

BMM PSSR Report

INSPECTION DATE	
DEPARTMENT/ AREA	
PROJECT TITLE	
PROCESS/ EQUIPMENT	

APPROVAL BY PSSR TEAM

The PSSR team concludes that the equipment / processes are safe to start-up after completion of recommendations/ actions required before start-up.

PSSR Team Member Name	Department	Signature

ACTION-ITEMS TO BE COMPLETED BEFORE START-UP:

S.N.	Action	Responsible	Target Date / Signature of responsible person

(Add more rows as required)

START UP AUTHORISED BY:

(Operations Head / Engg. Head Name):	Signature / Date
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NOT TO BE SIGNED UNTIL THE ABOVE ACTION ITEMS ARE COMPLETED
ACTION-ITEMS THAT CAN BE COMPLETED AFTER START-UP:

Ref. No (Ref. clause from PSSR checklist)	Actions	Responsible	Target Date/ Signature of responsible person

BMM Check list for Pre-Startup Safety Review

This checklist is presented in the form of questions. It is required to check [v] the appropriate box while answering these questions. Any checks in boxes with an asterisk (*) should be addressed through appropriate recommendations.

It is emphasized that this is not an all-inclusive listing but should serve to stimulate additional questions and actions.

A. SAFETY & HEALTH

1.1 General Safety		NO	YES	N/A	Remarks (If 'No' is ticked [v])
1.1.1	Have ALL personnel, (Operations, Maintenance, Technical, and Supervision), received adequate and appropriate training on the process /equipment?				
1.1.2	Has adequate and appropriate PPE (Personal Protective Equipment) been specified and provided?				
1.1.3	Have measures been taken adequately to guard dangerous part of the equipment? (360 deg. Machine Guarding)				
1.1.4	Has sufficient provision been made for the electrical and/or mechanical isolation of the equipment? (LOTO)				
1.1.5	Are points of isolation clearly marked/labeled and readily accessible?				
1.1.6	Have bump/trip hazards been identified and all sharp edges removed?				
1.1.7	Has proper guarding, handrails/barriers, been provided to prevent falls?				

1.1.8	Have all hot/cold surfaces been adequately guarded to prevent burns?				
1.1.9	Are Safety Showers and Eye Wash facilities provided and adequate?				
1.1.10	Has Lighting / Lux Survey has been carried out? Has sufficient lighting been provided as per survey recommendations so that operation, servicing, maintenance, and repair of the facility can be carried out safely?				
1.1.11	Are display systems for providing operational instructions, safety warnings and emergency information provided and positioned so that they are clearly visible and easily read?				
1.1.12	Are all required statutory licenses, consents, and approvals in place?				
1.1.13	Is housekeeping as per acceptable standard?				
1.2 Machinery Safety		NO	YES	N/A	Remarks (If 'No' is ticked [√])
1.2.1	Has the machinery been installed so that it will be stable and secure during operation?				
1.2.2	Has all access to dangerous moving parts, (or danger zones created by moving equipment) been prevented by the provision of the correct guards, interlocks and/or fencing?				
1.2.3	Have the correct safety measures been taken to prevent any risk from hot/cold surfaces, ejection of material, failure of parts and their ejection, overheating/fire?				
1.2.4	Has safe access been provided to those parts of the machinery that require operator access for operation, adjustment, service, maintenance, or repair, i.e., elimination of slip, trip, trap, crush, entanglement, fall, bump and cut hazards?				
1.2.5	Is the machinery provided with the properly identified START/STOP and EMERGENCY controls that are positioned for safe operation without hesitation, or loss of time, and without ambiguity?				
1.2.6	Is the machinery provided with a clearly identified means to securely isolate it from ALL energy sources?				
1.3 Ergonomics		NO	YES	N/A	Remarks (If 'No' is ticked [√])
1.3.1	Has the workstation, workplace, or equipment, been constructed so that the need for stooping, bending, stretching, over-reacting, and working over-head during operation has been eliminated, or reduced, to the minimum?				
1.3.2	Has the need to lift, carry, push, or pull, heavy loads, or parts, been eliminated as far as possible?				
1.3.3	Are all display screens, dials, START/STOP/EMERGENCY buttons positioned so that they are easily seen and accessible by those who will operate the equipment, or machine?				
1.3.4	Have Visual Display Screens been positioned so that interference from glare is reduced to the minimum?				
1.3.5	Has the workstation been designed and equipped so that a comfortable position can be adopted by the operator? i.e., able to stand, or change position and sit upright, angle at elbows and knees 90 deg., feet on floor.				

1.3.6	Does the operation of the equipment does not increase the risk of UpperLimb Disorder, e.g., repetitive tasks, handling of loads, machine paced work, and prolonged operation?				
1.4 Occupational Health		NO	YES	N/A	Remarks (If 'No' is ticked [√])
1.4.1	Have all health risks due to liquids, dusts, mists vapors or gases, used by, contained in, or emitted by the process/ equipment been assessed, and where necessary, eliminated or adequately controlled?				
1.4.2	Has adequate Personal Protective Equipment (PPE) and/or Respiratory Protective Equipment (RPE) been specified in the Operating Procedures?				
1.4.3	Has the need for an Occupational Health Monitoring Program been assessed?				
1.4.4	Have Operating Procedures been reviewed to take into account any additional "hazards to health" which may arise from operation or maintenance of this equipment?				
1.4.5	Has adequate Local Exhaust Ventilation (LEV) been installed, tested, balanced, and entered on an Inspection (PM) Schedule?				
1.4.6	Have adequate inspection/cleaning ports been provided on all ductworks?				
1.4.7	Are relief facilities directed to a safe place away from the workplace?				
1.4.8	Has a Noise Survey been considered, and a Noise Compliance Plan prepared, if required?				
1.4.9	Has all pipe work, tanks, etc., containing hazardous materials been adequately labeled?				
1.4.10	Are medical facilities available with competent medical personnel and are adequately stocked?				

B. PROCESS SAFETY MANAGEMENT

2.1 Process Technology (PT)		NO	YES	N/A	Remarks (If 'No' is ticked [√])
2.1.1	Are up to date material safety data sheets available?				
2.1.2	Have the hazardous effects of inadvertent mixing of different materials including waste streams been considered (i.e., has a chemical interaction matrix been prepared/updated)?				
2.1.3	Has the process design basis (e.g., Standard Operating Conditions) been documented /updated?				
2.1.4	Has the equipment design basis (e.g., Design specification/P&ID) been documented /updated?				
2.2 Process Hazards Analysis (PHA)		NO	YES	N/A	Remarks (If 'No' is ticked [√])
2.2.1	Have project PHAs been approved, and a final project safety report been prepared?				
2.2.2	Are all action items, deemed necessary by the PHA team for start-up, complete?				
2.2.3	Has the facility been approved as "Safe to Operate" by the PHA team?				
2.3 Management of Change – Technology / Facilities		NO	YES	N/A	Remarks (If 'No' is ticked [√])

2.3.1	Has a management of change (MOC) – technology/facilities site procedure been approved?				
2.3.2	Are all action items, arising from the MOC, that were deemed necessary for start-up, complete?				
2.3.3	Have all changes made during construction/modification been recorded and authorized?				
2.4 Quality Assurance (consult with personnel who have qualification responsibilities)		NO	YES	N/A	Remarks (If 'No' is ticked [√])
2.4.1	Have checks and inspections been made to ensure that critical equipment is installed properly and is consistent with design specifications and vendor's recommendations?				
2.4.2	Have quality assurance inspection reports, covering fabrication, assembly, and installation, been completed as per the project's qualification plan and reports filed with the equipment design basis documentation?				
2.4.3	The PSSR team should agree on, and field check specific items: (a) Does the construction meet the design specifications? (b) Does the construction match the drawings?				
2.5 Mechanical Integrity		NO	YES	N/A	Remarks (If 'No' is ticked [√])
2.5.1	Have maintenance procedures been approved and issued?				
2.5.2	Have maintenance personnel been trained?				
2.5.3	Have inspections and tests (including regulatory requirements) for the following equipment been included in preventive maintenance schedule (i.e., added to the SAP System)?				
	• Pressure vessels and storage tanks				
	• Pressure relief systems, vent systems, and devices				
	• Critical controls, interlocks, alarms, and instruments				
	• Emergency devices, including shutdown systems and isolation systems				
	• Fire protection equipment				
	• Piping systems in critical service				
	• Electrical grounding and bonding				
	• Emergency alarm and communication system				
	• Monitoring devices and sensors				
	• Pumps				
	• Lifting equipment				
	• Other identified PSM critical equipment (if any)				
2.5.4	Is the equipment inspected by an internal/external agency and certificates are available? (E.g., lifting equipment test certificates, pressure systems regulations, etc.).				
2.5.5	Have all commissioning tests or inspections been identified? (e.g., pressure or leak tests)				
2.6 Operating Procedures & Safe Work Practices		NO	YES	N/A	Remarks (If 'No' is ticked [√])
2.6.1	Have operating procedures been prepared/updated and approved?				

2.6.2	Have site procedures for safe work practices (e.g., Permit to work, LOTO, Work at Height, Confined space entry etc.) been prepared/updated and approved?				
2.7 Training and Performance		NO	YES	N/A	Remarks (If 'No' is ticked [√])
2.7.1	Has specific process (or job task) training been given to all personnel?				
2.7.2	Have initial/refresher training records been updated?				
2.8 Contractor Safety		NO	YES	N/A	Remarks (If 'No' is ticked [√])
2.8.2	Have all contract personnel been adequately trained in appropriate maintenance and operating activities?				
2.9 Interlocks and Alarms		NO	YES	N/A	Remarks (If 'No' is ticked [√])
2.9.1	Has the alarm/interlock been classified into safety (or) process interlocks and appropriate integrity levels are determined?				
2.9.2	Is the SOP for interlock/critical alarm testing been written and implemented prior to this PSSR?				
2.9.3	Have all interlocks been checked to ensure that those actions, under all conceivable failure conditions, to be fail-safe?				
2.9.4	For alarms/interlocks with more than one software or hardware circuit, have all possible interlock routes been tested?				
2.9.5	Do you have an appropriate procedure to ensure that your software is protected? (E.g., routinely archived, key/password protected etc.).				
2.9.6	Has the software been properly documented and filed? (E.g., logic drawings, schematics, sequence/batch descriptions).				
2.9.7	Has all software been properly validated and tested?				
2.9.8	Have you ensured that the equipment does not restart either on the resetting of a protective device such as an interlock or the re-establishment of power after an outage?				
2.9.9	Are all installation and / or any changes to the SCADA / DCS (Control Software) have been tested and verified by the operators as functional?				

C. ENVIRONMENT

3.0 ENVIRONMENT		NO	YES	N/A	Remarks (If 'No' is ticked [√])
3.1	Are all secondary containment/bundling facilities adequate? (Curb walls, Dykes etc.)				
3.2	Are all material storage facilities adequate and appropriately labeled?				
3.3	Have adequate arrangements been made, prior to start-up, for the identification, classification and safe disposal of all waste materials?				
3.4	Do Area Spill Procedures need to be developed / updated?				
3.5	Are relief vents/ facilities adequate and directed to an environmentally safe location?				
3.6	Have the Corporate Resource Conservation Guideline been followed during the design stage of this project?				

3.7	Have all waste streams been identified, quantified, analyzed and minimized?				
3.8	Is there a procedure for disposal of solid/liquid waste?				

D. EMERGENCY RESPONSE PLANNING

4.0 EMERGENCY RESPONSE PLANNING		NO	YES	N/A	Remarks (If 'No' is ticked [√])
4.1	Are all necessary Emergency warning signs, lights or other devices installed where necessary?				
4.2	Have all necessary precautions been taken to ensure that the equipment inspected is not a source of ignition to any flammable materials, irrespective of their source?				
4.3	Are fire protection facilities adequate, e.g., fire extinguishers, fire walls, sprinkler systems, Alarm Boxes, foam system etc., and have they been included on an Inspection Schedule?				
4.4	Are Emergency Escape Routes, including ladders, adequate and properly signposted?				
4.5	Is Emergency Lighting adequate & tested?				
4.6	Is sufficient Respiratory Protective Equipment, such as Escape Sets or Self-Contained Breathing Apparatus (SCBA) available?				
4.7	Have Emergency Procedures been prepared, and relevant personnel trained?				
4.8	Are assembly points / muster points clearly marked and appropriately selected?				

E. ELECTRICAL SAFETY

5.0 ELECTRICAL SAFETY		NO	YES	N/A	Remarks (If 'No' is ticked [√])
5.1	Have operations/areas been electrically classified?				
5.2	Has the equipment been properly installed and constructed to the company standards and local legislation and does it meet any special installation requirements noted on the manufacturer's certificate?				
5.3	Are all live parts adequately enclosed to prevent access?				
5.4	Do earthing/ grounding / bonding comply with local standards/legislation?				
5.5	Are MCCs and electrical isolation devices appropriately labeled?				
5.6	Have fuses or circuit breakers been provided which will automatically disconnect the supply?				
5.7	Are first aid stations, single line drawings and PPE requirements available in MCC/PCC/Main Load Tension Panel (MLTP)/Sub stations as appropriate?				
5.8	Have all relevant documentation and drawings (e.g., P&IDs, SLD's, Schematics, equipment arrangement, I/O, logic, electrical classification and Panel Schedule drawings) been updated to reflect the current installation?				
5.9	Have all new Substation Breakers, MCC isolators, starters or other appropriate equipment been added on to the site inspection schedule?				
5.10	Have any electrical circuits, made redundant by this installation, been properly removed?				

5.11	Whether Lightening arrester circuit / connectivity is there or not.				
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F. FIRE PROTECTION

6.0 FIRE PROTECTION		NO	YES	N/A	Remarks (If 'No' is ticked [√])
6.1	Does the site have a written emergency control plan that includes a list of the major workplace fire hazards, proper handling and storage procedures, potential ignition sources(such as welding, smoking and others), and the type of fire protection equipment or systems that can control a fire involving them?				
6.2	Are fire separations/ Fire walls identified and maintained properly to prevent fire spread including separations between operations and storage areas?				
6.3	Does the site fire water supply have sufficient capacity to supply the design demand for the specified duration (one to four hours – depending on the severity of the hazard)?				
6.4	Can the fire pumps deliver 100% of the maximum fire water demand at the required pressure for the largest credible fire expected to occur on the site?				
6.5	Have new sprinkler/foam systems been tested to ensure they meet the Acceptance Requirements of NFPA 13/NFPA 16 and will all sprinkler systems be maintained in accordance with NFPA 25?				
6.6	Are all the facilities that handle flammable liquids fully protected with water spray, foam, or other automatic suppression system that complies with a nationally recognized code or standard?				
6.7	Is Nomex or garments made from other flame-resistant fibers worn by personnel who work with flammable liquids?				
6.8	Is all portable fire extinguishing equipment located in proper locations along normal paths of travel, including exits from areas, and will this equipment be properly maintained per NFPA 10?				
6.9	Is there a site fire alarm system and are alarms perceivable and above ambient noise or light levels?				
6.10	Has the site established a site ERT and are all ERT members trained to a level of competency commensurate with the duties members are expected to perform?				

G. OTHERS (For any additional requirement specific to Equipment)

7.0 OTHERS		NO	YES	N/A	Remarks (If 'No' is ticked [√])