



Hot Work (High Risk) Procedure

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Authority

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History

Revision	Date	Amended By (Name)	Details of Amendment
0.0	06/01/2015	Codie Davies	Document renumbered, supersedes WI-OHS-009
1.0	23/06/2017	Anthony Gollan	Document reviewed with minor amendments
2.0	07/10/2020	Anthony Gollan	Change minimum cutting disc width to 1.5mm
3.0	27/07/2023	Vanessa Placheta	SCEE Electrical Branding and Review

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1 Purpose

To provide Southern Cross Electrical Engineering Limited (SCEE) employees with the necessary guidance and information to ensure that while working on Hot Work activities they will be done in a safe and efficient manner.

2 Scope

This procedure applies to all SCEE employees, contractors, subcontractors, visitors or members of the public working on or visiting sites under the control of SCEE.

3 Definitions

Term	Definition
AS	Australian Standard
JHA	Job Hazard Analysis
Shall	Shall is to be understood as mandatory.
Should	Should is to be understood as recommended but not mandatory
VRD	Voltage reduction devices

4 Responsibilities

Role	Responsibility
Project Manager	The Project Manager shall be responsible for ensuring resources are available to enable the implementation of this procedure and for the accountability of person's responsibilities as defined.
Site Manager	Ensure full compliance with the requirements of this procedure Ensure the effective implementation of this procedure.
Employee	Employees shall comply at all times with the procedure
HSE Advisor	Audit and monitor compliance with this procedure. Assist in undertaking inspections in accordance with this procedure
Supervisor	Ensure the application of this procedure. Conduct workplace Inspections in accordance with this procedure within their areas of responsibility.

5 Flowchart

N/A

6 Hot Work

Hot Work has been assessed as a High Risk Work Activity by SCEE.

The statutory requirements regarding duty of care to both SCEE and its Employees remain the first priority at all times.

All SCEE Employees involved in work that may necessitate the use of this procedure should be made aware of it at SCEE inductions.

Each Employee directed to complete a Hot Work task has responsibilities to incorporate this procedure into their scope of work and JHA to ensure that variables relevant to each task are recorded via risk assessment.

At all times this procedure and associated JHA makes all employees aware of the need to provide safe interactions and clear communications with other workgroups involved or working near the task.

Hot Work is defined as any work generating heat or sparks capable of causing combustion and includes electrical welding, gas cutting, grinding, heat shrinking and use of cut-off machines.

Prior to the commencement of Hot Work in any area, the following precautions should be taken, to prevent any fire, explosion, injury or other danger developing during the performance of the Hot Work:

- Identify and control any fire hazard (including the presence of flammable or combustible liquids, gases, vapours, dusts, fibres or substances) within 10 meters from the Hot Work
- Locate fire extinguishers at all work locations where Hot Work is being undertaken
- Confirm fire extinguisher is charged and in test
- Consider relevant hazards that may exist outside the area referred to above
- Consider the possibility of changing circumstances during the progress of the Hot Work and whether they may render the area unsafe for the work to continue
- Properly ventilate the Hot Work area
- Suitably locate the equipment, including emergency fire-fighting equipment
- Isolate the area where the Hot Work is to be performed
- Provide a safe entry to and exit from the Hot Work area; If specified by the Hot Work permit, a firewatcher should be stationed in the area near the Hot Work, for the purpose of safeguarding personnel and equipment
- When developing a task based risk assessment for hot work operations, consideration is to be given to surrounding structures and their potential impact to or from the work (e.g. flammable/combustible liquid stores, confined spaces, explosive magazines)
- The permit holder's Supervisor should make a thorough inspection of the site
- When the Supervisor is satisfied that Hot Work may safely proceed, the Supervisor shall sign the Hot Work permit

Do not commence the Hot Work, until complying with all of the above requirements.

6.1 Welding, Cutting and Grinding

The following general conditions shall apply for all welding, cutting and grinding tasks:

- Operators of welding equipment shall be suitably qualified to do so
- Electrical welding shall be carried out in accordance with Australian Standard AS1674, Part 2
- Electric welding cables in work areas, walkways and access ways should be protected against physical damage at all times. Where possible, they should be routed overhead or under elevated walkways, but in all cases routed in such a manner as to eliminate tripping or other hazards
- Electrical welding units are inspected and maintained in accordance with the relevant Australian Standards
- Keep electric welding cables free from grease and oil. Worn or damaged electrical welding cables with exposed wire or bare conductors should be replaced or discarded immediately
- No person shall use matches, rope, wicks or other smouldering materials for the lighting of gas torches. An approved type flint gun shall be used for this purpose
- No welding or burning shall be undertaken where hot metal can fall into an uncovered conveyor, cable ladder or onto electrical cables. Before cutting or burning work is started, all cables shall be covered in an approved manner, using sheet metal or fire protection blankets
- The use of flammable solvents, oil or grease is strictly forbidden for the cleaning or lubrication of gas or oxygen hoses, fittings or other apparatus because of the risk of explosion in the oxygen atmosphere
- Whenever oxy/acetylene cutting is necessary in an enclosed space, the cylinders shall not be positioned in that space. The vessel or space shall be well ventilated by forced fan, if necessary. Oxy/acetylene flame must be established outside of the enclosed space
- Oxy/acetylene cutting/heating torches shall not be ignited inside tanks and vessels or any other place where gases can accumulate
- Operator to determine when suitable fire resistant screens are required for electric arc welding to ensure that adjacent workers are not adversely affected by the process
- Prior to the commencement of Hot Works, all combustible/flammable material should be removed or adequately protected within 10 metres of Hot Works area
- Voltage reduction devices (VRD) are to be used with all welding machines

Harmful gases can be given off when carrying out certain types of cutting and welding work, and SCEE management shall provide a proper atmosphere or appropriate respiratory protection when welding, cutting or heating:

- Zinc, lead, cadmium, mercury or beryllium bearing based or coated materials
- Stainless steel with inert gas equipment
- In confined spaces
- Where an unusual condition can cause an unsafe accumulation of contaminants

6.2 Angle Grinders

No angle grinding should be carried out on materials that contain asbestos or synthetic mineral fibres (glass fibre, ceramic fibres, etc).

Operators should ensure:

- The guard and handles are secured
- The grinder should be held against the work piece with minimum pressure, so the disc does not “dig in” and cause kick back
- The grinding disc is kept at a 15 to 30 degree angle to the work
- The work piece is held firmly in a bench vice, where practical
- The work is kept at waist height during grinding, where possible
- Grinders are never positioned between the legs while sitting on the floor
- The grinder is stopped at regular intervals for a short break to rest your hands and arms
- The power is disconnected and the grinder placed on a bench with the disc facing upwards when not in use
- Grinders are not put down with the disc still rotating
- The plug is removed from the power source before changing discs
- Cut off wheels are only used for cutting, and grinding discs for grinding.
- Cutting discs smaller than 1.5mm are prohibited on all sites
- The correct disc is being used for the task and that the recommended rpm for the disc is equal to or lower than the rpm rating of the grinder
- The correct flange and locking nut is in place for the type of disc being used
- The disc is checked for damage and defects before use
- The grinder has correct Tri-monthly inspection tag
- A Dead man switch is fitted and operational
- No grinder or buffer is fitted with any other cutting wheel, e.g. saw blade, polishing disc or pad, etc other than those recommended by the manufacturer

6.3 Guarding and Care of Leads and Connections

The following general guarding rules should be followed:

- Fail-safe switches or devices should be installed on all rotating fixed plant and hand tools (e.g. saws, lathes, drill presses, etc)
- Guards should only be removed for maintenance and repair, and only once the equipment is isolated and locked out (only fixed plant can be locked out, otherwise use of out of service tag is required)
- Guards should be replaced prior to equipment being put back into service
- No guarding shall be modified or altered in any way

All leads and connections should be adequately protected from damage. Damaged leads should not be used. When a defect in a lead or connection is observed, it should be reported immediately to the authorised person and taken out of service. Connections to the leads should be made with suitable connectors and should be insulated and inspected at least once every 3 months and be no longer than 30 meters.

6.4 Personal Protective Equipment

PPE Includes impact rated face mask and safety glasses, or impact rated welding mask and safety glasses, gloves and fire resistant jackets / harness.

Angle grinding and abrasive cut off wheels generate excessive noise when in operation. Hearing protection is to be worn when angle grinding or using abrasive cut off wheels and when warranted during other operations.

Buffing, grinding and drilling operations produce airborne projectiles. Operators of such machines should protect themselves and others in the work vicinity by the use of personal protective equipment, the minimum being hearing and double eye protection (mono goggles and face shield). Anti-spatter and clear welding plates commonly fitted to welding helmets provide insufficient impact protection when used in isolation for grinding.

No person shall operate a bench or pedestal drill, grinder or buffer in a temporary work situation until the equipment has been levelled and securely anchored.

Refer: [SCEE-BS-HS-GUI-0004 SCEE Minimum PPE Matrix](#)
[SCEE-BS-HS-PRO-0013 Personal Protective Equipment Procedure](#)
[SCEE-BS-HS-GUI-0005 SCEE Glove Matrix](#)

6.5 Working in Elevated Areas

When carrying out welding, cutting and grinding tasks the operator is responsible for ensuring that when working in elevated areas, hot material is prevented from falling or entering any areas below or adjacent to the operation, unless the drop zone is barricaded to prevent personnel from entering.

Tools and equipment carried or used at height should, where practicable, be secured or tethered against falling. Tool lanyards should be considered as a first method of securing items. The area beneath the work at height location that may be affected by a falling tool/equipment must be clearly signposted and barricaded. Welding blankets must be used wherever the possibility exists of falling sparks or slag. Electrical cables are to be protected at all times from falling sparks or slag when undertaking hot works. Cables should be covered with welding blankets.

6.6 Generators and Welding Machines

SCEE shall ensure all generators and welding machines used on Site comply with the requirements of this Standard Specification and are fitted with Australian Standard compliant voltage reduction devices (VRD).

Self-contained transportable generating sets driven by internal combustion engines which are intended to provide an independent 50 Hz ac supply at above 32V ac, single phase or three phase, should meet the following requirements:

- Comply with AS 3010:2017 with the additional features, as varied below. All live parts, including 'neutral' parts should be guarded and insulated, including terminals at the back of the outlet;

- Single-phase windings should have the neutral terminal connected to the earth terminal of the device as per AS 3010:2017. Three phase units should have the star point of neutral connected similarly;
- All socket outlets providing non-welding power should be weatherproof hi-impact polycarbonate or similar construction, with an isolating switch that operates in all live conductors;
- The single-phase outlets indicated above should be protected by a residual current operated circuit breaker set to trip at a maximum earth leakage of 30 mA; and
- Generators should be inspected and tested by a licensed electrical worker and tagged in accordance with the tagging procedure.
- The location of welding machines should be as close as possible to the work area, with the earth returns securely clamped as close as practicable directly to the area of the task or at a minimum distance not exceeding 3 metres.

Welding machines should be stopped or switched off before the connection or disconnection of leads to the machine terminals. All exposed terminals and wiring should be insulated or covered.

6.7 Fire Watch and Fire Prevention

During Hot Work, adequate precautions should be taken to prevent fire or explosion. In particular, compliance with the following should be ensured:

- Watch for any fire that may occur, both during the Hot Work operation and after the conclusion of it;
- Know where the fire equipment is located and how to use it;
- Know how to raise the alarm;
- Initiate immediate steps to extinguish any fire if needed; and
- Do not try to fight a fire which is beyond the capability or the capacity of the equipment or personnel involved.

An extinguisher complying with the following should be provided:

- Be appropriate for the particular type of fire hazard;
- Be selected in accordance with AS 2444-2001;
- Comply with the relevant Australian Standard;
- Be located within 10 meters of the work area;
- Be maintained in accordance with AS 1851-2012; and
- Be used in accordance with the recommendations of the manufacturer or supplier of the equipment.

SCEE shall ensure that all employees are instructed in the basic inspection, safe use and operation of all relevant fire extinguishers types.

Assigned firewatchers should:

- Be alert for any fire outbreak or hazard;
- Inspect compartments adjoining the Hot Work and check if heat transfer is possible;

- Take immediate action to combat any outbreak of fire that may occur;
- Not allow Hot Work to proceed outside the area specified on the Hot Work permit;
- Immediately stop the work and withdraw the Hot Work permit, if a hazardous condition is observed;
- Monitor changes in wind direction (e.g. by means of a windsock, flags etc);
- Be aware of the need to use eye protection, to protect eyes against flashes where Hot Work involves arc welding, cutting or arc gouging;
- Obtain fire extinguishers or fire hose or both; and
- Not leave the job unless properly relieved by an authorised person.

NOTE: Fire-watching does not consist of periodic checks, but is a continuous and thorough inspection and presence in the area and its vicinity by the assigned personnel, with special attention being given to any new developments that might affect the safe condition of operations.

6.8 Working in Wet Conditions

The presence of water in the work area increases the risk of electric shock. Materials when wet offer very little resistance to the flow of electric current, therefore the work area should be considered to be conductive and to have the potential to form part of the external welding circuit. Body contact between the electrode or torch and wet surroundings should be carefully avoided. Where necessary, steps should be taken to ensure that excess water is drained from the work area prior to and during the work.

Wherever possible, work should be performed on a dry insulated floor. Wooden platforms, rubber mats, or dry areas provide extra protection especially in confined spaces.

Output leads, connecting plugs, electrode holders, torches and isolating switches should be carefully checked for insulation defects such as cracks, fraying or bare patches and should be supported above and protected from water or wet surfaces. Where water is present above the work area, i.e. dripping roof or rain, suitable covers should be positioned to protect the welder and the equipment.

The Emergency Response Plan incorporated into the JHA should list relevant contact details of site Paramedics. The JHA should also indicate the team member who is First Aid Qualified.

7 References

Documents, both internal and external, that are referenced within the content of this procedure, including Australian and International Standards and legislation.

Document ID	Document Title
AS1674.2-2007	Safety in welding and allied processes Part 2: Electrical
AS1851-2012	Routine service of fire protection systems and equipment
AS2444-2001	Portable fire extinguishers and fire blankets—Selection and location
AS3010:2017	Electrical installations—Generating sets
SCEE-BS-HS-GUI-0004	SCEE Minimum PPE Matrix
SCEE-BS-HS-GUI-0005	SCEE Glove Matrix
SCEE-BS-HS-PRO-0013	Personal Protective Equipment Procedure

8 Related Documents

Related documents are those that have a relationship with this document, for example if this was the Operational Risk Management procedure related documents would include the work instruction to complete a JHA, the JHA template, Take 5 work instruction and booklet, etc.

Document ID	Document Title
SCEE-BS-HS-TEM-0008	Job Hazard Analysis template
SCEE-BS-HS-PRO-0001	Job Hazard Analysis
SCEE-BS-HS-PRO-0011	Inclement Weather Management