



Asian Safety Professionals Forum

effective process safety management for small field developments

27 September 2012

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Recognising process Safety

“There are too many companies that have been congratulating themselves on the success of their safety management because they’ve reduced their number of incidents every year. But then it turns out that they’ve been counting the number of papercuts in the office, instead of paying proper attention to the danger posed by the process plant they were running.”



Judith Hackitt, Chair of Britain’s Health & Safety Executive.



the importance of process safety

- Strong industry performance in reducing occupational injuries during last 20 years
- Historically less focus on process safety and asset integrity management
- Still a significant number of major accident events occurring
- Maintaining a license to operate dependant upon maintaining an excellent process safety record

Is this too great a challenge when developing small, marginal fields?



major accident events

Never a single cause, but due to an erosion of protective barriers (Swiss Cheese Model)

Causes

- Poor design
- Poor quality of construction
- failure to inspect, maintain or test equipment
- Non-compliance with procedures
- Poor monitoring
- Corrosion, erosion etc.

Solution

Develop and implement an effective Process Safety and Asset Integrity Management System





ROC asset integrity management system

- **A company expectation established based on OGP, UKOOA and oil company systems, covering:**
 - Leadership and awareness
 - Process safety aspects of facilities design, construction, operations and management of change
 - Well engineering and operations (WEMS)
 - Production safety (PTW, energy isolation, CMMS)
 - Competency assurance
 - Process safety incident reporting and investigation
 - Target setting, KPIs and monitoring the health of barriers
- **Fit for purpose application is mandatory for all ROC Business Units**



facilities for small fields

Do small fields need complex, expensive facilities to prevent major accidents?

Apply the principles of intrinsic safety:

- Simplify the process; minimum facilities, minimum manning
- Minimise leak paths by eliminating flanges, valves, vents
- Minimise inventories of flammable materials – smaller vessels
- Minimise electrical equipment in hazardous areas (ignition source)
- Use technology; multi phase flowmeters – no test separator
- Design for minimum maintenance
- Ease of decommissioning or preferably reuse (EPV, re-deployable platforms)

Intrinsically safe facilities are simpler, safer, easier to maintain and economic for small fields



monitoring and leadership

- Main cause of major accident events is failure to maintain barriers
 - Critical to monitor the 'health' of barriers using KPIs, 'line-of-sight' techniques
- Set process safety targets e.g. loss of containment events, fires and ignition sources
- Incorporate process safety performance into business reporting throughout the organisation
- Perform annual Process Safety and Asset Integrity Management reviews
- Board involvement through HSE Committee meetings, regular briefings, participation in Process Safety Audits



conclusions

- Process Safety and Asset Integrity Management need a higher profile in the upstream industry
- Fit for purpose Asset Integrity Management controls need to be implemented
- A continuing record of major accidents events will lead to a loss of license to operate and stricter regulatory control
- Principles of intrinsically safe design can be applied to the development of small fields resulting in facilities that are safer, cheaper and easier to maintain
- Use KPIs and monitoring to keep all levels of the business informed of the health of the controls in place to prevent or mitigate major accident events



glossary

CMMS	Comprehensive Maintenance Management System
EPV	Early Production Vessel
KPI	Key Performance Indicator
OGP	International Oil and Gas Producers Association
PTW	Permit to Work System
UKOOA	UK Offshore Operators Association
WEMS	Well Engineering Management System