

Use of Reliable Technology in Reserves Estimation and Reporting

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Some Questions ...

- What is “Reliable Technology”?
- How can Reliable Technology be used in reserves estimation and reporting?
 - What is the SEC position?
 - What is the PRMS position?
 - What is the ASC position?
- What recent technologies has the industry proposed?
 - What is the SEC’s position on these recent technologies?
 - How can we evaluate a technology for which the SEC has issued no formal guidance?



What is 'Reliable Technology'?

From SEC Regulation S-X, 4-10(a) (25):

'Grouping of one or more technologies (including computational methods) that

has been field tested and demonstrated to provide reasonably certain results **with consistency** and repeatability in formation being evaluated or analogous formation'



What Do the Criteria Mean?

- **Field tested:** More than just an idea based on sound scientific and engineering principles, but actually demonstrated in practice to lead to correct conclusions
- **Consistency:** ... leads to correct conclusions much more often than not



What Guidance Has SEC Provided for Reliable Technology?

From SEC “Compliance and Disclosure Interpretations (CD&I),” October 26, 2009:

- **Question:** Does the staff intend to publish a list of reliable technologies that the SEC will accept for the determination of proved reserves?
- **Answer: No.** An issuer has the burden of establishing and documenting the technology (or set of technologies) that provides reliable results, consistent with the criteria set forth in Rule 4-10(a)(25) of Regulation S-X. This information should be made available to the Commission's staff upon request in support of any reserves estimates that the staff may be reviewing.



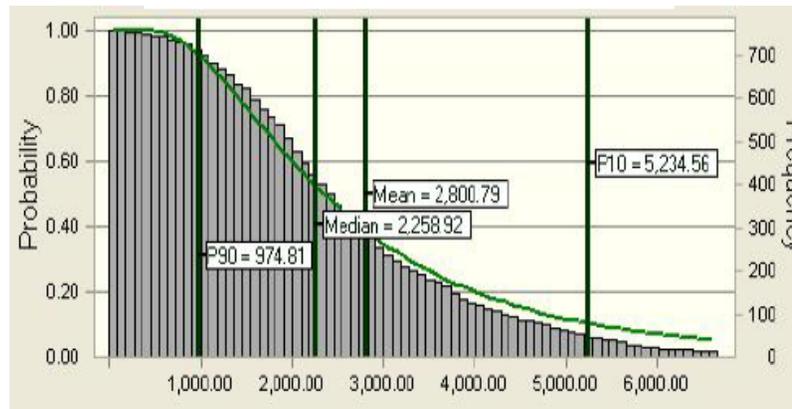
Example: SPEE Monograph 3

- Objective: To suggest logical, reasonable, and practical procedures to estimate *undeveloped* reserves and resources volumes in resource plays



SPEE Monograph 3 – Basic Idea

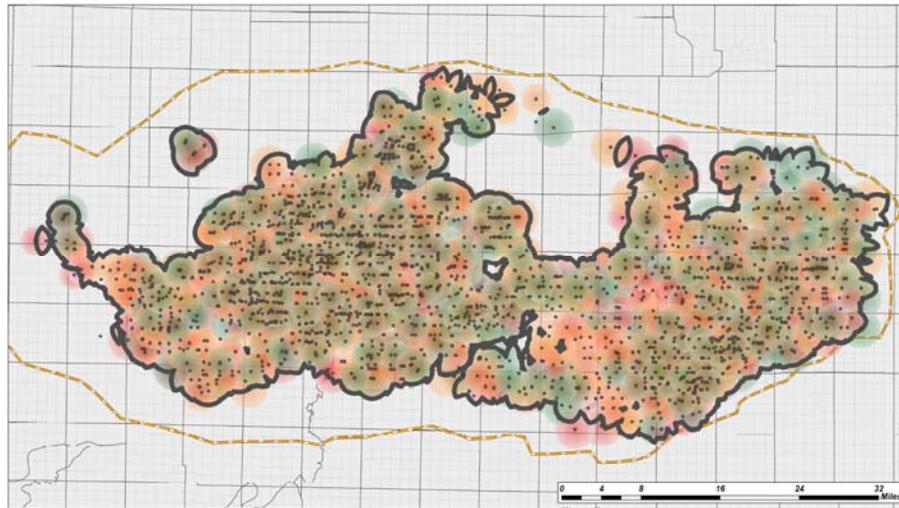
- Establish distribution of EUR's for PDP's in area with geological similarity



- Determine how far away from selected PDP's same distribution (similar P90, P50, mean, P10) is appropriate

SPEE Monograph 3 – Basic Idea

- Sum proved area near each PDP to determine total proved area
- Any drilling location in area with same spacing assumed to have proved reserves, with value near mean or median of existing PDP's



SPEE Monograph 3 – Status

- Monograph first printed in 2010, now in third printing
- Many short courses based on Monograph presented by SPEE in North America
- U.S. Securities & Exchange Commission has accepted technology in Monograph as ‘reliable’ when applied properly by several filers
- Potential weakness: How valid are the EUR’s used to establish distribution?
 - Monograph 4 commissioned to provide guidance on ultimate recovery estimation methods for PDP’s to industry



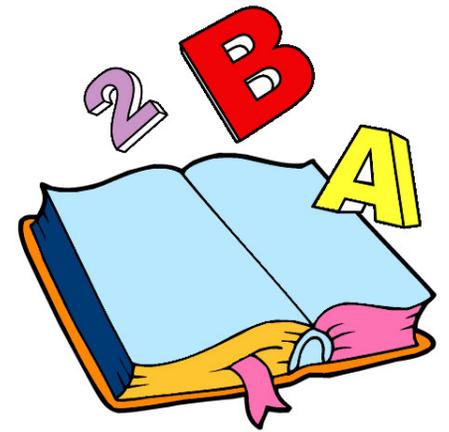
And Monograph 4?

- Traditional technology
 - Modified Arps decline model
- More recent technology
 - Alternative 'simple' decline models
 - Rate-transient analysis
 - Modified and enhanced reservoir characterization and simulation techniques



Status of Monograph 4?

- All chapters drafted, reviewed, edited
 - Reviewers include SPEE R&D and Executive Committees, SPE OGRC, AAPG CORE, SEG Reserves Committee
- Book targeted for publication by early June
 - Two-day short course scheduled for SPEE Annual Conference in Lake Tahoe, Nevada in early June
 - Copies of Monograph to be distributed to participants



How Are Technologies in SPEE Monographs Affected by Reliable Technology Requirements?

- Monograph 3: Some filers have, in interchanges with SEC staff, been able to demonstrate that they have field evidence that their application of technology meets criteria – **but no ‘blanket’ approval**
- Monograph 4: Similar outcomes with, e.g., analytical and numerical models – again, **no blanket approval**



What Will It Take for SEC to Accept Recent Technologies, Such as Monographs 3 and 4?

- Forecasts must meet criteria for proved reserves
 - Booked volumes ‘reasonably certain’
 - Volumes ‘much more likely than not’
 - As historical data added, EUR for fixed groups of wells remains constant or increases
- Technology used for forecasts must meet criteria for ‘reliable technology’



PRMS, ASC and Reliable Technology

- Reliable technology not defined explicitly in PRMS
 - Some observers have suggested that reliable technology consistent with PRMS principles
 - Since PRMS not a regulatory system, what is allowed (such as Monographs 3, 4) up to regulators in individual country
- ASC definitions, principles similar to PRMS



Summary

- Reliable technology provides means to validate new, novel approaches to reserves estimation
- Technology must have been field tested and found to lead to correct conclusions consistently
- SEC will not provide blanket approval to any novel technology – burden of proof rests with filer
- SPEE Monographs 3 and 4 provide examples of potential reliable technology

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End



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