk Analysis
  Veterans Advisory Board on Dose Reconstruction (vbdr.org), decision analyst.
  Subcommittees: Quality Management, Risk Communication.
  National Science Foundation Proposal Review Panel: Deterrence Theory and Analytics
  Scientific Review Panel on EMF Risk, State of California.
  Testified before Alaska Oil Spill Commission, re transportation oil spill risk assessment.
  Prepared expert testimony on behalf of State of California for major suit,
  comparing risks of tanker vs. pipeline transportation of crude oil.
  Co-developed a graduate course in societal decision analysis at the University of Michigan.
  Directed a study of, and international workshop on, nuclear accident preparedness and management, focused on Three Mile Island, at the International Institute for Applied Systems Analysis, Austria.
  Developed and presented short course: "Getting Stakeholder Values Into Decisions."
  Cluster Chair: Organized all 14 decision analysis sessions for national meeting, Fall '99.
  Referee for Journals: Risk Analysis, Decision Analysis, Interfaces.
  National judge of graduate student papers in decision analysis.
  Publications listed on last 3 pages: edited, co-edited two books; authored or co-authored 9 book chapters, 14 journal articles, and over 30 technical reports and proceedings papers. Examples:
  Readings in Decision Analysis (S. French, Chapman & Hall), Operations Research,
  Journal of the Operational Research Society, Risk Analysis, Environment/Risk,
  Democracy & Security,
  Reliability Engineering & System Safety, Behavioral Science, Journal of Environmental Systems.
  Planning for Rare Events: Nuclear Accident Preparedness and Management (ed. book, Pergamon).

Representative Project Experience

1-Line Overviews of Example Past Projects (summaries follow, same numbering)

Risk Assessment in the Political Process

1. Compared political approval/siting procedures for large hazardous facilities in four countries.
2. Compared 17 risk assessments from those procedures in those four countries.

Wrote/co-authored five articles on the role of risk assessment in the political process. Also three articles on evaluating technological risk and using a decision analytic perspective to determine acceptable risk.

Risk Assessment and Management

3. Risk reduction assessment of a toxic gas cleanup plant, with a complex spatial pipeline risk model.
4. Analytic selection of a risk assessment method for routine air emissions.
5. Environmental impairment liability (EIL) risk assessment for a major business acquisition.
6. Risk management strategy for a complex, multi-phase environmental liability problem.
7. Risk management strategy for a "fleet" of underground tanks: testing and remediation.
8. Risk management of uranium tailings: comparing risks of thick cover vs. thin cover.

Risk Management, Long Term Strategy

9. Developed methodology for energy utility long term risk management: adaptation to climate change.

Management Procedures for Risk Management

10. Quality assurance and risk management in the Lawrence Livermore Nuclear Test Program.
11. QA for nuclear waste repository risk management, for the Experimental Studies Facility.
12. Management metrics to guide DHS decisions using dueling portfolio games against N adversaries.

Risk Assessment and Management: Oil Spills and Transportation

13. Prepared expert testimony comparing risks of tanker vs. pipeline transportation of crude oil, for California.
14. Testimony before the Alaska Oil Spill Commission, critiquing oil spill risk assessment.
15. Upgrade cost-effectiveness evaluation of Santa Barbara County's oil spill response system.
16. Risk assessment: Network of oil pipelines, tanks, and increased tanker port capacity.
17. Rail hazmat transportation risk assessment/management, developed risk assessment model.
18. Hazwaste transportation risk assessment, of truck, rail, barge and ship transport, storage.
19. Risk comparison: Asbestos release from excavation versus resulting traffic risk reduction.

Terrorism Risk Assessment and Risk Management Countering Adaptive Adversaries

20. Make, Buy, Steal: Model for nuclear terrorist risk management, with 3 adaptive adversary models.
21. Adaptive Adversary Model based on plural modeling, for DHS terrorism risk assessment models.
22. Project Manager, Third Party Review of DHS's BTRA, Biological Terrorism Risk Assessment.
23. Third Party Review of DHS's RAPID, Risk Assessment Process for Informed Decisions, model.
24. Third Party Review of DHS's RNTRA, Radiological/Nuclear Terrorism Risk Assessment, model.
25. Methodology development for (sensitive project name), U.S. nuclear weapons terrorism safety.
26. Methodology development to add adversary model to Maritime Security Risk Analysis Model.
27. Resource allocation across terrorism countermeasures, accounting for the adaptive adversary, DHS.
28. Comparison of five expert assessments and models of the risk of nuclear terrorism.
31. Aiding nuclear material safeguard management decisions, modeling adversary behavior.

Planning and Preparedness for Terrorism and Rare Events, Incident Management

34. Compounded Infrastructure Threat. Study of use of infrastructure by terrorists as a weapon.
35. Assessed upgrades: county-level HS preparedness, Regional Technology Integration Initiative.
36. Assessed regional homeland security preparedness needs, with Bay Area Economic Forum.
37. Information architecture, user requirements, conops, table top exercises for Bio Defense Initiative.
38. Incident management communications standards: req'ts, table top exercises: IEEE 1512.
39. Concepts of operations, table top exercises for decon/restoration of major transportation facilities.
40. Concepts of operations, signal detection operational challenges for vehicle radiation detection system.
41. Developed concepts of operations for responses to BioWatch detections.
42. Table top exercise for conops, user requirements for D-WATS vehicle radiation detection system.
43. Nuclear accident preparedness as an organizational / information management problem.

Policy Choice, Stakeholder Involvement, Using Value Tradeoffs From Stakeholders, Experts, Executives

44. Santa Barbara County oil transportation policy development, using stakeholder values.
46. Measures of effectiveness elicited from stakeholders for Intelligent Transportation Systems.
48. Multiattribute landfill siting to determine defensibility.

Technology Choice & Siting Using Elicited Value Tradeoffs From Stakeholders, Experts, Executives

50. Generation technology choice, adaptive timing strategy using value tradeoffs of executives, SMEs.
51. Power plant siting considering CO_2 sequestration and its risks, political considerations, coal supplies.
52. Power plant siting considering sequences of units added to different sites over time.
53. 3000 MW power plant siting using value tradeoffs of the applicant & a Stakeholder Advisory Group.
54. Pumped-storage technology choice/siting using value tradeoffs of executives, specialists.
55. Transmission line route EIS alternatives analysis using value tradeoffs of three agencies.
56. Transmission line route selection with stakeholder involvement, developed defending arguments.
57. Large crude-upgrading facility siting, accounting for risk of political/regulatory delay, value tradeoffs.

Decision Analysis

58. Fuel-delivery technology/contract choice, slurry pipeline vs. rail, focusing on resilience.

The Rest of This Resume: Summaries of Past Projects, same projects, numbering as above, then the last two pages: Publications

Summaries of Past Projects (same numbering as 1-line overviews)

Risk Assessment in the Political Process

1. Compared political approval/siting procedures for large hazardous facilities in four countries
Directed the U.S. portion of a study comparing procedures for large LNG and LEG terminals in four countries: The US (California), the United Kingdom (Scotland), The Netherlands and (then) West Germany. Focused on the role of technical risk assessment in the political process.

2. Comparison of risk assessments:
As part of the above project, systematically compared 17 risk assessments from four countries. Used several measures of technical adequacy and effectiveness in the political process.

Literature:
Wrote or co-authored five articles on the role of risk assessment in the political process. Developed new concepts, appearing in the literature (three articles) on evaluating technological risk and using a decision analytic perspective to determine acceptable risk.

Risk Assessment and Management

3. Risk reduction assessment of a toxic gas cleanup plant:
Developed/applied a model to assess the risk of a complex spatial arrangement of high-pressure toxic gas injection pipes and populations at risk. Accounted for changing toxicity over time. Assessed cost per expected life saved. For a major oil company (confidential), with Woodward Clyde Consultants.

4. Analytic Selection of a risk assessment method for routine air emissions:
Directed a workshop to develop a decision-analytic framework for selecting the most appropriate risk assessment method for routine air emissions. For the (then) Chemical Manufacturers' Association.

5. Environmental impairment liability (EIL) risk assessment:
Assessed EIL risk for each of over 80 sites involved in a major business acquisition, and calculated overall risk of the acquisition. Elicited expert judgments regarding probabilities of outcomes and liabilities. Results played a significant role in negotiations. (Confidential client.)

6. Risk management strategy for a complex, multi-phase environmental liability problem:
Developed methodology considering potential legal and regulatory liabilities, timing of liability exposures, and several different risk remediations. Strategy included sequencing/scheduling of data collection and risk remediations. For Brown & Caldwell.

7. Risk management strategy for a "fleet" of underground tanks:
Developed methodology for testing and remediating underground tanks for each of two consulting firms (Converse and Versar). Developed guidance for when to test where and when to remediate where, based on likelihood of contamination, different liability exposures before and after testing, and funds available per year.

8. Risk management of uranium tailings:
Conducted brief comparative risk assessment for a uranium tailings site: risk of trucking soil and rock for thick tailings cover, versus radiological risk of thin cover. While with Woodward Clyde.

Risk Management, Long Term Strategy

9. Strategic Planning for Climate Change:
Developed a methodology for energy utility long term risk management: adaptation to climate change. A unique risk management challenge. With the utility, we are identifying adaptive measures and associated climate-related tracking parameters. Then we calculate thresholds those tracking parameters must cross in order to seek regulatory, financial and political support to launch each adaptive measure, taking into account climate model results and the large data lags and adaptive action delays. Are seeking to blend that long term strategic planning with shorter term strategic planning practices of the utility. Are seeking results formats that will be effective in the regulatory, financial and political environment of the utility.

Management Procedures for Risk Management

10. Quality assurance and risk management in the LLNL Nuclear Test Program:
In a team with a management consultant, developed organizational and procedural measures to maintain reliability in LLNL's Nuclear Test Program. Included a series of management retreats.

11. Quality Assurance for nuclear waste repository risk management:
Developed and applied Quality Assurance classification analysis, based on probabilistic risk assessment, for the Experimental Studies Facility for the potential U.S. high-level nuclear waste repository at Yucca Mountain. For DOE, with Raytheon Services Nevada.

12. MARS Management Metrics: Developed management metrics to guide DHS decisions, to guide otherwise disaggregated decisions such that the overall DHS-wide implications fit a dueling portfolio strategy in a game against multiple adversaries. (Actually, four dueling portfolios and one countering portfolio.) Dueling portfolio: Manage the Blue portfolio of security measures to best counter Red

portfolios of potential attacks, accounting for Red adaptation to Blue moves. At LLNL, based on the MARS model (#35).

Risk Assessment and Management: Oil Spills and Transportation

13. Prepared expert testimony comparing risks of tanker vs. pipeline transportation of crude oil:
Presented several arguments in depositions in a pretrial adversarial process which resulted in plaintiff deciding not to go to trial. Part of a major legal action: Exxon vs. California Coastal Commission. On behalf of California.

14. Testimony before the Alaska Oil Spill Commission:
Critiqued oil spill risk assessment of another company (finding an important flaw) and presented guidance concerning oil spill preparedness.

15. Evaluated the adequacy of Santa Barbara County's oil spill response system:
Used a combination of decision analysis and risk assessment techniques, including multiattribute utility scaling of different types of environmental damage. Compared cost effectiveness of several alternative system upgrades. Elicited subjective probabilities when necessary.

16. Risk assessment: Network of oil pipelines, tanks, increased tanker port capacity:
Found that the risk reduction caused by fewer tanker port calls was larger than the risk increase caused by larger tankers and more storage. For Southern California Edison, with Entrix, Inc..

17. Rail hazmat transportation risk assessment and management:
Assessed and compared effectiveness of alternative rail hazmat risk management policies for the City of Denver, Colorado, using different land use growth scenarios.. Developed a risk assessment model that calculates several measures of societal and individual risk, day vs. night risk, risk by distance from route, and can allocate risk by chemical category and accident type.

18. Hazwaste transportation risk assessment:
Assessed risks of truck, rail, barge and ship transport, and tank farm storage, of liquid hazardous wastes, part of an ocean incineration system. Risks were stated in formats specifically designed to be meaningful to participants in the political process. For At-Sea Incineration, Inc.

19. Risk comparison: Asbestos versus traffic:
Compared risks of asbestos released from an excavation vs. traffic accident risk reduction resulting from the light rail and freeway routes made available by that excavation. Found traffic risk reduction far outweighed asbestos risk. Directed several traffic model runs. Conducted error analysis of complex, cascaded risk. Elicited subjective probabilities. For Santa Clara County, California.

Terrorism Risk Assessment, Risk Management Countering Adaptive Adversaries

20. Make, Buy, Steal: Built model at LLNL to assess relative risks of different scenarios involving terrorist IND detonation on the homeland, considering a broad set of scenarios (as indicated by the project name), spanning domestic and foreign sources, with adaptive adversary models at three places in the event trees. Elicited the model architecture, as well as model parameters. Applied a systematic process to characterize IND scenarios in ways most amenable to elicitation of expert opinion, and that makes the best use of available data, much of which is only available from SMEs. Building a calculation platform for more general use for decision advice for risk management on this threat spectrum. Seeking follow-on funding.

21. Adaptive Adversary Model based on plural modeling, for DHS terrorism risk assessment models:
As part of a team at Innovative Decisions, Inc. (IDI), developed a plural modeling approach to adaptive adversary modeling. Developed new concepts regarding the need for deeper SME elicitations than previously performed. Developed key concepts, "Cost of Overconfidence" and "Epistemological Modesty," regarding how little can be known about adversary behavior, and how that lack must be systematically elicited and built into risk management advice.

22. Third Party Review of DHS's BTRA, Biological Terrorism Risk Assessment, model: Project Manager of a seven-person three-company (IDI/Tauri/Unisys) team conducting a one-year review of DHS's Biological Terrorism Risk Assessment model, BTRA, assessing its representation of bioterrorism risk, examining the accuracy of its theories and assumptions, evaluating its computer programming and implementation, evaluating coding practices, assessing the adequacy of its quality assurance, verification and validation approaches, and of its data management. Identified a largenumber of opportunities for improvement. The report well accepted within DHS.

23. Third Party Review of DHS's RAPID, Risk Assessment Process for Informed Decisions, model: As part of an IDI team, identified several potential enhancements. Addressed key issue: RAPID's goal of putting very different risk types (terrorism, natural hazards, cross-border threats) on a common yardstick. The report well accepted within DHS.

24. Third Party Review of DHS's RNTRA, Radiological/Nuclear Terrorism Risk Assessment, model: As part of an IDI team, developing methods for IV&V (Independent Verification & Validation) for terrorism risk assessment models, and reviewing RNTRA, specifically focusing on validation methods, including its threat assessments, adversary choice model and subject matter expert elicitations. Recommending the development of an "IV&V Culture" in DHS, including building IV&V into model development budgeting.

25. Methodology Development for (project with sensitive name): Three-National-Laboratory risk assessment project assessing risks of U.S. nuclear weapon terrorism safety for every combination of nuclear weapon and its venue, status and configuration. Converting what was originally a vulnerability assessment into a risk assessment model oriented toward decision support for risk management. Including adversary choice model, new elicitation protocols and results formats. Currently in progress.

26. Maritime Security Risk Analysis Model, MSRAM: Working with MSRAM team, developed an adaptive adversary functionality to insert into existing model. Special methodological features to integrate adversary model into existing model structure, including special challenges involving very large numbers of targets.

27. The MARS Model: Modeling the Adversary for Responsive Strategy: Developed a model at LLNL for resource allocation across terrorism countermeasures, accounting for the adaptive adversary, for DHS. The methodology is based on a dueling decision tree underlying paradigm, i.e., decision trees, "facing each other," U.S.'s vs. those of several terrorist groups. Recognizing that a countermeasure delivers its benefits to the U.S. not only by reducing probabilities and/or consequences, but also by shifting the relative attractiveness of sections of the attack space available to the adversary. The model includes an adversary choice model, and tailored elicitation techniques to elicit key information from expert panels.

28. Comparison of Expert Assessments of the Risk of Nuclear Terrorism: Working with an intelligence analyst, compared the methodology and results of five national nuclear terrorism risk assessments. Aggregated the results into joint conclusions, critiqued each methodology, developed methodology recommendations. LLNL.

31. Aiding Nuclear Material Safeguard Management Decisions, using models of adversary behavior: Developed guidance for performance indices for the International Atomic Energy Agency. Participated in a related study evaluating nuclear material safeguards accounting for adversary preferences, while at LLNL.

Planning and Preparedness for Terrorism and Rare Events, Incident Management

34. Compounded Infrastructure Threat: Using Critical Infrastructure as a Weapon: Studied use of infrastructure by terrorists as an attack instrument. Convened a workshop with Monterey Institute for International Studies where conducted workshop sessions as brainstorming and elicitation sessions with

subject matter experts. Found significant risks and guidance for further work, largely involving using infrastructure to disseminate biological agents and more general effects multipliers, and disruption effects.

35. Assessed Upgrades to County-Level Regional Preparedness for Terrorist Attacks:
Deputy Project Leader at LLNL for the Regional Technology Integration Initiative, a Department of Homeland Security initiative integrating vulnerability assessment and homeland security preparedness evaluation to select the most effective new technologies and operations to increase homeland security preparedness. County assessed: Orange County, California. For DHS.

36. Assessed Regional Homeland Security Preparedness Needs:
Consulted to LLNL, in support of the Bay Area Economic Forum, to coordinate San Francisco Bay Area nine counties in developing regional homeland security preparedness. Conducted surveys of Office of Emergency Services Directors and critical infrastructure security executives, to assess homeland security preparedness needs in communications, conops development, exercises and technology development.

37. Biological Defense Initiative: Info Architecture, User Requirements, Conops, Table Top Exercises:
Consulted to Lawrence Livermore National Laboratory and Sandia National Laboratories, working on the Biological Defense Initiative. That project was developing a system for early detection of bio-terrorism attacks, then supporting consequence management for those attacks, to be deployed in U.S. cities and at special events. Dr. Lathrop was part of the System Integration Ops Team, assisting in drafting the information architecture, user requirements, conops and table top exercises to define user requirements and guide system integration.

38. IEEE 1512 Family of Standards: emergency management communications between Intelligent Transportation Systems (ITS) and public safety:
Consulted to the Institute of Electrical and Electronics Engineers, working with the IEEE Incident Management Working Group to write the 1512 Family of Standards, which is on the critical standards short list of ITS standards. Working from 1997 through 2003, he was responsible for supporting the Working Group in:
- defining the requirements for each standard;
- scripting and conducting table-top exercises (TTXs) (multi-day workshops);
- translating TTX results into standards requirements;
- drafting all text sections of each standard except definitions and coding, and
- creating outreach / training materials for the Family of Standards, the IEEE 1512 Short Course.

Developed and ran TTX scripts that have proven instrumental in engaging public safety representatives in what was previously a primarily ITS activity. Results from the 1512 TTXs have been central to defining the requirements for the 1512 Family of Standards.

39. Decontamination & Restoration of Major Transportation Facilities: Conops, Table Top Exercises:
Consulted to LLNL on concepts of operations for decon/restoration of major transportation facilities. The design scenario was an anthrax release at San Francisco International Airport. Working with Stein Weissenberger (LLNL), developed scenario and walk-through for a "Discovery Workshop" (discovering current conops patterns, user requirements).

40. Response Options for Highway Radiation Detection: Conops, operational challenges:
Consulted to LLNL on concepts of operations for a system to detect radiation signatures from vehicles, then dispatch state law enforcement to interdict where called for. System development guidance to match operational realities of low tolerance for nuisance alarms in a noisy environment.

41. Developed concepts of operations for responses to BioWatch detections:
BioWatch is a DHS system of air samplers to detect a biological warfare attack on American cities. In the 2006 "enhancement" phase, plans were developed for deploying samplers in indoor locations. As part of that effort, Dr. Lathrop, as part of an LLNL team, developed concepts of operations for each sensor host facility. For Department of Homeland Security.

42. Domestic Wide Area Tracking System (D-WATS): Table Top Exercises for Conops, User Rqts:
Consulted to Lawrence Livermore National Laboratory's D-WATS program in 1998, developing (with Stein Weissenberger), conducting and analyzing a key table-top exercise organized around the Los Angeles County Terrorism Early Warning group. That TTX raised many key institutional issues to be addressed by the TEW group. The D-WATS system is a network of sensors and communications for detecting, tracking and interdiction of radiologically-based terrorist weapons being transported through an urban area.

43. Nuclear accident preparedness as an organizational / information management problem:
While at the International Institute for Applied Systems Analysis, Vienna, Austria, conducted research and convened an international workshop on that topic. Key challenges: information management under the extreme uncertainty of an unfolding accident, and maintaining organizational learning from rare events. Wrote articles and edited a book on those topics, focusing on the accident at Three Mile Island but with several other examples.

Policy Choice, Stakeholder Involvement, Using Elicited Value Tradeoffs From Stakeholders, Experts, Executives

44. Oil Transportation Policy Development Using Stakeholder Values:
Developed and evaluated policies considered by Santa Barbara County, California, for tanker, pipeline and rail transport of offshore crude oil. Assessed environmental risk and impacts on 21 dimensions, using value tradeoffs elicited from 38 representatives of 8 stakeholder groups. Evaluated policies by impacts and breadth of support. While at Woodward Clyde Consultants, for Santa Barbara County.

46. Measures of Effectiveness Elicited From Stakeholders for Intelligent Transportation Systems:
Teamed with Dr. Kan Chen to conduct two focus group workshops of ITS stakeholders to elicit and analyze issues related to automated highway systems (AHS), including the different measures of effectiveness (MOEs) used by the different stakeholder groups to evaluate AHS benefits.

48. Landfill Siting to Determine Defensibility:
Conducted rapid multiattribute comparison of landfill sites to determine if proposed site was defensible. Determined that it was defensible. Supporting arguments prevailed in a politically contentious case. For Kansas City BFI, while at Woodward Clyde Consultants.

Technology Choice & Siting Using Elicited Value Tradeoffs From Stakeholders, Experts, Executives

50. Generation technology choice and adaptive timing strategy using value tradeoffs of executives, SMEs:
Developed/evaluated strategies for Baltimore Gas & Electric to use in dynamically deciding when to commit to which technology as data is acquired, using corporate objectives tradeoffs and risk attitudes elicited from senior executives and specialists. Several uncertainties explicitly modeled: load growth, new technology availability/performance. With Ralph Keeney, Alan Sicherman.

51. Power plant siting considering CO2 sequestration and its risks, political considerations, portfolio of coal supplies over time, distances to load center, for Southern California Edison:
Challenging siting problem, given novel technologies and risks, with alternative sites ranging many hundreds of miles from coal-centric to load-centric, which in turn brought compelling political considerations into play.

52. Power plant siting considering sequences of units added to different sites over time:
Multiple sites each with different capacities, advantages and disadvantages. Laid out all alternative capacity growth strategies, in terms of sequences of units allocated to the different sites over time. Consumer's Energy.

53. Power plant siting using value tradeoffs of the applicant and an N-stakeholder advisory group:
Multidimensional spatial scoring to select a site for a 3000 MW plant, using value tradeoffs and attitudes

toward risks elicited from utility executives and specialists, as well as from an external Environmental Advisory Group. Two members of EAG praised the process in the media. Though client expected great difficulties, resulted in a successfully licensed site. For Florida Power Corporation.

54. Pumped-storage technology choice/siting using value tradeoffs of executives and specialists: Multidimensional ranking of alternative sites and technologies. Dimensions included environmental and socioeconomic impacts, costs, technical and permitting delays, and public opposition. Uncertainties were explicitly assessed and modeled. For Georgia Power Co.

55. Transmission line route EIS alternatives analysis using value tradeoffs of three agencies: Elicited and used value tradeoffs of the U.S. Forest Service, National Park Service and Army Corps of Engineers for Appalachian Power Company 765-kV Wyoming-Cloverdale Line, crossing Jefferson National Forest and the Appalachian Trail. Developed impact scales, evaluation function, and phasing logic to select and rank alternative corridors. Facilitated key committee meetings. For USFS.

56. Transmission line route selection with stakeholder involvement:
Reviewed a transmission line route selection study by another consulting firm. Found several major flaws in the study, including how weights were elicited from a "Siting Criteria Council" of representatives of different value perspectives. Helped client prepare defending arguments.

57. Sited a very large crude-upgrading facility for a major oil company, oil company consortium:
Study area: the southern third of California. Used preference tradeoffs and risk attitudes elicited from client executives and specialists. Analytically considered differential risk of political/regulatory delay across sites. Successfully warned client away from a previously-favored site with high potential for political delay.

Decision Analysis

58. Fuel-delivery technology choice:
Co-analyst comparing long-term versus short-term contracts, and slurry pipeline versus rail technologies, for a major fuel supply system, evaluating "what could go wrong," focusing on resilience. While at Woodward Clyde, for (confidential) electric utility, with Ralph Keeney.

Publications

Edited Books

Planning for Rare Events: Nuclear Accident Preparedness and Management (ed.),
Pergamon Press, Oxford, 1981.

Statistical Selection Guide (ed. with S. Saulson et al.), C.L. Dugan, Ann Arbor, 1973.

Book Chapters, Journal Articles, Proceedings

"Validation in the Absence of Observed Events" (with B. Ezell) (concerning adversary modeling), revising in response to referees, Risk Analysis, Summer 2014

"The modeler meets the SME: The challenge of integrating quantitative and qualitative models of terrorist decision making" (with J. Post), Democracy and Security, 8(3), September 2012.

"Using plural modeling for predicting decisions made by adaptive adversaries"
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Exhibit A: Personal Financial Information

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