
CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

TRIP REPORT

SUBJECT: EPRI Performance Confirmation Workshop
20.01402.971

DATE/PLACE: November 5-8, 2001

AUTHOR: English Percy and Budhi Sagar

DISTRIBUTION:**CNWRA**

W. Patrick
CNWRA Directors
CNWRA Element Managers

NRC-NMSS

J. Linehan
D. DeMarco
E. Whitt
B. Meehan
J. Piccone
W. Reamer
K. Stablein
J. Ciocco
B. Leslie
B. Dam
J. Bradbury
J. Davis
J. Pohle
J. Greeves
D. Brooks
S. Wastler
T. Essig
T. McCartin

SwRI

T. Nagy (Contracts)

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

TRIP REPORT

SUBJECT: EPRI Performance Confirmation Workshop
20.01402.971

DATE/PLACE: Palo Alto, California
November 5–8, 2001

AUTHOR: English Percy and Budhi Sagar

PARTICIPANTS:

About 40 participants including representatives from Electric Power Research Institute, U.S. Nuclear Regulatory Commission (NRC) (on video link), Center for Nuclear Waste Regulatory Analyses (CNWRA), U.S. Department of Energy (DOE), Bechtel-SAIC (and other DOE contractors), Exelon, National Academy of Sciences, Nuclear Waste Technical Review Board, Clark and Nye Counties, Nevada (a complete participant list is attached to this report).

BACKGROUND AND PURPOSE OF TRIP:

Organized by the Electric Power Research Institute, the objective of this workshop was to discuss the role of long term research and development and performance confirmation activities related to decision making for the proposed Yucca Mountain high-level waste repository. The workshop organizers considered the long-term research and development activities needed at Yucca Mountain to be broader than performance confirmation activities required by the applicable NRC regulations at 10 CFR Part 63. The workshop consisted of open discussion among all participants and a closed session of the multidisciplinary panel selected by the Electric Power Research Institute; this panel will develop a report based on insights developed during workshop discussions. The workshop and panel were chaired by Chris Whipple (ENVIRON). Other members of the panel are Robert Budnitz (Future Resources Associates), Barry Gordon (Structural Integrity Associates), Alice Shorett (Triangle Associates), John Taylor (Electric Power Research Institute), Warner North (Decision Analysis), and Rod Krich (Exelon Corp). Following the ground rules of the workshops, statements or ideas are not attributed to specific participants.

SUMMARY OF PERTINENT POINTS:

Workshop participants were unanimous that long-term research and development will be an essential component of confidence building in the system's safety. There was some confusion about whether all such activities would be covered under the performance confirmation activities required by the applicable regulation. Many participants argued that long-term research and development activities include not only those activities identified by the regulations but also those identified or wanted by other stakeholders, even if such activities are not fully scientifically justifiable. The workshop was successful in improving understanding of the requirements of 10 CFR Part 63. However, the workshop was not successful in developing

agreement on an approach to defining and prioritizing particular DOE performance confirmation activities, despite a lengthy discussion of the DOE's eight step process outlined in their Performance Confirmation Plan. Although only a minor part of the workshop agenda, a good part of the meeting time was spent discussing means to improve public confidence in the DOE high-level waste program in general and the prospective DOE Performance Confirmation Program in particular. Whereas there was general recognition of the importance of improving public confidence in the DOE program, and many ideas were advanced to achieve that goal, no clear course of action emerged as a path forward for the DOE. At least one participant emphasized repeatedly that it is important to take appropriate account of potential institutional instabilities during the long-period (50 to 300 years) for which performance confirmation activities may be conducted.

SUMMARY OF PERTINENT POINTS:

The workshop was intended to provide an informal forum to develop a better understanding of the role of long-term research and development and performance confirmation activities at the proposed Yucca Mountain repository. Since the final regulation applicable to the potential Yucca Mountain repository (10 CFR Part 63) was published only the previous week, the workshop also provided a forum to discuss its requirements with respect to performance confirmation. To this end, the workshop consisted of several introductory talks to provide a framework followed by extensive discussion moderated by Chris Whipple.

In his introductory remarks, Chris Whipple noted his uncomfortableness with use of the word confirmation for the prospective work. He believes confirmation suggests that deviations from predictions are failures, and he expressed concern that use of the term could be interpreted by the public as overconfidence. He also said that the idea of confirmation was counter to the scientific paradigm of testing a hypothesis by falsifying. That is, it would be more illuminating to design tests where failures can be observed than to design all tests to produce positive results. Whipple identified these potential traps awaiting DOE as it prepares its Performance Confirmation plans: (i) agreeing to do things that cannot be done, (ii) agreeing to measure things that do not affect performance, (iii) claiming safety based on monitoring of too limited duration or extent, and (iv) requiring unnecessary accuracy or precision in measurements.

Some participants stressed that the research and development and the performance confirmation program should not be a static process, that it should evolve with improvements in the knowledge base, and that it should lead to optimization of the repository systems (e.g., change in design) in the future.

One of the DOE participants interpreted the 10 CFR Part 63 requirements as excluding long-term research and development and narrowly defined performance confirmation as those activities that are required to evaluate the adequacy of the data in a license application. This participant indicated that the DOE will design its performance confirmation plan around testing of the principal factors in DOE safety strategy. In response to questions regarding the current status of the DOE performance confirmation work, another DOE participant reported that while DOE has gathered information, it has not yet begun to formally establish the baseline with respect to which performance confirmation activities will be defined and measured. There was general recognition that most of the DOE site characterization data will be used to develop the required baseline. A participant suggested that identification of research needs for developing

appropriate monitoring and measurement techniques should be a part of the performance confirmation plan.

One participant described the objective of the long-term research and development and performance confirmation as managing uncertainties. This included reducing uncertainties where possible, better characterizing of uncertainties, and gaining confidence in the projections of long-term performance of the system.

One participant suggested that a pilot high-level waste facility be built first at the selected site. He noted that it is often best to learn by doing. This idea was seconded by another as an excellent opportunity to build public confidence. Other participants described successful pilot demonstrations (for low and intermediate level wastes) in European countries. Some, however, disagreed with this approach and claimed that such a step will only lead to the public losing confidence as a pilot will be seen as a foot in the door. In addition, it was pointed out that nobody has yet defined a condition (or conditions) that can be observed in a short period that would definitively lead to the abandonment of the project, so the usefulness of a pilot is questionable.

Alice Shorett, one of the panel members, led a group exercise to elicit ideas for improving public confidence in the DOE Yucca Mountain Program. Ideas put forward included: increasing involvement of Nevada universities, establishing a DOE Yucca Mountain Chief Scientist, increasing DOE efforts at communication with the general public, making the planned observation drifts below the repository horizon accessible to the public, working to overcome the emotional aspects of public concerns, increasing tours of the site, increasing public participation in decision making, seeking public input on design criteria, increased effort to address transportation issues, separation of the Yucca Mountain Program from DOE, empowering Nye County elected officials with some level of project oversight, improving the clarity with which DOE communicates uncertainty versus ignorance, and increasing funding of social science research. One participant observed that the more one engages the public externally, the more the public learns of you internally. Therefore, to really improve public confidence, DOE must improve internally. DOE must be worthy of public trust. This participant said that there is now a deep deficit of public trust and that it would take years just to rise to zero. Shorett closed this portion of the meeting calling for technical uncertainty to be balanced by process certainty. This would be accomplished through adaptive management to allow for changes to the Performance Confirmation Plan as DOE work progresses and more information becomes available. A participant from the counties indicated that the contribution to the local economy from the \$ 350 M or more per year Yucca Mountain project was less than the contribution from a \$ 17 M local dairy farm.

The latter part of the workshop involved the group stepping through an example exercise to apply the current version of an eight step process DOE has drafted to prioritize and plan a performance confirmation activity. The proposed steps are (i) identify which processes are to be measured, the key performance confirmation factors, (ii) define database and predict performance, (iii) establish tolerances or predicted limits or deviations from predicted values, (iv) identify completion criteria and guidelines for corrective action, (v) conduct detailed test planning, (vi) monitor performance, perform tests, and collect data, (vii) analyze and evaluate data, and (viii) recommend and implement appropriate actions if there are deviations. The group made its way through steps one and two for the example, but was unable to come to a common understanding of step three.

CONCLUSIONS:

There was much discussion of the differences between DOE Performance Confirmation activities and other DOE long-term research and development directed toward Yucca Mountain, but no clear criteria for differentiation were agreed upon. The planning for DOE's performance confirmation program is in its preliminary stages so that what will be measured, how, where, and how frequently are not yet clear. Also, DOE use of such data in deciding when and what type of an action would be triggered by data falling outside of bounds is still being formulated.

PROBLEMS ENCOUNTERED:

None.

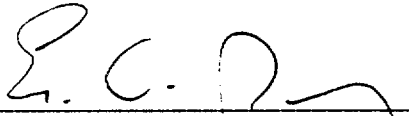
PENDING ACTIONS:

Obtain a copy of the Whipple Panel report from the workshop.

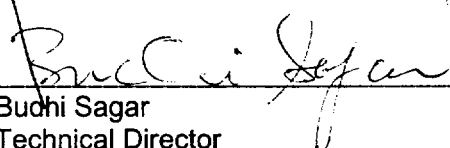
RECOMMENDATIONS:

Continue to monitor DOE progress as they develop a revision to their current draft Performance Confirmation Plan.

SIGNATURES:

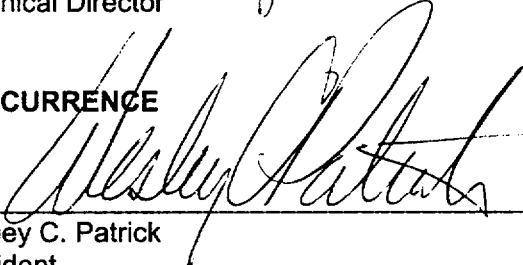

English C. Percy, Manager
Geohydrology/Geochemistry, Element

11/13/2001
Date


Budhi Sagar
Technical Director

11/13/2001
Date

CONCURRENCE


Wesley C. Patrick
President

11/13/2001
Date

ATTACHMENT

PERFORMANCE CONFIRMATION EPHI

ATTENDEES.

Bill Miller

Alan Ross

Matthew Eyre

Alice Shorett

Milt Levenson

E. von TIESENHAUSEN

ROBERT BUDNITZ

Tom Isaacs

Todd LaPorte

JERRY M. HARRIS

JAMES M. WILLIAMS

ERNEST N. LINOWER

Bimal Mukhopadhyay

ERIC SMISTAD

Barry Gordon

English Percy

CLAUDIA M. NEWBURY

DOUGLAS M. FRANKS

Budhi Sagar

Joonhong Ahn

Rod McCollom

John Kessler

BRUCE PARKS

Leonid Neymark

DANIEL BULLEN

PRISCILLA NELSON

Jeff Wong

Dave Diodato

Maria Skorska

QUANTISCI UK

Ross & Associates

Exelon Nuclear

Triangle Associates, Inc.

Pirato CONSULTANT

CLARK COUNTY

FRA Inc, Berkeley CA

Lawrence Livermore Natl. Lab.

UNV. of Calif. Berkeley

STANFORD UNIVERSITY

Nye County, Nevada

BSC, Las Vegas, NV

MTS / Las Vegas, NV

DOE / YMP

Structural Integrity Associates

CNWARA

USDOE / YUCCA MT. PROJECT

BSC (DUKE ENGINEERING & SERVICES)

CNWARA, San Antonio

U.C. Berkeley

Nuclear Energy Institute

EPRI, Inc.

U.S. Geological Survey

U.S. Geological Survey

U.S. NWTRB

U.S. NWTRB

U.S. NWTRB

US NWTRB

BSC / YMP

MARK Sellers
Greg Gdowski
ABE VAN LUIK

BSC / Safety & Regulatory Strategy
LLNL
DOE / OMP

BARBARA PASTINA

National Academy of Sciences

Mark Peters

Los Alamos National Laboratory

Joseph Wang

Lawrence Berkeley National Laboratory

MICK APTED

MONITOR SCIENTIFIC

WALTER NORTH

CHRIS WHITTLE

ENVIRON International

JOHN TAILOR

EPRI

VIDEO LINK

JEFF POORE

NRC

Bill ROTHEN

NRC

Tim McCarten

NRC