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</table>
INTRODUCTION

Welcome

Welcome to the Learner’s Guide for Unit of Competency “Attend to Breakdowns in Hazardous Areas”. This is just one of a number of Learner’s Guides produced for the General Engineering Skills stream of the Metal, Engineering and Maintenance Industry, and it is designed to guide you, the learner, through a series of learning processes and activities that will enable you to achieve the specified learning outcomes for the competency unit.

The content of this guide was developed from the Competency Standard MEMCOR0063A, which is one of the basic building blocks for the National Vocational Qualification of Jamaica (NVQ-J) certification within the industry. Please refer to your Learner’s Handbook for a thorough explanation of standards and competencies, and how these relate to the NVQ-J certification.

You are also advised to consult the Competency Standard and assessment instrument for a better understanding of what is required to master the competency.

This Competency Unit

“Attend to Breakdown in Hazardous Areas” addresses the knowledge and skills requirements for effectively attending to breakdown in hazardous areas. There are four main areas or elements:

- **Element 1:** Prepare to attend breakdown
- **Element 2:** Evaluate extent of work
- **Element 3:** Arrange repair work
- **Element 4:** Confirm completion

As you go through each element, you will find critical information relating to each one. You are advised to study them carefully so that you will be able to develop the necessary knowledge, skills and attitudes for attending to breakdowns in hazardous areas.
Before you start

Before you start this Learner’s Guide, you need to:

a. Obtain a Learner’s Logbook. You will use to record evidence of your new skills/competence. As you demonstrate your new skills, record your activities and have your learning facilitator sign off on them. This will allow you to provide evidence of your competence when you are being assessed against the competency standard.

b. Ensure that you have access to the facilities and equipment necessary for learning.

c. Ensure that your learning resources are available.

d. Ensure that you are wearing suitable clothing, that tools and equipment are safe, and that the correct safety equipment is used.

e. Plan your learning programme (see below)

f. Understand how to use this Learner’s Guide (see below)

Planning your learning programme

The self-assessment checklist on the following page will assist you in planning your training programme as it will help you to think about the knowledge and skills needed to demonstrate competency in this unit. As you go through the checklist you will be able to find out what elements you have already mastered and which ones you will need to pay more attention to as you go through the learning process.

To complete the self-assessment checklist, simply read the statements and tick the ‘Yes’ or ‘No’ box. You should do this exercise now.
# Self-Assessment Checklist

**Attend to Breakdown in Hazardous Areas**

<table>
<thead>
<tr>
<th>Element 1</th>
<th>Prepare to attend breakdown</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I can confirm nature of breakdown with appropriate personnel to establish the need to enter the hazardous area</td>
<td>( )</td>
<td>( )</td>
<td></td>
</tr>
<tr>
<td>2. I can establish safety to enter the hazardous area in accordance with established procedures and obtain relevant clearance to do the work</td>
<td>( )</td>
<td>( )</td>
<td></td>
</tr>
<tr>
<td>3. I can obtain and check testing devices and tools, anticipated as being needed for the work, for correct operation and safety</td>
<td>( )</td>
<td>( )</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Element 2</th>
<th>Evaluate extent of work</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I can follow OH&amp;S policies and procedures for working in a hazardous area</td>
<td>( )</td>
<td>( )</td>
<td></td>
</tr>
<tr>
<td>2. I can ascertain other personnel required to determine cause and rectify breakdown from available evidence and make arrangements for their attendance where applicable</td>
<td>( )</td>
<td>( )</td>
<td></td>
</tr>
<tr>
<td>3. I can ascertain extent of repair work from available evidence and confirm with appropriate personnel</td>
<td>( )</td>
<td>( )</td>
<td></td>
</tr>
<tr>
<td>4. I can establish limits or repair work that can be carried out in-situ with regards to explosion risk and in accordance with established procedures and requirements</td>
<td>( )</td>
<td>( )</td>
<td></td>
</tr>
</tbody>
</table>
Element 3  **Arrange repair work**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I can isolate equipment in accordance with established procedures</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. I can terminate and isolate circuits of equipment being withdrawn from service safely and in manner approved for the classification of the area</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3. I can ensure certification documentation for replacement equipment is sighted that it is identical with the equipment it replaces and is in accordance with the explosion-protection system design</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

Element 4  **Confirm completion**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I can inspect and test explosion-protected equipment after repairs are completed to ensure the integrity of the system</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. I can notify appropriate personnel of the completion of the repair work and document details in accordance with established procedures and requirements</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

**How did you do?**

If you ticked all or most of the ‘Yes’ boxes then you might not need to go through the entire guide. Ask your learning facilitator to assist you in determining the most appropriate action you should take.

If you ticked a few of the ‘Yes’ boxes or none at all then you should work through all of the guide, even though some of the material may be familiar to you.

Plan your learning based on your answers. Be sure to involve your learning facilitator in the planning process.
How to use this Learner’s Guide

This Learner’s Guide is designed to assist you in working and learning at your own pace.

We suggest that you:

- Go through the sections/elements as they are presented (starting at Section 1)
- Check your progress at each checkpoint to ensure that you have understood the material
- Observe the icons and special graphics used throughout this guide to remind you of what you have to do and to enhance your learning. The icons and their meanings are as follows:

  **Complete Assessment Exercise**
  This exercise requires you to think about the knowledge and skills that you have or will develop in this competency unit.

  **Definition Box**
  Words/phrases are defined or explained in this box. The words/phrases being explained are in bold print.

  **Checkpoint**
  This denotes a brain teaser and is used to check your understanding of the materials presented. No answers are provided for the questions asked.

  **Activity**
  This denotes something for you to do either alone or with the assistance of your trainer/supervisor.

  **Reference**
  Points you to the reference materials and
other support documents or resources used in compiling the unit content.
• Ask your learning facilitator for help if you have any problems with the interpretation of the contents, the procedures, or the availability of resources.

• Complete each activity as you come to it. If the activity requires you perform an actual task, be sure to tell your learning facilitator when you get to that activity so that he/she can make any arrangements, if necessary.

• Get your learning facilitator to sign and date the Learner Logbook when you have completed an activity.

• Complete the self-assessment checklist at the end of each section or element.

When you have worked through all elements of the guide, and when you can tick every ‘Yes’ box, you are ready for assessment and should ask your learning facilitator to assist you in making the arrangements to have your performance assessed.

Using the Computer and Other Resources

Where your activities refer you to the library, computer and Internet resources, ask your learning facilitator to assist you with locating these resources. If you are getting your training in an institution, there may be a library and a computer laboratory. If this is not the case, visit the local library and find out what resources are available.

If you are new to the computer and the Internet, someone in the computer room should be able to show you how to use these resources.

Please note that in many of your activities you have been referred to information on the Internet. This is because the Internet has a vast amount of information that can help you in acquiring the particular competencies. We would like to advise you, however, that we cannot guarantee that all the sites will be available when you need them. If this happens, ask your learning facilitator to assist you with locating other sites that have the information you require.

Method of Assessment

Competency will be assessed while you are actually performing the tasks related to this competency, this may be in a real workplace or a simulated situation that accurately relates to the work situation. You are advised to consult the associated competency standard for further details relating to the assessment strategies.

You may now start your learning. Have fun while you work!
ELEMENT 1: PREPARE TO ATTEND BREAKDOWN

LEARNING OUTCOMES

As you go through this element it will provide you with the knowledge, skills and attitudes required to enable you to prepare to attend breakdown. Your learning facilitator is there to assist you with the various activities, so on completion you should be able to:

1. Confirm nature of breakdown with appropriate personnel
2. Establish safety to enter area
3. Obtain the necessary tools/testing devices to carry out work

CONFIRM BREAKDOWN

You should ensure that routine maintenance checks are done on machines and electro-mechanical systems to ensure smooth and efficient operations. It is because of these checks that faulty operations are identified, and such faults are corrected.

Sometimes the area where the breakdown has occurred is more of a hazard than the actual breakdown itself. Before you enter the work area, there has to be some form of confirmation of the type of breakdown that has occurred. This should be ascertained from trained personnel, maybe a maintenance engineer or technician.

Remember that breakdowns do not only happen when the machine or system has halted, but when input/output values are different from input/output-preset values. The type of breakdown that has happened must be clear, i.e.

- Is it electrical or mechanical?
- Is the cause internal or external?
- What failed?
- When did it occur?
- Was anyone present?

CHECKPOINT

With whom would you most likely confirm a breakdown?
ESTABLISH SAFETY TO ENTER AREA

Repair/maintenance work is often considered routine but at any time there might be unseen hazards that may cause serious injuries. Before you go to any breakdown area you should first obtain a safety clearance. There are a number of questions that may be asked that would help to direct you to the cause more speedily:

- Is the cause electrical or mechanical?
- Cause internal or external (local power company)?
- What failed?
- Is machine/system isolated (power turned off)?
- Where is the location (trench, confined space, elevated position)?
- What type of environmental condition is the area (damp, wet, cold, hot)?
- Are there chemicals, fumes, oil, or grease present?

After these questions are answered, your attention should now be directed to, maintenance records, and personal safety, which includes:

- Protective clothing
- Safety shoes
- First aid kit
- Clearance from safety organization if there is chemical spillage

You must also remember never to attempt any form of repair work with personnel who are not trained to effect these repairs.

ACTIVITY

Listen to a machine in your workshop and try to determine if it is working properly. Discuss this with your supervisor.

Refer to: Learner’s Guide LG-MEMCOR0131A Undertake Interactive Workplace Communication (Ask your learning facilitator how to access this)
CHECKPOINT

What five questions can be asked before going to a breakdown area? Why are these questions so important?

ACTIVITY

Try to gain information from a local environmental agency about the necessary precautions that must be taken when visiting a hazardous work site. Discuss with your colleagues and/or learning facilitator

Refer to: Learner’s Guide LG-MEMCOR0131A Undertake Interactive Workplace Communication, MEMCOR0141A Apply Principles of Occupational Health and Safety in Work Environment, MEMCOR0161A Plan to Undertake a Routine Task (Ask your learning facilitator how to access this)

TOOLS/TESTING DEVICES

To effectively carry out repair work at a location it is essential that you take along the correct tools and testing devices. The tools and testing devices that will be identified will depend on the:

- Location of the machine/equipment (trench, above first floor, underground, confined space)
- Type of problem that caused breakdown (electrical or mechanical fault)
- Environmental condition where breakdown has occurred (hot, cold, or wet conditions)
- Tests to be done on machine/equipment (electronic/electrical or mechanical)

Depending on the location you may need:
- Ladder
- Scaffolding
- Hoist
- Winch

OR,
Depending on type of problem you may need:
• Spanners
• Screw drivers
• Electric hand drill
• Drill bits
• Hacksaw
• Measuring tape
• Hammer
• files
• Chisels
• Socket set
• Wrench
• Pliers
• Ac/dc welding set
• Any other specialized tool

Regarding environmental condition and testing requirement you may need:
• Small hp pump
• Hose
• Shovel
• Ammeter
• Voltmeter
• Digital multimeter
• Tachometer
• Torque wrench

ACTIVITY
Discuss the factors that need to be considered in preparing to attend to breakdown.

CHECKPOINT
What are some of the tools and testing devices that may be carried to do repair work?

ACTIVITY
As the supervisor what steps would you follow to prepare to attend to breakdown?
Refer to: Learner’s Guide LG-MEMCOR0131A Undertake Interactive Workplace Communication, MEMCOR0062A Attend to Breakdown MEMCOR0161A Plan to Undertake a Routine Task (Ask your learning facilitator how to access this)
ARE YOU READY TO PROVE YOUR COMPETENCE?

Now that you have completed this element, see if you have fully grasped all the components by doing the following self-assessment.

<table>
<thead>
<tr>
<th>Checklist 1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I know how to confirm breakdown</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. I know how to establish safety to enter area</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3. I understand the necessity of tools/testing devices to carry out work</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Checklist 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Breakdown is confirmed correctly</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. Work clearance is obtained appropriately</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3. Tools/equipment are chosen correctly</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
ELEMENT 2: EVALUATE EXTENT OF WORK

LEARNING OUTCOMES

As you go through this element you need to ensure that you acquire the necessary knowledge, skills and attitudes to enable you to evaluate the extent of work. Your learning facilitator is there to assist you with the various activities, so on completion you should be able to:

1. Adhere to OH&S requirements
2. Work with other personnel to determine cause and rectify breakdown
3. Ascertain extent of repair work
4. Establish limits of repair work

ADHERING TO OH&S REQUIREMENTS

Whenever work is done on a site it is important for you to observe safety measures as it applies to the given situation. Some of these are: clean the work area free of debris, oils, and grease that may cause damage to personnel or equipment.

Remove obstacles such as ladders, scaffolds, or boxes when finished so that they do not cause injury to workers or maintenance personnel.

Observe the safety conditions when working in trenches, confined spaces, elevated positions, hot and cold conditions, and damp and wet conditions.

Look out for pipes underground, observe no naked light signs, wear specific type shoes for the given situation, and look out for gas leaks.

Wear proper protective clothing. Isolate electromechanical equipment. For chemical spills, get clearance from national environment agencies. Can you identify any safety malpractices in the picture below?

[Image: Machine inspection underway in difficult conditions]

CHECKPOINT

Name five OH&S requirements for a work site
OTHER PERSONNEL REQUIRED TO DETERMINE BREAKDOWN

Machines/equipment acquired by any enterprise normally come with some form of warranty during a specified lifetime of the device. This may be in the form of:

- Spare parts
- Operational support
- Technical support
- Condition monitoring
- Periodic maintenance
- Breakdown maintenance
- Corrective action

Sometimes machines/equipment do not give the required output but remain in a functioning mode that seems to indicate everything is running smoothly. At this time it may be necessary for you to call in specialist personnel.

This may be the manufacturer, dealer or specially trained personnel to assess the problem to confirm a breakdown and determine the necessary corrective action to be taken.
This may be site repair, removal of machine/equipment for repair, replacement, or alternative device to be installed instead.

**CHECKPOINT**

Name three warranties that may be given when a device is purchased.

**ACTIVITY**

With the help of your learning facilitator, look at a machine in your workshop and try to determine who would be called in to effect repairs.

**EXTENT OF REPAIR WORK**

Machines/equipment that you operate will generate some form of data to give maintenance personnel information about its condition. This allows the maintenance department to set up maintenance records and maintenance scheduling of the particular device.

The records will show the frequency of failure, causes of failure, what failed, the ones most likely to fail and the corrective actions taken.

You should provide engineering and design support for the systems and/or equipment:

<table>
<thead>
<tr>
<th>Equipment/System</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lathe</td>
<td>Number 6</td>
</tr>
</tbody>
</table>

You should furnish the services of engineers, surveyors, and draftsmen as necessary to support repair and/or modification efforts on the systems during the repair availability for the machine. Where necessary, obtain copies of the system and equipment drawings to facilitate engineering work and services. Print or copy the applicable portions of each drawing for use as working copies. Conduct a check to determine system and/or equipment conditions. Note each drawing to show the current conditions, and include needed changes, including, but not limited to: piping runs, equipment locations, valve identification, cable identification, etc. Verify, to the maximum extent possible, without actual equipment validation, the drawing(s) material lists and specifications for major system components and equipment.
The extent of repair work to be done may also be drawn from past records and also physical inspection of the device. This depends on how much the device has depreciated and how much it has deviated from its preset values.

Sometimes the surrounding conditions may cause the device to be submerged or rust. This would require special care to remove or repair on site. Chemical spillage can also represent very hazardous conditions to operate in.

You should provide repair recommendation and specifications to correct the conditions found during check. Develop work scopes, repair procedures, drawing and sketches to support the refurbishment of the systems and equipment which are not in accordance with standards. Ensure repaired systems and equipment are returned to original condition (or as near to original condition as possible). Include in the repair specifications procedures and processes necessary to ensure quality repair. Provide one copy of the repair specifications and supporting engineering documentation.

**CHECKPOINT**

What do maintenance records show?

**ACTIVITY**

Make notes on what you think would be required to repair a machine in your workshop. Discuss this with your learning facilitator.
LIMIT OF REPAIR WORK

Repairs to devices are not easily done on site because of certain hazardous conditions this may be:

- Location where device has broken down (trench, elevated position, confined space)
- Condition of surrounding where device is located (hot, cold, wet, chemical spill)
- Cause of breakdown (electrical, mechanical)

The work may be performed inside and/or outside, and includes exposure to:

- extreme heat
- noise
- vibration
- mechanical hazards
- chemical hazards
- atmospheric conditions that affect the respiratory system or skin
- oil
- the use of respirator
- confined spaces, and
- darkness or poor lighting conditions

Care must be taken in extremely hazardous conditions when carrying out repairs.

The solution could be to use ladder, scaffolding, winch, or hoist to move the device to a suitable location for repairs. Surroundings should be cleaned free from oils, grease, and liquids.

Refer to:

ACTIVITY

Research other limitations to repair work and discuss with your learning facilitator.
ARE YOU READY TO PROVE YOUR COMPETENCE?

Now that you have completed this element, see if you have fully grasped all the components by doing the following self-assessment.

<table>
<thead>
<tr>
<th>Checklist 1</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I know the OH&amp;S procedures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I know the appropriate personnel to call</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I understand how to ascertain the extent of repair work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I understand how to establish the limit of repair work</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Checklist 2</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. OH&amp;S policies are followed correctly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Appropriate personnel are called</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Extent of repair work is diagnosed correctly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Limits of repair work are established</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ELEMENT 3: ARRANGE REPAIR WORK

LEARNING OUTCOMES

As you go through this element you need to ensure that you acquire the necessary knowledge, skills and attitudes to enable you to arrange repair work. Your learning facilitator is there to assist you with the various activities, so on completion you should be able to:

1. Isolate equipment
2. Terminate and isolate circuits
3. Check certification and documentation of replacement

ISOLATE EQUIPMENT

Whenever you are attempting to do repairs on any device, first shut off the power, then isolate. The power is usually supplied through some form of power cable connected to an isolator switch. Mechanical power is transmitted through:

- Shafts
- Pulleys
- Gears
- Chains
- Hoses

These should be disconnected.

Procedure

Prior to beginning work on any piece of equipment that could start-up, move or release stored energy and de-energize the equipment:

- Lockout any valve, switch, breaker, or other control which supplies energy to the equipment. When the equipment can be restarted from a remote location, you should report the shutdown.
- You will then need to attach a dated and signed tag that indicates the reason for the lockout.
- Before carrying out any further work on the equipment, you should appropriately test the equipment to ensure that it is in fact de-energized.
- Each employee who is required to lock out controls, should be issued personal locks and keys which should only be used for isolating equipment while you service the particular piece of equipment.
- When more than one trades person works on a piece of equipment, each will apply his or her lock to the appropriate control.
- A lock will only be removed by the person who installed it. The lock will be removed only, when the person who installed it is satisfied that it is safe to do so. The person removing the last lock will only do so when he or she is satisfied that it is safe to re-start the equipment.
- No one, other than the person who installed it, should remove a lockout lock. In exceptional cases, the Supervisor responsible for the work may remove a lock after being satisfied that it is safe to start the equipment. The supervisor will immediately report such action to the manager of Engineering Services.
- Before beginning work on equipment that is controlled by a computer system, you should contact the operator and request that the equipment be shut down. You should then isolate the equipment and lock out the control.
- The engineering services should ensure that equipment isolation procedures adequately protect employees.

*ACTIVITY*

Discuss with your learning facilitator the importance of isolating equipment and suggest ways to ensure this is done conveniently to avoid prolonged down time.
TERMINATE AND ISOLATE CIRCUITS

Sometimes you may have to remove circuits from devices for repairs. These should be terminated and isolated from the device. This is done by removing the wiring from its contacts and the individual wires taped at the ends. You may label the various circuits removed, and/or label the individual wires as necessary. Also note:

- Install insulated equipment grounding conductors in all electrical work.
- Busway supply circuits: Install insulated equipment grounding conductor from the grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
- Computer outlet circuits: Install insulated equipment grounding conductor in branch circuit runs from computer-area power panels or power-distribution units.
- Isolate grounding receptacle circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal.
- Isolate grounding conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
- Isolate equipment enclosure circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install an insulated equipment grounding conductor.
- Isolate equipment grounding conductor from raceway and from panelboard grounding terminals.
- Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

ACTIVITY

Carry out the termination and isolation of a circuit given to you by your learning facilitator. Ask for guidance and allow your work to be assessed.
CHECK CERTIFICATION AND DOCUMENTATION

When you replace devices or parts check to see if it is compatible with the system or identical to what is to be replaced. You may check for:

- Power consumption
- Voltage
- Current
- Flow rate
- Input/output
- Operating pressures
- Operating temperatures

The purpose of certification is to confirm that the system, as installed, meets established design requirements, that is, adequate logistic support is available, and that major installation deficiencies are corrected. Certification conferred on any part signals no further certification inspections.

In the case of documentation you should:

- Submit one copy of the documentation needed to support the replacement of equipment, including replacement procedures, engineering drawings, and stability data.
- Submit any changes to the required repair parts in accordance with specification, repair parts; provisioning and stowage.
- Ensure logistic records are updated as necessary in accordance with specification, logistics records and reports; maintenance and update.
- Submit the revised engineering drawings and studies to support the replacement equipment. Such drawing include, but are not limited to: piping, electrical, foundation, and support services drawings.

**ACTIVITY**

Make a checklist using the areas listed, and discuss with your learning facilitator the factors that must be taken into consideration for each when doing a check, then document the repair work.
ARE YOU READY TO PROVE YOUR COMPETENCE?

Now that you have completed this element see if you have fully grasped all the components by doing the following self-assessment.

<table>
<thead>
<tr>
<th>Checklist 1</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I can explain how to isolate devices</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. I understand how to isolate and terminate the circuits</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3. I know how to check certification and documentation</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Checklist 2</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Devices are isolated</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. Circuits are terminated and isolated</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3. Certification and documentation are checked</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
ELEMENT 4: CONFIRM COMPLETION

LEARNING OUTCOMES

As you go through this element you need to ensure that you acquire the necessary knowledge, skills and attitudes to enable you to confirm completion. Your learning facilitator is there to assist you with the various activities, so on completion you should be able to:

1. Inspect and test after repairs
2. Notify personnel after completion

INSPECTION AND TESTING AFTER REPAIRS

After you complete the repairs, inspect the device to check if:

- Circuit boards are inserted securely
- Wiring is connected properly to contacts
- Contacts are free from rust
- Chains are fitted properly to sprockets and greased
- Gears are properly meshed
- Pulleys are secured
- Hoses are clamped securely
- Shafts are secured with keys
- Power cables are connected properly

Use a chart to record the completion of the above information.

After completing the inspection, check if there is power to the device.

Run the machine for 10-second intervals or whatever times the manufacturer recommends. This will show if the required settings are being met.

ACTIVITY

Carry out testing after you have inspected a drilling machine or lathe, and discuss the operation with your learning facilitator. If none of these machines is available, then, use a machine your learning facilitator deems appropriate.
NOTIFY PERSONNEL AFTER COMPLETION

After you have completed the inspection and testing, record all the relevant information on some form of documentation sheet. Notify your supervisor of your activities so that the information may be verified to ensure that the device can be commissioned. Below is an example of a job sheet from which your report may be written:

<table>
<thead>
<tr>
<th>Operation:</th>
<th>Part Name:</th>
<th>Date Issue:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model:</td>
<td>Material:</td>
<td>Wt./lbs</td>
</tr>
</tbody>
</table>

Operator: Date Completed

Where visual inspection was done, ensure all requirements were clearly understood. If you were working from instructions ensure that you understood clearly what needed be done.

Your maintenance report should include:

- date of repairs/replacement/modification
- material used
- parts used
- nature of repairs/replacement/modification
- tools and equipment used
- working condition of component
- name of maintenance personnel

Your report could follow this format:

Description:

Job Pre-Processing Instructions:

- Dependencies
- Prompted Variables
  - None
Job Post-Processing Instructions:

- **Log Entries**
  - Date job run
  - Number
  - Date reports sent

- **Additional Verification**
  - None

- **Additional Procedures**
  - None

- **Report Distribution**
  - Send both ANN1001D reports to Carol Parkinson, 5th Floor, Kaiser
  - UCRS Annuitant Maintenance for (DATE) Report
  - PERS Annuitant Maintenance for (DATE) Report

Rerun Procedures:

**Activity**

Ask your learning facilitator to show you how to make up a documentation sheet to notify the appropriate personnel.

**Activity**

Prepare a maintenance report with specifications determined by your learning facilitator and submit for assessment.
ARE YOU READY TO PROVE YOUR COMPETENCE?

Now that you have completed this element, see if you have fully grasped all the components by doing the following self-assessment.

<table>
<thead>
<tr>
<th>Checklist 1</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I can explain how to inspect and test after repairs</td>
<td>(   )</td>
<td>(   )</td>
</tr>
<tr>
<td>2. I know how to notify appropriate personnel</td>
<td>(   )</td>
<td>(   )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Checklist 2</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inspection and testing are done correctly</td>
<td>(   )</td>
<td>(   )</td>
</tr>
<tr>
<td>2. Appropriate personnel are notified</td>
<td>(   )</td>
<td>(   )</td>
</tr>
</tbody>
</table>