



FOCUS ARTICLE

A New Approach to Process Safety Management

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The Limits of Conventional Process Safety Management

Every organization dedicated to excellence strives for continuous improvement, and nowhere are the stakes higher than when it comes to safety. The chemical industry has developed Process Safety Management (PSM) and invest considerable resources to prevent incidents. Even companies engaged in less risky fields are increasingly committed to protecting people, assets and the environment. The challenge has been to design and implement universally effective process safety management systems. As long as incidents continue to occur, it is clear that industry has not fully achieved its safety goals.

In recent decades, a number of PSM schemes have been developed for different business sectors or specific areas of interest. Among the most widespread are:

> OSHA PSM Standard. Focuses on highly hazardous chemicals stored or handled above given thresholds (but risks like dust explosions are not considered). It is a very prescriptive, compliance oriented standard. It is not risk based and does

not include cultural or organizational elements. Assessments are typically compliance audits, and there is no tool to assess maturity levels or to determine a roadmap for improvement.

- > **Seveso** Directive Safety Management Systems. Very similar in intention to the OSHA PSM Standard, but more functional than prescriptive (i.e. it names elements that require management, but does not tell you how). Still, it is focused on large inventories of highly hazardous materials, and compliance is determined by binary audits.
- > Energy Institute PSM system. It is risk-based and takes into consideration cultural and organizational elements. The Energy Institute has developed the Process Safety Survey (EIPSS) as a compliance self-assessment tool, limited to members of the Energy Institute. The system, as well as EIPSS, is focused on the oil&gas and energy industries, and the method is difficult to use beyond this scope.
- > DuPont Corporate Standard S21A. This system is also focused on high risk facilities. One of its main strengths is the consideration of cultural and organizational elements, sometimes to the detriment of more technical elements.

Rethinking What Effective Process Safety Means

It is clear then, as more and more corporations are trying to improve their process safety management, that there is a gap between their needs and the systems available. At DEKRA we reflected on the properties that a comprehensive process safety system should have, starting with the progress made by the Center for Chemical Process Safety (CCPS), whose system was developed in 1989 and revisited in 1992 and 2007.

The result of this thought process is **Organizational Process Safety (OPS)**, a methodology specifically designed to support our clients in their journey towards process safety excellence. In the design of OPS, we gathered the combined expertise of our consultants and experts, together with the experience and lessons learned in a large number of assessments and audits.

Synthesizing Knowledge and Experience to Create Organizational Process Safety

OPS inherits some of the key features of the CCPS system:

- > It is comprehensive, covering all elements considered relevant by CCPS in preventing process incidents.
- > It is risk-based, with implementation depth commensurate with the risk involved.
- > Our team included additional features to reinforce our new methodology:
- > It is universal, applicable regardless of business sector or industry risk level.
- > It includes cultural and organizational elements, above and

beyond the CCPS model, as at DEKRA we believe those to be the glue that holds together the technical elements.

- > It establishes a maturity level scale and includes an assessment tool, or methodology that measures the success of **process safety management** practices.
- > The measurement tool has all the properties necessary in such an assessment:
 - Objectivity: the result of the assessment is independent of the assessor.
 - Precision: the result of the assessment is as accurate as possible.
 - Repeatability: two assessments of similar plants performed by the same team yield similar results.
 - Reproducibility: two assessments of the same plant performed by different teams yield similar results.
- > The assessment process intrudes on day-to-day activities at the site or organization as little as possible.
- > The system reflects the current status, and also provides an optimized roadmap for improvement.

Organizational Process Safety is not merely the product of our dedicated experts but lives through them and their experience performing countless assessments worldwide. This depth of experience is specifically critical when evaluating elements more related to cultural or organizational aspects, where the background of our legacy organizations has proven to be invaluable. OPS is a system that recognizes the interconnected nature of safety and all its moving parts, and a methodology where people are pivotal as agents of change, both in the organizations seeking to transform and on our team of trusted advisors.

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Dr. Arturo Trujillo is Global Director of Process Safety Consulting. His main areas of expertise are diverse types of process hazard analysis (HAZOP, What-if, HAZID), consequence analysis and quantitative risk analysis. He has facilitated more than 200 HAZOPs over the last 25 years, especially in the oil & gas, energy, chemicals and pharmaceutical industries.



DEKRA Process Safety

The breadth and depth of expertise in process safety makes us globally recognised specialists and trusted advisors. We help our clients to understand and evaluate their risks, and work together to develop pragmatic solutions. Our value-adding and practical approach integrates specialist process safety management, engineering and testing. We seek to educate and grow client competence to provide sustainable performance improvement. Partnering with our clients we combine technical expertise with a passion for life preservation, harm reduction and asset protection. As a part of the world's leading expert organisation DEKRA, we are the global partner for a safe world.

Process Safety Management (PSM) Programmes

- > Design and creation of relevant PSM Programmes
- > Support the implementation, monitoring, and sustainability of PSM Programmes
- > Audit existing PSM Programmes, comparing with best practices around the world
- > Correct and improve deficient Programmes

Process Safety Information/Data (Laboratory Testing)

- > Flammability/combustibility properties of dusts, gases, vapours, mists, and hybrid atmospheres
- > Chemical reaction hazards and chemical process optimisation (reaction and adiabatic calorimetry RC1, ARC, VSP, Dewar)
- > Thermal instability (DSC, DTA, and powder specific tests)
- > Energetic materials, explosives, propellants, pyrotechnics to DOT, UN, etc. protocols
- > Regulatory testing: REACH, UN, CLP, ADR, OSHA, DOT
- > Electrostatic testing for powders, liquids, process equipment, liners, shoes, FIBCs

Specialist Consulting (Technical/Engineering)

- > Dust, gas, and vapour flash fire and explosion hazards
- > Electrostatic hazards, problems, and applications
- > Reactive chemical, self-heating, and thermal instability hazards
- > Hazardous area classification
- > Mechanical equipment ignition risk assessment
- > Transport & classification of dangerous goods

We have offices throughout North America, Europe, and Asia.

For more information, visit www.dekra.com/process-safety

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