Guidance on meeting expectations of
EI *Process safety management framework*

Element 6: Hazard identification and risk assessment

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GUIDANCE ON MEETING EXPECTATIONS OF EI PROCESS SAFETY MANAGEMENT FRAMEWORK

ELEMENT 6: HAZARD IDENTIFICATION AND RISK ASSESSMENT

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FOREWORD

Process safety management (PSM) is vital to ensuring safe and continued operations in major accident hazard (MAH) organisations. However, PSM is a multifaceted process, and a number of high profile incidents since 2005 have suggested that without a holistic understanding of the various factors required for effective PSM it can be difficult and inefficient to ensure, and measure, performance.

In 2010 the Energy Institute (EI) published *High level framework for process safety management* ('*PSM framework*'), which aimed to define what PSM should involve. Divided into four focus areas (process safety leadership, risk identification and assessment, risk management, and review and improvement) and sub-divided into 20 'elements', it sets out a framework of activities MAH organisations should undertake to ensure PSM. Each element lists a number of high level activities organisations should meet (expectations).

EI *Guidance on meeting expectations of EI Process safety management framework* is a series of 20 publications ('guidelines') that build on the *PSM framework*. Commissioned by the EI Process Safety Committee (PSC) each guideline captures and presents current industry good practices and guidance on how organisations can meet the expectations set out in each element of the *PSM framework*. Each guideline includes:

- A logical flow diagram of activities ('steps') the organisation should undertake to manage that element.
- Descriptions of those steps.
- Example performance measures (PMs) to measure the extent to which key steps have been undertaken.
- A list of further resources to help undertake key steps.
- A table mapping the steps against the expectations in the *PSM framework*.
- Annexes of useful information.

Readers implementing the guidance in this publication should be aware of the *PSM framework* and the other publications in this series, particularly if they are a manager with oversight of the wider implementation of PSM.

Suggested revisions are invited and should be submitted through the Technical Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR. e: technical@energyinst.org

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1 INTRODUCTION

1.1 HAZARD IDENTIFICATION AND RISK ASSESSMENT

This guideline sets out good practices for hazard identification and risk assessment. A fundamental requirement of any health, safety and environment (HS&E) and process safety management system is the identification and assessment of risk. Management should ensure that a comprehensive hazard identification and risk assessment process systematically identifies, assesses and appropriately manages the risks arising from the organisation's operations.

In order to address the expectations of this element this guideline addresses identification of hazards and assessment of risk considering outcomes or consequences in three key categories: health and safety, environment and reputation, and business interruption. An integrated approach should be taken to the assessment and management of all risk arising from the activities of the organisation as this will assist in embedding a sustainable, systematic process for risk management into the way the organisation conducts its operations.

1.2 EXPECTATIONS FOR ELEMENT 6: HAZARD IDENTIFICATION AND RISK ASSESSMENT

Element 6 of EI *High level framework for process safety management* ('*PSM framework*') describes fifteen expectations – arrangements and processes that organisations should (to an appropriate degree) have in place in order to ensure they are managing this aspect of PSM appropriately:

'Overview A fundamental requirement of any HS&E and process safety management system is the identification and assessment of risk.
Management must ensure that a comprehensive risk assessment process systematically identifies, assesses and appropriately manages the risks arising from the organisation's operations.

6.1 A structured process is applied to identify the hazards and ensure that the risks arising from the organisation's assets and operations are systematically assessed.

6.2 Risk control measures are identified and implemented, using the hierarchy of control, to manage the identified risks to a tolerable level.

6.3 The tolerable level of risk is defined for all risks (to human health and safety, environmental impact, property and financial loss) and is consistently understood and applied throughout the organisation.

6.4 Risk assessments are conducted for:
- ongoing operations;
- hazardous materials;
- new projects;
- products and services, and
- all changes.

6.5 Risk assessments consider risk to:
- health and safety of employees, contractors and members of the public;
- process safety;
- environment;
- reputation;
- asset integrity;
- business interruption;
- security;
- third party assets, and
- customers.

6.6 Risk assessments consider human and organisational factors.

6.7 Risk assessments are carried out by competent personnel with appropriate independence.

6.8 Risk assessments take into account learnings from incidents from both inside and outside the organisation.

6.9 Completed risk assessments are reviewed, approved and accepted by specific levels of management appropriate to the magnitude of the risk and any decisions are clearly documented.

6.10 All stakeholders are kept informed about the risk assessment process and results.

6.11 The status of risk control measures is reviewed at regular intervals by specified levels of management to ensure risk assessment recommendations are resolved in a timely manner.

6.12 The implementation of mitigation recommendations for the top HS&E and process safety risks is reviewed regularly by specified levels of management.

6.13 Risk assessments are updated as changes occur and reviewed and updated at a defined appropriate frequency.

6.14 Arrangements for hazard identification and risk assessment are understood and followed; understanding of arrangements and compliance with them is regularly tested.

6.15 Compliance and performance trends are reviewed by specified levels of management.

This guideline provides a process, along with guidance, to help organisations meet these expectations. It also suggests a number of compliance checks and performance measures (PMs) to measure the extent to which key activities involved in meeting these expectations have been or are being undertaken.