Process safety focuses on: preventing fires, explosions and accidental releases; process facilities dealing with hazardous materials such as chemical and pharmaceutical plants, refineries, oil and gas production installations. Occupational safety and health primarily covers the management of Personal Safety, however well developed management systems also address Process Safety issues.

The importance of a systematic approach of safety provisions is obvious looking at some devastating accidents in the process industry, i.e. the 2005 Refinery Explosion at Texas City (USA) were fifteen people died, more than 170 people were injured. This accident has been thoroughly investigated by different independent parties. Safety management was not adequate, resulting in an inadequate hazard identification (HAZOP) and insufficient safety instrumentation for overfill prevention.

Process Safety involves, for example, the prevention of leaks, spills, vapour releases, equipment malfunctions by controlling corrosion, metal fatigue and other degradation mechanisms as well as upset-conditions like over-temperatures, over-pressures.

Process safety programs focus on design and engineering of facilities, maintenance of equipment, effective alarms, effective control points, operation and maintenance.

It is sometimes useful to consider Process Safety as the outcome or result of a wide range of technical, management, and operational disciplines coming together in an organised way.

To meet the increasing expectations of multiple stakeholders (regulators, insurance, owner), companies need to continually improve and demonstrate the health of their business.

Kienbaum has developed together with TÜV SÜD Industrie Service the “Process Safety Excellence” system to manage major accident risks, achieve operational efficiency, provide assurance of management control and create confidence among stakeholders.
The Focus Areas

Kienbaum and TÜV SÜD have developed a system for measuring, improving and demonstrating safety environmental and business performance. Process Safety Excellence helps to manage risks. It assures and improves the health of business processes, provides management with advanced decision support and builds reputation. It drives business results and helps to establish competitive advantage.

To achieve a sustainable Process Safety Management System focus is directed at two main areas: Asset Safety Integrity and Process Safety Management. Each is segmented into its constituent elements. These elements need to be evaluated, optimised and aligned to the "Voice of the Regulator", ensuring they are sustainably implemented.

Each of the six elements consists of logical, functional blocks which collectively and holistically provide process safety assurance. As such, successful transformation requires all of these blocks to be performing optimally.

Phases of a Process Safety Program Implementation – the Approach

The Kienbaum and TÜV SÜD approach uses a six phases approach to achieve cultural and process transformation and deliver sustainable Process Safety Excellence. The first phase establishes the capability of the existing Risk Management System and Processes. Identified opportunities for optimisation lead to the design, development and implementation required upgrades. The rigorous implementation of Systems and Processes means that they can be certified and, as sustainable changes, can be monitored over time with regular Audits.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Process Safety Excellence</th>
<th>Design Integrety</th>
<th>Operational Integrity</th>
<th>Maintenance Integrity</th>
<th>People Capability</th>
<th>Manager Safety Focus</th>
<th>Process Safety KPI’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-Appraisal</td>
<td></td>
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<tr>
<td>2</td>
<td>Process Safety Baseline</td>
<td>3 weeks</td>
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<tr>
<td>3</td>
<td>Design Certification</td>
<td>6 weeks</td>
<td></td>
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<tr>
<td>4</td>
<td>Realisation &amp; Implementation</td>
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<tr>
<td>5</td>
<td>Initial Certification</td>
<td>2 weeks</td>
<td></td>
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<tr>
<td>6</td>
<td>Regular Safety Audits</td>
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</tbody>
</table>

* Defects per million Opportunities

* Safety Integrated Systems
** Process Hazard Analysis
Kienbaum and TÜV SÜD developed the “House of Process Safety Excellence” to support their Partners

The “Process Safety Excellence” Approach combines Process Excellence principles, tools (like Lean Management, Six Sigma) and systems with the identification, understanding and control of process hazards to prevent process-related injuries and accidents.

The Way to sustainable excellence

Kienbaum and TÜV SÜD helps its partners in the industry to improve on the way to Process Safety Excellence, concerning “Process Safety Integrity & Management Improvements”, “Design Improvements” and the development of “New Processes”.

Kienbaum Management Consultants

- In the 60 years since the founding of our company, we have provided over 60,000 successful consulting projects for our customers.
- We can rely on our workforce of 690 Kienbaum employees worldwide (end of 2009).
- With its turnover of € 56 million in 2009, Kienbaum Management Consultants ranks among the top 25 consultancies in Europe.
- We are proud to be counted among the top 100 employers.

Philosophy of Kienbaum

- Measurable benefits for our customers: seniority, industry and management experience and a track record of successful performance improvement projects (incl. management & reporting systems, IT etc.).
- Partner for the entire transformation process.
- We develop intelligent, integrated and realistic solutions for strategic challenges hand-in-hand with our clients.

TÜV SÜD

- Established more than 140 years ago, TÜV SÜD today is a committed and responsible process partner with comprehensive industry knowledge.
- We focus on our core competencies of Consulting, Testing, Certification and Training.
- 15,000 staff optimise technology, systems and expertise at over 600 locations in Europe, the Americas, Asia Pacific and Africa.
- Generating consolidated sales of more than € 1.4 billion in 2009, TÜV SÜD ranks fourth among the world’s leading technical service providers.

Philosophy of TÜV SÜD

- "Choose certainty. Add value." is the core idea behind the services we provide to our clients.
- As process partners with comprehensive industry knowledge, our teams of specialists provide timely consultation and continuous guidance, thus optimising technology, systems and expertise.
- In this manner we enhance the competitive strength of our customers throughout the world.
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