

Coming out of Shutdown – Recommissioning and Start Up Fundamentals

Risk Engineering Services

CHUBB®



As many manufacturing operations, processes and even entire buildings may be temporarily removed from service from time to time, it is important to consider safe start up and turnaround measures now. In any process, the shutdown and restart operations present the greatest risk, even when well-planned and well-managed.

A “turnaround” is an event during which one or more processing or production units are removed from service temporarily. A poorly planned or executed shut down or turnaround can be a dangerous proposition.

Start up and turnaround can also be overwhelming if managed as a single, standalone event. Facilities should have effective communication, provide workers with appropriate training, and have in place strong and current policies and procedures for hazardous operations.

Define Responsibilities for Safety and Success

Responsibilities should be established for the pre-start up safety review plan at the facility. Senior management representatives should be designated to ensure that pre-start up safety reviews are conducted and documented within each specific area and department. To help manage the process:

- ~ **Define the Scope** - Planning, scoping and organization is essential for safe turnaround. Turnarounds are high cost, high impact events, and you must have a strategy in place to execute safely. Involve all levels of the organization, especially the environmental, health and safety (EHS) team.
- ~ **Prepare** - Make sure your EHS plans are ready to address safe plant start up. Consider logistics for storage, protection, equipment, services, and utilities. Work plans should detail job scope, manpower, contractors, and labour hours. Safety steps, permitting, drawings and photos are all an essential part of the process.

Careful planning and implementation of any turnaround is critical

- **Execution** - Execute the known items in the plan, and prepare for the unknowns too, such as scope changes. Inspect the main assets while equipment is down. Recommission testing must validate safety and readiness to return equipment to normal operation. Testing activities will likely need electricians, technicians, process control staff, vendors, and operations staff.
- **Start Up and Turnover** - After testing is completed, final inspection by operations, maintenance, and vendors must evaluate readiness for service. After equipment is operational, ramp up can begin. Upon completion, review the turnaround to update EHS plans, key performance indicators, checklists, contractor management, shut down / start up /ramp up, critical path and lessons learned.



Further Guidance

Turnaround guidance checklist (attached below)

Contact us

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Turnaround Guidance and Checklist

Often, there are additional employees and contractors used to assist, and they might be new to the plant and safety procedures. Existing employees might be asked to perform new tasks in isolated, confined or hazardous areas of the facility, elevating risk. Certain risks are part of the shutdown process, such as exposure to toxic chemicals, the unexpected release of energy from machines, the potential for damaged or defective equipment and electrical hazards.

Careful safety planning of any turnaround is critical. Planning should include developing, documenting and communicating safety procedures between different facility operations. Ensure your safety plan details all shutdown and turnaround activities to identify potential risks and hazards.

Consider the following:

- ☐ Conduct, complete, and apply written safety reviews (such as Pre-Start Up Safety Reviews – PSSRs) prior to turnarounds.
- ☐ Review process hazards analyses (PHAs) where required and make sure they are current to reflect any process modifications, new equipment, installations or potential hazards.
- ☐ Conduct a management of change (MOC) analysis for equipment, processes, and procedures that are not replacements in kind. Provide start up safety orientation to new workers and train them on how to avoid identified risks. Instruct them in emergency safety procedures.
- ☐ Screen new contractors for competence, relevant skills and familiarity with the type of turnaround being conducted and specify who is responsible for supervising them.
- ☐ Lockout and tagout equipment (per applicable regulation and good practice) to help prevent machines from unexpectedly restarting or energising.
- ☐ Make sure the confined space programme (per applicable regulation and good practice) is fully enforced.
- ☐ Ensure the hazard communication programme (per applicable regulation and good practice) is current to reflect new equipment or processes and any new chemicals being introduced.
- ☐ Review any additions or modifications to equipment that may require arc flash analysis (per applicable regulation and good practice).
- ☐ Review and protect locations that present or may present ignitable atmospheres.
- ☐ Ensure Chubb Hot Work Permits and Programmes are strictly followed.
- ☐ Do not bypass critical safety devices during troubleshooting operations or unit start ups.
- ☐ Verify auxiliary plant equipment such as sump pumps, emergency batteries, UPS systems and water treatment systems are all fully operational.
- ☐ Ensure all boilers and pressure vessels are inspected and maintained to jurisdictional standards prior to start up.
- ☐ Heavy machinery brought in to move equipment may increase the risks onsite. Ensure equipment moves are only conducted by suitably trained and where applicable certified operators. Sufficient guide staff and spotters should be available.
- ☐ Protect wet locations. Keep moisture out of enclosures to prevent electrical shock hazards and damage to equipment.
- ☐ Make sure machinery is properly earthed/grounded. Use power source and line quality monitoring devices to alert operators to problems.
- ☐ Pay special attention to air and gas cylinders. Close their main valves when not in use, remove regulators and install safety caps.
- ☐ Review ventilation requirements for new equipment that may generate hazardous vapours / gases / fumes.
- ☐ Conduct a full inspection of major machinery prior to start up.
- ☐ Ensure fire protection systems are operational, and inspected, tested and maintained per applicable regulation.

Shutdowns and plant turnarounds are challenging and can introduce unnecessary risks. The right planning, training and communication can support a turnaround in an effective and efficient manner, whilst ensuring risks are suitably controlled.

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