



400 Series: Process Safety

Pre-Startup Safety Review

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Global Environmental, Health and Safety
Indorama Ventures

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1. Purpose

This standard establishes Indorama Ventures minimum requirements for conducting a Pre-Startup Safety Review (PSSR) to ensure that prior to startup new or modified equipment and facilities have been constructed and installed in accordance with design specifications, all procedures and programs are in place and adequate, hazards have been adequately evaluated/addressed, and all required training has been completed.

2. Scope

This standard applies to all Indorama Ventures owned/operated sites. This standard does not apply to joint ventures (JVs) in which Indorama Ventures is a minority owner, nor to third-party warehouses and tollers, unless specifically requested by the related Segment EHS Leader.

For the purpose of this standard, the term 'EHS' includes process safety, transportation, and security, as well as environmental, health and safety.

This standard must be implemented by each site. Until implementation of this standard is complete, each site must at a minimum be in compliance with the local applicable regulations.

3. Responsibilities

Following is an overview of key responsibilities for this standard. Additional responsibilities, as applicable, are included in Section 4, Requirements.

3.1. Corporate EHS

- 3.1.1. Provide ongoing technical assistance related to this standard.
- 3.1.2. Periodically audit sites to determine compliance with this standard.
- 3.1.3. Review, update and communicate to all Indorama Ventures sites any updates or changes to this standard and associated documents and tools.
- 3.1.4. Periodically review this standard to ensure its continuing adequacy and suitability to Indorama Ventures operations.
- 3.1.5. Ensure this standard is consistently implemented from site-to-site within Indorama Ventures.
- 3.1.6. Communicate, as applicable, any lessons learned as a result of best practices identified or any non-compliances associated with implementation of this standard.

3.2. Site Head or Designee

- 3.2.1. Ensure implementation of and compliance with this standard including that it is adhered to and a site-specific program is developed so all employees receive the proper training, resources, and communications.
- 3.2.2. Assist with the implementation of the site-specific program; in particular:
 - Be thoroughly familiar with the requirements of this standard, the site-specific program, and any associated procedures and work practices.
 - Provide support, resources and training needed to carry out the requirements of this standard and the site-specific program.
 - Ensure required records are maintained on file.
 - Ensure compliance with site-specific program by employees and contractors (as applicable).

3.3. Segment EHS

- 3.3.1. Ensure that any site or local standard or procedure related to the same topic follows the corporate requirements at minimum.
- 3.3.2. Support the sites on any technical point related to the standard, including implementation.
- 3.3.3. Periodically evaluate sites' level of compliance with this standard.

3.4. Program Owner

- 3.4.1. Be thoroughly familiar with the requirements of this standard and local regulatory requirements.
- 3.4.2. Develop and implement a site-specific program that meets the requirements of this standard and any local/regional regulatory requirements.
- 3.4.3. Periodically review and monitor for compliance with the requirements of this standard, and per local regulatory requirements, at least every five (5) years.
- 3.4.4. Develop an action plan to correct any non-conformance with local regulatory or Indorama Ventures requirements.

3.5. Project Manager

- 3.5.1. Ensure PSSRs are completed for capital projects with the assistance of site or project resources as deemed necessary according to the size and complexity of the project. A competent team shall be utilized consisting of individual(s) who have the knowledge to properly review the installation and answer the PSSR questions.

3.6. Employees and Contractors

- 3.6.1. All personnel must understand and follow the requirements of the site-specific program including:
 - Being aware of and trained on, as applicable, the legal, regulatory and other associated requirements.
 - Immediately reporting any situations that may cause or have a potential to cause a non-compliance.
 - Completing any assigned regulatory tasks or actions.
 - Being aware of and trained on the process safety information relevant to the process(es) they operate and/or maintain.
 - Being aware of and trained on the requirements for completing PSSRs prior to startup of equipment after a change or after a shutdown of more than one month.
 - Completing PSSR actions as assigned.

3.7. In addition to the roles and responsibilities detailed above, the site-specific program must define and document the roles and responsibilities for all personnel who play a role in implementing the site-specific program, at a minimum:

- Supervisors
- Engineering and Maintenance
- EHS Personnel
- Other applicable functions, as staffed at individual site level

4. Requirements

The site shall develop and implement a written site-specific program that, at a minimum, conforms to this standard and to applicable regulatory standards. The site-specific PSSR program, at a minimum, must address the following:

4.1. A PSSR shall be completed:

- 4.1.1. For all changes that require an MOC per the Management of Change (MOC) Standard, IVL EHS-204.
- 4.1.2. For a plant/unit that has been shut down for a period exceeding one month.
- 4.1.3. When required by national or local regulatory requirements.

Pre-Startup Safety Reviews are not required for organizational changes per the Organizational Change Management Standard, IVL EHS-104.

4.2. The PSSR must ensure the following:

- 4.2.1. The plant/unit has been constructed in accordance with the design intent.
- 4.2.2. Actions from relevant Process Hazard Analyses (PHAs) (per IVL EHS-403) have been completed and implemented in the design and installation, as applicable.
- 4.2.3. Actions from relevant MOCs (per IVL EHS-204) have been completed and documented, as applicable.
- 4.2.4. All operating, maintenance and emergency procedures are in place and meet the standard required for safe operation of the process.
- 4.2.5. All personnel affected by any change have received training.

4.3. A PSSR shall be completed, documented, and included with the MOC, project files, or other tracking system. The forms referenced in Attachment A, PSSR Simple Level Form and PSSR Higher Level Form, or functionally equivalent forms shall be used. The PSSR Higher Level Form, or a functionally equivalent form, shall be used for any High Hazard Process Systems (HHPS) per the Process Safety Management Applicability Standard, IVL EHS-417.

4.4. The team completing the PSSR shall consist of an appropriate number of competent persons to ensure sufficient knowledge and experience to effectively carry out the PSSR. The completion of a PSSR shall not be performed by a single person.

4.5. Any actions identified through a PSSR shall be managed and added to the MOC documentation if being conducted in conjunction with an MOC. All pre-startup actions shall be completed prior to the authorization for startup of the plant/unit; all post-startup actions must be tracked to closure.

4.6. The site-specific PSSR program shall establish required approvals for startup.

4.7. All completed PSSR forms shall be retained per the site document retention policy.

4.8. Timing

- 4.8.1. A PSSR must be completed prior to startup after a change or after a shutdown of more than one month. For projects that are started up in phases, the PSSR for the associated phase must be

completed before startup of that phase (e.g., introduction of hazardous materials, including nitrogen, steam, electricity, and other utilities).

- 4.8.2. For construction projects, it is suggested that the PSSR review start at the end of the construction and equipment testing phase, with the final PSSR review to be executed after completion of all pre-startup actions and during the commissioning process.

4.9. Clarifications

- 4.9.1. A plant/unit may be subdivided for the purpose of starting up sections individually. In these cases, a completed PSSR is required for each section prior to startup.
- 4.9.2. A key intention of the PSSR is to provide an opportunity for those responsible for personnel safety, employee health and environmental protection to satisfy themselves that the installation meets statutory, Company and regulatory requirements. The PSSR team ensures there is no potential issue that may have been missed or introduced by the design or construction process.
- 4.9.3. The forms referenced in this standard are the preferred forms; however, functionally equivalent forms may be used provided they address all of the elements and intentions of this standard.

5. Training

Training requirements must be defined in the site-specific program. At a minimum, all training must be documented with the training date, the names of employees trained, the names of the trainer(s), the content of the training (or reference to content) and other site-specific/business segment requirements, when applicable.

5.1. Initial

Training on the requirements of this standard and the site-specific program must be provided to Indorama Ventures personnel based on their relevant responsibilities and shall be provided in the local language. At a minimum, personnel and/or management with direct responsibilities for this standard and site-specific program must be trained prior to conducting activities associated with the site-specific program.

5.2. Refresher

Refresher training shall be provided periodically according to the requirements of this standard, the site-specific program, and any local legal requirements, at appropriate intervals (e.g., changes to regulatory requirements), or at least once every three (3) years.

6. Recordkeeping

Records associated with the site-specific program and PSSRs must be controlled and retained in accordance with regulatory or site business segment record retention requirements, whichever is more stringent. Examples of records to be maintained include but may not be limited to completed PSSR forms and any associated information/documentation referenced.

7. References

- 7.1. IVL EHS-104 Organizational Change Management Standard
- 7.2. IVL EHS-204 Management of Change Standard
- 7.3. IVL EHS-403 Process Hazard Analysis Standard
- 7.4. IVL EHS-417 Process Safety Management Applicability Standard

8. Terms and Definitions

See IVL EHS Glossary

9. Revision History

| Version | Date | Summary of Update | Owner | Approver | Next Review Date |
|----------|----------------|--|---|---|------------------|
| Original | 18 April 2022 | Initial Release | Chad Wyble, Global Process Safety Program Director | Todd Hogue, VP, Global Head of EH&S | 18 April 2025 |
| 1.0 | 09 August 2024 | Updated implementation timeframe (Section 2) and Responsibilities (Section 3); made minor editorial updates. | Chad Wyble, Global Process Safety Program Director | Todd Hogue, VP, Global Head of EH&S | 09 August 2029 |

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Attachment A: Example PSSR Forms

The following forms are available on the Global EHS SharePoint site.

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|-------------|--------------------------------|
| EHSF-413-01 | Example PSSR Simple Level Form |
| EHSF-413-02 | Example PSSR Higher Level Form |