Using Quantitative Risk Analysis Tools for Early Project Definition Decision Support

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Abstract

Decisions regarding process facility/equipment layout, directionality, proximity, location, and protection may be driven by regulatory, geological, or logistical concerns, but they have HSE input elements as one of the drivers. Many of us who work in upstream (or downstream) oil & gas projects have come across questions that have to be made early in concept selection stage or they will add a lot more cost when the design moves to a more detailed engineering stage of the project. How do you justify these decisions?

Utilizing quantitative tools coupled with established risk analysis techniques is one way forward when there a lack of time and resources for a detailed study, when engineering details that are not finalized, and when the scope of the project is not completely defined.

This paper will use HSE element of complex decisions examples by utilizing consequence and probability analysis mixed with risk level /matrix based approach to determine incremental risk. Hence, a way forward to a complex decision. Some of the examples this paper will tackle the following:

- Can distance between a new offshore platform tie-ing into an existing platform complex that is processing sour gas be shortened?
- Can subsea pipeline protection length be shortened?
- Is there an incrementally higher safety concern with one large process train instead of two smaller process trains?

Oil & gas projects in today’s world are expected to be completed on schedule at a much faster pace than before coupled with cost effectiveness and commitment to quality, reliability and safe operability. This makes justifiable early project decisions in concept or feasibility stage more important that ever. Furthermore, record keeping of HSE based decisions is also helpful for a regulatory approval process in many parts of the world.