



[COMPLIANCE TIPS]

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E&P facilities: Using risk-based process safety applications

Process safety and major accident prevention practices for offshore exploration and production (E&P) facilities vary somewhat around the globe. In the United Kingdom, the Safety Case is "king." Elsewhere, quantitative risk analysis (QRA) is widely used during the design process to ensure that fire and explosion risk areas are identified and either inherently safer measures are integrated into the design or appropriate "life-cycle managed" safety critical elements are employed during operation to manage residual process safety risks. Embedded within both the safety case and any underlying QRA is a presumption that appropriate management systems are employed to nurture the equipment throughout its operating lifetime to ensure stable risks.

Formal safety management systems have been in place in some companies for many years. To promote process safety management (PSM) excellence and continuous improvement throughout industry, in 2007 the Center for Chemical Process Safety created "Guidelines for Risk-Based Process Safety" (RBPS) as the framework for the next generation of PSM. ABS Consulting

wrote this guideline for CCPS, which was primarily aimed at managing process safety for downstream facilities. In 2008, ABS Consulting adapted the RBPS framework for use in the unique circumstances of the offshore environment.

Risk-based process safety approach

The RBPS approach recognizes that all hazards and risks are not equal. Consequently, it focuses more resources on greater hazards and higher risks. The main emphasis of the RBPS approach is to put just enough energy into each activity to meet the anticipated needs for that activity. In this way, limited company resources can be optimally apportioned to improve both facility safety performance and overall business performance.

Three RBPS criteria are to be considered to design, fix or improve a PSM system:

1. An understanding of the hazards and risks of the facilities and operations.
2. An understanding of the demand for (and resources used in) process safety activities.
3. An understanding of how process safety activities are influenced by the process

safety culture within the organization.

Offshore E&P context differences

In the offshore environment, these RBPS elements and activities must be adjusted to recognize the different life-cycle context involving design, fabrication and emplacement of facilities and the drilling, completion and renewal of exploration and production wells. The following are some examples of how traditional downstream PSM activities differ from offshore E&P implementation.

> Inherently safer design aspects are more prevalent since worker populations are typically co-located within these facilities offshore. This affects the way that risk studies are done and risk tolerance is viewed.

> Production crews change every few weeks and supervision may change at different intervals. These staffing cycles create great challenges in the area of communication of changes and refresher training.

> Different operating modes such as helicopter operations, marine vessels and combined operations create different hazards to address in risk assessments and in implementation of PSM activities.

> Capital project activities and major changes tend to be managed via onshore resources. This creates special commissioning challenges to ensure that handover to production operations is effective.

> Additional types of process safety documentation — marine, wells and subsurface structures — must be developed, protected and used.

> Emergency management takes an increased emphasis due to the remoteness of the typical platform and the planning needed for effective evacuation in case of emergencies.

> Conduct of operations is more important because of potential fatigue, crew handover and crew welfare issues that can affect safe operation.

> Management of change is more challenging because of the coordination that must occur between myriad onshore and offshore departments.

For more information on how RBPS principles can be applied to improve process safety at offshore facilities, contact Steve Arendt at sarendt@absconsulting.com or call (281) 673-2914. □


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