Reinstating Mothballed Plant and Equipment - Property

Plant and equipment can be mothballed or temporarily decommissioned for a number of reasons. Ensuring a safe reinstatement requires careful management to avoid breakdowns, process failures or loss events.

This Loss Prevention Standard provides practical guidance on reducing the risks associated with reinstating mothballed plant and equipment.

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Introduction

Many businesses and organisations will have to temporarily decommission or mothball plant and equipment on occasion. This can happen for a variety of reasons, such as business downturn, repair following a significant loss event, seasonal production requirements, global impact event such as pandemic, etc.

Recommissioning plant and equipment without following a documented and well-planned start-up programme can result in unanticipated breakdowns, losses or damage incidents.

This document provides general guidance on reinstating plant and equipment following a temporary shutdown. For guidance on reinstating buildings, refer to the Aviva Loss Prevention Standard **Reinstating Mothballed Buildings - Property**.

Note: This document relates to the reinstatement of mothballed plant and equipment and is focussed on property loss prevention and related risk management guidance. It is not intended to address liability exposures. The presumption is that all regulatory requirements, such as fire risk assessments and compliance with local building regulations, codes, or standards, have or will be met.

Understanding the Risks

Recommissioning plant and equipment after a period of shutdown or inactivity presents a number of risks if not properly managed, including but not limited to:

- **Fire and Explosion Risks.** Recommissioned systems may leak hazardous substances due to degraded seals, valves, or pipework. This can lead to fires or explosions, especially in flammable environments. Lack of lubrication can lead to machinery overheating and potentially igniting.
- **Electrical Hazards**. Moisture ingress, insulation degradation, or outdated wiring can lead to short circuits, arcing, or electrical fires when systems are powered back on. Restarting isolated plant and equipment may create power surges which can cause internal damage to circuits and sensitive components.
- **Mechanical Failures**. Equipment that has not been maintained or tested may fail under load or pressure, which can cause secondary damage to surrounding infrastructure.
- **Loss of Containment**. Lubricants, fuel and other liquids can escape potentially spreading fire through the premises.
- **Structural Damage**. Sudden start-up of heavy machinery or systems under pressure can cause vibration, shock loads, or collapse of poorly supported structures.
- **Improper Setup**. If equipment has been dismantled and incorrectly reassembled, misalignment can damage the equipment and surrounding areas.

Managing the Risks

Planning

Thorough planning is essential when reinstating process plant and equipment. Allocating adequate time and resources for the planning phase significantly reduces risks to business operations. The specific considerations will vary depending on whether a single piece of equipment or whole process lines are being reinstated; however, should address the following:

Scope of Reinstatement Works and the Reinstatement Plan. It can be helpful to prepare a scope of reinstatement works. This can include:

- What is being re-instated?
  - ✓ An item of plant/equipment?
  - ✓ A process?
- The nature of the re-instatement?
  - ✓ Continuously operated?
  - ✓ Intermittently operated?
- Whether any changes are needed from how it was operated previously?
  - ✓ Changes to production requirements or outputs?
  - ✓ Changes to plant configuration and any new/changed installations?
  - ✓ Changes to working practices and procedures?
  - ✓ Changes to maintenance requirements?
  - ✓ Changes to hours of operation?
- New or changes to permits to operate?
- Whether any new or changed resources will be needed?
  - ✓ Changes to raw materials and/or suppliers?
  - ✓ Changed staffing requirements?
  - ✓ Changes to tooling, raw materials, etc?
  - ✓ Any new facilities to accommodate changes in working practices, e.g., additional staff changing/welfare facilities, hand washing stations, toilets and lockers?
  - ✓ Changes to stock holdings of consumable items such as spares for machinery and Personal Protective Equipment (PPE)?

To manage reinstatement activities effectively, a detailed plan should be developed and maintained. This plan must be regularly reviewed and updated to reflect progress, ensuring all aspects of the reinstatement are tracked, coordinated, and aligned with project objectives.

Scheduling. When scheduling reinstatement works, it's important to allow for unexpected delays and unforeseen circumstances. If a phased approach is being considered—such as reopening buildings or premises in stages—careful consideration should be given to the implications of this strategy. This is particularly important where skeleton staffing is planned in certain areas or during specific periods.

Your plans should aim to identify and mitigate risks associated with:

- Lone working.
- Reduced supervision.
- Absence of key personnel, such as first aiders or fire wardens

Wherever possible, measures should be implemented to ensure safe working conditions and maintain operational resilience throughout the phased reinstatement.

Risk Assessment and Operating Procedures. Ensure risk assessments, and related Standard Operating Procedures (SOPs) are reviewed and remain suitable and sufficient for the planned work activities. Ensure any changes introduced, or the period of shutdown, have not resulted in new risks or a deterioration in the performance of existing risk control strategies.

Note: Statutory risk assessments are deemed the minimum requirement, and following the recommendations in this document can help further reduce the risk and exposures.

Material Damage Risk Assessment. Before undertaking any reinstatement, an assessment of the anticipated/potential financial losses, for both material damage and business interruption exposures, in the event of a significant or catastrophic loss event, should be undertaken.

This helps ensure that the measures taken during the reinstatement process are sufficient and reflective of the potential property loss estimates.

Refer to the Aviva Loss Prevention Standards **Material Damage Risk Assessment** and **Business Impact Analysis** for further guidance.

Managing Change. Any proposed changes to the equipment and activities undertaken as part of the reinstatement works should be managed through a formal Management of Change process. This helps ensure all stages of the change are progressed with minimal exposure to the existing arrangements.

Refer to the Aviva Loss Prevention Standards **Managing Change – Property** for further guidance.

Identifying Critical Works. A key part of the planning process is determining which tasks are essential for a safe restart and which can be deferred. For example, some equipment may have been serviced recently, e.g., either before the decommissioning or during the downtime, and may not require repeat maintenance. In such cases, a simplified pre-start safety check may be more appropriate than a full servicing. This approach helps prioritise critical activities while ensuring a safe and efficient restart.

Notifying Stakeholders. Consider who may need to know about the reinstatement and how and when they will be notified?

- **Employees**. Ensure staff required to operate, maintain the plant and equipment are informed in advance and understand any changes to working arrangements.
- **Customers**. Ensure customers are notified of production activities, delivery schedules, etc.
- **Supply Chain**. Check supply chains are still operational and able to provide products, materials, etc., in the required quantities at the required times and the longevity of any stockpiled supplies and arrangements for replenishment
- **Insurers and Insurance Brokers**. Check that policy coverage remains in effect and revisit and understand any existing policy conditions or endorsements
- **Regulatory Bodies**. Confirm that existing permits to operate remain in effect and that no changes or additional regulatory compliance requirements are needed
- **Contractors**. Check that any contractors used for servicing, maintenance are still operating and able to provide the required services.
- **Neighbours or Co-occupants**. Neighbours or other businesses sharing the premises may well have adjusted their own work practices and arrangements to reflect the shutdown/mothballed status of operations. Discussing reinstatement with them can help ensure that risks to each other's businesses and employees are adequately controlled following reinstatement.

Staffing. When preparing a staffing plan for reinstated operations, it is important to assess whether all necessary employees and support staff will be available. It's also prudent to consider whether temporary staffing solutions, e.g., recruitment contractors, may be required to address any shortfalls and ensure operational continuity.

Equipment and Tooling. Identify whether any specialist equipment, spares, components, or tooling is required to complete the reinstatement works. Understanding what is needed, and when it will be available, can help to plan and schedule activities more effectively. Ensure any necessary safety measures are taken to avoid delays, e.g., requirements for access equipment, personal protective equipment (PPE), etc.

Additional Facilities. Identifying any new or additional facilities required for reinstatement is essential. This may include changing rooms, welfare areas, product testing facilities, etc. Determine what is needed, where it should be located, and when it can be sourced or installed. Planning the placement of these facilities is equally important to ensure they do not disrupt existing operations or other ongoing activities.

Operating Procedures and Employee Training Packages. You should plan to review and if necessary update Standard Operating Procedures (SOPs), employee training packages for the reinstated operations, processes and plant. You should satisfy yourself that any changes introduced, or the period of shutdown, have not resulted in new risks or a deterioration in the performance of existing risk control strategies.

The Reinstatement Works

When reinstating an item of plant, equipment, or a process line, it's advisable to prepare an action plan for each. These should outline the steps and sequence required to safely bring each item back into operation. The exact requirements will vary depending on the nature and condition of the equipment or process, but the following should be considered:

- Recommendations from the equipment manufacturer/installer and requirements to maintain warranties or avoid installer penalty clauses.
- Ensuring any software, programming or data input needed to safely operate the equipment has been uploaded into any control systems and is the most current and up-to-date safe version.
- Inspection, testing and replacement of any components removed during the decommissioning works.
- Refilling any tanks, pipework and reservoirs and priming or purging lines necessary for safe operation.
- A visual inspection/check to ensure contamination, corrosion, seizure or blockage has not occurred during the shutdown period.
- Safe removal of any isolations and lock outs of power or process lines/feeds.
- Checks on the integrity and condition of any machinery guarding.
- Testing of any alarms or safety interlocks and emergency stops provided on the equipment, checking correct operation and impacts.
- Confirming any automatic fire detection systems or fixed fire protection systems remain active/operational.
- Confirming that any necessary maintenance and inspections (including statutory inspections) are up to date.
- Whether any battery backup power supplies to equipment are in good health, e.g., within lifetime recommendations, recharging normally, etc., or whether batteries should be replaced.

- The condition of any pits, sumps, containment and any guarding, their integrity and the absence of any debris or other unwanted contents.
- Checking the condition and integrity of any access equipment used to access plant and process lines.
- Checking the areas around all plant/equipment and installations are clear and free from debris/combustible materials or other unwanted items that may have accumulated during the shutdown period.
- Updating engineering drawings and schematics to reflect the status and configuration of the plant.
- Re-ordering any spares/consumables used from stocks held on site to enable the completion of reinstatement works. Also, the sourcing of any newly required critical spare parts as a result of any changes made.

The following additional specific risks are also worth considering:

Electrical Installation. Ensure fixed and portable appliance testing arrangements are up to date. Testing of electrical circuit breakers, Residual Current Devices (RCDs) and surge protection devices is also advised.

Emergency Generators. These should be inspected and serviced by a competent engineer. Consider the condition of any fuels within the fuel tank and whether this should be drained, flushed and replaced. The condition of any battery used to start the engine should be assessed and it should be replaced if necessary. It is important to conduct a test under full load also to confirm the generator will perform as required as well as exercising transfer switches. Ensure no combustible items have been moved in direct proximity during the shutdown period.

Electrical Charging Equipment. Each item of plant, equipment, or process line should be inspected by a competent engineer to verify its continued safety. Particular attention should be given to the condition of connectors, the functionality of safety cut-offs, and the integrity of protection devices within electrical circuits. It is essential to confirm that the equipment remains suitable for the expected operational loads and that no recent changes to the installation compromise its safe operation.

Gas Supplies – Exercise gas isolation valves and check the operation of any interlocks to fire alarm systems or other safety devices on specific equipment or installations.

Combustion Equipment (including boilers). This should be serviced and maintained prior to being put back into use with the operation of any combustion safety controls, and the integrity and adequacy of any flue/exhaust/chimney arrangements verified by your competent inspecting engineer.

Plant Handling Hazardous Substances and Flammable Liquids. Inspect and verify the integrity of any plant/process lines handling hazardous substances/flammable liquids. This should be verified without the introduction of the hazardous substance so far as is possible, e.g. using pneumatic/hydraulic methods where safe and permitted to do so. Where flammable liquids are handled, the integrity and suitability of any electrical equipment in hazardous areas should be verified. The earth bonding/grounding arrangements should be checked with earth continuity and the absence of any isolated conductors within the installation confirmed.

Refrigeration Plant. Refrigeration engineer to check and verify the performance of any reinstated refrigeration plant. This should include the safety of the installation including any statutory inspections of pressure systems, the operation of any alarms, pressure relief and any shut down devices as well as the performance of the plant including cooling rates.

Ventilation Plant/Systems. Inspect and clean ventilation ducts should any contamination or corrosion have occurred, e.g., fly infestations or corrosion of ducts or joints where liquid has pooled or been allowed to enter ductwork. Any filters should also be changed. Where local exhaust ventilation is used to control exposure of employees to hazardous substances or to prevent hazardous atmospheres forming, the performance of this system should be verified, confirming adequate capture, transport and exhaust velocities.

Pressure Systems . The integrity of pressurised lines and equipment should be checked and verified. Any statutory inspections must be up to date or brought forward if the equipment has been out of use for a considerable period. Check any pressure relief mechanisms or breather vents for signs of corrosion or blockage that may impede operation.

Calibration of Safety Devices and Monitoring Equipment. Undertake any necessary calibration of safety devices and monitoring equipment before operations resume. This could apply to high- or low-level liquid measurement devices as well as gas, noise and vibration monitoring equipment.

Cooling Towers. These should be cleaned by your competent water management contractor prior to being put back into use and the absence of legionella confirmed by testing. Refer to current HSE guidance on managing legionella risk.

Hot Work

Hot work is a major cause of losses and strict supervision of any hot works completed as part of reinstatement works is critical. Works should only be conducted following a specific risk assessment and in strict accordance with the Aviva Loss Prevention Standard **Hot Work Operations**, ensuring:

- Any persons, including contractors, undertaking hot work are adequately monitored (i.e., regular checks to be carried out to ensure procedures are being followed), with appropriate permit authorisation and sign-off procedures throughout the duration of the work.
- Fire watches are undertaken for up to 240 minutes after the hot works and only reduced where supported by a specific risk assessment.
  - ✓ A minimum fire watch period of 120 minutes should be enforced.
- A continuous fire watch is to be in place throughout the duration of the hot work operations for a minimum continuous period of at least 1 hour after the work is completed. Intermittent checks (e.g., every 20 minutes) can be completed for the remainder of the fire watch period.
- The fire watch must include any area(s) on the other side of any walls, partitions or ceilings within 10 metres of the area, and/or floors below, in which the hot work has been carried out.
- Thermographic cameras should be used throughout the process and fire watches.

- Emergency procedures should be formalised and agreed with the workers or contractors.

Refer to Aviva Loss Prevention Standards **Hot Work Operations** and **Use of Thermographic Cameras – General Considerations** for further guidance.

Emergency Procedures

You should plan to review and if necessary, update emergency procedures to reflect the reinstatement works and any changes made. This should reflect the introduction of new hazards, altered configurations and layouts.

The emergency response rules should be formally documented, and appropriate training provided.

Refer Aviva Loss Prevention Standard **Emergency Response Teams** for further guidance.

Business Continuity Planning

The Business Continuity Plans (BCP) should be reviewed, particularly where customers, suppliers, equipment, processes, raw materials have changed since the shutdown.

Where any changes to the BCP are made, consideration should be given to testing arrangements by carrying out training exercises. This helps validate the effectiveness of the plan.

Refer to the Aviva Loss Prevention Standards **Business Continuity Management**, **Business Continuity – Roles and Responsibilities** and **Business Continuity – Testing and Maintenance** for further guidance

Checklist

A generic **Reinstating Mothballed Plant and Equipment** Checklist is presented in Appendix 1 which can be tailored to your own organisation.

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Sources and Useful Links

- Legionella and Legionnaires' disease
- Control of Major Accident Hazards (COMAH) - HSE

Note: Whilst UK standards and legislation are referenced in this document, other international standards and legislation should be referenced where applicable.

Additional Information

Relevant Aviva Loss Prevention Standards include:

- **Reinstating Mothballed Buildings - Property**
- **Hot Work operations**
- **Use of Thermographic Cameras - General Considerations**
- **Self-Inspections**
- **Maintenance Regimes**
- **Managing Change - Property**
- **Material Damage Risk Assessment**
- **Business Impact Analysis**
- **Fire Safety Legislation**
- **Arson Prevention**
- **Housekeeping - Fire Prevention**
- **Smoking and the Workplace**
- **External and Internal Third-Party Exposures - Property Protection**
- **Emergency Response Teams**
- **Business Continuity Management**
- **Business Continuity - Roles and Responsibilities**
- **Business Continuity - Testing and Maintenance**

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Email us at riskadvice@aviva.com or call 0345 366 6666.*

*The cost of calls to 03 prefixed numbers are charged at national call rates (charges may vary dependent on your network provider) and are usually included in inclusive minute plans from landlines and mobiles. For our joint protection telephone calls may be recorded and/or monitored.

Appendix 1 – Reinstating Mothballed Plant and Machinery Checklist

Location	
Date	
Completed by (name and signature)	

	Planning	Y/N	Comments
1.	Have you prepared a scope of works with a supporting schedule to support your reinstatement plans?		
2.	Have you identified critical works and those tasks which can be deferred until after reinstatement?		
3.	Have you notified the appropriate stakeholders of your plans to reinstate your process/plant/premises?		
4.	Have you prepared a staffing plan to complete the reinstatement works?		
5.	Have you identified whether specialist equipment and tooling are required to complete the works, including access equipment, PPE, and other safety equipment?		
6.	Have you identified any additional facilities that maybe needed to permit reinstatement and resumption of operations?		
7.	Have you planned to review and update risk assessments, operating procedures, and employee training packages?		
8.	Have you planned to review and update emergency procedures?		
9.	Have you planned to review and update your BCP to reflect the reinstatement and any changes made?		

	The Reinstatement Works	Y/N	Comments
10.	Have reinstatement plans been made for individual items of plant/equipment or process lines?		
11.	Have recommendations from the equipment manufacturer/installer been adhered to and requirements to maintain warranties or avoid installer penalty clauses?		
12.	Have you been able to ensure any software, programming or data input needed to safely operate the equipment has been uploaded into any control systems and is the most current and up to date safe version?		
13.	Have you inspected, tested, and replaced any components removed during the shutdown procedure?		
14.	Have you refilled any tanks and reservoirs and where appropriate primed or purged lines where this is necessary for safe operation?		
15.	Have you conducted a visual inspection/check to ensure contamination, corrosion, seizure, or blockage has not occurred during the period of shutdown?		
16.	Have you safely removed any isolations and lock outs of power or process lines/feeds?		
17.	Have you checked the integrity and condition of any machinery guarding?		
18.	Have you tested and verified the correct operation of any alarms, safety interlocks and emergency stops provided on the equipment?		
19.	Have you confirmed that any automatic fire detection systems or fixed fire protection systems remain active/operational?		
20.	Have you confirmed that any necessary maintenance and inspections (including statutory inspections) are up to date?		
21.	Have you checked that any battery backup power supplies to equipment are able to be fully recharged or whether these battery backup units require replacement?		
22.	Have you checked the condition of any pits and sumps, confirming their integrity and the absence of any debris or other unwanted contents?		

	The Reinstatement Works	Y/N	Comments
23.	Have you checked the condition and integrity of any access equipment used to access plant and process lines, ensuring it remains safe for use?		
24.	Have you checked that areas around all plant/equipment and installations are clear and free from debris/combustible materials or other unwanted items that may have accumulated during the shutdown period?		
25.	Have you updated engineering drawings and schematics to reflect the status and configuration of the plant?		
26.	• Have you re-ordered any spares/consumables used from stocks held on site to enable the completion of reinstatement works? • Also have you sourced any newly required critical spare parts as a result of any changes made?		
27.	Have you inspected and cleaned ventilation ducts?		
28.	Have you replaced/changed filters?		
29.	Where local exhaust ventilation is used to control exposure of employees to hazardous substances or to prevent hazardous atmospheres forming, have you confirmed the performance of this system?		
30.	Have you ensured all measurement devices remain in calibration including all safety devices such as those used for level measurement devices as well as gas, noise, and vibration monitoring equipment?		
31.	Have cooling towers been cleaned by your competent water management contractor and the absence of legionella confirmed by testing?		
32.	Has the integrity of pressurised lines and equipment been checked and verified?		
33.	Are statutory inspections up to date?		
34.	Have any pressure relief mechanisms been checked for signs of corrosion or blockage that may impede operation?		
35.	Has all equipment been serviced and maintained prior to being put back into use with the operation of any combustion safety controls and the integrity and adequacy of any flue/exhaust/chimney arrangements verified by your competent inspecting engineer?		

	The Reinstatement Works	Y/N	Comments
36.	Has the integrity of any plant/process lines handling hazardous substances/flammable liquids been verified?		
37.	Has the integrity and suitability of any electrical equipment in hazardous areas been verified?		
38.	Have earth bonding/grounding arrangements been checked with earth continuity and the absence of any isolated conductors within the installation confirmed?		
39.	Has electrical charging equipment been inspected by a competent engineer to verify its continued safety, with particular regard to damaged connectors, the operation of safety cut offs and other protection devices on the electrical circuits?		
40.	Has a competent person inspected the condition of these systems with particular regard to the condition of anchorage points and any harnesses or fall arrest devices?		
41.	Have lifts and all lifting equipment and any lifting accessories been checked by a competent person prior to being put back into use?		
42.	Are statutory inspections up to date?		
43.	Have emergency generators been inspected and serviced by a competent engineer?		
44.	Has a competent refrigeration engineer verified the continued safety and performance of refrigeration plant?		
45.	Have you used thermal imaging tools to check for electrical hazards associated with electrical distribution boards and any electrical connections which may have become loosened during the shutdown?		
46.	Have you confirmed the correct operations of all electrical circuit breakers, RCDs, and surge protection devices?		

	The Reinstatement Works	Y/N	Comments
47.	Have you checked and tested UPS to confirm correct switching and operation?		
48.	Have you exercised gas isolation valves and checked the operation of any interlocks to fire alarm systems or other safety devices on specific equipment or installations?		
49.	Additional Comments:		

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