EM143 Maintain emergency power generation equipment used in food and drink operations		
SQA Unit Code	**HD63 04**	
Level 3	**SCQF Level 6**	**Credit value 53**

Unit Summary
This standard identifies the competences you need to carry out corrective maintenance activities on emergency power generation equipment used in food and drink operations, in accordance with approved procedures. This will include the engine/primary power source, the generator, the electrical load connection, and the appropriate control equipment. The maintenance activity will involve dismantling, removing and maintaining faulty or damaged sub-assemblies and
components, including engine components, generator, fans, pumps, valves, couplings, ducting, heaters, filters and control gear, and equipment including speed governors, voltage regulation, safety control devices, fire protection and shutdown systems, measurement display and recording systems, control panels, electrical components and wiring. Food and drink operations is a term used in this standard to cover the following sub sectors of Meat, Drinks, Confectionery, Fresh Produce, Bakery, Seafood and Dairy.

You will be required to apply a range of dismantling and assembly methods and techniques, to include marking/labelling of components to aid the assembly, aligning/adjusting of components, and dismantling components by mechanically dismantling, unplugging, de-soldering, and removal of screwed, clamped and crimped connections.

You will be expected to work with minimal supervision, taking personal responsibility for your own actions, and for the quality and accuracy of the work that you carry out.

In order to be assessed as competent you must demonstrate to your assessor that you can consistently perform to the requirements set out below. Your performance evidence must include at least one observation by your assessor.

You must be able to:	You need to show: Evidence must be work-based, simulation alone is only allowed where shown in ***bold italics***
1. Maintain emergency power generation equipment used in food and drink operations This means you: Work safely at all times, complying with health and safety and other relevant food and drink regulations, directives and guidelines	Evidence of maintaining emergency power generation equipment used in food and drink operations as part of your role in accordance with workplace procedures and within the limits of your own responsibilities.

Follow the relevant maintenance schedules to carry out the required work Carry out the maintenance activities within the limits of your personal authority Carry out the maintenance activities in the specified sequence and in an agreed timescale Report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule Complete relevant maintenance records accurately and pass them on to the appropriate person Dispose of waste materials in accordance with safe working practices and approved procedures	

You need to know and understand: Evidence of knowledge and understanding should be collected during observation of performance in the workplace. Where it cannot be collected by observing performance, other assessment methods should be used.
1. the health and safety requirements of the area in which the maintenance activity is to take place, and the responsibility these requirements place on you not to compromise food safety 2. the isolation and lock-off procedures or permit-to-work procedure that applies to the equipment being maintained including the critical control points 3. the specific health and safety precautions to be applied during the maintenance procedure, and their effects on others 4. the requirements of the British Retail Consortium (BRC) guidelines and standards in relationship to the maintenance activities 5. the specific requirements of your customer/client specifications in relationship to the maintenance activities 6. your responsibilities in relationship to Hazard Analysis and Critical Control Points (HACCP, TACCP, VACCP) during the maintenance activities 7. the importance of wearing the correct personal and environmental protection equipment (PPE) and other appropriate safety equipment during the maintenance process 8. what constitutes a hazardous voltage and how to recognise victims of electric shock 9. how to reduce the risks of a phase to earth shock (including insulated tools, rubber mating and isolating transformers)

10. hazards associated with carrying out maintenance activities on emergency power generation equipment/systems (including moving machinery, hot components, stored pressure/force, live electrical connections, handling oils and coolants, using damaged or badly maintained tools and equipment, not following laid-down maintenance procedures), and how to minimise them to reduce any risks
11. how to obtain and interpret drawings, specifications, manufacturers' manuals and other documents needed in the maintenance process
12. the procedure for obtaining replacement parts, materials and other consumables necessary for the maintenance activities
13. company policy on repair/replacement of components during the maintenance process
14. the basic principles of how the equipment functions, its operation sequence, the working purpose of individual units/components and how they interact (to include principles of power generator sets, the function of the stator, rotor and excitation system, principles of AC power generation, electrical losses, synchronizing and loading, output voltage control)
15. the principles of the equipment's design features for safe operation in a food or drink environment including minimising the chance of contaminates or foreign bodies in the final product
16. generator and prime mover tripping and protection devices
17. generator and bus terminal connections
18. why electrical earthing and bonding is critical and why it must be both mechanically and electrically secure
19. the sequence to be adopted for the dismantling/reassembly of various types of assemblies
20. the methods and techniques used to dismantle/assemble emergency power generation equipment (including removing bolted components and assemblies, removing components requiring pressure, unplugging, de- soldering, removal of screwed, clamped and crimped connections)
21. methods of checking components are fit for purpose, how to identify defects and wear characteristics, and the need to replace `lifed' or consumable items (including lubricants, batteries, lamps, filters, seals and gaskets)
22. how to make adjustments to components/assemblies to ensure they function correctly
23. methods of removing and replacing components and units without damaging the system and infrastructure
24. the use of electrical measuring equipment (including multimeters and resistance testers)
25. methods of testing equipment and systems for leaks, and the tools and equipment that can be used
26. types and application of coolants and antifreeze agents; quantities used; and methods of flushing and filling the system
27. how to check that tools and equipment are free from damage or defects, are in a safe and usable condition, and are configured correctly for their intended purpose
28. the processes in place to segregate the tools and equipment used into high or low risk areas
29. the checks required to ensure that all tools, materials and components are all accountable before operating the equipment
30. the cleaning requirements/policies in place before returning the equipment into full operational production
31. the generation of maintenance documentation and/or reports following the maintenance activity

32. the equipment operating and control procedures to be applied during the maintenance activity
33. how to use lifting and handling equipment correctly and safely in the maintenance activity
34. the problems associated with the maintenance activity, and how they can be overcome
35. the organisational procedure to be adopted for the safe disposal of waste of all types of materials including any spoilt food or drink products
36. the extent of your own authority and to whom you should report if you have problems that you cannot resolve

Evidence of performance may employ examples of the following assessment:

- observation
- written and oral questioning;
- evidence from company systems (e.g. Food Safety Management System)
- reviewing the outcomes of work
- checking any records of documents completed
- checking accounts of work that the candidate or others have written