Chemicals Accident Risk seminar

European Commission JRC
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Process & Plant Safety
A Matter of Governance

2011:
OECD Guidance Corporate Governance for Process Safety
Cefic Guidance on Process Safety Performance Indicators

2016:
ICCA Guidance for Reporting on the ICCA Globally Harmonized Process Safety Metric

Next:
OECD: Developing Guidance for Ownership Change in Hazardous Facilities
Despite all efforts, incidents continue to occur

**2005 Buncefield, UK:** Biggest explosion in peacetime

**2005 Texas, USA:** 15 killed, 170 injured

**2016 BASF, Germany:** 4 Fatalities, 29 injured

Leaders need to change from active to PRO-active
Corporate Leadership – what we mean

The way in which:

- Leaders actively engage with all levels within the organisation
- Process safety considerations feature in key business decisions
- Major hazard risks are understood and critical control measures are communicated and championed by senior managers
- Resources (staffing and monetary) are allocated to mitigate risks along the manufacturing lifetime and across supply chains
- Organisational changes get scrutinized during normal operations and across M&A processes
- KPIs are in place and reported at the highest level
OECD has issued a draft guidance on ownership change transactions

Suggestion of a self-assessment:

**SELF-ASSESSMENT QUESTIONS FOR THE EXISTING/ CURRENT OWNER**

The original owner needs to focus on their legal responsibilities to hand over a plant and site with the potential for a major accident which could harm the workforce, the surrounding factories, people living nearby and the environment. The checklist gives a series of pointers to fulfilling their responsibilities. These may be greater but more easily fulfilled if the plant has been openly offered for sale. This may be more difficult with a hostile takeover where there has been little time or incentive to prepare.

**Planning Phase**

1. Have you determined which information you should provide to the new owner to assure continuity in the safety of operation?

   **Tips:** You can look at the template for transparency on page 18 for a detailed list of documents that you would want to share with the new owner.

   1.a Have you reviewed this information to make sure it is complete and up to date?

   1.b Have you made sure this information will be provided in a way that will be easy for the new owner to review?

Taking the next step:

Introducing *Process Safety* into all aspects of corporate governance
Quotes from the Survey

Mergers of equals do not allow the exchange of too much information before day-1 due to competition law

Part of due diligence is to check on the main safety projects and their status

Due Diligence considers safety issues. But you take care of the details later

The OECD guidance is probably the best compilation out there.

Lack of safety can be a reason to walk away from the deal

In case of M&A you want to get the deal done

Expecting a larger acquisition we are currently reworking our processes.

We have extensive questionnaires for Due Diligence, covering all aspects, of course incl. safety

Different companies have different reporting systems and thresholds

Hostile takeovers may pose a certain risk

We have our own guidance summarizing our experience from M&A’s

We prepared our own guidance summarizing our experience from M&A’s

We found some “surprises” after the acquisition

We experienced that sole “investor companies” care less about safety

Our processes cover all aspects but there is no “umbrella” like the OECD guidance

M&A are a rare event for smaller companies. They do not plan for it

More a topic for the new owner, not for the old one.

We check whether a Hazop is in place. And if applicable, whether Seveso is fulfilled

A good topic for all changes in ownership, e.g. generation change; implementing new management

We are checking on PPS very early on but the real integration can take > 1 year

We decided early in the process to keep the main HSE-PPS experts

We have a dedicated function for this topic

The OECD guidance is more for smaller companies. Larges ones are covered

Safety can be priced into the purchase price

No, we do not consider this

Large chem. company
National association
Midsize company
Large chem. company
Large chem. company
Small company
National association
Large chem. company
National association
National association
Large chem. company
Large chem. company
Small company
National association
Large chem. company
Large chem. company
Large chem. company
National association
Large chem. company
Large chem. company
Small company
Large chem. company
Midsize company
Results of a brief survey

Current State of Play

Large companies have sufficiently detailed processes on:

- Management of Change
- Organizational Changes
- Process & Plant Safety Evaluations / Hazops
- Qualification, retention of employees
- Quality Management and Document Retention
- Due diligence Process for M&A, Divestment

→ This is not or only partially the case in smaller companies

However, there is usually not this ONE document or process which combines all of the above like the proposal compiled by OECD

Recommendation to inform the national working groups and to circulate the draft through the industry to get a more comprehensive feedback.

This guidance can be a valuable additional step in the spirit of RC and continuous improvement.
Guidance to be used early in the process
As M&A are expected to increase in the future

Simplified M&A Process:

First rough “background check” e.g. historical incidents

OECD Guidance could take a distinct function in the Due Diligence process
Thank you
BACK – UP Slides
You cannot improve what you do not measure

Several Databases track incidents across the globe

- **INRS**
  The French national research institute for safety (INRS) holds the EPICEA database, which provides 17,000 detailed "workplace accidents".

- **ERA – European Railway Agency**
  The European railway agency publishes reports on railway accidents in Europe (in English).

- **ILITY (Finland)**
  The Finnish database ILITY gathers accidents worldwide ("database" in English, but without any search engine).

- **FACTS (Pays-bas)**
  FACTS is a database which contains information on more than 24,000 (industrial) accidents (incidents) involving hazardous materials or dangerous goods worldwide. (restricted access)

- **ZEMA**
  The ZEMA database (Zentrale Melde- und Auswertestelle für Störfälle und Störungen in verfahrenstechnischen Anlagen) centralises information on accidents in Germany. The database is in German.

- **ARIA**
  ARIA: Lessons learnt from industrial accidents
  Collect, analyze, inform

- **NTSB**
  An independent United States Federal Government Agency

- **Process Safety Beacon**
  - U.S. Chemical Safety Board
Process Safety Management
The adopted answer

Based on the “management system” approach, PSM is not a “one-off” task.

Its success depend on continuous commitment and efforts, once a satisfactory performance level is achieved, to maintain it during time.

Organizations are living systems, in need to cope with challenges like personnel turnover, technology and organizational changes: a continuous adaptation process is needed.

A good PSM allows a diffuse involvement of all the components of the organization, at the proper, relevant level, and this helps the organization to deliver the most efficient answer to the multiple challenges it has to cope with.
Occupational Health and Safety

- Workplace rules
- Worker training
  - Supervision
- Individual behaviors
- Safety equipment
- Focus on individual well being

Process Safety

- Collective commitment
- Addresses events over which the individual worker has little or no control
- Focus on systems
- Broader impact – events that could affect groups of workers or general public
Process Safety: a definition.

- Process safety: the prevention of leaks, spills, equipment malfunction, overpressures, over-temperatures, corrosion, metal fatigue and other similar conditions.
  (Baker et al., 2007)
Process Safety: another definition

- Process Safety is a blend of engineering and management skills focused on preventing catastrophic accidents, particularly explosions, fires and toxic releases associated with the use of chemicals and petroleum products (CCPS, 2010).
At approximately 1:20 p.m. on March 23, 2005, a series of explosions occurred at the BP Texas City refinery during the restarting of a hydrocarbon isomerization unit. Fifteen workers were killed and 180 others were injured. Many of the victims were in or around work trailers located near an atmospheric vent stack. The explosions occurred when a distillation tower flooded with hydrocarbons and was overpressurized, causing a geyser-like release from the vent stack.
The recommendations of
BAKER REPORT
(BP Texas City Refinery incident, March 2005)
RECOMMENDATION #7 – LEADING AND LAGGING PERFORMANCE INDICATORS FOR PROCESS SAFETY

BP should develop, implement, maintain, and periodically update an integrated set of leading and lagging performance indicators for more effectively monitoring the process safety performance of the U.S. refineries by BP’s refining line management, executive management (including the Group Chief Executive), and Board of Directors. In addition, BP should work with the U.S. Chemical Safety and Hazard Investigation Board and with industry, labor organizations, other governmental agencies, and other organizations to develop a consensus set of leading and lagging indicators for process safety performance for use in the refining and chemical processing industries.

RECOMMENDATION #8 – PROCESS SAFETY AUDITING

BP should establish and implement an effective system to audit process safety performance at its U.S. refineries.
Process Safety Management: best practices
Objective and duty of the Operator: adequate performance and its improvement which requires:

→ Performance measurement, trend analysis
→ reporting (internal to the site)
→ driving a continuous improvement process

Implementation of State-of-the art Process Safety performance monitoring and reporting, internal of each company.
General Requirements

Simple to understand and to communicate
Promoting trust
Ambitious
Challenging
Long lasting value
...
Allow visionary objectives like:
 „No unintended substance or energy release“
 „ZERO Accidents“
Primary Goal of Process Safety Management

Handle **inevitable hazard potentials** professionally, so that the **likelihood** of their **activation** and **adverse effects to environment, people and assets** is **as low as practicable**.

Source: www.circus-krone.de

**Simplified:**

*keep the hazard potentials contained.*
Near misses (reporting and analysis)

Leading Indicators (typically site specific)

Limited value in comparison among sites and benchmarking.

Nevertheless, these practices are strongly recommended as crucial tools in Process Safety Management.