PRE-STARTUP SAFETY REVIEW (PSSR) PROCEDURE AT KUWAIT OIL COMPANY

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Abstract - this procedure provides the minimum requirements for preparation and conducting of Pre-Startup Safety Reviews (PSSRs) of operating, new or modified facilities. PSSR shall be performed after mechanical completion, prior to commissioning or the introduction of hazardous substances in the process.

I. INTRODUCTION

The PSSR process entails identifying, documenting and managing all startups from all type of shutdowns, ensuring that all the Process Safety Management (PSM) elements have been analyzed, and any new or modified system is ready and safe to start.. The PSSR process shall ensure the following:

- New or modified facilities and equipment are built, installed and tested in accordance with design requirements.
- The required safety reviews are conducted prior to startup.
- All applicable operating, safety, emergency and maintenance procedures (developed) are adequate and in place prior to startup.
- All Process Hazard Analyses (PHA) or Management of Change (MOC) has been implemented and the recommendations satisfactorily solved before startup.
- Each employee involved with the operation of the covered process has been adequately trained.
- PSSRs shall be conducted for the following trigger events:
- Any modification being made to an existing process, when the modification is significant enough to require a change in the process safety information.
- Any new Capital Project related to Operational Facilities.
- Re-start of an idled process (e.g. mothballed process).
- After maintenance shutdown planned for the facility.

II. PROCEDURES

PSSR Philosophy:
It is important to understand that the PSSR process is the verification step that a new project, or modification to an existing facility or process, were carried out as prescribed and that the recommendations from the PSM and HSE studies and those other processes such as MOC, Factory Acceptance Test (FAT), Site Acceptance Test (SAT) or punch listing, have been completed. In other words, the purpose of the PSSR is not to determine whether the PSM and other fundamental design aspects have been adequately addressed, but rather its purpose is to verify that those critical aspects have been considered in the design, and that all recommendations stemming from those aspects have been implemented. It is also part of its purpose to sample the coverage and condition of those aspects.
PSSR is also mandatory to confirm any plant is ready for startup after partial or total operational shutdown.

Determining if a PSSR is required:
A PSSR is required for all new facilities (including equipment) and modified facilities when the modification is significant enough to require a change in the process safety information (PSI). In addition, it is mandatory for all operational facilities and equipment after partial or total shutdown before returning to normal operation or when construction / modification / maintenance activities are completed.

Categorizing the PSSR by Risk (projects and MOC):
The PSSR shall be categorized by the risk level determined by the corresponding risk assessment studies performed for projects or MOC, otherwise, a qualitative risk assessment based on KOC.PS.018, "Process Safety Risk Assessment and Management Procedure" shall be performed.

Building the PSSR Team and Selecting the Checklist Form (projects and MOC).
The PSSR team shall be formed by appropriate members based on their knowledge, experience and responsibilities associated with the covered process area.
Although the PSSR team composition can vary, the typical participants may include representatives from the following groups:

- Design & Construction.
- Operations.
- Engineering.
- Maintenance (Static, Rotating, Piping)
- Electrical.
- Instrument.
- Quality Control.

- Civil
- PSM (Asset/ Directorates).
- HSE (Asset/ Directorates).
- Fire (Support Services) Team.

Conducting the PSSR (projects and MOC)

The PSSR Coordinator schedules the team meetings and assigns roles for the team members.

The review will consist of two parts:

- A review of the changes and the PSSR checklist in an effort to discuss the status of the checklist items not requiring a field visit (e.g. training, procedures, etc.) and to generate a list of items for review in the field.
- A field visit by the PSSR team to verify the status of items requiring a field visit, as well as to verify the status of issues identified during the review mentioned above.

The PSSR coordinator shall lead the team in completing the PSSR checklist. For each portion of the checklist, the team must determine if the status of the item is adequate to allow the unit to start safely.

If the team determines that there are substandard conditions, they must identify the corrective action and the individual who is responsible for ensuring that the issues are resolved, as well as the appropriate due date for the resolution of the issue. The team must also determine whether the issues must be resolved prior to starting the equipment, or they can be postponed until after the startup. Safety critical shall not be started until all corrective actions that require resolution prior to startup are verified as completed.

The Team conducts physical examination of the new or modified plant, process or equipment, or that has been shut down for any reason. This physical examination is necessary to verify that the plant or process was built according to design and that all necessary safety features have been incorporated and are functioning.

This examination includes interviews with key personnel and reviews of documentation such as specifications and drawings to verify that the design criteria are met The PSSR team members shall confirm that:

- All Construction and equipment have been verified and tested in accordance with original design specification.
- Operating, Maintenance, HSE and Emergency procedures are in place and adequate.
- All PHA and required process safety documentation have been performed, are updated and on file.
- Training of each employee involved in the operating process is complete.

Completing the PSSR Form (projects and MOC)

PSSR is carried out with the help of checklists for mechanical, instrumentation, electrical, fire, HSE, civil and general items. These checklists are classified as “short form” and “long form”, and are depicted in appendices 1 and 2, respectively.

The PSSR team will perform a physical review of the facility just before startup to confirm that all related requirements have been met before the hazardous substances are introduced in the process and/ or equipment.

All members of the PSSR team shall review and sign the PSSR form to confirm the facility is safe for startup.

Tracking of Corrective Actions (projects and MOC)

If, during the PSSR process, incorrect or incomplete items are found by the PSSR Team, they may be divided into two groups:

- Actions that shall be corrected before startup, i.e. items that must be completed or corrected before the process can safely startup.
- Actions that shall be corrected after startup, i.e. an issue that does not impact safe startup or operation but, if corrected, enhances process safety.

Note: The completion dates for both pre and post startup cases must be included in the action tracker. Priority on resolution of these corrective actions should be based on the residual risk associated with the items, with highest priority given to those items that must be completed prior to startup of the equipment.

Authorization for Startup (projects and MOC)

Startup. Upon completion of all pre-startup action items, the PSSR report and corresponding form are forwarded to the Operations Manager/Team Leader of the area for approval to implement and startup the project or modification.

After Startup. The Project Manager or MOC Change Coordinator as appropriate shall ensure that the “after startup” action items are completed by the target date, and that the new or modified equipment is safe to operate.

Closure of PSSR (projects and MOC)

The PSSR Coordinator will verify that all recommendations and issues have been satisfactory resolved and proceeded to signature and closure of the PSSR process. The PSSR shall be closed only when all before and after start-up items are completed. The closure of a PSSR shall be communicated to all concerned persons, including the PSSR team members.

The PSSR Coordinator should seek out all appropriate approvals prior to reviewing the PSSR with the Operations Manager/Team Leader.

Completing the PSSR Form (Operational PSSR)

The Operations responsible person (Operator 1 on duty or the employee assigned by the facility custodian) will confirm by the application of the

Operational PSSR Checklist if there are substandard conditions on the process equipment after a partial or total shutdown. This person shall monitor the implementation of corrective actions until those substandard conditions are eliminated. Then he will authorize starting the equipment or plant to normal operations. Equipment shall not be started until identified deviations are corrected. All necessary safety features shall be available to recommence production.

The operations on duty will confirm through the physical examination of the plant processes or equipment that the safe operating conditions for startup exist completing the Operational Checklist (it shall be filled totally but whenever some items are to be omitted simply tick them as NA).

III. FIGURES AND TABLES

PSSR CHECKLIST (Short form)

PRE – STARTUP SAFETY REVIEW CHECKLIST – SHORT FORM				
Date:	PSSR Coordinator:		Checklist:	
Facility/ Process Equipment Reviewed:				
Type of Startup	New [ ]	Modified/ Change process/ Re-start [ ]		
Item No.	Tick Cross Answer:	Yes	No	N/A
1.	The construction and equipment has been tested and checked for conformance with design specifications and applicable codes and standards.			
2.	Applicable process safety information has been developed or updated as necessary to reflect the new/ modified process.			
3.	Plantwide safe work procedures are adequate considering the new/ modified process conditions.			
4.	Standard operating procedures and emergency procedures have been developed or updated as needed to ensure safe operation of the new/ modified process.			
5.	Maintenance procedures and a preventive maintenance schedule have been developed or updated as needed to ensure safe operation of the new/ modified process.			
6.	For new facilities, the initial process hazard analysis (PHA) and all recommendations have been resolved or implemented before startup.			
7.	Training of each employee involved in operating and/ or maintaining the process has been completed and documented.			
8.	For modified processes, the modification has been subjected to management of change review and all recommendations have been resolved or implemented before startup.			

Recommendations/ Actions (Attach relevant documents to this forms)			
Item No.	Description	Assigned to/ Initials	Date Resolved

PSSR Completion Summary: The issues above have been resolved and the undersigned believe the process/ facility is ready for startup.

Name/ Title	Signature	Date

Comments:		
Sign below only when all punch list "before startup" items are completed		
Authorized:	Facility/ Equipment Owner Signature:	Date

Figure 1: PSSR Checklist

CONCLUSION

A systematic and thorough check of a process prior to the introduction of a highly hazardous chemical to a process. The PSSR must confirm the following: Construction and equipment are in accordance with design specifications; Safety, operating, maintenance, and emergency procedures are in place and are

adequate; A process hazard analysis has been performed for new facilities and recommendations have been resolved or implemented before startup, and modified facilities meet the management of change requirements; and training of each employee involved in operating a process has been completed.

REFERENCES

[1] KOC.PS.014 - Pre-Startup Safety Review (PSSR) Procedure

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