The Old Weaving Mill, Church Lane, Whitwick, Leicestershire, LE67 5DJ
Tel:- 01530 836017 Fax:- 01530 839551 e mail:- enquiries@chillertech.co.uk
Company registration number:- 07168098
Website:- www.chillertech.co.uk

METHOD STATEMENT & RISK ASSESSMENT

INTRODUCTION

The Management of Health and Safety at Work Regulations 1999 places a duty on employers to assess and manage risks to their employees and others arising from work activities.
We recognise that risk assessments are the most important part of effective health and safety management. Risk Assessments help us to prevent accidents and ill health by considering the hazards that exist and how we manage them. From these assessments, we can develop safe systems and methods of work and ways to prevent problems occurring.
'Specific' risk assessments are required by certain regulations. These regulations may contain a specific reference to the requirement for risk assessment or may refer to the Management of Health and Safety at Work Regulations for this requirement.
It is difficult to assess the risk of a process unless a clear idea of logical steps is available. The risk assessments are therefore in two parts:

Part 1 - Task Procedure
These give a brief description of the task that is to be assessed.

Part 2 - Risk Examination
These describe the types of accidents that can occur, their prevention and also what should be done in the event of an accident/imminent danger occurring.
The Task Procedure should not be considered as a definite method on instruction in how to carry out the tasks concerned. They are a brief description only.
All processes carried out must be carried out by qualified Refrigeration Engineers or under the supervision of a qualified or competent person.
A large number of instruments are used for testing various parts of refrigeration systems and this equipment is mentioned often in this document. Please remember particularly that all test instruments should be calibrated before use.

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Assessment Ref: Section 1: Contents Sheet: 1 of 1
Issue Date: DECEMBER 2018
Risk Priority None

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Assessment Ref: Section 1: Contents Sheet: 1 of 1
Issue Date: DECEMBER 2018
Risk Priority None

SECTION 1 CONTENTS: MECHANICAL REFRIGERATION

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Assessment Ref: R1.1 Issue Date: DECEMBER 2018

Risk Priority Low/Medium

TASK: Replacement of Refrigerant Line Components

METHOD STATEMENT

Before any component is removed or replaced within a refrigeration system, the refrigerant must be evacuated from the section of the system concerned.

This can be achieved by either of the following methods.

Pumping down the system.
See *Risk Assessment R2 (Pump down of refrigerant procedure)*

Or

Evacuating the entire refrigerant from the system.
See *Risk Assessment R5 (Refrigerant removal and handling).*

1. Close off isolation valves each side of the component.

2. If the component that requires replacing is on the discharge side of the system.
(a) Switch off the system.
(b) Isolate the components with hand shut off valve each side of the component.
(c) Evacuate the refrigerant from the section of pipe work isolated.

3. After all processes are complete isolate the system electrically.

4. After replacement of component, dehydration of the system should be carried out. See *Risk Assessment R9 (Evacuation of systems).*

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Assessment Ref: R1.2 Issue Date: DECEMBER 2018

Risk Priority Low/Medium

TASK: Replacement of Refrigerant Line Components

Risk Element in Method Statement

1. Asphyxiation.
2. Explosion.
3. Refrigerant leakage.

Risk Evaluation: LOW/MED

Method of Eliminating/Reducing Risk

1. Do not attempt to use brazing equipment if refrigerant is present.

2. Do not seal off pipe work, which may contain liquid refrigerant, which is below ambient temperature.

3. Make sure all refrigerant has been removed from the section of the system before breaking into the system.

IMMINENT DANGER PROCEDURE

1. See Risk Assessment *R5 (Refrigerant removal and handling).*
2. Ventilate area.
3. Isolate system electrically.
4. Extinguish all naked flames.
5. Wear correct personal protective equipment.

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Assessment Ref: R2.1 Issue Date: DECEMBER 2018

Risk Priority Low

TASK: Pump Down Of Refrigerant Procedure

METHOD STATEMENT
Before a component can be replaced in a refrigeration system, the plant, in most instances, will need to be pumped down.

Process

1. Fit suction and discharge gauges.

2. Switch off electricity supply to the system.

3. Re-calibrate low pressure switch to 0 bar.

4. Close off the shut-off valve at the outlet of the liquid receiver/condenser.

5. Switch on compressor and when the suction gauge reaches 0 bar switch off, check discharge pressure gauge for excessive discharge pressure.

6. If suction gauge/pressure rises above 0 bar repeat process 5 until suction gauge reading is static at 0 bar.

7. Front seat compressor suction valve.

8. Isolate system electrically.

9. Front seat compressor discharge shut off valve.

10. When plant is put back into operation (Normal), do not forget to re-adjust low pressure switch setting.

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Assessment Ref: R2.2 Issue Date: DECEMBER 2018

Risk Priority Low

TASK: Replacement of Refrigerant Line Components

Risk Element in Method Statement

1. Refrigerant leakage to atmosphere.
2. Explosion.

Risk Evaluation: LOW

Method of Eliminating/Reducing Risk

1. Check and make sure pressure relief valves are fitted to liquid receiver.

2. Check operation of high pressure switch.

3. Fit discharge gauge if excessive discharge pressure is indicated.
See *Risk Assessment R5 (Refrigerant removal and handling).*

Imminent Danger Procedure

1. If discharge pressure is excessive, switch off plant and isolate.
See *Risk Assessment R5 (Refrigerant removal and handling).*

2. Wear correct personal protective equipment.

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Assessment Ref: R3.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Brazing Of Copper Pipe

METHOD STATEMENT

1. Contact customer"s management to gain permission and to advise of work to be carried out.

2. Where required, complete Hot Work Permit and adhere to any rules printed thereon, over and above these procedures.

3. All Health & Safety rules must be obeyed.

4. A fire extinguisher of the correct type must be present and within reach.

5. Arrange for isolation of any fire alarms, i.e. smoke detectors, and heat sensors if in the vicinity of the working area.

6. Cordon off area within which work is being carried out to prevent the entrance of unauthorised personnel.

7. If work is to be carried out in a confined space then adequate ventilation must be made.

8. If there is a possibility of refrigerant gas being present or flux is being used when joining dissimilar metals in a confined space, then a respirator must be used or adequate ventilation provided.

9. Eye protection must be used at all times.

10. Flame resistant clothing should be worn.

11. Heat resistant gloves should be worn.

12. Before commencing work, check all brazing equipment.

13. Under certain circumstances a second person should be present whilst carrying out brazing, e.g. confined spaces, hazardous locations etc.

14. Heat shields should be used to protect any surrounding material.

15. Ensure work area is clear of any combustibles. e.g. oil, lagging, paper, etc.

16. The preparation of the materials being joined, and the actual brazing process itself, should be carried out in accordance with any specified standards. If no standards are specified then the work should be carried out in accordance with good refrigeration practice.

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17. On completion of work, check surrounding area for smouldering.

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Continuation
Assessment Ref: R3.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Brazing Of Copper Pipe

METHOD STATEMENT (continued)

18. Re-check for smouldering after 30 minutes.

19. Complete Hot Work Permit if required.

20. Report back to customer"s management.

21. Arrange to reinstate fire alarms.

NB Cadmium based materials should not *be used.*

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Assessment Ref: R3.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Brazing of Copper Pipe

Risk Element in Method Statement

1. Spread of fire.
2. Exposure to fumes.
3. Eye injury.
4. Burn injury.
5. Danger to third parties.
6. False alarm trips.

Risk Evaluation: HIGH

Method of Eliminating/Reducing Risk

1.
a) Use of heat shields
b) Removal of combustibles.
c) Two checks, one after 30 minutes interval at the end of the operation.
d) Fire extinguisher.
e) Second person present if required.

2.
a) Ventilate work area.
b) Removal of refrigerant gas.
c) The use of a respirator.
d) Second person present if required.

3. Wear eye protection.

4. Wear fire retardant clothing, heat resistant gloves and suitable safety shoes.

5. Effectively cordon off working area.

6. Isolation or protection of sensors.

Imminent Danger Procedure

1. Turn off gas and/or switch off electrical supply.
2. Raise alarm and clear personnel (especially injured persons) from danger area.
3. Call emergency services.
4. Render first aid.

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Assessment Ref: R4.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Welding Of Steel Pipes

METHOD STATEMENT

This is one of the most common methods of joining steel pipe and involves the use of an electric arc to cause localised melting of the steel pipe and the electrode rod thereby forming an integral joint by the process of fusion. Please note, when using this process, check that it will not interfere electrically with any electronic equipment installed in the building.

1. Contact customer"s management to gain permission and to advise of work to be carried out.

2. Where required, complete Hot Work Permit and adhere to any rules printed thereon, over and above these procedures.

3. All Health and Safety rules must be obeyed.

4. A fire extinguisher of the correct type must be present and within reach.

5. Arrange for isolation of any fire alarms, i.e. smoke detectors, and heat sensors if in the vicinity of the working area.

6. Cordon off area within which work is being carried out, to prevent the entrance of unauthorised personnel.

7. If work is to be carried out in a confined space, then adequate ventilation must be made and a suitable respirator should be used.

8. Suitable screening should be provided to protect other personnel from the effects of the rays produced from the electric arc.

9. Eye protection must be worn at all times.

10. Flame resistant clothing should be worn.

11. Suitable safety shoes should be worn.

12. Heat resistant gloves should be worn.

13. Before commencing work, check all welding equipment.

14. Under certain circumstances a second person should be present whilst carrying out welding, e.g. confined spaces, hazardous locations etc.

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15. Heat shields should be used to protect any surrounding material.

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Continuation

Assessment Ref: R4.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Welding Of Steel Pipes

METHOD STATEMENT (continued)

16. Ensure work area is clear of any combustibles, e.g. oil, lagging, paper, etc.

17. The preparation of the materials being joined and the actual welding process itself should be carried out in accordance with any specified standards. If no standards are specified then the work should be carried out in accordance with good refrigeration practice.

18. On completion of work, check surrounding area for smouldering.

19. Re-check for smouldering after 30 minutes.

20. Complete Hot Work Permit if required.

21. Report back to customer"s management.

22. Arrange to reinstate fire alarms.

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Assessment Ref: R4.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Welding Of Steel Pipes

Risk Element in Method Statement

1. Spread of fire.
2. Exposure to fumes.
3. Eye injury.
4. Burn injury.
5. Danger to third party.
6. False alarm trips.

Risk Evaluation: HIGH

Method of Eliminating/Reducing Risk.

1.
a) Use of heat shields.
b) Removal of combustibles.
c) Two checks, one after 30 minutes interval at the end of the operation.
d) Fire extinguisher.
e) Second person present if required.

2.
a) Ventilate work area.
b) Removal of refrigerant gas.
c) The use of a respirator.
d) Second person present if required.

3. Wear eye protection.

4. Wear fire retardant clothing, heat resistant gloves and suitable safety shoes.

5. Check all electrical equipment to ensure that it has been connected correctly.

6. Effectively cordon off working area.

7. Isolation or protection of sensors.

Imminent Danger Procedure

1. Turn off gas and/or switch off electrical supply.
2. Raise alarm and clear personnel (especially injured persons) from danger area.
3. Call emergency services.

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4. Render first aid.
5. Call emergency services.

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Assessment Ref: R5.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Refrigerant Removal and Handling

METHOD STATEMENT

1. Become familiar with the equipment.

2. Establish refrigerant type to be removed. If no identification Pressure Temperature Relationship may have to be used.

3. Make sure of the following before attempting procedure:

a) Correct number of recovery cylinders are available.

b) That the cylinders to be used are designated for received refrigerant and labelled for the refrigerant.

c) All necessary paperwork such as labels and transfer notes are to hand.

d) Make sure recovery equipment is in working order and a set of working instructions is on hand.

e) Make sure a set of weighing scales is available preferably electronic and in good working order.

f) Make sure all hoses are complete with leak free disconnect coupling and all in good order.

g) All personal protective equipment is available and being used correctly.

h) Mechanical handling equipment is available if required for handling refrigerant cylinders.

i) Check recovery cylinder is complete with pressure relief valve and the cylinder and associated shut off valves in good working order.

j) Ensure that empty recovery cylinders are either evacuated or cooled before recovery occurs.

Continued on page 2

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Continuation

Assessment Ref: R5.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Refrigerant Removal and Handling

METHOD STATEMENT (continued)

4. Pumping down refrigeration system if possible. See *Risk Assessment R2 (Pump Down Procedure).*

5. If pump down is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

6. Make sure that the cylinder is situated on the scales before recovery takes place.

7. Supervise recovery at all times, by a competent person.

8. Start recovery machine and operate in accordance with manufacturer‟s instructions.

9. Take into account that refrigeration/oil moistures have a lower density than pure refrigerant, which will reduce cylinder capacity.

10. Do not overfill cylinders.

11. Do not exceed the maximum working pressure of the cylinder, even temporarily.

12. When cylinder filled correctly and process completed, make sure cylinders and equipment removed from site promptly.

13. Recovered refrigerant should not be charged into another refrigeration system unless it has been cleaned and checked by a competent person.

14. Due to the fact the polyester oils are non-miscible and to avoid cross contamination, it is advisable to use a separate set of equipment when using a new refrigerant or blend as follows:
a) Vacuum pump
b) Recovery system
c) Flexible hoses
d) Gauges

15. Label equipment stating that it has been decommissioned and emptied of refrigerant. The label should be dated and signed.

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Assessment Ref: R5.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Refrigerant Removal and Handling

Risk Element in Method Statement

1. Explosion.
2. Asphyxiation.
3. Refrigeration burns.
4. Injury when moving cylinder and plant.

Risk Evaluation: HIGH

Method of Eliminating/Reducing Risk

1. Use correct plant and trained personnel.
2. Read COSHH information on substances before proceedings.
3. Use the correct recovery cylinders and make sure they are not damaged.
4. Use accurate weighing scale, preferably electronic.
5. Use correct protective equipment and clothing.
6. Use correct mechanical handling equipment.
7. No smoking, heat source or naked flame.

Imminent Danger Procedure

1. Shut off leak and evacuate area, if there is no risk.

2. Switch off electrical supply.

3. Recover cylinders that have been damaged.

4. Handle refrigerant in accordance with COSHH Assessment Sheet.

5. Treat injuries in accordance with COSHH Assessment Sheet.

6. Shut off leak, if without risk, and evacuate area.

7. Remove cylinders from heat source, keep cylinders cool.

8. Cylinders must be clearly identified and stores in separate area.

9. General first aid in cases of accident.

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Assessment Ref: R6.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Refrigerant Charging *(Including new refrigerants and blends)*

METHOD STATEMENT

Transfer of refrigerants from storage cylinder to plant.

1. Check for correct refrigerant.

2. Check plant has been evacuated or holds a positive pressure of the same refrigerant.

3. Connect manifold to storage cylinder and to high and low side of plant.

4. No refrigerant must be allowed to escape into the atmosphere. A decanting machine must be used when evacuating part of/or the whole system.

5. Check system control circuit and safety devices.

6. Check system is ready to run.

7. Ensure air and moisture in charging line is kept to an absolute minimum.

8. Run system and charge refrigerant.

9. Leak test.

10. Fixed charged systems: It is advisable the charge is weighed in using suitable scales.

11. Certain refrigerants are mixtures and as such will need to be charged in liquid form.

12. When charging with new refrigerants or blends the correct lubricant should be used in accordance with compressor manufacturer/supplier"s recommendations.

13. Ensure components are compatible, e.g. filter drier/expansion valve when using new refrigerants or blends.

14. For charging plant on retrofits, depending upon the refrigerant or blend that is used, checks must be made with manufacturer in connection with the acceptable level of residual quantities of the original oil within the system.

15. Separate devices, vac pumps, fittings and components, (e.g. specialist flexible hoses), should be used for new refrigerant and blends.

16. Due to the molecular structure of the new blends, leakage is more prevalent, therefore mechanical joints should be kept to an absolute minimum.

17. Pressurisation: Refer to *Risk Assessment R10 (Pressure Testing).*

18. Refer to COSHH Assessment Sheets and refrigerant handling information.

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Assessment Ref: R6.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Refrigerant Charging *(Including new refrigerants and blends)*

Risk Element in Method Statement

1. Escape to atmosphere.

2. Transport of refrigerant.

3. Non-ventilated areas.

4. Explosion.

5. Naked flames and smoking.

Risk Evaluation: HIGH

Method of Eliminating/Reducing Risk

1. Always use correct tools and equipment for the purpose of re-charging.

2. Use mechanical handling equipment for cylinders when possible.

3. Ventilate area before commencement of task.

4. Trained personnel only.

5. Labels prominently displayed to state refrigerant in system and warning against charging any other gas into system. Where an ester lubricant is being used, this should be clearly indicated.

Imminent Danger Procedure.

As in *Risk Assessment R5.2 (Refrigerant removal and handling).*

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Assessment Ref: R7.1 Issue Date: DECEMBER 2018

Risk Priority Low/Med

TASK: Installation of Copper Pipe work at High and Low Level

METHOD STATEMENT

1. All works to be carried out as per client"s specification (where applicable).

2. Ensure sufficient clearance is allowed for expansion and contraction of pipe work during operation of the system.

3. Remove all debris from pipe ducts before commending work.

4. All pipe supports are to be firmly fixed, following the manufacturer"s instructions and recommendations.

5. All fittings and pipes are to have brazed connections, unless mechanical joint shave exceptionally been specified.

6. Low pressure dry nitrogen should be passed through sections of pipe work while brazing operations are carried out to prevent scale formed by oxidisation. *(Refer to Task Procedure R 10 (Pressure Testing).*

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Assessment Ref: R7.2 Issue Date: DECEMBER 2018

Risk Priority Low/Med

TASK: Installation of Copper Pipe work at High and Low Level

Risk Element in Method Statement

1. Fire caused by flame from welding torch.
2. Danger of personnel falling into pipe ducts or from scaffolding.
3. *Refer to Risk Assessment R3 (Brazing and Welding).*

Risk Evaluation: LOW/MED

Method of Eliminating/Reducing Risk

1. All gas bottles are to be secured in a bottle trolley.

2. Flash back arrestors are to be fitted to welding equipment gas lines.

3. A suitable fire extinguisher or fire blanket to be at hand.

4. All scaffolding must be erected by a competent person, and have safety rails and kick boards fitted.

5. All scaffolding to be held firmly in position and scaffolding towers are to be fitted with out-riggers.

6. All work areas to be cordoned off with suitable safety barriers.

7. All dry nitrogen bottles must be fitted with a pressure reducing regulator and gauge, see *Task Procedure R10 (Pressure testing).*

8. Brazing to be carried out in accordance with COSHH assessment information.

Imminent Danger Procedure

1. Wear correct personal protective equipment.

2. Safety harnesses to be worn, where appropriate, when working at high level.

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Assessment Ref: R8.1 Issue Date: DECEMBER 2018

Risk Priority Medium

TASK: System Clean Up after Compressor Motor Burn Out

METHOD STATEMENT

Heat generated by a hermetic system burn out causes a percentage of the oil and refrigerant to break down and form acids and sludge, which contaminate the system.
These contaminates must be removed from the system or they will probably attack the replacement compressor motor windings and another burn out will result.
The suction line filter method of clean up has been tested both in the laboratory and in the field. It has been found that it works very well. A filter drier in the suction line not only filters out sludge but the desiccant removes acid.
The suction line filter drier method is, in reality, a flushing method. The agent used for flushing the system is the refrigerant in the system. The pump used is the compressor, all that the suction line filter drier does is collect the sludge and acid that has been flushed from the system.
The following is the recommended procedure for servicing a refrigeration unit, which has had a motor burn out:

1. No refrigerant must be allowed to escape into the atmosphere. A decanting machine must be used when evacuating part of/or the whole system.

2. Remove the burned out compressor or motor and replace.

3. Install a suitable suction line filter drier.

4. Renew liquid line drier cores or where applicable, the liquid line drier.

5. When the motor and starter have been replaced, drain off the old oil and recharge the compressor with new oil.

6. Re-commission plant.

7. At the end of 48 hours the system should be shut down and the suction line drier should be removed and the liquid line drier cores or drier should be replaced.

8. Where applicable an oil sample should be taken and the oil should be checked for acid using an appropriate acid test kit.

9. This procedure should be carried out in accordance with the appropriate COSHH Assessment information and with reference to the Environment Protection Act 1990.

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Assessment Ref: R8.2 Issue Date: DECEMBER 2018

Risk Priority Medium

TASK: System Clean Up after Compressor Motor Burn Out

Risk Element in Method Statement

1. Contaminated refrigeration and oil may contain dangerous acid which can cause burns to exposed eyes and skin.

Risk Evaluation: MEDIUM

Method of Eliminating/Reducing Risk

1. Always use a decant machine to remove refrigerant from systems.

2. Ensure that contaminated oil is placed into marked container.

Imminent Danger Procedure

1. Where appropriate wear correct personal protective equipment.

2. If without personal risk, isolate all equipment both electrically and mechanically by closing shut off valves and by isolating the electrical supply.

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Assessment Ref: R9.1 Issue Date; DECEMBER 2018

Risk Priority Medium

TASK: Evacuation of Systems Utilising CFC, HCFC and HFC Refrigerants

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METHOD STATEMENT

1. The purpose of the evacuation is to remove all moisture, air and other non-condensable from the system, leaving it in a clean and dry condition, prior to charging the system with refrigerant.

2. On the successful completion of a pressure test or leak test *(*see *Risk Assessments R10 and R14),* the inert gases should be released from the system through a suitable vent to a safe place, and preparations should be made to evacuate and dehydrate the system. A vacuum pump of the gas ballast type should be selected for the size of the system to be evacuated.

3. The vacuum pump should be tested for effective operation and then connected to both the high and low pressure sides of the system. In order to achieve the best efficiency from the vacuum pump, the connecting pipe or hose from the pump to the system should be the largest size possible and kept to a minimum length.

4. A suitable vacuum gauge should be connected to the system at the furthest point from the vacuum pump. *NB*. *A standard compound pressure gauge should not be used as this will not be sufficiently accurate.*

5. Before commencing the evacuation of the system, checks should be made to ensure there are no isolated areas of the system and any vulnerable components are sealed off, e.g. pressure switches.

6. Some components may need to be left electrically powered and should be labelled accordingly.

7. To ensure a satisfactory evacuation of the system, a vacuum of at least 2mm Hg needs to be observed on the remote sited vacuum gauge.

8. On satisfactorily obtaining the required vacuum, isolate the pump from the system before switching off, and break vacuum on the system with the refrigerant to be used.

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Assessment Ref: R9.2 Issue Date: DECEMBER 2018

Risk Priority Medium

TASK: Evacuation of Systems Utilising CFC, HCFC and HFC Refrigerants

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Risk Element in Method Statement

1. Electric shocks from connection of electrical equipment or damage to trailing electrical leads.

2. Uncontrolled escape of refrigerant.

Risk Evaluation: MEDIUM

Method of Eliminating/Reducing Risk

1. Use only 110V electrical equipment or 240v equipment fitted with residual current circuit device. Protect trailing leads.

2. Use only equipment that is in a safe working order.

3. Operator(s) to wear correct personal protective equipment.

4. Ensure refrigerant cylinder(s) are secured.

Imminent Danger Procedure

1. Electric shock - switch off and disconnect electrical equipment from supply.

2. Escaping refrigerant - isolate leak if without risk, ventilate area.

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Assessment Ref: R10.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Pressure Testing Of Refrigeration Pipe-work Systems

METHOD STATEMENT

A. Strength Pressure Test is the pressure applied to a refrigeration system for its integral strength and it is usually defined as maximum working pressure (MWP) x factor of 1.3 (for rolled or drawn materials) and MWP x 1.5 for castings.

B. Leak Pressure Test is the pressure applied to a refrigeration system or part of a system to test its pressure tightness. This test pressure is defined as MWP of the particular system x factor of 1.1.

1. Only oxygen free nitrogen (OFN) shall be used as the test fluid. . Prior to testing, sensitive gauges, controls and instruments that may be damaged, by excess pressure must be isolated from the system. Relief valves shall be removed and the openings capped and plugged. Solenoid valves, pressure regulating valves and other control valves should be opened as necessary and the circuit(s) checked to ensure all relevant parts of the system can be pressurised.

2. Test pressure shall not exceed that applied to the components by the manufacturer of the particular component. This may require the testing of the low pressure side of the system separately from the high pressure side.

3. Before carrying out the pressure test, precautions shall be taken to evacuate all personnel from the area of risk and post notices advising that the system or equipment is under pressure.

4. Pipe work under pressure must be suitably labelled while the test is progressing and after if the systems are left under standing pressure.

5. The pressure in the system should be built up gradually and monitored by a remote gauge located in a safe place. Once the test pressure is reached, the nitrogen cylinder(s) should be closed off and isolated from the system under test.

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Continuation

Assessment Ref: R10.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Pressure Testing Of Refrigeration Pipe-work Systems

METHOD STATEMENT (continued)

6. The test pressure in the system should be held for at least one hour. A longer period may be appropriate for larger systems or a fall in pressure due to leaks may not be detected. Any fall in pressure indicates a leak which should be traced, see *Risk Assessment R14 (Leak Testing).*

7. If any leaks are present, the fault(s) should be corrected and the system retested (repairs involving welding or brazing shall not be carried out on any system, part of system or component while it is still under pressure).

8. Equipment required and to be used for pressure testing:

a) A pressure regulator complete with gauges with range 0-300 bar on cylinder side of nitrogen cylinder and range of 0-10 bar on outlet side of regulator.

b) ¼" copper tube complete with a range of ¼" compression and flare fittings plus a pressure relief valve set at 27 bar.

c) A high pressure gauge range 0-34 bar connected by ¼" OD copper tuber at safe viewing point in the system.

NB - Under no circumstances should a refrigeration gauge manifold and lines be used for pressure testing purposes.

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Assessment Ref: R10.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Pressure Testing Of Refrigeration Pipe-work Systems

Risk Element in Method Statement

1. Uncontrolled release of energy (explosion)

Risk Element: HIGH

Method of Eliminating/Reducing Risk

1. Clear all non essential personnel from the risk area.

2. Operator(s) to wear correct protective personal equipment.

3. It is mandatory that nitrogen cylinders are properly secured to prevent them from being knocked over.

Imminent Danger Procedure

1. Close off cylinder(s) at isolating valve.

2. Clear area.

3. Isolate leak if without risk.

4. Release pressure from system slowly and safely.

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Assessment Ref: R11.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Positioning of: Chillers, AHU's, Evaporators, Condensers, etc.

METHOD STATEMENT

1. Craneage of plant - when items of plant are being lifted by crane the following should be carried out:

a) The crane should be positioned in a pre-determined position.

b) The out-riggers should be placed on sleeper pads, to spread the static load.

c) It should be observed that the crane jib is not obstructed when turning through 360 degrees.

d) A banks-man should be in attendance at ground level and another if the load is to be fitted above or below ground level.

e) Hand held guide lines should be attached to the load to prevent it spinning throughout the lifting operation.

2. Movement of plant.

a) When moving a large item of plant through a building or site the item being moved should be placed on skates.

b) To avoid causing damage to the floor or „slab" the skates should be run on ¼" steel plate strips. This also spreads the static weight.

c) When raising or lowering plant „toe" jacks should be used.

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Assessment Ref: R11.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Positioning of: Chillers, AHU's, Evaporators, Condensers, etc.

Risk Element in Method Statement

1. Risk of injury to personnel due to plant moving unexpectedly.

Risk Evaluation: HIGH

Method of Eliminating/Reducing Risk

1. Observe and follow client"s Health and Safety statement, use safety (warning) signs and barriers.

2. Manual handling regulations apply to these operations.

3. Large items of plant should only be moved by suitably trained personnel using appropriate equipment.

Imminent Danger Procedure

1. Wear correct personal protective equipment.

NB It is the responsibility of the hirer of the crane to inspect all relevant test certificates appertaining to the crane and any slings which are to be used.

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Assessment Ref: R12.1 Issue Date: DECEMBER 2018

Risk Priority Low/Medium

TASK: Commissioning/Re-commissioning

METHOD STATEMENT

The procedures for evacuating and charging the system with refrigerant should be carried out in conjunction with this procedure, see *Risk Assessment R9 (Evacuation of system) and Risk Assessment R6 (Refrigerant charging)* and observe “live” working procedures.
Where appropriate, this work should be carried out in conjunction with a competent electrician.

1. Check compressor oil level is correct.

2. Check installation wiring is correct.

3. Do a dry run on the electrical control circuit with the compressor fuses removed to ensure the controls are set to the correct values and are connected in the correct sequence.

4. Operate the compressor and monitor suction and discharge pressure, suction return temperature, oil level and pressure, and compressor motor amperage.

5. Regularly check oil level in compressor crank case.

6. Do not allow suction and discharge pressure to rise or fall outside the application range.

7. Check electrical current at regular intervals to make sure plant is operating within application limits.

8. Check Expansion valve superheats.

9. Adjust finally all safety pressure and temperature controls.

10. Check retention of fan motors.

11. Final leak test.

12. Log all final settings of controls. Log all final amperage of electrical equipment.

13. Instruct personnel in the operation of the equipment.

14. Make sure Service Manual is left on site.

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Assessment Ref: R12.2 Issue Date: DECEMBER 2018

Risk Priority Low/Medium

TASK: Commissioning/Re-commissioning

Risk Element in Method Statement

1. Refrigeration leakage.

2. Electrocution.

3. Explosion

4. Asphyxiation.

Risk Evaluation: LOW/MED

Method of Eliminating/Reducing Risk

1. Isolate all electrical equipment before adjustment or investigation.

2. Make sure all safety controls are set and proved before plant is operational.

3. Make sure all hand shut off valves are open before plant is switched on electrically.

Imminent Danger Procedure

See *Risk Assessment R5 (Refrigerant removal and handling).*
1. Ventilate area.

2. Extinguish all naked flames.

3. Isolate all electrical systems.

4. Wear correct personal protective equipment.

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Assessment Ref: R13.1 Issue Date: DECEMBER 2018

Risk Priority Low/Medium

TASK: Decommissioning

METHOD STATEMENT

Before carrying out this procedure, it is essential that the engineer is completely familiar with the plant and all its detail. Prior to the task being carried out, an oil and refrigerant sample should be taken in case analysis is required prior to re-use in reclamation. It is essential that electrical power is available before the task is commenced.

1. Isolate system electrically.

2. Remove refrigerant, see *Risk Assessment R5 (refrigerant removal and handling).*

3. Close off all isolation valves.

4. Label equipment stating that it has been decommissioned and emptied of refrigerant. The label should be dated and signed.

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Assessment Ref: R13.2 Issue Date: DECEMBER 2018

Risk Priority Low/Medium

TASK: Decommissioning

Risk Element in Method Statement

1. Leakage of refrigerant and oil to atmosphere.

2. Explosion.

3. Asphyxiation.

Risk Evaluation: LOW/MED

Method of Eliminating/Reducing Risk

1. See *Risk Assessment R5 (Refrigerant removal and handling).*

2. Isolate electrical equipment.

Imminent Danger Procedure

1. Ventilate area

2. Isolate electrical system.

3. Wear correct personal protective equipment.

4. See *Risk Assessment R5 (Refrigerant removal and handling).*

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Assessment Ref: R14.1 Issue Date: DECEMBER 2018

Risk Priority Low

TASK: Leak Testing

METHOD STATEMENT

There are currently four methods employed for leak testing and they are as follows:

1. Electronic leak detection unit.

2. A chemical dye in the lubricating oil/refrigerant.

3. Fluid either painted or sprayed on.

4. Halide lamp (non-preferred method).

ELECTRONIC UNIT
There are no foreseeable risks involved in using this type of unit for leak detecting purposes, but all Health and Safety rules must be applied when using it.

CHEMICAL DYE
Chillertech Ltd does not recommend the use of dyes.

FLUID - EITHER PAINTED OR SPRAYED ON
Chillertech Ltd do not use chemical sprays.

HALIDE LAMPS
Chillertech Ltd does not use Halide lamps.

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Assessment Ref: R14.2 Issue Date: DECEMBER 2018

Risk Priority Low

TASK: Leak Testing

Risk Element in Method Statement

None foreseeable

Risk Evaluation: LOW

Imminent Danger Procedure

1. Electric shock - switch off and disconnect electrical equipment from supply.

2. Escaping refrigerant - isolate leak if without risk, ventilate area.

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Assessment Ref: R15.1 Issue Date: DECEMBER 2018

Risk Priority Medium/Low

TASK: Oil Charging Into a System or Compressor

METHOD STATEMENT

Before adding oil to an operational system or compressor, the reasons for any loss of oil should be investigated.

METHOD 1) Charge Oil into a Compressor through Oil Filler Port

a) Carry out a pump down, see *Risk Assessment R2 (Pump down of Refrigerant).*

b) Allow compressor to stand for short time to allow any refrigerant to boil out of the oil (ensure suction pressure is at 0 bar).

c) Remove oil filler plug.

d) Charge required amount of oil using clean dry receptacles, i.e. oil can or funnel.

e) Refit oil plug and carry out evacuation, see *Risk Assessment R9 (Evacuation of Refrigeration systems.*

f) Re-commission system, see *Risk Assessment R2 (Re-Commissioning).*

METHOD 2) Charge Oil By Means Of Vacuum (Hermetic Units Only)

a) Carry out pump down, see *Risk Assessment R2 (Pump down of refrigerant).*

b) Fit length of tube with ¼" flare fitting and in line shut off valve to suction service valve.

c) Insert other end of tube into can of clean refrigeration oil.

a. Draw vacuum on compressor.

b. Open shut off valve in oil line, drawing required amount of oil into compressor.

c. Allow compressor suction pressure to balance at 0 bar.

d. Remove oil charging line from compressor.

e. Purge air from compressor or carry out evacuation, see *Risk Assessment R9 (Evacuation of Refrigeration Systems).*

f. Re-commission system, see *Risk Assessment R12 (Re-commissioning).*

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Continuation

Assessment Ref: R15.1 Issue Date: DECEMBER 2018

Risk Priority Med/Low

TASK: Oil Charging Into a System or Compressor

METHOD STATEMENT (Continued)

METHOD 3 Charge Oil by use of a Hand Pump.
(This method is normally used for larger compressors/systems)

a) Connect flexible line from hand pump to oil inlet shut of valve of oil reservoir or appropriate port on compressor, see *Risk Assessment R2 (Pump down of refrigerant).*

b) Connect inlet connection of hand pump into oil can and purge air from lines.

c) Open inlet shut of valve on oil reservoir and pump in required amount of oil.

d) Backseat oil inlet shut of valve and disconnect hand pump, etc.

e) Monitor condition and operation of system.

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Assessment Ref: R15.2 Issue Date: DECEMBER 2018

Risk Priority Med/Low

TASK: Oil Changing Into a System or Compressor

Risk Element in Method Statement

1. Asphyxiation.

2. Oil leakage.

3. Refrigerant leakage.

Risk Evaluation: MED/LOW

Method of Eliminating/Reducing Risk

1. Make sure all refrigerant has been removed from the particular section of system before breaking into it.

2. Make sure suction and crank case pressures are at balance (0 bar) before breaking into compressor.

3. Clear up any spillage of oil immediately.

Imminent Danger Procedure

1. Wear correct personal protective equipment.

2. Isolate leakage if without risk.

3. Ventilate area.

4. Extinguish any naked flames.

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Assessment Ref: R16.1 Issue Date: DECEMBER 2018

Risk Priority Med/Low

TASK: Removal and Disposal of Oil from Refrigeration System

METHOD STATEMENT

The carriage and disposal of waste refrigeration oil should only be undertaken after reference to all current legislation and COSHH regulations. Personnel should ensure they are working within these regulations.

1. Removal of oil from compressor or plant.

a) Pump down system and isolate compressor or component, see *Risk Assessment R2 (Pump down of refrigerant).*

b) Allow short time for refrigerant to boil out of oil.

c) Discharge waste oil into suitable sealable container. Do not fill over 80% volume.

2. **Disposal of waste oil.**

a) Ensure containers are adequately sealed.

b) Arrange for waste transfer notes to be made out.

c) Arrange delivery of waste oil to registered waste company.

d) Keep records of transfer notes for at least 2 years.

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Assessment Ref: R16.2 Issue Date: DECEMBER 2018

Risk Priority Med/Low

TASK: Removal and Disposal of Oil from Refrigeration System

Risk Element in Method Statement

1. Asphyxiation.

2. Oil leakage.

3. Refrigerant leakage.

Risk Evaluation: MED/LOW

Method of Eliminating/Reducing Risk

1. Make sure all refrigerant has been removed from the particular section of system before breaking into it.

2. Make sure suction and crank case pressures are at balance (0 bar) before breaking into compressor.

3. Clear up any spillage of oil immediately.

Imminent Danger Procedure

1. Wear correct personal protective equipment.

2. Isolate leakage if without risk.

3. Ventilate area.

4. Extinguish any naked flames.

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Assessment Ref: R17.1 Issue Date: DECEMBER 2018

Risk Priority Medium

TASK: The Use and Maintenance of Secondary Coolants

METHOD STATEMENT

NB: Before attempting to work on any secondary coolants system, operative(s) should refer to the relevant COSHH sheets and be aware of the hazards involved in handling the substances

1. In many refrigeration applications heat is transferred to a secondary coolant (any liquid cooled by refrigerant and used to transmit heat without changing its state). This procedure describes the use and maintenance of the more commonly employed secondary coolants.

2. The decision of which secondary refrigerant to use in any application will be made initially upon the temperature at which it is required to operate, but other factors need to be considered chiefly from the health and safety point of view. These are as follows:

a**. Health and Safety Hazards**

1. Methyl and ethyl alcohol fumes are flammable.
2. Methylene chloride decomposes in the presence of a flame or ultra violet light, giving off highly toxic fumes as a result of this decomposition. At normal temperatures (10ºC to 25ºC) Methylene chloride is slightly toxic by inhalation of the vapour or swallowing. Methyl alcohol (known as methanol) and ethylene glycol are both toxic.

b. **Corrosion:** Water and all aqueous solutions are corrosive to some extent. It is possible to give protection by the use of inhibitors, but providing that the solution concentrations are maintained in slightly alkaline conditions (PH8 to PH9) and that air is eliminated from the solution, then the corrosive effects can be minimised by the inhibitors.

c. **Weak solutions at low temperature:** If the solution mix is too weak for the working temperature, then water will freeze out on the evaporator surface, reducing the heat transfer effect, and thereby the efficiency of the plant.

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Continuation

Assessment Ref: R17.1 Issue Date: DECEMBER 2018

Risk Priority Medium

TASK: The Use and Maintenance of Secondary Coolants

METHOD STATEMENT (continued)

3. **Corrosion Inhibitors**

To limit the corrosive tendency of brine solutions as much as possible the solution should be kept slightly alkaline (PH value between 8.0 and 9.0) This will not entirely eliminate corrosion and the addition of a suitable corrosion inhibitor may be necessary (sodium chromate or sodium bichromate). Frequent testing of the brine using cresol red test papers is required to maintain the required levels of alkalinity.

4. **Storage and Handling**

a) Always follow the manufacturer"s recommendations for the storage and use of each particular chemical.

b) Inhibited glycol concentrates are stable, relatively non corrosive, but such materials may decompose when heated above normal temperature and give off nitrogen oxide fumes.

c) Before charging a system with a coolant, ensure residual contaminates are removed such as sludge, rust, oil and ensure complete removal of any cleaning agents used.

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Assessment Ref: R17.2 Issue Date: DECEMBER 2018

Risk Priority Medium

TASK: The Use and Maintenance of Secondary Coolants

Risk Element in Method Statement

1. Poisoning from the inhalation or ingestion of the substance.

2. Irritation of skin or eyes from splashes of the substance.

3. Leakage from system.

4. Fire (certain coolants used are flammable and also give off toxic fumes).

Risk Evaluation: MEDIUM

Method of Eliminating/Reducing Risk

1. Use appropriate personal protective equipment when handling the product.

2. Refer to appropriate COSHH sheets before handling.

Imminent Danger Procedure

1. Switch off plant or circulating pumps (if without personal risk).

2. Contain any spillage with sand or earth.

3. Remove injured person(s) to warm ventilated area.

4. Wear suitable breathing apparatus if fighting a fire where refrigerants and coolants are involved.

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Assessment Ref: R18.1 Issue Date: DECEMBER 2018

Risk Priority Low/Med

TASK: Refrigeration System Fault Diagnosis (Mechanical)

Fault diagnosis must follow a certain pattern at all times.

1. Inspect the system and its controls.

2. Ensure commission information and maintenance records are available.

3. Fit suction and discharge gauges.

4. The pressures indicated on the gauge and the information given by the customer may give some indication of the problem.

5. Symptoms can be categorised as follows:
a) Plant operating but not refrigerating.
b) Plant not operating.
c) Plant noisy.
d. Plant overheating.

6. If the plant has stopped then this could indicate a control malfunction or an electrical fault. See *Risk assessment E2 (Control Circuits fault diagnosis).*

7. Temperature checks at various points on the plant could also indicate a fault.

8. A planned concise method of fault elimination should be adopted.

9. Concentrate at all times - be aware of moving machinery and electrical terminals.

10. If the equipment is complex, make sure a permit to work system is adopted so that plant is not inadvertently switched on.

11. Make sure you are aware of fire exits, main electrical switches, ventilation systems, etc.

12. Once the fault is located, use a planned method of rectification.

13. Check on risk assessments to make sure you are aware of any changes and procedures.

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Assessment Ref: R18.2 Issue Date: DECEMBER 2018

Risk Priority Low/Med

TASK: Refrigeration System Fault Diagnosis (Mechanical)

Risk Element in Method Statement

1. Leakage of refrigerant and oil to atmosphere.

2. Explosion.

3. Asphyxiation.

4. Electrocution.

Risk Evaluation: MED/LOW

Method of Eliminating/Reducing Risk

1. See Risk Assessment appropriate to fault diagnosed.

Imminent Danger Procedure

1. Ventilate area.

2. Isolate electrical system.

3. Wear correct protective personal equipment.

4. See *Risk Assessment appropriate to fault being handled.*

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Assessment Ref: Section 2 Contents Sheet: 1 of 1

Issue Date: DECEMBER 2018

Risk Priority None

SECTION 2 CONTENTS ELECTRICAL OPERATIONS

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Risk Priority Med/High

Task: Electrical Isolation

METHOD STATEMENT

NB Reference should be made to the IEE Regulations and the Electricity at Work Regulations 1989 before implementing these procedures.

1. Contact customer"s management to gain permission and to advise of work to be carried out.

2. Where required complete permit to work and adhere to any rules printed thereon, over and above these procedures.

3. All Health and Safety rules must be obeyed.

4. Arrange for isolation of any Plant alarms, i.e. if they are likely to be affected by the isolation requirement.

5. Cordon off area within which work is being carried out to prevent the entrance of unauthorised personnel, should “live testing” be a requirement.

6. Ensure adequate access to isolator has been provided.

7. Ensure that by isolating any equipment, “danger” is not caused to others as a result.

8. Ensure that any tools required for the task in hand are in good condition and suitable for the purpose.

9. After isolating has been carried out checks should be made using a single purpose mains tested to establish equipment has been disconnected properly. (The test equipment in question must comply with Health and Safety Regulation guidelines).

10. Prior to testing, mains testers should be tried on a known “live” circuit to establish correct working.

11. To allow safe working isolators when switched off should be “locked off” and suitably labelled. If the removal of fuse links is the only available safe method of isolation, then personnel must ensure that the links stay in their possession until the work is completed.

12. On completion of works personnel must ensure that any shields or protection guards removed from isolator during any repairs are replaced in a correct manner.

13. On completion of work check all items isolated are operating and warning notices are removed.

14. Ensure work area is clear of any obsolete equipment, fuses, contractors, etc.

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Assessment Ref: E1.2 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: Electrical Isolation

Risk Element in Method Statement

1. Exposure to the danger of electrical shock.

2. Eye injury.

3. Burn injury.

4. Danger to third parties.

Risk Evaluation: MED/HIGH

Method of Eliminating/Reducing Risk

1.
(a) Use of proper test equipment suitably maintained.
(b) Adequate training to assess risk.
(c) Second person present if risk assessment requires it.

2. Wear protective personal equipment.

3. Effectively cordon off working area and post warning notices.

Imminent Danger Procedure

1. Switch off and isolate electrical supply.

2. Remove injured person(s) from danger area (if without risk).

3. Render first aid.

4. Call emergency services.

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Assessment Ref: E2.1 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: Control Circuits - Fault Diagnosis and Trouble Shooting

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METHOD STATEMENT

NB Reference should be made to the IEE Regulations and the Electricity at Work Regulations 1989 before implementing these procedures.

1. Be familiar with the system before attempting any work

2. Be familiar with all safety and operating controls such as:

- Pressure switches
- Oil differential switches
- Thermostats
- Time delay relay
- Motor starters
- Motor overloads
- Thermistor circuits

3. Check faults in a planned and concise manner.

4. Make sure all power supplies are isolated, withdraw fuses, and lock off isolators and test before proceeding.

5. Use safe and recommended test equipment, i.e. test lamp and amp probe.

6. Start testing from the source of the power supply, and work by a process of elimination.

7. Make sure a sign is available stating the electricity supply has been switched off.

8. When the fault has been located isolate the electricity supply and test.

9. Before replacing faulty component, test to make sure circuit is dead.

10. After replacement of component switch on electricity supply to control circuit and test.

11. Switch on power circuits and test.

12. Remove warning notice from electricity source.

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Assessment Ref: E2.2 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: Control Circuits - Fault Diagnosis and Trouble Shooting.

Risk Element in Method Statement

1. Electrocution.

2. Electric Shock

3. Fire

4. Explosion.

Risk Evaluation: MED/HIGH

Method of Eliminating/Reducing Risk

1. Wear correct personal protective equipment.

2. When working in isolated area(s) ensure other persons are available to render assistance if required.

3. Always ensure that section(s) of electrical system being worked on are satisfactorily isolated.
4. Safe systems of work (Permits to work).

5. Ensure satisfactory working space.

Imminent Danger Procedure

1. Switch off and isolate electrical supply.

2. Remove injured person(s) from danger area (if without risk).

3. Render first aid.

4. Call emergency services.

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Assessment Ref: E3.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Replacement of Electrical Components

METHOD STATEMENT

NB Reference should be made to the IEE Regulations and the Electricity at Work Regulations 1989 before implementing these procedures.

1. Ensure that the electrical system to be worked on is effectively earthed.

2. Switch off and isolate the section of the electrical system from which the components are to be replaced.

3. Post safety hazard notices adjacent to isolator and/or fit “locking off” device to warn other personnel that electrical circuits are switched off for the repairs to be undertaken.

4. With a suitable and proven test instrument. Check there is no secondary voltage or current applied to all the terminals or connections of the component(s) to be replaced or worked on.

5. Replace component(s) as required ensuring that all connections are fully tightened and cables correctly positioned and are secure.

6. Carry out a visual and manual check on the operation of the replacement component(s) (if applicable) i.e. contractors etc.

7. Re-connect and switch on electrical supply and check for satisfactory operation of components and system (as required) and monitor voltage and current as applicable.

8. On completion of work, ensure all items isolated are operational (unless unsafe) and all notices and locking off devices removed.

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Assessment Ref: E3.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Replacement of Electrical Components

Risk Element in Method Statement

1. Electrocution.

2. Electric Shock.

3. Fire.

4. Explosion.

Risk Evaluation: HIGH

Method of Eliminating/Reducing Risk

1. Wear correct personal protective equipment.

2. When working in isolated areas(s) ensure other persons are available to render assistance if required.

3. Always ensure that section(s) of electrical system being worked on are satisfactorily isolated.

4. Safe systems of work (Permits to work).

5. Ensure satisfactory working space.

Imminent Danger Procedure

1. Switch off and isolate electrical supply.

2. Remove injured person(s) from danger area (if without risk).

3. Render first aid.

4. Call emergency services.

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Assessment Ref: E4.1 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: The Inspection and Testing Of Terminals, Fuses, Circuit Breakers and Overloads

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METHOD STATEMENT

NB Reference should be made to the IEE Regulations and the Electricity at Work Regulations 1989 before implementing these procedures.

1. Before proceeding with any inspection and testing of the equipment, ensure there is adequate access and working space available to the equipment with the equipment isolated electrically *(Regulation 15 EWA 1989).*

2. A physical inspection of the equipment should be made to ensure that joints in conduit, trunking and armoured cables are correctly made to ensure earth continuity, other items to be included in the checks are:

a) All connections are tight.

b) That each circuit has a means of isolation.

c) That all removable barriers have been replaced.

d) That labels identifying purpose of switchgear, control gear and safety devices have been installed where confusion would occur as to which item controlled which equipment.

e) That warning notices have been fixed where the voltages exceeding 250 volts in equipment where it would not normally be expected to exist.

f) That the equipment is protected against corrosion, vibration and any other form of environmental condition.

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Assessment Ref: E4.2 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: The Inspection and Testing of Terminals, Fuses. Circuit Breakers And Overloads

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Risk Element in Method Statement

1. Electrocution.

2. Electric shock.

3. Fire.

4. Explosion.

Risk Evaluation: MED/HIGH

Method of Eliminating/Reducing Risk

1. Wear correct personal protective equipment.

2. When working in isolated area(s) ensure other persons are available to render assistance if required.

3. Always ensure that section(s) of electrical system being worked on are satisfactorily isolated.

4. Safe systems of work (Permits to work).

5. Ensure satisfactory working space.

Imminent Danger Procedure

1. Switch off and isolate electrical supply.

2. Remove injured person(s) from danger area (if without risk).

3. Render first aid.

4. Call emergency services.

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Assessment Ref: E5.1 Issue Date: DECEMBER 2018

Risk Priority Med/High

Task: Electrical Connection

METHOD STATEMENT

NB Reference should be made to the IEE Regulations and the Electricity at Work Regulations 1989 before implementing these procedures.

CAUTION: PARTICULAR ATTENTION SHOULD BE PAID TO THE FOLLOWING REGULATION FROM THE ELECTRICITY AT WORK ACT 1989, WHICH IS ABSOLUTE

Regulation 10:
Where necessary to prevent danger, every joint and connection in a system shall be mechanically and electrically suitable for use.

1. Establish what type of joint is required.

2. Check the system voltage.

3. Check that the connection is suitable for the environment.

4. Check that the connection chosen is suitable for the equipment.

5. Check the current carrying capacity of the connection.

6. Special attention should be given to joints required for portable equipment since these may be handled whilst live.

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Assessment Ref: E5.2 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: Electrical Connection

Risk Element in Method Statement

1. Exposure to the danger of electrical shock.

2. Risk of fire due to overheating and overloading of joint.

3. Danger to third parties.

Risk Evaluation: MED/HIGH

Method of Eliminating/Reducing Risk

1. Adequate training to assess risk.

2. Proper use of manufacturer‟s specification tables.

3. Ensuring that joints are situated and/or covered to ensure safe usage.

Imminent Danger Procedure

1. Switch off and isolate electrical supply.

2. Remove injured person(s) from danger area (if without risk).

3. Render first aid.

4. Call emergency services.

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Assessment Ref: E6.1 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: Commissioning and Testing

METHOD STATEMENT

NB Reference should be made to the IEE Regulations and the Electricity at Work Regulations 1989 before implementing these procedures.

1. Ensure proper documentation is available to record results of checks and tests.

2. Complete Permit to Work where required, and adhere to any rules printed thereon over and above these procedures.

3. Obey all Health and Safety rules.

4. Ensure that any tools required for the test in hand are in good condition and suitable for the purpose.

5. Ensure that correct instrumentation is available and in good working order. Any test equipment used for work carried out under this procedure must comply with current Health and Safety guidelines.

6. Cordon off areas within which work is being carried out to prevent the entrance of unauthorised personnel where “live testing” is necessary.

7. Exercise care and use protective barriers or covers where appropriate if it is necessary to work in a “live” situation.

8. Carry out commissioning in an orderly manner on an item to item basis. Data sheets should be filled in as the commissioning task progresses and not at the end of the commissioning period.

9. Carry out appropriate tests prior to connection of electricity supplies.

10. Ensure that on completion of works any shields or protective guards removed from control panels during commissioning and/or testing are replaced in a correct manner.

11. Check on completion of work all equipment is operating and warning notices are removed.

12. Ensure work area is clear of any installation equipment, cables, trays, etc.

13. Complete Permit to Work if required.

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Assessment Ref: E6.2 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: Commissioning and Testing

Risk Element in Method Statement

1. Exposure to the danger of electrical shock.

2. Risk of fire due to overheating of equipment due to loose or poor connections.

3. Danger to third parties.

Risk Evaluation: MED/HIGH

Method of eliminating/Reducing Risk

1.
a) Use of proper test equipment suitable maintained.

b) Adequate training to assess risk.

2. Ensure all connections are inspected and checked.

Imminent Danger Procedure

1. Switch off and isolate electrical supply.

2. Remove injured person(s) from danger area (if without risk).

3. Render first aid.

4. Call emergency services.

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Assessment Ref: E7.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Check Out and/or Change Of an Electric Motor/Compressor Motor.

METHOD STATEMENT

NB Reference should be made to the IEE Regulations and the Electricity at Work Regulations 1989 before implementing these procedures.

1. Become familiar with the equipment and electrical circuits.

2. Make sure all electrical supplies are isolated and necessary warning labels and signs are in place, i.e. "WARNING - MEN WORKING - DO NOT SWITCH ON". Lock off isolators if possible.

3. Check all electrical wiring to make sure all is isolated.

4. Remove wiring and test motor with correct test equipment.

5. Remove motor and replace if faulty, using correct handling procedure.

6. Use correct test equipment to test whether motor wiring is satisfactory.

7. Re-connect electrics making sure it is wired correctly.

8. Ensure safety guards, if applicable, are fitted correctly.

9. Check out circuit(s), and, if correct, switch on and test.

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Assessment Ref: E7.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Check Out and/or Change Of An Electric Motor/Compressor Motor.

Risk Element in Method Statement

1. Electric shock.

2. Handling *(*See *Risk Assessment R11)*

Risk Evaluation: HIGH

Method of Eliminating/Reducing Risk

1. Always use correct tools and equipment.

2. Always isolate supply.

3. Use correct personal protective equipment.

Imminent Danger Procedure

1. Turn off electricity supply.

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Assessment Ref: E8.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: To Provide An Electrical Supply.

METHOD STATEMENT

NB Reference should be made to the IEE Regulations and the Electricity at Work Regulations 1989 before implementing these procedures.

1. Calculate total working current.

2. Check to see if appropriate and adequate supply is available.

3. Calculate cable sizes as per IEE Wiring Regulations.

4. Install equipment and cables in accordance with IEE Regulations.

5. Carry out necessary electrical test and checks, and rectify faults if necessary, *(*see *Task Procedures E6 and E7).*

6. Switch on supply, run and check equipment.

7. Hand over project to client after completing all relevant documentation.

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Assessment Ref: E8.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: To Provide An Electrical Supply.

Risk Element in Method Statement

1. Electric shock.

2. Injury whilst installing equipment and cables.

Risk Evaluation: HIGH

Method of Eliminating/Reducing Risk

1. Make sure supply is isolated.

2. Correct plant and tools are used throughout the project.

3. Correct safety precautions are used/followed.

Imminent Danger Procedure

1. Isolate electricity supply.

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Assessment Ref: Section 3 Contents List

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Issue Date: May 2009 Supersedes: DECEMBER 2018

Risk Priority None

SECTION 3 CONTENTS BUILDING PROCEDURES

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Assessment Ref: B1.1 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: Working at Heights

METHOD STATEMENT

Working at heights presents many problems. It is important that the correct equipment is used so that the potential for accidents is removed as much as possible. Ladders and steps are perhaps the most commonly used access equipment, but are not always the most suitable.

STEP LADDERS
1. Good working order.

2. Correctly opened and securely erected.

3. Ensure they on level ground.

4. Must be in a good state of repair and free from grease on the stiles, etc.

LADDERS
1. Good working order.

2. Correctly and securely fixed at the top. If not the footed, but only if they are under 5m height.

3. Must extend 1.05m above landing place.

4. Must be in a good state of repair and free from grease on the stiles, etc.

5. Should be placed at a suitable angle 1m out for every 4m height.

TRESTLE SCAFFOLD
1. Intended for light work of a short duration.

2. Consists of two pairs of trestles supporting scaffolding boards.

3. Must be on a firm base.

4. Not to be used where anyone can fall more than 4.05m.

5. Recommended that above 1.83m staging is made high enough for persons to work in a sitting position.

6. Only one tier permitted when folding supports used (no guard rails and toe boards required).

7. May be erected on a scaffold platform only if there is sufficient space for men and materials. Must be firmly braced and attached to scaffold.

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8. Scaffold boards must be of equal size.

9. At least one third of the trestle should be above the top platform.

10. Toe boards and guard rails shall be used on fixed trestles where the platform level is over 2m high.

TOWER SCAFFOLDS

1. Ensure an adequate instruction manual is available on site.

2. Shall be erected and maintained by a competent person.

3. Ensure tower remains stable in all weather conditions.

4. The instruction manual must notify you of the maximum height the tower can be erected or for free standing towers the maximum height to at least base ratio.

5. The platform must have a safe means of access on the narrowest side of the tower.

6. Do not climb the tower frame unless a ladder is incorporated.

7. Scaffold towers in which a person could fall more than 2m should be fitted with guard rails and toe boards.

8. The guard rails should be 3' to 3'6" above the platform.

9. The base of the tower must rest on a firm level ground.

10. Before moving the tower, make sure there are no obstructions at high level; remove all tools and equipment from platform.

11. Push tower from base only.

12. Check tower before use for defects etc.

MOBILE ELEVATION MOBILE PLATFORM

1. Operators to be trained and competent (CPCS* or IPAF*)

2. MEWP not to be used if damaged or in high winds

3. MEWP not to be overloaded and never used as lifting appliance

4. Equipment must be adequately serviced and maintained

5. Harnesses to be worn by operatives in boom lifts. In scissor lifts separate risk assessment to be carried out to determine the likelihood of the machine overturning

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6. Wear worn, harnesses to be clipped inside of basket. Lanyard to be of fall restraint type not fall arrest
7. Head protection
8. Separate people routes
9. Toe boards on working platform
10. Waste disposal procedures in operation
11. Work area to be barriered/coned off
12. Route of access planned – especially on street working
13. Hi-visibility barriers on equipment
14. Working area (including footprint of lifting apparatus) barriered
15. Equipment checked prior to use
16. Defect reporting system in operation
17. Weekly, visual, inspection to be carried out by competent person
18. 6 monthly statutory inspection to be carried out by competent person, certificate to be obtained
19. Do not operate near overhead cables
20. As far as reasonably practicable cables to be diverted / buried, shrouded or protected by other means (in this priority)
21. If unable to divert, bury or shroud, relevant authority to be contacted to determine heights of cables
22. Relevant protection to be put in place in accordance with the requirements of the cable owners
23. Separate risk assessment to be carried out for the works being carried out under cables
24. Overhead obstructions to be reviewed before use
25. Keep equipment away from overhead obstructions when practicable
26. Care to be taken when elevating under overhead obstruction
27. Overturning of equipment – use on level ground
28. Equipment only to be used for access – not as a crane

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29. Safe working load of equipment not to be exceeded. Take into account the weights of those using it

30. Tyres properly inflated

31. Check ground conditions

32. Outriggers to be used where fitted

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Assessment Ref: B1.2 Issue Date: DECEMBER 2018

Risk Priority Med/High

TASK: Working At Heights

Risk Element in Method Statement

1. Falling

Risk Evaluation: MED/HIGH

Method of Eliminating/Reducing Risk

1. Use correct method of access and a safe system of work.

2. Use correct personal protective equipment.

3. Do not use any access equipment that have signs of damage

4. Ensure the access equipment been inspected before use

5. Do not over reach – make sure the access equipment is the correct type.

Imminent Danger Procedure

1. Move away or off the access equipment as soon as possible.

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Assessment Ref: B2.1 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Working In Confined Spaces.

METHOD STATEMENT

1. It is important that when working in a confined space that a third person is aware of your locations.

2. Use of safe system of work, this may mean a „Permit to Work" system.

3. There are two main problems in confined spaces:

   a) A leakage of refrigerant/fumes from brazing equipment or other substances which may displace the oxygen.
   b) Electrical shock

4. If in doubt about the safety of yourself, insist that a person is available so that you can communicate if you are in difficulty, and:

   a) Use a lifeline.
   b) Make sure you have a respirator of the type suitable for the task

5. Make sure the electricity supply in the area is switched off and suitably labelled as such.

6. If a refrigerant leak is suspected, leak test prior to entering the area.

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Assessment Ref: B2.2 Issue Date: DECEMBER 2018

Risk Priority High

TASK: Working in Confined Spaces

Risk Element in Method Statement

1. Suffocation.

2. Electrical shock.

3. Burn injuries freezing or normal.

Risk Evaluation: HIGH

Method of Eliminating/Reducing Risk

1. Check for refrigeration leaks before entering confined spaces.

2. Switch off and isolate electricity supply.

3. If brazing or welding evacuate area if there are any signs of dizziness etc.

4. Check COSHH statement before carrying out work.

5. Use correct personal protective equipment

6. Use correct respirator.

7. Shielded and low voltage lighting may reduce risks of burns or electrical shocks.

Imminent Danger Procedure

1. Remove all personnel from danger area (confined space).

2. Switch off electricity supply.

3. Use fire extinguisher.

4. Ventilate area.

5. Isolate equipment.

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Assessment Ref: B3.1 Issue Date: DECEMBER 2018

Risk Priority Medium

TASK: Fixings and Structure

METHOD STATEMENT

STRUCTURES

1. Ensure the suitability (e.g. load bearing or material) of the structure that you are either going to:

a) gain access to
b) fix equipment to
c) fix pipe work on.

2. If in doubt, request information from a specialist:

a) supervisor
b) architect
c) customer
d) site agent
e) foreman.

See *Risk Assessment B1 - Working at Heights (in particular roof works).*

FIXINGS

1. Use correct equipment for carrying out the task. Portable electrical equipment should conform to the Electricity at Work Act.

2. Make sure you are familiar with the nature of the structure and position of services.

3. Use the correct type of access equipment. See *Risk Assessment B1 (Working at Heights).*

4. Use the correct method of fixing as instructed by the fixing manufacturer.

5. Ensure that permission has been given by the client/his representative that the equipment etc can be fixed in the area that you have chosen, and that it is safe to do so.

6. Ensure there are no hazards that will cause a danger when carrying out the task.

7. Ensure that the equipment being fixed will not cause a hazard or danger to personnel working in the area.

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Assessment Ref: B3.2 Issue Date: DECEMBER 2018

Risk Priority Medium

TASK: Fixings and Structure.

Risk Element in Method Statement

1. Falling.

2. Electrical shock.

3. Burns.

4. Refrigerant leakage.

5. Explosion.

Risk Evaluation: MEDIUM

Method of Eliminating/Reducing Risk

1. Check routing of all cables, gas pipes, etc.

2. Switch off electricity supply.

3. Use correct fixing and tools, etc.

4. Use correct personal protective equipment.

Imminent Danger Procedure

1. Isolate equipment.

2. Isolate services.

3. Clear area of all personnel.