

FROM: James C. (Chris) Hall
Chairman, URTAC On-Shore Committee

DATE: July 13, 2009

TO: URTAC On-shore Committee

SUBJECT: 1) March 18, 2009: Notes on DOE/NETL Peer Review of Benefits Estimation Methodology for Unconventional Natural Gas and Small (Mature) Producer Projects
2) April 14, 2009: Notes on RPSEA Unconventional (On-Shore) Gas Project Review Meeting (Does not include Small Producer Projects)

The following comments were made by the following persons who attended one or more the two conferences and are provided as input to the full committee as part of the program review:

Jessica Cavens, EnCana Oil & Gas
James C. (Chris) Hall, Drilling & Production Co.
Shahab Mohaghegh, West Virginia University
Sally Zinke, Ultra Petroleum

The Committee needs to decide on a mechanism to more fully evaluate the on-going projects. This will become more difficult as the number of projects increases. It has been recommended by several committee members that RPSEA modify their Review Meeting so that it can be made at a public forum which could be attended by members of the oil and gas producing industry. This would allow the producing community to rate the projects, allow the URTAC to evaluate the effectiveness of the program, and serve as a technology transfer event. Representatives of RPSEA have indicated that they are willing to consider such an event.

- awarding of contracts. If properly coordinated, RPSEA could provide the necessary information to NETL in the "2 Pager" format which they needed.
3. The problem of which metrics should be used to best evaluate describe projects has always existed. There is no simple answer, although the general consensus is that quantifying the benefits in terms of barrels of equivalent production is best.
 - a. In some cases, are we forced into trying to quantify something that cannot be easily quantified. For example, transferring technology from a project to producers will result in application of the technology that cannot be easily summarized in increased recovery.
 - b. Sometimes the smallest projects yield the greatest benefit in terms of greatest return on investment. However, they might not get the credit they deserve when compared with larger projects that are more impressive.
 4. Additional Points:
 - a. There should be a technology transfer and small producer advocate on the benefits assessment panel, or else projects that focus on those areas will be talked down because the benefits are not as easily quantifiable.
 - b. It is important to have stakeholders involved in the review process who are aware of the particular regional and political challenges. They best know the issues and comment on the assessment process.
 - c. Need output of results that can be understood and valued by diverse groups (not just OMB):
 - i. OMB: technical justification
 - ii. The Hill: policy vision
 - iii. The Industry: end user that will use the technology
 - d. Only "single point" projections were made in the benefits analysis. Since all projects involve risk and unknowns, as range of values representing probabilities should be made in possible rather than single values.
 - e. All projections were made looking forward.
 - i. No attempt was made to look back to historical data that might be used to guide and or validate the results. Looking as past programs could provide considerable information in evaluating benefits of future programs as well as justifying their existence.
 - ii. The presented assessment process could have been calibrated/validated by applying it to the previous data. Previous data refers to projects that had been funded by DOE in the past and some have resulted in major successes several years after the projects were completed. Examples include projects that were funded by DOE during the 1980s and 1990s on fundamentals of flow mechanism and gas production from coalbed methane and shale formations. It seems that DOE/NETL has access to the necessary data and the personnel that can perform this analysis in order to calibrated/validated the process to identify potential shortcomings. During some casual out of meeting conversations, this idea was communicated with the program director (study past projects to calibrate and validate the developed assessment process) and he seemed to be quite favorable. It is interesting to see if any action has been taken.
 - f. The adequacy of Technology Transfer funding continues to be a concern. The

**April 14, 2009: Notes on RPSEA Unconventional (On-Shore) Gas Project Review Meeting
(Does not include Small Producer Projects)**

OVERVIEW:

RPSEA held a meeting to have representatives of Unconventional Gas Projects present the status of their individual projects as part of their Advisory Committee oversight responsibilities. The meeting took 1-1/2 days and was followed by a RPSEA Project Advisor Committee Meeting.

ATTENDEES:

5. RPSEA Project Advisory Committee.
6. RPSEA Project Representatives.
7. DOE/NETL representatives as observers.
8. Three representatives from the Federal Advisory Committee for the Unconventional Resources/Small Producers portion of the Section 999 Program: Present to observe the process but not to otherwise participate in the conference.

COMMENTS/OBSERVATIONS:

1. OVERALL:
 - a. Good turnout; good cross section of industry, academia and interested parties.
 - b. Good interaction among conference attendees.
2. PROS:
 - a. RPSEA obviously looked for a balance in project topic areas. (This was not as evident in terms of geographical balance). Note that much of the balance was based on the URTAC matrix of suggested topic expansion.
 - b. The oversight by the RPSEA Project Advisory Committee members was very good. They were very engaged in the review process. Their membership represented a good cross section of the industry (producers, service companies, both large and small companies).
 - c. The material was very well presented. There was significant interaction between the presenters and the audience. Much was learned by everyone involved. The presenters themselves learned information that was valuable to their research.
 - d. It was realized during the conference that some material had applicability to regions of the country that was not initially considered (i.e.: from gas reservoirs to oil reservoirs). This expands the technology transfer component of the project that needs to be implemented.
3. CONS:
 - a. Project focus was not geographically diverse, but was concentrated in mid-continent regions of the country. Often “regional credit” was taken for where project awardees were located (i.e.: Lawrence Livermore was credited as being a California project, although the field it was addressing was located elsewhere and the topic had absolutely no California application.) This would have to be balanced by an effective national technology transfer program.
 - b. Often, the size, duration, cost and matching fund requirements (cost share) of the project were not presented. There was a comment made that cost estimates were

FROM: James C. (Chris) Hall

DATE: August 31, 2009

TO: URTAC Program Sub-Committee

SUBJECT: Program Evaluation Method Being Used by Ultra-Deepwater Advisory Group

Elena Melchert has provided the following information to assist us in designing a method to evaluate the portfolio of on-shore projects.

Below are questions prepared by the Ultra-Deepwater Portfolio subcommittee for their review of the portfolio of projects. The questions were applied to each project, and then a spreadsheet was developed to help the members understand the data (answers). Following their review of the spreadsheet, the subcommittee met via conference call and formulated a report that they will present to the full committee. The projects in the Ultra-Deepwater are very different in nature from those onshore but this approach may have applicability to our on-shore program evaluations.

SURVEY QUESTIONS

- 1) Is the project aimed at increasing the size of the ultra-deepwater resource base, converting identified resources into economic recoverable resources, neither, or both?
- 2) Is the technology in this project primarily an incremental improvement or a breakthrough?
- 3) Is this primarily an R&D project or a demonstration project?
- 4) Is it intended to provide benefits near term (1-3 years) or long term (3-10) years?
- 5) At what field size is the project primarily aimed?
- 6) What is the primary obstacle the project is intended to address?
 - a. Time
 - b. Cost reduction through technology
 - i. Exploration
 - ii. Drilling
 - iii. Completion
 - iv. Development subsea
 - v. Development surface facilities
 - vi. Production
 - c. Development of enabling technology to access reserves
 - d. Human capability development