

Linking Safety and Process in the Oil & Gas Industry

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This past July marked the 21st anniversary of the world's worst offshore oil disaster, when the Piper Alpha burned and sank in the North Sea, killing 162 people. Unfortunately, the safety record in the oil and gas industry, perhaps one of the most dangerous of all industries, hasn't gotten much better since then. In October 2008, four lives were lost when a supply vessel sank. In April 2008, 16 people died in a helicopter crash while transporting oil and gas workers off the coast of Scotland. Sadly, these statistics in no way paint a true picture of the extent of the problem; numerous other incidents happen every day that don't make the news.

Some accidents can be traced to a lack of competence or sheer negligence, but many more are likely due to root cause deficiencies in process safety, such as the failure to follow change management procedures or lack of proper design criteria. In contrast to *personal safety* programs, which emphasize the use of personal protective equipment, safe body positioning and material handling, and the like, *process safety* encompasses design, engineering, equipment maintenance, effective alarms, accurate control points, correct standard operating procedures, and training.

Many oil and gas accidents could be avoided if more companies used the Lean Six Sigma methodology to identify and correct process deficiencies. Lean Six Sigma enables companies to attain a clear understanding of which "inputs" have the most effect on a desired "output" – which, in this case, is safe oil and gas operations. Improved safety performance is all about measuring and assessing risks. Risk analysis must start during the initial front-end engineering and design (FEED) studies and carry through to steady-state operations.

Simply put, a Lean Six Sigma project gathers all the input variables, assesses them using an assortment of statistical methods and tools, quantify the influence of each input on the desired output, and then develop systems to mitigate their impact. Some examples of solutions companies have implemented as a result of applying the Lean Six Sigma methodology include:

- Implementation of value stream managed teams where safety is owned by everyone, as opposed to only the Safety Team.
- Improvement of Integrity Management Systems through the use of Predictive Maintenance techniques via ultrasound and lasers, including standardized wall thickness measures and predictions when conditions reach a disconcerting safety level and require replacement or repair.
- Permit to work system – streamlined and standardized processes across platforms; development of risk criteria based on statistical data, simplification of forms, development of checklists and creation of consistent roles and responsibilities all focused on safety improvement.

Applying Lean Six Sigma methodologies in an offshore environment can help companies focus on the bigger picture, which will ultimately help save lives, reputations, and equipment.