Break-Out Session 2

The Role of SPIs in Safety Performance

PLANT INTEGRITY

Group 1

PLANT INTEGRITY elements

- Primary containment, e.g., vessels, piping, pumps etc.
- Safety systems, emergency shutdown,overpressure, etc.
- Site layout

Session 2A

(2A)1. how often do operators use SPIs for plant integrity?

- Begin here

Frequency	Number of inspectors
Always	0
Nearly always	1
Sometimes	7
Almost never	2
Never	0
Not applicable	2

(2A)2. What kind of SPIs should be used for each of the specific plant integrity categories?

Why different sites establish SPI for plant integrity?

- Improve and monitor the availability of the plant
- Operation integrity system: business risk as well as safety risks
- Reliability of equipment
- Overview for the management and benchmarking at corporate level (comparison between different sites)
- What about remotely operated sites or automated sites??

What kind of SPI are used?

- Inspections (tanks, piping, safety valves, SIF, …) planned vs executed
- Overdue inspections
- Failure rate of equipment (pumps, valves, …
- Number of reported LoC related to mechanical integrity
- Number of non-programmed stops

(2A)2. What kind of SPIs should be used for each of the specific plant integrity categories?

What kind of SPI are used? (continued)

- Resources for programmed maintenance
- % overdue follow up actions after inspection
- Expected lifetime expectancy
- Number of activated barriers or layers of protection

Conclusion: both leading and lagging indicators are used for plant integrity monitoring

SPI for site layout???

- OBRA and MoC

(2A)2. What kind of SPIs should be used for each of the specific plant integrity categories?

Aging of plants?

- Also connected to maintenance/inspection programme and MoC
- Repairing vs replacing
- Leakage rate
- Cost of maintenance
- Difficult to define specific SPI for monitoring aging
- Not specifically designed for aging but could interpreted as a measure of aging
- Fitness-for-service analysis

(2A)2. What kind of SPIs should be used for each of the specific plant integrity categories?

Types of industries in which SPI might be more critical?

- Depends of the complexity of the sites and consequences/location of LoC
- More Critical : Refineries, multipurpose plants, continuous vs batch production, biocide production, production and storage of very toxic substances,
- Less critical: warehouses, simple storage (fuel storage), storage of ores and minerals, air separation units, power generation

Session 2B

(2B) 1. How can you tell when SPIs are appropriate for plant integrity?

- Seveso-inspector cannot say if SPI/KPI alone is appropriate to monitor plant integrity as an inspector but should look at the systematic approach
- Use of SPI from industry association
- Some examples:

- test/inspections of SIF, safety interlocks, PSV: % passed vs % failed
- Number of safety critical items passed the test should be 95% and adapting the inspection frequency accordingly
- Investigate the failed 5% (same equipment?)
- Failed test of safety critical equipment considered a near miss

- SPI can be good as well as bad depending on how operator is using them
- They should be dynamic: periodic re-evaluation

(2B) 2. How can you tell when the SPIs for plant integrity are having an impact on performance?

- Positive link and impact on performance
- Corrective actions linked to results of SPI
- Small spills, failure of SCE (related to plant integrity) are also specific SPI and the integrity system should take this into account to improve performance
- Performing spot checks
- How long after implementation of SPI you get successful results?
- Impossible to say because too many influencing factors but should give enough time in order to be statistically relevant

(2B) 3. How do sites manage follow-up of SPI results for plant integrity?

- Periodic management review
- Technical/maintenance department and upper management
- Not only give SPI as numbers but also background information and explanation
- Not only results of SPI but also meaning of failed or bad results of SPI