level: 4  
credit: 36  
planned review date: January 1998  
sub-field: Maritime  
purpose: This unit standard is for people in the maritime engineering industry. People credited with this unit standard are able to: identify the sequence of work required to restore and maintain marine instrumentation and control systems; prepare work area and resources for instrumentation and control systems maintenance; service and maintain instrumentation and control systems to schedule; and rectify unacceptable or unscheduled variation to instrumentation and control systems.  
entry information: Open.  
accreditation option: Evaluation of documentation and visit by NZQA and industry.  
moderation option: A centrally established and directed moderation system has been established by Maritime Qualifications New Zealand Inc.  
special notes: 1 Instrumental and control systems includes:  
   - Electronic, pneumatic, electrical, hydraulic.
2 Safety rules, specifications, regulations, legislation, and their subsequent amendments are defined in:
- Marine Pollution (MARPOL);
- Resource Management Act (RMA) 1994;
- Maritime Transport Act (MTA) 1994;
- Company or Organisational rules and regulations;
- Manufacturer’s guidelines.

3 Maintenance activities include:
- scheduled maintenance and servicing;
- restoration.

4 Scheduled maintenance and servicing includes:
- replacement of consumables;
- minor adjustments;
- replacement of faulty components;
- operational changeovers.

5 Restoration includes:
- repair;
- recondition;
- replacement;
- dismantling;
- construction;
- fabrication;
- insulation.

6 Work procedures, codes of practice, legislation requirements include:
- Maritime Safety Authority Regulations;
- Code of Safe Working Practice;
- Maritime Transport Act (MTA) 1994 and its amendments;
- Local Harbour Regulations;
- General Duties;
- Wearing of protective clothing;
- The guarding of machinery;
- Movement on board ship;
- Operation of hatches and lifting plant.

7 Technical requirements are defined by:
- Company or Organisational rules, procedures, and regulations;
Elements and Performance Criteria

element 1

Identify the sequence of work required to restore and maintain marine instrumentation and control systems.

performance criteria

1.1 The defined work sequence is in accordance with the maintenance plan specification.

Range: specification - master schedule and breakdown procedures.

1.2 Maintenance activities are planned in accordance with technical, safety, and procedural specifications, and resource limitations.

Range: technical and procedural specifications are defined by individual companies and manufacturer guidelines.

1.3 The sequence and scope of planned work restore and maintain instrumentation and control systems within agreed time scales.

Range: agreed time scales are set between the individual conducting maintenance and their supervisor.

1.4 The timing and conduct of work maintain planned routine operational demand for systems and equipment.
1.5 Restrictions and variances to work schedules are anticipated and communicated to the supervising officer within a time frame which enables corrective action to be taken.

Range: restrictions and variances - other maintenance, operational requirements, resources.

**element 2**

Prepare work area and resources for instrumentation and control systems maintenance.

Range: work area preparation includes - access, lighting, atmosphere, lifting plant, electrical isolation, machinery isolation, machinery preparation, provision of alternative service.

**performance criteria**

2.1 The equipment and materials selected are safe, serviceable, and of a type and quantity required to carry out the tasks.

Range: equipment and materials - those available at the work site and required to complete maintenance.

2.2 Restrictions and variances to planned resource usage are identified, recorded, and reported in accordance with work procedures, codes of practice, and legislative requirements.


2.3 Materials and equipment are safely handled, stored, and secured in accordance with work procedures, codes of practice, and legislative requirements.

2.4 Work area, machinery, and equipment are confirmed as safe prior to work commencement and comply with legislative requirements, codes of practice, and permit to work procedures.
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2.5 Work area is accessible and free from obstruction for the receiving and storage of materials and resources needed for work to proceed.

2.6 Specifications, plans, materials, and equipment are available at the workplace according to the maintenance schedule.

element 3
Service and maintain instrumentation and control systems to schedule.

performance criteria

3.1 Servicing and maintenance are carried out in accordance with established safety rules and regulations.

Range: service and maintenance - scheduled checks, tests measurements and inspections, replacement of consumables, minor adjustments, replacement of components.

3.2 The sequence and scope of work activities conform with routine maintenance and servicing plans and schedules.

3.3 Variance from plans and schedules is agreed prior to continuing.

Range: agreed between trainee and supervisor.

3.4 System settings are completed to specification.

Range: adjustable settings - input, output, clearances, ranges, power.

3.5 Static checks and tests are completed to statutory regulations and technical requirements.

3.6 Work practices and techniques are completed to specification within stated time frames.

Range: stated time frames - supervisor.
element 4

Rectify unacceptable or unscheduled variation to instrumentation and control systems.

performance criteria

4.1 Rectification of variation is planned and carried out in accordance with established safety rules and regulations.

Range: rectification techniques - installation, replacement, repair, recondition, assemble and dismantle, erect, construct.

4.2 Dismantling and reassembly procedures and equipment conform with technical specification and agreed work plan.

Range: technical specifications - statutory requirements, manufacturer's drawings and plans, manufacturer manuals, supervisor's instructions.

4.3 Dismantled parts are stored, handled, and cleaned in accordance with work procedures and codes of practice.

4.4 The selected method for restoring equipment or system is within identified operational and physical constraints.

Range: constraints - equipment design, equipment position, safety requirements, availability of spares, operational requirements for the equipment, economic.

4.5 Repair of defective parts is completed to manufacturer's or instructed standard, utilising accepted engineering practices.

Range: instructed standard - supervisor’s instructions.

4.6 Selected replacement parts meet system and equipment manufacturer’s specifications.

4.7 Product and components are restored to specification within the agreed time schedules and quality requirements.
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4.8 Static checks and tests meet statutory regulations and technical requirements.

Comments to:

Maritime Qualifications New Zealand Inc
Unit Standard Revision
PO Box 160
WELLINGTON


Please Note: Providers must be accredited by the Qualifications Authority before they can offer programmes of education and training assessed against unit standards.

Accredited providers assessing against unit standards must engage with the moderation system that applies to those unit standards. [Please refer to relevant Plan ref: 0054].