

Guidance on meeting expectations of
EI Process safety management framework

Element 13: Operational readiness and process
start-up

GUIDANCE ON MEETING EXPECTATIONS OF EI PROCESS SAFETY
MANAGEMENT FRAMEWORK

ELEMENT 13: OPERATIONAL READINESS AND PROCESS START-UP

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- *Element 20: Audit, assurance, management review and intervention*

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*, and
- 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.

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1 INTRODUCTION

1.1 OPERATIONAL READINESS AND PROCESS START-UP

This guideline sets out good practices for operational readiness and plant start-up and the management of HS&E and process safety risks introduced into the business by commissioning and start-up of new plant or re-commissioning and start-up of existing plant. This guidance will address:

- start-up of new or modified plant and equipment;
- restart following partial or full plant trip or planned shutdown, and
- restart following return from maintenance.

The commissioning and start-up of new, modified or existing plant and equipment, if not appropriately managed, can significantly increase the levels of HS&E and process safety risk.

Management should ensure that risks arising from any form of start-up are systematically identified, assessed and managed and that there is a systematic process to verify that plant and equipment is in a safe condition, and that personnel are appropriately prepared, before start-up or return to normal operation.

1.2 EXPECTATIONS FOR ELEMENT 13: OPERATIONAL READINESS AND PROCESS START-UP

Element 13 of EI *High level framework for process safety management* ('PSM framework') describes 10 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 | The commissioning and start-up of new, modified or existing plant and equipment is a high risk operation.
Management must ensure that there is a systematic process to verify that plant and equipment is in a safe condition, and that personnel are appropriately prepared, before start-up or return to normal operation. |
| 13.1 | There is a systematic process for checking operational readiness and the integrity of systems before they are brought into service. |
| 13.2 | The checking process addresses: <ul style="list-style-type: none">– new or modified plant and equipment;– return from maintenance, and– restart following system or full plant trip or planned shutdown. |
| 13.3 | There are defined criteria for operational readiness reviews and they are regularly reviewed and updated. |
| 13.4 | The criteria cover: <ul style="list-style-type: none">– hardware;– control system and software;– human and organisational factors; |

- operating procedures, and
- documentation.

- 13.5** System checks are carried out and documented by competent personnel.
- 13.6** There are defined criteria for categorising and handling identified issues and outstanding work items.
- 13.7** Completed system checks are reviewed, approved and accepted by specific levels of management appropriate to the magnitude of the risk.
- 13.8** Commissioning and start-up procedures have defined stages, hold/check points and progression criteria and review authorities.
- 13.9** Arrangements for operational readiness and process start-up are understood and followed; understanding of arrangements and compliance with them is regularly tested.
- 13.10** 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.