# Pre Start-up Safety Review (PSSR) Procedure

| Rev No. | Reason for Revision | Prepared By | Checked By | Approval by |
|---|---|---|---|---|
| R00 | Initial Issue | R&P Sub Committee | D Kamath | Vijay Chourey |
| R01 | Standardization of procedure | Bhavin Bhansali (Asso. Group Head – EMD, CGPL.) | Navendra Singh (Group Head – P & CB; Corp Safety.) | Vijay Chourey (Chief – Corp Safety) |
| R02 | Periodic revision | *Navendra Singh Head- Safety (T&D) Corp safety* | *Rajesh Sharma Head- Safety (Generation) Corp safety* | *Suresh Khetwani Chief - Corporate Safety & Environment* |
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## 1. OBJECTIVE:

Objective of this procedure is to provide guidelines for safe initial startup of a new facility or restart of a modified facility. The PSSR process verifies that the new/modified facility meets the original design and operating parameters. The intent is to prevent incidents caused by inadequate, incomplete, unauthorized design, construction, installation, and/or commissioning. .

## 2. SCOPE:

This procedure applies to all operating plants and project sites of Tata Power Group companies *including JVs/Subsidiaries*.

## 3. EXPECTED RESULTS:

**3.1.** All New facility and modified facility meets the original design and operating intent of process plant/facility.

**3.2.** Safety, operating, maintenance and emergency procedures are in place and adequate

**3.3.** Any site modifications during construction phase have been properly controlled and noted.

## 4. ACCOUNTABILITY & RESPONSIBILITY:

**4.1. ACCOUNTABILITY**: Concerned Division's Heads/Assets Custodian.

**4.2. RESPONSIBILITY**: As defined in the procedure.

## 5. GLOSSARY/ DEFINITIONS:

**MOC**: Management of change
**PPE**: Personnel Protective equipment
**PSSR:** Pre Startup Safety Review
**Procedure**: Specified way in carrying out an activity or process
**Shall:** Mandatory requirement
**Should:** Optional requirement
**Statutory requirements**: Laws, regulations applicable at the location of plant /work.

## 6. PROCEDURES:

**6.1.** Following activities shall be carried out in a PSSR with coordination between Construction personnel and Owner (Operations) & Maintenance Personnel and Safety personnel of the plant / facilities:

a. Coordinate PSSR participation from knowledgeable Construction ( Electrical, Mechanical, Civil and Instrumentation) personnel and Owner ( Operation ) & Maintenance Personnel ( Mechanical , Electrical , Instrumentation , Civil ) and Safety personnel.

b. Conduct Technical and HSE reviews of documentation and on site

c. Verify all construction and equipment is in accordance with safety, environmental and health rules & regulation and standards.
d. Complete all corrective action items raised in the PSSR
e. Complete Post- Start-up corrective action items
f. Representative of the Project Owner sign the PSSR checklists for approval of commissioning/start-up of the plant.
g. Documentation of PSSR.

**6.2.** Pre Startup Safety Review (PSUSR) Practices: PSSR shall be conducted by a team, lead by a Leader. The leader is normally a representative of operation group because they are the ultimate customer of the facility. A PSSR process shall consists of 3 steps:

6.2.1. **Follow-up HAZOP Review:** includes the following activities:

6.2.1.1. Verification on the follow-up action items provided by project on recommendations from previous HAZOP study.

6.2.1.2. Systematic review of all changes to the design since the previous HAZOP study.

6.2.1.3. The support documents for follow-up HAZOP review should be:

a. Engineering Flow Schemes or P& IDs
b. Utility Flow Schemes or P&IDs
c. Lists of site modifications since the original HAZOP study
d. Process Safeguarding Philosophy.
e. Operating and control philosophy, Cause and effect diagram
f. Other support documentation.

6.2.2. **Documentation Review:** The documentation review is to check the availability and status of operating manuals, startup/shutdown and emergency procedures. Following documents shall be checked for availability and status:

a. Operating manuals/procedures
b. Emergency procedures
c. Instruction of handling of chemicals
d. Operation checklists on safety equipment
e. Safeguarding Philosophy
f. As-built P&IDs/PFDs ( Process Flow Diagram)
g. Area Classification drawings, Plot Plans etc.
h. Fire Protection drawings

6.2.3. **Technical HSE Site Review:** Technical HSE Site Review shall be carried out when the construction is nearing mechanical completion (about 90-95 % completion) and the site is reasonably accessible. The site review shall concentrate on such issues but nor limited to as:

i. Equipment operability and maintainability
ii. Outstanding punch list items from mechanical completion associated with PSUSR
iii. Access and exit routes for operators and maintenance personnel
iv. Small-bore connections
v. Location of emergency and safety equipment, warning signs
vi. Safe location of vent lines
vii. Locking systems

**6.3.** A multidisciplinary team of PSSR trained people from different department (e.g. Const-Mech, Const-Elect, Commissioning, Operation, & Safety) shall carry out inspection of the ready to start facilities prior to taking into operation.

**6.4.** PSSR shall be carried out to understand various safety issues prior to operation and observations shall be categorized into three categories “A” ,”B” & “C”. Criteria for ascertaining category of observation is given below-

6.4.1. Category “A” – Observations of non-conformance of any Risk involved related to safety requirements.

6.4.2. Category “B” – Observations of Non-conformance of any Risk involved related to process/operation.

6.4.3. Category “C” - All Observations other than not covered in category “A” and “B”.

**6.5.** No facility can be taken into operation if category “A” points are not resolved. Category “B” can be resolved within a week’s time and Category “C” can be resolved within a fortnight’s time.

## 7. Records:

**7.1.** Pre Startup Safety Review (PSSR) Checklist – Life time of the facility

## 8. Training & Communication:

**8.1.** Training of Safety Communication shall be included and covered in Safety Training Calendar as per Safety Training needs.

**8.2.** Initial Communication to be done through Corporate Communication, Email and subsequently shall be made available at safety portal at Sangam.

## 9. VERIFICATION

**9.1.** Verification of implementation shall be done during Safety audit, field safety visit and site inspections.

**10. Exceptions:** Any Exception to this procedure shall only be done as per Document Control Procedure (TPSMS/GSP/DC/014)**.**

## 11. REFERENCES

- Indian Factory Act 1948 and State Factory Rules
- Electricity Act and Rules

## 12. Review:

**12.1.** Review of this procedure shall be done as and when but not later than once in every three (03) years. Typical Factors like Changes in legislation, Review of Incident Reports, Inspection & Audit findings, Feedback from users, Recommendations in Incident investigation reports may be inputs for the review and revision of the procedure.

***12.2.*** *In case release of revised procedure gets delay due to obtaining feedback or any other reasons, safety advisory may be issued immediately to take precautions for the proposed changes in the procedure and revised procedure should be released subsequently.*

## 13. ATTACHMENTS/APPENDIX :

Annexure 1- Pre Startup Safety Review (PSSR) Checklist -TPSMS/GSP/PSSR/010/FORM/001

**Annexure – 1**

TPSMS/GSP/PSSR/010/FORM/001

## Pre Startup Safety Review (PSSR) Checklist

| **Division:** | | **Name of Unit for PSSR:** | | |
|---|---|---|---|---|
| **PSSR REPORT (Pre start-up Safety Review)** | | | | |
| | **PSSR Document No** | | **Category** | |
| | **Package / System / Facility** | | **A** | **Hold up** |
| | **Date** | | **B** | **Within One week** |
| | **Time** | | **C** | **One month** |
| | **Persons Present:** | | | |

| Sr. No. | Concern | Observation / status | Corrective Action | Category | Responsibility (Department) | Target Date | Status |
|---|---|---|---|---|---|---|---|
| 1 | Structural / mechanical / electrical completion | | | | | | |
| 2 | Entry and exit including emergency exit. | | | | | | |
| 3 | Ventilation / Illumination / dust ingress protection / Emergency/ bake up for Illumination & Auxiliary | | | | | | |
| 4 | Fire detection | | | | | | |
| 5 | Fire protection / Drainage system | | | | | | |
| 6 | Pest & Reptile control | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | Labeling & signage | | | | | | |
| **Sr. No.** | **Concern** | **Observation / status** | **Corrective Action** | **Category** | **Responsibility (Department)** | **Target Date** | **Status** |
| 8 | Equipment Integrity aspect – Inspection / Test / Calibration certification | | | | | | |
| 9 | Design intension & Equipment trip alarm design basic / Logic diagram review | | | | | | |
| 10 | Safety systems – verification & test report for suitability | | | | | | |
| 11 | Verification of electrical equipment for hazardous area classification & ingress protection | | | | | | |
| 12 | HAZCHEM- as per MSDS review | | | | | | |
| 13 | Review of Services air / Service water / Controlled Air / Drinking water / Horticulture water | | | | | | |
| 15 | Color code of process pipe lines & Equipments | | | | | | |
| 16 | Buried cables / Service lines -route marking | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | Availability of as built drawings | | | | | | |
| **Sr. No.** | **Concern** | **Observation / status** | **Corrective Action** | **Category** | **Responsibility (Department)** | **Target Date** | **Status** |
| 18 | Availability of operation procedures for commissioning startup &Emergency shut down and Training of Operational staff | | | | | | |
| 19 | Maintenance procedure for isolation, draining, depressurization, decontamination, de-energization, Locking & tagging | | | | | | |
| 20 | Ergonomics& Occupational health | | | | | | |
| 21 | HAZOP Study or HIRA as applicable | | | | | | |
| 22 | Statutory requirements (Pr. Vessel, Relief valves, Lifting equipment, electrical) | | | | | | |
| 23 | General safety (PPE, Safety shower, Emergency contact nos. Visual display etc | | | | | | |
| 24 | Emergency preparedness and | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | response | | | | | | |
| 25 | Housekeeping | | | | | | |
| **Sr. No.** | **Concern** | **Observation / status** | **Corrective Action** | **Category** | **Responsibility (Department)** | **Target Date** | **Status** |
| 26 | Any Other | | | | | | |
| | **Name & Signatures of Team Members** | | | | | | |
| | **Team Lead** | | | | | | |
| | **Member -1** | | | | | | |
| | **Member -2** | | | | | | |
| | **Member -3** | | | | | | |
| | **Member -4** | | | | | | |
| | **Member -5** | | | | | | |

**Note:**

Category “A” – Observations of non-conformance of any Risk involved related to safety requirements.

Category “B” – Observations of Non-conformance of Risk involved related to process/operation.

Category “C” - All Other Observations other than not covered in category “A” and “B”.