

**LTS Science and Technology Roadmap
Needs Assessment Workshop / Board of Directors Meeting
Dallas-Fort Worth Airport Marriott (North), Dallas, TX
January 28-20, 2002**

A Needs Assessment Workshop and Board of Directors Meeting for the LTS Science and Technology Roadmap was held on January 28-20, 2002, at the Dallas-Fort Worth Airport Marriott (North Property) in Dallas, TX. The following objectives were addressed during the meeting:

- Establish a 2008 vision for each Working Group
- Identify key activities and capabilities (needs) necessary to achieve LTS objectives
- Assess impact of identified capabilities on DOE goals to reduce cost, uncertainty, and risk
- Identify short-term targets for high-impact capabilities
- Determine capability maturity toward meeting identified targets
- Report to Board of Directors on results of workshop and associated path forward.

Attendees were as follows:

Board of Directors (Day 3)

E. Larry Davis (EC Chair), BWXT Savannah River Company
George Apostolakis, Massachusetts Institute of Technology
J. Lane Butler, Kaiser-Hill Company, LLC
Lorne G. Everett, The IT Group
Shah Choudhury, DOD Environmental Cleanup
Howard Roitman, Colorado Department of Public Health and Environment
James Woolford, Environmental Protection Agency
Clay Nichols, DOE-Idaho Operations Office
Bruce Hallbert, INEEL Roadmapping Project Manager

Steering Committee / Working Groups Chairs

David J. Borns, Sandia National Laboratories – Monitoring and Sensors
James H. Clarke, Vanderbilt University – Contaminant Containment and Controls
William R. Freudenburg, University of Wisconsin-Madison – Decision Making and Institutional Performance
James V. Mohatt, JVM and Associates – Safety Systems and Institutional Controls

Working Group Members

Chris Beck, Project Enhancement Corporation – Monitoring and Sensors
Dawn Kaback, Concurrent Technologies Corporation – Monitoring and Sensors
Horace Moo-Young, EPA Research Fellow, Lehigh University – Monitoring and Sensors
Bridget Scanlon, University of Texas – Monitoring and Sensors
Mike Serrato, Savannah River Site – Monitoring and Sensors
Everett Springer, Los Alamos National Laboratory – Monitoring and Sensors
Ron Wilhelm, Environmental Protection Agency – Monitoring and Sensors

Douglas E. Burns, INEEL – Contaminant Containment and Controls
R. Jeffrey Dunn, GeoSyntec – Contaminant Containment and Controls
Margaret MacDonell, Argonne National Laboratory – Contaminant Containment and Controls
Ellen D. Smith, Oak Ridge National Laboratory – Contaminant Containment and Controls
Robert D. Waters, Sandia National Laboratory – Contaminant Containment and Controls
W. Jody Waugh, MACTEC-ERS – Contaminant Containment and Controls

Lee "Chip" Clarke, Rutgers University – Decision Making and Institutional Performance
Deborah Griswold, Albuquerque Operations Office – Decision Making and Institutional Performance
Elizabeth K. Hocking, Argonne National Laboratory – Decision Making and Institutional Performance
Thomas M. Leschine, University of Washington – Decision Making and Institutional Performance

Thomas Marshall, Rocky Mountain Peace & Justice Center – Decision Making and Institutional Performance

Norman Brandon, Creative Concepts – Safety Systems and Institutional Controls

David French, Aspen Resources – Safety Systems and Institutional Controls

David Johnson, University of Oklahoma Health Sciences Center – Safety Systems and Institutional Controls

Donald Paine, Nuclear Fuel Services, Inc. – Safety Systems and Institutional Controls

Kimberley Ann Peone, Critical Data Tribal, LLC – Safety Systems and Institutional Controls

Darby C. Stapp, Pacific Northwest National Laboratory – Safety Systems and Institutional Controls

Technical Support / Facilitation

Bryan L. Parker, Lead Facilitator

Mark Gladstone, Gladstone Group, Facilitator – Monitoring and Sensors

Doug Hamelin, Logistics Support/Facilitator – Contamination Containment and Controls

Buck West, Facilitator – Decision Making and Institutional Performance

Lori Braase, Facilitator – Safety Systems and Institutional Controls

INEEL Roadmapping Core Team

Steven J. Kowall

Other Attendees

Jeffrey J. Short, DOE Office of Long-Term Stewardship

Paul Kearns, Laboratory Director, Idaho National Engineering and Environmental Laboratory

C. Brooks Weingartner, DOE-ID National Long-Term Stewardship Program

Steve Wassersug (DOE-ID Guest), Global Environment & Technology Foundation

Tom Schneider (Guest Speaker), Ohio Environmental Protection Agency

Summary proceedings of the three-day meeting appear below.

Day 1 – Monday, January 28

The meeting began with introductory comments by Bryan Parker (Lead Facilitator) and Bruce Hallbert (BOD member and LTS Roadmap Project Manager). Following introductory remarks, the remainder of the morning was spent presenting background, resource, and instructional information to the Working Group members. Presentations were as follows (see binder insert for January 28-30, distributed at meeting):

- Background & Goals, LTS S&T Roadmap Project – Bruce Hallbert, INEEL
- DOE Overview – Brooks Weingartner, DOE-Idaho Operations Office
- Roadmapping Workshop Overview – Steve Kowall, INEEL
- Roadmapping Process Overview – Bryan Parker, INEEL

Attendees were then introduced to their respective facilitators and dismissed to breakout rooms on the 19th floor of the hotel to begin needs assessment activities relative to their individual groups. The primary objective for the morning of Day One was to establish a working group vision for 2008 (and 2020, if feasible) that could be “leased” by the working group members and form a focal point toward which other needs assessment activities could be directed.

During lunch, attendees were privileged to listen to Tom Schneider, Ohio EPA representative for the Fernald cleanup effort. Mr. Schneider discussed current efforts at Fernald to address long-term stewardship objectives and lessons learned from on-going LTS activities. Mr. Schneider then fielded questions from the attendees regarding his insights into the LTS process.

Following lunch, working groups returned to their respective breakout rooms where they identified key activities and associated capabilities necessary to achieve the LTS vision established during the morning

session. Working groups then assessed the impact (high, moderate, negligible or none) each needed capability would have on achieving DOE goals to reduce the overall cost, uncertainty, and risk associated with LTS.

Day One activities concluded with a status report to all attendees on the progress of each working group's efforts, followed by an informal, no-host social to allow attendees to mingle and get to know each other on a more personal basis.

Day 2 – Tuesday, January 29

Day two with each working group meeting in their respective breakout rooms to continue needs assessment activities, as outlined in introductory comments on Day One. Objectives for the morning of day two were to (1) revisit and revise, as necessary, capability impacts and (2) identify science and technology targets for each high-impact capability that could be reached within the 2008 timeframe.

During lunch, attendees were privileged to listen to Steve Kowall, Project Lead for the DOE Vadose Zone Science and Technology Roadmap recently completed at the INEEL. Mr. Kowall presented a brief overview of Vadose Zone issues facing the DOE, followed by a summary of the organizational structure and process used to develop the Vadose Zone Roadmap. Mr. Kowall then fielded questions from the attendees regarding the applicability and integration of Vadose Zone results and lessons learned to the LTS S&T Roadmap effort.

Following lunch, working groups returned to their respective breakout rooms where they continued to identify science and technology targets for each high-impact capability. Working groups then assessed to maturity for current science and technology developments to meet established target based on three maturity scenarios: (1) process or method exists but isn't widely deployed, (2) process or method under development, and (3) no known process or method. Status was indicated by coloring worksheet cells green, yellow, or red, respectively.

Day Two activities concluded with a status report to all attendees on the progress of each working group's efforts, followed by summary instructions on the path forward to complete workshop objectives and prepare for a Roadmap Development Workshop in March. Working group activities were then adjourned and working group members departed for home.

Day 3 – Wednesday, January 30

Wednesday morning consisted of two separate meetings: (1) A Steering Committee Meeting to clarify the path forward for the working groups and finalize briefings to the Board of Directors on Workshop results, and (2) A Board of Directors' Meeting to address BOD operations issues and oversight of the roadmap effort.

Steering Committee Meeting – Through a discussion of working group activities, the following deliverable was agreed to by the Working Group chairs:

- By February 21 – Working group members deliver to WG chairs (with copy to INEEL) a one-page “essay” for each identified activity containing a list (and brief description) of associated capabilities, a list of the high-impact targets, and a uniquely compelling argument for R&D.
- By March 12 – Working group members deliver to WG chairs revised copies of activity “essays” along with a list of technical contacts used to validate target information. WG chairs deliver essays and contact list to INEEL for reproduction and distribution to all WGs and BOD members.

Issues/Concerns/Opportunities resulting from the Steering Committee meeting are as follows:

- Communications (what is meant by it)
 - Access to data
 - Maintenance of data
 - Quality assurance/control
 - Who is the audience
- Feedback loop to DOE
 - LTS vs. remediation
- Responsibility for LTS
 - Local inhabitants (tribes, etc.)
 - Educational Science issue

Board of Director's Meeting – The BOD meeting began with Clay Nichols (DOE-ID) sharing expectations DOE has for the roadmap, namely, a Roadmap that gives DOE guidance on making thoughtful decisions regarding LTS S&T. The expectation of the BOD is to give guidance to the effort and help identify priorities within the technology portfolio (i.e., define what we do not have vs. what we need to have). The following questions/issues were raised during the ensuing discussion:

- Question: “What is a roadmap?” Response from Clay Nichols, “It’s a way to set a target (goal) and systematically work backward to get there (with “pull” in mind).
- General sense (without checking for consensus): Define where is it we want to be and how we get there. Don’t worry about calling it a roadmap; the end result is the same.
- Need: A shorter-term focus than 2008. Need to deliver before 2008. Challenge is to be visionary and still address the issues that face users tomorrow (not 5 years from now).
- Board could/should recommend some input into the larger LTS strategic plan. Jeff Short has extended invitation to project for input.
- Hardest thing to do is decide how to prioritize the recommendations across workgroups. Bruce: Parallel effort at INEEL on prioritization process. Suggest the board review the process and see if the process would be helpful for helping make more informed decisions. This board should be viewed as the customer. Decision analysis effort at the INEEL is a tool to use within Critical Path Analysis. Provide the tools and decision support not prejudging. Provide methodology and tools to look at suite in a progressive way that we will have best decision in the end.
- Board member shared concern about our March deliverable to comprehensively deliver the “needs.” Clay responded that we need to wait and see what is going to happen with National program. Wait for “dust to settle”.
- R-mapping may/should have stronger tie into closures. For decisions being made now for 2004/2006/2008, we “owe” board guidance to workgroups. *[Can we apply decision analysis to STCG/IPABS databases to determine S&T Ra7D needs with short-term payoff? LDavis 2/12/02]*
- Need to understand and communicate goals.
- Process question: How do we make better connection with WG chairs to give them guidance before they get too far?
- Comment: Larry observed the group during Tuesday’s workgroup meetings definition of needs may be too narrow right now. We may need to decide how to decide how narrow or how broad.
- Comment: From now on need a clearer picture of what they (working groups) plan on doing. Board should meet first day versus the last.

Project manager's expectations for the BOD are as follows (Refer to charter for broader sense):

1. Help develop the roadmap—consider board as critical part of process. Need to be a process check and ask the questions—do the activities support achieving the milestones? Are we on schedule? Are we (the project) getting the kind of input we need? Are we getting 40 peoples input (workgroup meetings)
2. We adopted r-map approach—does this approach address the issues (are we getting at the issues)?
3. Content—we have people with very good credentials—need to make some evaluation to determine if the recommendations are of exceptionally high quality.
4. Need to ask the question of ourselves as a board—“Could the Department stand by the r-map (could they rely on the results of the r-map?) “Could we stand behind our product?”
5. Are the right people involved in the needs process? Is there a good plan to involve others e.g., stakeholders?
6. Need “assistance” with implementation of the roadmap (nothing but plan unless acted upon). How can we go beyond plan to implementation? Be thinking about implementation now—future activities.

Following their respective meetings, the Steering Committee joined the Board of Directors for a formal Executive Committee meeting, where the Working Group Chairs reported to the BOD on roadmap progress and results for the preceding two-day workshop. Presentations and highlights of the resulting discussions are as follows:

DOE Overview – Brook Weingartner, DOE-ID

- No comments or concerns were noted.

Workgroup Process – Steve Kowall, INEEL

- BOD has some concern about short-term goals not being evident. Groups have started the process to define near-term (even before 2008). Some of this is evident in WG presentations.
- Uncertainty goal – Use the term “adequate protection of” rather than conservative; and change “large” to “significant”
- Exactly what is LTS? Be sensitive to how we use this term.
- Consider changing one of the goals to a closure goal to link better between DOE goals (Brook's presentation) and 3 goals as presented to groups as a beginning point.

Contamination Containment and Control – Jim Clark

- Who is making the higher-level decisions to guide LTS? We need to get better guidance linkages to DOE at a higher level
- Consider some way to have a systematic check and balance. Include experts in the process.
- Concern for bias in workgroup. Need to ensure that it is not a research push. Need people that are pushing to question need for R&D.
- Are there needs crying today for research that need to be considered today?

Monitoring and Sensors – Dave Born (Lunchtime Presenter)

- Comment (from Larry Davis): Need to incorporate explanation of assumptions, etc. (e.g. available funding, funding cycles,) that constrained initial WG efforts. DOE will need that information in order to make real decisions.
- Concern: Some sensor systems in use now have fatal flaws. Need to address these specific issues/concerns. Find a way to get this feedback into considerations.

Safety Systems and Institutional Controls – Jim Mohatt

- Concern: What about security issues (terrorism)? Workgroup addressed, looked at the 9 sites between now and 2006—felt impact was negligible. Need to treat this like any other threat (e.g., flood). Leave this as a placeholder.
- Question: Where do the legal aspects of this effort belong? Need to revisit
- Analysis of the S&T underpinnings for defining a legal strategy (Activity 4)

Decision Making and Institutional Performance – Bill Freudenburg

- Question: The charge then is to look at what institutional measures need to be in place now to make smart decisions in the future? Yes. This piece is NOT focused on making decisions regarding the roadmap itself, rather on how DOE makes decision regarding LTS over the long term.
- Question: A significant lesson learned from Vadose Zone was to involve stakeholders up front. Here we are a significant way into the program and we have yet to have any interaction with stakeholders.
- Comment (from Bruce Hallbert): Many of the WG and EC members are considered stakeholders. However, stakeholder interaction beyond membership representation does need to be pursued with those people that will be affected by the decisions (residents, etc.) over the long term. Realize also that those stakeholders will change over time.
- Needs identification—no comprehensive needs assessment now. Warning
- What exactly is the “process Gestapo”?
- Do we have enough operations involvement? May be answered by “as is” desired stated discussion.

The afternoon concluded with several of the BOD members resuming a discussion of BOD organizational and operational issues, specifically address the “as is” condition versus the “desired state” of BOD functionality and oversight responsibility.

BOD Issues and Concerns

- Need clear understanding of risks and hazards at each site & pathways by which those hazards affect environment
- Need to map risks/pathways to environments (social, political, cultural, geological, biological) to identify “generic” needs from LTS standpoint
- Need to communicate those risks/needs/interactions to stakeholders, participants, regulators, etc.
- Marry “risk analysis from remediation side with residual risk from stewardship side to convince DOE management
- Consider “risk-informed” approach to NRC oversight changes.

- Risk assessment in reactor safety areas – risk insights are driving functional elements & crosscut issues
- The whole process needs to be based on “decision-analysis” bases and activities.
- Need to understand DOE's concept of what LTS really is and what the roadmap piece is within that framework.

Action Items

Action	Actionee	Due Date
<i>From BOD / Executive Committee Meetings</i>		
1. Conference call (follow-on discussion from Dallas) – Feb. 14, 11 to 12 EST. Core Team to define agenda.	Board of Directors	2/14/02
2. Clarify “bigger picture” for R-map and how it fits into National Picture (via on-going telecons & PM discussion)		
3. Ensure common set of constraints and assumptions across WGs	WG chairs / INEEL Core Team	
4. Consider specific format/logistics/process for next and future BOD/WG meetings	Larry Davis / Core Team	
5. Develop cartoon to capture essence of risk-informed approach concept (Consider National Research Council report on EPA Standards for Yucca Mtn [risk process cartoon])	J. Clarke / G. Apostolakis to draft; INEEL to develop	
6. Forward copies of G. Apostolakis’ papers on risk-based approaches to BOD/SC members	INEEL Core Team	
7. Add NAS report “Research Opportunities for D&D” to reference collection on web-site (Also, explore publication options for EC distribution of all NAS docs)	INEEL to pursue	
8. Restate or revisit WG goals such that the S&T element is emphasized.	Joint effort between DOE, INEEL, WG chairs	
<i>From Day 1 and Day 2 General Sessions</i>		
1. Communicate change of location for March Workshop via e-mail	Bryan Parker	2/6/02
2. Provide additional guidance on how broad to vet with community ...		
3. Consider how to utilize LTS Core Team (D. Geiser)		
4. Discuss involvement (formal) of other user groups. How, when, if ...	Board of Directors	On-going

Future Meetings

Meetings	Location	Attendees
Technology Pathways Development Workshop Date: Mar 19-21, 2001	Orlando, FL	Working Groups (Mar 19-20) Exec. Committee (Mar 21)
Roadmap Development Workshop Date: May 21-23, 2001 (purpose: prioritization)	Washington, DC	Working Groups (May 21-22) Exec. Committee (May 23)
Workshop with Research Community	TBD	TBD

The meeting adjourned at 5:00 pm.

Attachment A

Monitoring and Sensors Working Group Results and Status Report to Board of Directors

Facilitator: Mark Gladstone, The Gladstone Group

Attachment B

Contamination Containment and Controls Working Group Results and Status Report to Board of Directors

Facilitator: R. Douglas Hamelin, INEEL

Attachment C

Decision Making and Institutional Performance Working Group Results and Status Report to Board of Directors

Facilitator: William "Buck" West, INEEL

Attachment D

**Safety Systems and Institutional Controls Working Group
Results and Status Report to Board of Directors**

Facilitator: Lori Braase, INEEL