

Eliciting Expert Opinions and Uncertainty Assessments for Decision Making

Stephen H. Begg¹

¹Professor of Petroleum Engineering and Management Australian School of Petroleum-University of Adelaide, Adelaide, SA, Australia

Abstract

Key take-away: Human factors are big contributors to poor uncertainty assessments, and thus decisions - perhaps more than technical issues.

Formal decision-making tools (e.g. Monte Carlo simulation, decision trees, probability, etc.) require the elicitation of expert opinions and uncertainty assessments. But our heads are just not wired for uncertainty. Years of behavioral research on how people deal with uncertainty and its consequences reveal a variety of cognitive biases leading to error-prone heuristics. Inappropriate attitudes towards risk are major value destroyers and the way most organizations assess people's performance tends to exacerbate these undesirable effects!

The lecture will start by clarifying the relationship between uncertainty and decision-making and then exposing a common misunderstanding about the true nature of uncertainty — the fact that it is in our heads, not an inherent “parameter” of the systems we deal with. This has profound implications for uncertainty assessment. The difference between uncertainty and risk, and between uncertainty and variability will also be covered. A clear understanding of these concepts, combined with a decision-driven focus, can free experts to express their knowledge with greater integrity and lead to a more efficient, and more value-creating, mind-set around dealing with uncertainty.

Outcomes of recent research on the presence and impact of heuristics & biases, specifically within oil and gas industry, will be reviewed. A cognitive-science perspective can offer practical suggestions on how to avoid them and thus lead to improved outcomes for individuals and corporations.