

31 Hot Working

This chapter is split into two parts:

Part 1: Directive. This part provides direction that you **must** follow to help you comply with (keep to) health and safety law, Government policy and Defence policy.

Part 2: Guidance. This part provides the guidance and good practice that **should** be followed and will help you to keep to this policy.

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[Annex A – Chapter 31 – Assurance Checklist](#)

Amendment record

This chapter has been reviewed by the Directorate of Defence Safety & Support (DDSS) together with relevant subject matter experts and key safety stakeholders. Any suggestions for amendments to this chapter **should** in the first instance be directed to the Defence organisation's [Safety Centre/Team Group Mailbox](#) and with their approval, sent to People-DDS-GroupMailbox@mod.gov.uk.

Version No	Date of publishing	Text Affected	Authority
1.2	Oct 20	Interim update post-handover of Policy from DSA to D HS&EP.	D HS&EP
1.3	29 Jun 26	Release of two-part chapter structure.	Dir-DSS

Terms and definitions

The following table sets out definitions of some of the key terms used in this chapter. The current general safety terms and definitions are provided in the [Master Glossary of Safety Terms and Definitions](#) which can also be accessed on [GOV.UK](#).

Atmosphere testing	The continuous or periodic monitoring of the workplace to measure the concentration of flammable gases, vapours, or combustible dusts. It verifies that these levels remain safely below the point where an explosion or fire could occur.
Backfire	A short-duration event where the flame travels back into the torch tip or produces a loud popping sound, typically caused by incorrect pressures, blocked nozzles or equipment faults, and which may precede more serious conditions if not addressed.
Competent person	"The combination of training, skills, experience, and knowledge that a person has and their ability to apply them to perform a task safely. Other factors, such as attitude and physical ability, can also affect someone's competence". (See www.hse.gov.uk/competence/what-is-competence.htm for information on competence.)
Fire Watcher	A person appointed to observe hot working activities and the surrounding area for signs of fire, heat transfer or smouldering materials during and after the task, and to take immediate action to raise the alarm or initiate first response firefighting where required.
Flashback	A dangerous condition where a flame travels back through the torch or blowpipe into the hoses, regulators or gas supply system, creating a risk of fire or explosion.

Hot Working	Any activity or process that generates flame, heat or an incendiary spark and introduces (or presents) a foreseeable risk of fire or explosion through a source of ignition by means of tools or equipment either: <ul style="list-style-type: none"> a. intentionally arising from working methods (with or without the use of a naked flame) such as welding, flame-cutting, soldering, brazing; or b. the unintentional generation of heat or sparks, by the use of power hand tools e.g. grinding and the use of disc-cutters.
Permit to Work (PTW)	The permit to work is a documented procedure that authorises certain people to carry out specific work within a specified time frame. It sets out the precautions required to complete the work safely, based on a risk assessment. It describes what work will be done and how it will be done.

Must and should

Where this chapter says **must**, this means that the action is a compulsory requirement.

Where this chapter says **should**, this means that the action is not a compulsory requirement but is considered good practice.

Scope

The policy contained within this chapter:

- a. applies to all those employed by Defence (military and civilian) including reservists and those under the age of 18 (for example recruits and apprentices).
- b. applies to all those working on behalf of, or under the supervision of Defence (for example, contractors or visitors).
- c. applies to all Defence activities carried out in any location (UK or overseas) and at all times of the year.
- d. is not written for young persons in the cadet forces¹, Defence-run schools, nurseries and so on; those organisations **must** maintain their own safety policies and governance and **must** provide statutory compliant infrastructure and appropriate safe systems of work. They may use material from this chapter as a reference point, but where appropriate their respective policies **should** be adapted to meet the needs of young persons and to follow any applicable Department for Education guidelines or legislation.

Assurance

The application of the policy contained within this Chapter **must** be assured (that is, its use **must** be guaranteed). As part of their overall assurance activity, the commander, manager, or accountable person **must** make sure that this policy is followed and put into practice effectively. Assurance **must** be carried out in accordance with [JSP 815 \(Defence Safety Management System\) Element 12 – Assurance](#).

¹ Guidance for cadet forces is set out in JSP 814 (Policy and Regulations for Ministry of Defence Sponsored Cadet Forces).

A chapter assurance checklist can be found at [Annex A](#). Please note its use is not mandatory, but it can provide helpful evidence to assist in the assurance and conformance against the policy direction within this chapter.

Alternative acceptable means of compliance

This policy is mandatory across Defence and the only acceptable means of compliance (AMC) is attained by following the directive set out in this chapter. However, there may be circumstances where a small number of military units may be permanently unable to comply with (keep to) parts of the policy. In such circumstances an alternative AMC process is set out in the [JSP 375 Directive and Guidance](#).

Equality Analysis

The policy in this Chapter has been subject to an equality analysis in accordance with the [Public Sector Equality Duty](#) and Departmental Policy.

Part 1: Directive

Introduction

1. This chapter sets out the procedures and guidance for the health and safety management of hot working activities undertaken by Defence personnel and others working on behalf of Defence.
2. Hot working in Defence is described as any activity or process that generates flame, heat or an incendiary spark and introduces (or presents) a foreseeable risk of fire or explosion through a source of ignition by means of tools or equipment either:
 - a. intentionally arising from working methods (with or without the use of a naked flame) such as welding, flame-cutting, soldering, brazing; or
 - b. the unintentional generation of heat or sparks, by the use of power hand tools e.g. grinding and the use of disc-cutters.
3. This chapter does not cover working in hot climates this is covered in [Chapter 41](#) (Heat Illness Prevention) of JSP 375, Volume 1.
4. Hot working has resulted in major historic fires and explosions which have caused a number of fatalities, serious injuries as well as property / asset losses. Where reasonably practicable the need for hot working **should** be eliminated by the use of other processes that do not involve the application or generation of heat or sparks, in accordance with the requirements set out later in this chapter.
5. Flammable liquids and vapours such as petrol, diesel, fuel oil, paints, solvents, glue, dusts and so on are found in many places of work and under certain conditions (such as hot working) can explode violently which is covered in [Chapter 9](#) (Dangerous Substances and Explosive Atmosphere Regulations) of JSP 375, Volume 1. A nominally empty drum (emptied, but not cleaned) can cause an explosion, when the residue is heated and turned into a vapour.

Key health and safety legislation

6. The [Health and Safety at Work etc. Act \(HSWA\) 1974, Section 2](#) places general duties on employers for their employees so that 'it shall be the duty of every employer to ensure, so far as is reasonably practicable the health, safety and welfare at work of all of [their] employees' and, under [Section 3](#), persons not in their employment who may be affected.
7. There is also a duty on employers under the [Management of Health and Safety at Work Regulations \(MHSWR\) 1999](#) to carry out a suitable and sufficient assessment of the risks to the health and safety of their employees. As such, Defence requires commanders, managers and accountable persons to make sure that suitable and sufficient risk assessments are carried out in order to mitigate health and safety risks to the personnel under their area of responsibility. Defence safety risk assessments **must** be carried out in accordance with [Chapter 8](#) (Risk assessment and safe systems of work) of JSP 375 Volume 1.

8. The [Secretary of State \(SofS\) for Defence Policy Statement on health and safety](#), sets out SofS's commitment for Defence to comply with all the applicable health and safety legislation when in the United Kingdom (UK). When overseas, 'we will comply with the laws of Host States, where they apply to us, and in circumstances where such requirements fall short of UK requirements, we will apply UK standards so far as is reasonably practicable to do so.'

Policy Statements

9. Defence has established the following policy statements, which must be followed.

a. **Policy Statement 1.** The commander, manager or accountable person **must** make sure that a suitable and sufficient risk assessment is completed before any hot working activity is undertaken, and to consider whether safer alternatives can eliminate the need for hot work.

b. **Policy Statement 2.** The commander, manager or accountable person **must** make sure that suitable safe systems of work, competent personnel, appropriate planning and adequate resources are in place for the safe conduct of all hot working activities.

c. **Policy Statement 3.** The commander, manager or accountable person **must** make sure that all equipment, environmental controls, atmosphere testing, and Permit to Work requirements necessary for safe hot working are implemented, monitored and maintained so that the risks from hot work are reduced to as low as reasonably practicable.

d. **Policy Statement 4.** The commander, manager or accountable person **must** make sure that hot work areas are left safe and appropriately monitored after completion, including fire-watching, inspection for smouldering materials, removal of debris, and reinstatement of any fire protection systems affected during the task.

e. **Policy Statement 5.** Personnel conducting hot work **must** follow any safe systems of work and Permits to Work, use equipment correctly, implement fire-prevention measures, and report hazards, defects or unsafe conditions immediately.

Policy Statement 1

The commander, manager or accountable person **must** make sure that a suitable and sufficient risk assessment is completed before conducting any hot working activity is undertaken, and to consider whether safer alternatives can eliminate the need for hot work.

10. The commander, manager or accountable person **must** make sure that alternative non-heat methods such as cold cutting, hydraulic shears or water-jet cutting are considered and documented wherever reasonably practicable before progressing with the process to conduct hot working.

11. The commander, manager or accountable person **must** make sure that a suitable and sufficient hot work risk assessment is completed by a competent person before any hot work begins. Any hot work risk assessment **must** be completed in accordance with [Chapter 8](#) (Safety risk assessment and safe systems of work) of JSP 375, Volume 1.

12. The commander, manager or accountable person **must**:
- a. make sure that when storage tanks or drums require dismantling, pressure build-up risks are assessed before any hot work begins;
 - b. make sure that all combustible or flammable materials are removed, isolated or protected; atmospheres in tanks/drums **must** be assessed for residues and vapours, with gas-freeing, cleaning or inerting applied where required;
 - c. make sure that the assessment considers all relevant hazards, including combustible materials, heat transfer, explosive atmospheres, surrounding environments and non-heat-related hazards;
 - d. consider safer alternatives and document this before hot work is authorised, including cold cutting, remote removal, or replacement rather than repair; and
 - e. make sure that the risk assessment identifies all control measures needed to protect personnel and prevent fire or explosion.

Policy Statement 2

The commander, manager or accountable person **must** make sure that suitable safe systems of work, competent personnel, appropriate planning and adequate resources are in place for the safe conduct of all hot working activities.

13. The commander, manager or accountable person **must** make sure that:
- a. a Safe System of Work (SSW) is developed and followed for all hot working activities;
 - b. suitable systems, processes and resources are in place to enable hot work to be conducted safely in accordance with any SSW and Permit to Work (PTW);
 - c. only competent personnel carry out hot working activities;
 - d. personnel receive appropriate instruction and training on hot work hazards, equipment, fire prevention and emergency actions; and
 - e. personnel working on tanks or drums receive specific training on residue hazards, gas-freeing and explosion risks.

Policy Statement 3

The commander, manager or accountable person **must** make sure that all equipment, environmental controls, atmosphere testing, and Permit to Work requirements necessary for safe hot working are implemented, monitored and maintained so that the risks from hot work are reduced to as low as reasonably practicable.

14. Where tanks, drums or confined spaces are involved, the commander, manager or accountable person **must** make sure that atmosphere testing is carried out using suitable gas detection equipment operated by a competent person.

15. The commander, manager or accountable person **must** make sure that:
- a. all control measures identified in the risk assessment are implemented before work starts, including isolation of services, removal or protection of combustibles, and provision of fire-prevention measures;
 - b. equipment selected is suitable, maintained, inspected before use and operated safely by competent personnel, in accordance with [Chapter 22](#) (Work equipment) of JSP 375, Volume 1;
 - c. surfaces contaminated with oils, grease, paint, solvents or chemicals are cleaned before hot work to prevent toxic fume generation;
 - d. coatings, linings, paints, sealants or residues on either side of the worked surface, or within voids, seams or enclosed sections, are identified and assessed where heat transfer could cause ignition or the release of toxic or flammable vapours, and are removed, isolated or otherwise controlled before hot work begins;
 - e. gas welding / cutting equipment is:
 - (1) subject to leak testing and is fitted with non-return valves and flashback arrestors while damaged or leaking hoses **must** be removed from service; and
 - (2) is protected from heat, sparks and mechanical damage, and hoses **must** be routed to avoid crushing, cutting or overheating.
 - f. backfire and flashback procedures are included in personnel training / instructions, including safe shutdown steps, cooling of the torch, and equipment fault checks;
 - g. oxygen is never used for cooling, ventilation, or cleaning clothing due to the risk of violent ignition and explosion;
 - h. adequate ventilation is provided to prevent accumulation of fumes or vapours, particularly indoors or in confined spaces;
 - i. a Permit to Work is raised whenever significant risk is identified, and to follow the policy and procedures as set out in [Chapter 30](#) (Permit to Work) of JSP 375, Volume 1;
 - j. the PTW includes clear controls for before, during and after the activity, including the appointment of a competent fire watcher² where needed and the monitoring of the area for the duration specified in the risk assessment or PTW following completion of the task, but not less than 60 minutes; and
 - k. all personnel involved understand and follow the PTW requirements.

² Further information on Fire Watchers can be found in Part 2, Policy Statement 4.

16. When working in confined spaces including subsurface premises (bunkers), the commander, manager or accountable person **must** make sure that the use of gas mixtures such as oxy-acetylene³ is restricted and that alternative welding or cutting methods are used where reasonably practicable. They **must** also make sure that the specific risks associated with acetylene, including its wide flammability and explosive limits and the difficulty of effectively ventilating leaks in confined or subsurface environments, are identified and controlled in accordance with [Chapter 9](#) (Dangerous Substances and Explosive Atmospheres Regulations) of JSP 375, Volume 1.
17. All hot working **must** be monitored to make sure it is being carried out in line with the Safe System of Work and PTW controls.
18. Respiratory Protective Equipment (RPE) **must** be considered by the commander, manager or accountable person where hot work generates hazardous fumes, vapours or smoke.
19. Other forms of Personal Protective Equipment (PPE) **must** also be considered when hot working for example eye protection and gloves must be worn when grinding or welding, and welding visors particularly when Arc welding.
20. Contractors conducting hot work **must** be controlled in accordance with [Chapter 34](#) (4Cs System - Management of Visiting Workers/Contractors) of JSP 375, Volume 1, and [JSP 426: Defence Fire Safety & Fire Risk Management Policy, Guidance and Information](#).

Policy Statement 4

The commander, manager or accountable person **must** make sure that hot work areas are left safe and appropriately monitored after completion, including fire-watching, inspection for smouldering materials, removal of debris, and reinstatement of any fire protection systems affected during the task.

21. The commander, manager or accountable person **must** make sure that:
- a. post-work monitoring is carried out for the period defined by the risk assessment or PTW, including fire-watching and checking for smouldering materials;
 - b. all fire systems (for example smoke detectors, alarms and fire doors) that were isolated or disabled for the work are reinstated immediately after completion;
 - c. any equipment that retains heat is monitored until it reaches a safe temperature; and
 - d. any debris, slag, combustible waste, hot materials, screens, and equipment are removed safely and that the area is returned to a safe state.

³ Oxy-acetylene is a high-temperature flame produced by mixing pure oxygen and acetylene gas. It is widely used in metalworking for cutting, welding, brazing, and heating.

Policy Statement 5

Personnel conducting hot work **must** follow any safe systems of work and Permits to Work, use equipment correctly, implement fire-prevention measures, and report hazards, defects or unsafe conditions immediately.

22. Personnel engaged in hot working **must** comply with the required controls defined in the risk assessment, and where applicable, the SSW / PTW, and co-operate with management by undertaking appropriate instruction and training.
23. Personnel engaged in hot working **must** inspect equipment for leaks, wear, damage, and incorrect fittings before use.
24. Personnel **must** report defects, leaks, equipment faults, ventilation failures and unsafe site conditions without delay to their commander, manager or if the activity has a PTW, the named Person in Charge.
25. Personnel conducting hot working on tanks / drums **must** understand vapour behaviour, flammable residues and correct cleaning / gas-freeing processes.

Part 2: Guidance

This part provides the guidance and good practice that **should** be followed to help you comply with this policy.

Risk Management and Safe Systems of Work

Policy Statement 1

The commander, manager or accountable person **must** make sure that a suitable and sufficient risk assessment is completed before conducting any hot working activity is undertaken, and to consider whether safer alternatives can eliminate the need for hot work.

1. The commander, manager or accountable person **should** make sure that specialist support is sought where the risk assessment involves complex environments, confined spaces or containers with unknown residues.
2. The commander, manager or accountable person **should** make sure that, where hot work is to be carried out on enclosed or partially enclosed containers (such as tanks, drums or vessels), lids or top sections are removed using cold methods first, to allow vapours to be safely released and the internal condition inspected prior to any hot work.
3. The commander, manager or accountable person **should** make sure that only flame-proof or intrinsically safe lighting is used when inspecting the interior of tanks, drums or confined spaces and inspection tools **should** be suitable for use in potentially flammable atmospheres.
4. The commander, manager or accountable person **should** review historic incidents, manufacturer data and previous assessments to make sure emerging hazards are recognised.

Policy Statement 2

The commander, manager or accountable person **must** make sure that suitable safe systems of work, competent personnel, appropriate planning and adequate resources are in place for the safe conduct of all hot working activities.

5. The commander, manager or accountable person **should** prioritise cold removal of components where it reduces ignition risks, especially for tanks, drums or enclosed vessels.
6. The commander, manager or accountable person **should** make sure that fire-resistant screens, spark curtains and barriers are used to contain sparks and molten metal.
7. The commander, manager or accountable person **should** make sure that additional emergency procedures, ventilation, access control and third-party protection are incorporated into the SSW where appropriate.

8. The commander, manager or accountable person **should** make sure that Permits to Work are coordinated with contractor controls, confined-space arrangements or fire safety requirements where relevant.
9. The commander, manager or accountable person **should** make sure that supervision levels are proportionate to the complexity and risk level of the task.
10. The commander, manager or accountable person **should** make sure that operators are trained to recognise signs of backfire or flashback and know when to stop work and isolate equipment.
11. The commander, manager or accountable person **should** make sure that personnel receive refresher training when equipment changes, new hazards are introduced or after any significant incident or near miss.

Policy Statement 3

The commander, manager or accountable person **must** make sure that all equipment, environmental controls, atmosphere testing, and Permit to Work requirements necessary for safe hot working are implemented, monitored and maintained so that the risks from hot work are reduced to as low as reasonably practicable.

12. The commander, manager or accountable person **should** make sure that hoses and connections are positioned away from sharp edges, hot metal and areas where molten material may fall.
13. The commander, manager or accountable person **should** make sure that gas cylinders are stored, handled and secured safely when in use and when not in use, including being kept upright, protected from heat sources, and stored in appropriately designated, secure locations with suitable segregation to reduce fire and explosion risks.
14. The commander, manager or accountable person **should** make sure that atmosphere monitoring is repeated if work is interrupted, if conditions change, or where residues may release vapour during heating.
15. The commander, manager or accountable person **should** consider whether paints, coatings, linings, sealants or residues on the opposite side of the material, or within enclosed sections, could give off flammable or toxic vapours when heated. Where such materials cannot be removed, the Safe System of Work **should** set out additional controls, such as alternative cutting methods, improved ventilation, or longer post-work fire-watching.
16. The commander, manager or accountable person **should** make sure that ventilation arrangements for indoor hot working follow best practice: local extraction where reasonably practicable, avoidance of fume recirculation and promotion of safe air movement, and monitoring of atmosphere quality.
17. The commander, manager or accountable person **should** restrict the gas cylinder size for gas welding / cutting equipment to the smallest possible to undertake the task.

Post-Work Safety and Personnel Responsibilities

Policy Statement 4

The commander, manager or accountable person **must** make sure that hot work areas are left safe and appropriately monitored after completion, including fire-watching, inspection for smouldering materials, removal of debris, and reinstatement of any fire protection systems affected during the task.

18. The commander, manager or accountable person **should** make sure that extended monitoring, cooling or damping-down is used where materials retain heat or where fire spread could be concealed within structures, voids, insulation materials or slow-cooling metalwork. The commander, manager or accountable person **should** extend monitoring in areas with hidden voids, insulation materials or slow-cooling metalwork.
19. Where a fire watcher is required by the risk assessment or PTW, the commander, manager or accountable person **should** make sure that the fire watcher:
- Is a named person who is briefed on the task and remains in the area for the duration specified in the risk assessment or PTW, but not less than 60 minutes;
 - Understands the fire risks associated with the hot work and surrounding materials, including concealed spaces;
 - Has immediate access to suitable fire-fighting equipment and means of raising the alarm; and
 - Takes no other duties that would distract from monitoring for signs of fire, smouldering or heat transfer.

Policy Statement 5

Personnel conducting hot work **must** follow any safe systems of work and Permits to Work, use equipment correctly, implement fire-prevention measures, and report hazards, defects or unsafe conditions immediately.

20. Personnel who conduct hot working **should** attend refresher training annually or when new equipment or hazards are introduced.
21. Personnel conducting hot working **should** stop work and seek guidance if conditions change, such as unexpected fumes, temperature rise, or discovery of concealed flammable materials.

Retention of Records

22. All records **must** be kept in accordance with [Chapter 39](#) (Retention of Records) of JSP 375, Volume 1.

Related Documents

23. The following documents **should** be consulted in conjunction with this chapter:
- [JSP 375, Volume 1](#);
 - Chapter 1 - Military and civilian workplace safety

- (2) Chapter 8 - Risk Assessment;
- (3) Chapter 9 - Dangerous Substances and Explosive Atmospheres (DSEAR);
- (4) Chapter 16 - Safety occurrence reporting and investigation
- (5) Chapter 22 - Work Equipment;
- (6) Chapter 28 - Confined Spaces;
- (7) Chapter 30 - Permit to Work;
- (8) Chapter 34 - 4C System: The Management of Visiting Workers and Contractors; and
- (9) Chapter 39 - Retention of Records.

b. **Other MOD Publications;**

- (1) JSP 375 - Volume 3; and
- (2) [JSP 426: Defence Fire Safety & Fire Risk Management Policy, Guidance and Information.](#)

c. **Legislation and Guidance;**

- (1) [Health and Safety at Work, etc. Act 1974;](#)
- (2) [The Provision and Use of Work Equipment Regulations \(PUWER\) 1998;](#)
- (3) [Management of Health and Safety at Work Regulation 1999;](#)
- (4) [Dangerous Substances and Explosive Atmospheres Regulations \(DSEAR\) 2002;](#)
- (5) [The Regulatory Reform \(Fire Safety\) Order 2005;](#)
- (6) [Code of Safe Working Practices for Merchant Seafarers 2025 Edition – Chapter 24;](#)
- (7) [HSE L137 – Safe Maintenance, repair and cleaning procedures;](#)
- (8) [HSE INDG297 - Safety in Gas Welding, Cutting or Similar Processes;](#) and
- (9) [HSE INDG314 - Hot work on small tanks and drums.](#)