EM123 Maintain process controller equipment within an engineered system used in food and drink operations		
SQA UNIT CODE	**HD5R 04**	
Level 3	**SCQF Level 6**	**Credit value 56**

Unit Summary
This standard identifies the competences you need to carry out corrective maintenance to process controller equipment within an engineered system used in food and drink operations, in accordance with approved procedures. You will be required to maintain a range of process controller equipment, that typically includes process controllers or sequential controllers (including programmable logic controllers (PLCs), robots) which are working in an integrated system involving two of the following interactive technologies: mechanical, electrical or fluid power. 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

This will involve dismantling, removing and replacing faulty peripheral components, process controller units, and components, down to board level on `unitary' or `rack' type process controller systems. You will also need to be able to load and download process controller programs, check them for errors, make alterations to programs, and create and maintain back-up copies of completed programs.

You will be expected to work with minimal supervision, taking personal responsibility for your 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 process controller equipment within an engineered system 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 Follow the relevant maintenance schedules to	Evidence of maintaining process controller equipment within an engineered system used in food and drink operations as part of your role in accordance with workplace procedures and within the limits of your own responsibilities.

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 procedure or permit-to-work procedure that applies to the system being worked on, including critical control points 3. the isolation procedure which is specific to the process controller system being worked on 4. the specific health and safety food and drink precautions that need to be applied during the maintenance activities, and their effects on others 5. the requirements of the British Retail Consortium (BRC) guidelines and standards in relationship to the maintenance activities 6. the specific requirements of your customer/client specifications in relationship to the maintenance activities 7. your responsibilities in relationship to Hazard Analysis and Critical Control Points (HACCP, TACCP, VACCP) during the maintenance activities 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. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance activities, and where this can be obtained 11. the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD) hazards

12. hazards associated with carrying out maintenance activities on a process controlled integrated system (including handling fluids, stored pressure/force, electrical supplies, process controller interface, using damaged or badly maintained tools and equipment, not following laid-down maintenance procedures), and how to minimise these and reduce any risks
13. how to obtain and interpret drawings, charts, specifications, manufacturers' manuals, history/maintenance reports, symbols used on process controller documents, and other documents needed for the maintenance activities
14. the basic principles of how the system functions, its operation sequence, the working purpose of individual units/components, and how they interact
15. the principles of the equipment's design features for safe operation in a food or drink environment such as minimising the chance of contaminates or foreign bodies in the final product
16. the devices and systems for storing programmes
17. procedures to be applied to storage, location and method of backing up programmes
18. the different types of interface cards, and their application
19. the procedures for the application of computer-based authoring software for design and development
20. the numbering system and codes used for identification inputs and outputs
21. how to search a programme within the process controller for specific elements
22. programming techniques and codes used (including interlocking, timers, counters, sub-routines)
23. the techniques involved in editing, entering and removing contacts from lines of logic and, where applicable, the procedure to be followed for `on' and `off-line' programming
24. the procedure for obtaining replacement parts, materials and other consumables necessary for the maintenance, including their safe/hygienic storage before use
25. company policy on repair/replacement of components during the maintenance activities
26. the techniques used to dismantle/assemble integrated equipment (including release of pressures/force, proofmarking to aid re-assembly, plugging exposed pipe/component openings, dealing with soldered joints, screwed, clamped and crimped connections)
27. methods of attaching identification marks/labels to removed components or cables to assist with re-assembly
28. methods of checking that components are fit for purpose, and the need to replace items such as batteries, boards and other failed items
29. 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 the intended purpose
30. the processes in place to segregate the tools and equipment used into high or low risk areas
31. the checks required to ensure that all tools, materials and components are all accountable before operating the equipment
32. the importance of making `off-load' checks before proving the equipment with the electrical supply on
33. the cleaning requirements/policies in place before returning the equipment into full operational production
34. the generation of maintenance documentation and/or reports on completion of the maintenance activity
35. the equipment operating and control procedures to be applied during the maintenance activity

36. how to use lifting and handling equipment in the maintenance activity
37. the problems that can occur during the maintenance of the process controller system, and how they can be overcome
38. the organisational procedure to be adopted for the safe disposal of waste of all types of materials including any spoilt food or drink products
39. the extent of your own authority and to whom you should report if you have a problem 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