

Safety Corner

What are the Lessons Learned from the Deepwater Horizon Catastrophe?

The magnitude of the oil spill from Deepwater Horizon is unprecedented. While there is evidence of limited failure analyses associated with isolated systems of this offshore platform, there is no evidence of a total system quantitative risk assessment (QRA), like those conducted in the nuclear industry, to due diligently scrutinise *“What can happen, what is the likelihood and what are the consequences?”*

The operation of offshore oil operations has many parallels to the nuclear power application of QRA. For example, the failure of blowout preventer at depth can be treated as an undesirable end state as the melt-down of a reactor core; both represent the primary barrier to a major release. A detailed QRA would bring into sharp focus the likelihood and consequences of system failure, human intervention, and unavailability of backup system, as well as the options for risk mitigation, in managing the risk of blowout preventer failure.

However, care must be taken in conducting QRAs. For instance, great uncertainties are present at estimating the frequency and magnitude of rare catastrophic events due to lack of historic data and, sometime, over-confidence in management. The Minerals Management Service performed three assessments of the environmental impact of an oil spill in the Gulf of Mexico in 2007 with estimates ranging from a maximum spill of 1,500 barrels to a predicted frequency of five spills of 10,000 barrels or more per 100 billion barrels of oil produced. The actual rate of release of the BP spill is estimated to be greater than 60,000 barrels a day. Thus, we must consider reasonable worst case consequence and explicitly address uncertainties through appropriate probability distributions in order to reflect the state of knowledge.

Other lessons learned from the BP accident lead to an increase of the focus on backup systems and precursor events to accidents. History tells us that once a disaster occurs, there are always precursor events which, had they been known in advance and acted on, could have prevented the disaster or reduced the severity of its consequences.

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