



Equipment & Systems Outage Preparation & Recovery

Risk Control

What to do Before, During and After an Extended Outage

Overview

Shutting down equipment and systems for extended periods of time can present the potential, if not done properly, to result in equipment failures and loss of containment of hazardous contents upon start up. Here are some good practice tips to protect your business and reduce the risk of equipment problems as we look at three important phases: prior to shutdown, during the shutdown and recommissioning after shutdown.

Before the Shutdown: Develop a preparation plan to properly shutdown the equipment and systems

The quality of some items can degrade while idle; vermin can get into equipment or utilities, water and air can stagnate, fuel and lubrication systems can settle, leaks may develop in your absence, stocks of critical items may fall and some equipment just stays more reliable with routine use. Where do you begin? Consider the following:

How long will the shutdown period last?

- What equipment can be shut down during this period? Who will shut it down? Are any special procedures required for idling key machinery and equipment? Can it be electrically disconnected to prevent undesirable effects of power issues? Can water sources be shut off and drained to minimise the chance of water leakage? Has water chemistry been adjusted as necessary for this shutdown period?
- What equipment will be required to remain in operation? Who will be responsible to monitor and service it?
- Will key technology assets, documents and supplies necessary to maintain business operations be removed to a secure location? Have computer programs been properly backed up and stored off-site or in a remote fire area?

How will the equipment and systems be cared for during the shutdown period?

- What steps can I take to make sure equipment and systems are ready for re-commissioning? How can you come out of the downtime better than before? How often will the equipment be inspected? How will fire protection and detection systems be inspected, tested and maintained?
- How will utility disruptions, such as power loss, be monitored? Are notification and incident response procedures in place for temperature sensitive equipment and stock?

During the Shutdown: Equipment / System servicing and inspections

The downtime may be an opportunity to inspect equipment that is normally operating 24 hours a day. Crucial maintenance items may be conducted on key machinery and equipment during the outage. Periodic inspections of the facility's equipment and systems should be conducted regularly, at least once a week where safe to do so.

What should an effective, all-inclusive site inspection include?

- Conduct complete tours of the facility to identify any unusual smells, leaks or noises. Anything unusual should be investigated and appropriate corrective actions taken. Check all operating equipment and systems. Verify where the equipment is operational and is within its normal parameters with no unexpected alarms.
- Schedule and perform maintenance that may be done while the equipment is idle per the O.E.M. based on the manufacturer's guidelines and standards such as The Pressure Equipment Regulations 1999 and The Pressure Systems Safety Regulations 2000. This will prepare the equipment to operate in the safest, most reliable and efficient manner possible when you plan to return back to normal operation.
- Perform routine inspections of the idled equipment to verify the shutdown condition of the equipment remains as desired. Routine greasing of equipment and checking lube oil systems should be part of the regular preventive maintenance but also completed before and after any outage in accordance with equipment manufacturers guidelines. Water can settle out of petroleum products over time. Check your fuel and lubrication filters are clear from any debris accumulation and there are no dead-legs present.

After the Shutdown: Returning the equipment and system to normal operation

When the time comes to return the equipment and systems to normal operation, take the following steps to ensure a smooth transition:

- Prepare a systematic recommissioning plan for your equipment and ensure you have trained operators and maintenance support available.
- Prepare a punch list detailing any missing equipment items. This list should be checked prior to any power or materials being introduced.
- Have qualified individuals inspected the key machinery and equipment to ensure they are working as intended, and necessary maintenance is completed.
- If electrical systems or portions of the electrical distribution were disconnected, these should be restored gradually (with no/minimal load) to reduce the risk of transient voltage (surge) that can damage equipment and electrical components.

- If production equipment was idled, follow manufacturer instructions for commissioning and restoring the equipment to normal operating conditions. Additional checks for leaks (e.g. open ended pipework) during start-up should be taken,
- Verify the building systems and equipment that require 3rd party inspections are up to date.
- Have a licensed contractor or qualified employees inspect and service the HVAC systems. It will be necessary to complete preventive maintenance on Heating, Ventilation and Air Conditioning (HVAC) systems before the facility is re-occupied. Air filters may need replacement. Make sure your water towers are properly disinfected (See guidance available from the HSE at <https://www.hse.gov.uk/legionnaires/> or use other equivalent national guidance) and stagnant water is drained and systems have proper water treatment.
- Has a registered boiler contractor service the boilers. All of your controls and safety devices should be installed to an approved standard. Those devices have testing procedures that should be followed prior to restarting any system. Verify proper burner adjustments have been made to ensure proper efficiency is achieved alongside safe operation.

Use this checklist to help you create a customised plan for your business.

1. Preparation

- Prepare a list of the equipment that will need to be shut down off during an outage.
- Review the Original Equipment Manufacturers (OEM) requirements for shutting down the systems/equipment.
- Determine the best possible condition of the equipment in order to maximise preservation.
- Determine what qualified individual(s) will shut down the equipment and how long it will take.
- Be prepared to perform all possible shutdown maintenance during the outage.
- Develop a list of who will monitor and service the equipment left in operation.
- Check the status of all back-up systems to verify they are up to date and operational.
- Determine how building safety and security will be maintained.
- Develop a list of how to recover the equipment following the shutdown period.

2. During the shutdown

- Open any unused or unnecessary breakers.
- Remove key technology assets, documents, and supplies necessary to maintain business operations to a secure location.
- Maintain a log of the operating systems including routine maintenance, inspections, and the signature of the operator.
- Complete a log of the equipment that is shut down, including the name of the qualified individual that completed the OEM shut down.
- Safely perform the shutdown maintenance items that can be done during this shutdown period.

3. Returning to Operation

- Prepare a systematic recommissioning plan for your equipment, including a review of start-up operating instructions and a review of the competency of the recommissioning team.
- Complete a punch-list across all systems to ensure that production equipment is safe to be restarted. This should include checking all drain lines are closed, all relief systems are fitted, and no open ended pipework is present.
- Shut breakers and turn on equipment shall be restored gradually to minimise the risk of transient voltage (surge).
- Perform leak and integrity tests using non-hazardous materials, prior to the introduction of any hazardous materials.
- Turn on the most essential equipment and wait 15 minutes (or the time defined within operating or manufacturers guidelines) before reconnecting other equipment to give the system time to stabilise.
- Bring systems/equipment back on line as directed by the OEM instructions. Ensure contractors are used for all systems/equipment where the plant lacks qualified personnel.
- All controls shall be verified to be operational on all equipment. The trips and alarms installed on all equipment or systems should be functional along with all operating and other safety related features.
- Ensure all systems/equipment requiring third party inspections and certificates are up to date. For example. Boilers, waste water systems, air quality.

To learn more about how to manage your risks and increase efficiencies, please contact CNA Hardy Risk Control at RiskControlRequestEurope@cnaeurope.com or visit <https://www.cnahardy.com/business-capabilities/risk-control>.



20 Fenchurch Street London EC3M 3BY United Kingdom
Tel +44 (0)20 7743 6800

[cnahardy.com](https://www.cnahardy.com)

The information contained in this document does not represent a complete analysis of the topics presented and is provided for information purposes only. It is not intended as legal advice and no responsibility can be accepted by CNA Hardy for any reliance placed upon it. Legal advice should always be obtained before applying any information to the particular circumstances.

Please remember that only the relevant insurance policy can provide the actual terms, coverages, amounts, conditions and exclusions for an insured.

All products may not be available in all countries.

CNA Hardy is a trading name of CNA Insurance Company Limited ("CICL", company registration number 950) and/or Hardy (Underwriting Agencies) Limited ("HUAL", company registration number 1264271) and/or CNA Services (UK) Limited ("CNASL", company registration number 8836589) and/or CNA Hardy International Services Limited ("CHISL", company registration number 9849484) and/or CNA Insurance Company (Europe) S.A., UK Branch ("CICE UK", company registration number FC035780). CICL, HUAL and CICE UK are authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority (firm reference numbers 202777, 204843 and 822283 respectively). The above entities are all registered in England with their registered office at 20 Fenchurch Street, London, EC3M 3BY. VAT number 667557779.