

NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION**STATEMENT OF STANDARDS****UNIT NUMBER:** 3251213**UNIT TITLE:** OPERATIONAL PROCEDURES - PROCESSING

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME

1. CARRY OUT OPERATIONAL PROCEDURES FOR PROCESS UNITS AND SERVICES IN A PROCESS SYSTEM

PERFORMANCE CRITERIA

- (a) The use of start-up procedures is in accordance with given operational procedures.
- (b) The adjustments made are in accordance with the given specifications.
- (c) The use of shut-down procedures is in accordance with given operational procedures.
- (d) The use of emergency shut-down procedures is in accordance with given operational procedures.

RANGE STATEMENT

The range statement for this outcome is specified within the performance criteria.

EVIDENCE REQUIREMENTS

Practical evidence of the ability to use start-up and shut-down procedures, make adjustments and use emergency procedures.

OUTCOME**2. RECORD AND PROCESS OPERATIONAL DATA****PERFORMANCE CRITERIA**

- (a) The recorded measurements and observations are accurate and are structured in a format appropriate to the procedure.
- (b) The assessment of the reliability of results is correct with respect to the degree of accuracy of the procedure.
- (c) The graphical presentation of measurements or observations is/are appropriate to the results.
- (d) The calculations from measurements are correct.

RANGE STATEMENT

The range statement for this outcome is specified within the performance criteria.

EVIDENCE REQUIREMENTS

Written evidence of the ability to record measurements, assess their reliability, produce a graphical presentation and complete calculations.

ASSESSMENT RECORDS

In order to achieve this unit, candidates are required to present sufficient evidence that they have met all the performance criteria for each outcome within the range specified. Details of these requirements are given for each outcome. The assessment instruments used should follow the general guidance offered by the SQA assessment model and an integrative approach to assessment is encouraged. (See references at the end of support notes).

Accurate records should be made of assessment instruments used showing how evidence is generated for each outcome and giving marking schemes and/or checklists, etc. Records of candidates' achievements should be kept. These records will be available for external verification.

SPECIAL NEEDS

In certain cases, modified outcomes and range statements can be proposed for certification. See references at end of Support Notes.

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NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION**SUPPORT NOTES****UNIT NUMBER** 3251213**UNIT TITLE** OPERATIONAL PROCEDURES - PROCESSING

SUPPORT NOTES This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

NOTIONAL DESIGN LENGTH SQA allocates a notional design length to a unit on the basis of time estimated for achievement of the stated standards by a candidate whose starting point is as described in the access statement. The notional design length for this unit is 40 hours. The use of notional design length for programme design and timetabling is advisory only.

PURPOSE This module will enable the candidate to further devise the practical skills required to operate a range of process units and services. This module would be suitable for candidates on a full-time course.

SQA publishes summaries of NC units for easy reference, publicity purposes, centre handbooks, etc. The summary statement for this unit is as follows:

This module will enable you to further develop the practical skills for carrying out operational procedures for process plant. You will also be able to record and process operational data.

CONTENT/CONTEXT Industrial and/or pilot plant could be used to demonstrate these competences. Industrial units would be a great help in reinforcing procedures learnt on pilot plant.

Start-up/shut-down/adjustments for some of the following Services or Process Units. Correct use of equipment (including all safety equipment and/or procedures to the specification). Control or/recording/process variable.

Services

Water	Raw	-	Control valve, purity checks
	Storm	-	(pH, conductivity), De-ionizer units, Capacity of units.
Steam	Quality	-	Choice, control of supply to specification control valves, steam traps, condensate system, venting, purging, cleaning, trace heating.

Vacuum		-	Low and High Vacuum Systems
Electricity	AC/DC	-	Low and High Voltage Supplies
Refrigeration		-	Small and large scale units. Use of cryogenic methods in gas processing e.g. by industrial unit.

Process Units

Distillation		-	Simple, flash, continuous, bath steam, vacuum, azeotropic, molecular cryogenic etc. Packed/Plate towers. Food, reflux top, bottoms take off/control points. Reheater/boiler. Boil up rate. Steady state operation. Entrainment, hold up, dumping, weeping, etc. evidence of.
Extraction equipment		-	Batch, multistage. Stirred tanks, classified, mixer settlers, pulsed columns, centrifugal contractors. Hold up, entrainment, etc.
Gas Absorption Equipment		-	Packed/plate columns. Temperature, pressure, flow rate. Dumping, weeping, etc. - Evidence of.
Absorption Equipment		-	Activated charcoal Molecular sieves Electrostatic precipitators BP filters, etc.
Evaporation and Crystallisation		-	Plate and tube evaporators Cooling and evaporative crystallisers. Batch and continuous type. Tray driers.
Heat Exchangers		-	Shell, tube, plate.
Mixing and Blending Equipment		-	Spargers, use of inert gases Blenders. Sigma blade, anchor paddles, gate, etc. Power required. Torque.
Size Reduction Equipment		-	Mills, Ball and Hammer Crushers, grinders Power requirements Size classifiers.
Size Aggregation		-	Sinter, polleting, briquetting. Temperature, time control.

Gas Cleaning Equipment	-	Wet/dry methods Cyclones, precipitators Bag filters. Scrubbers.
Gas Compression	-	Liquefaction, refrigeration and separation units. Venting unit.

APPROACHES TO GENERATING EVIDENCE A candidate-centred, resource-based learning approach is recommended. The outcomes in this module needs to be taught separately and it is likely that an integrated approach will be used. The outcomes do not need to be tackled in the order shown.

During the work of the module, candidates should have several opportunities to develop practical and problem-solving skills. Each candidate should be assessed at appropriate points throughout the module. Where a candidate is unsuccessful in achieving an outcome, provision should be made for remediation and reassessment.

ASSESSMENT PROCEDURES Centres may use instruments of assessment which are carried out by tutors/trainers to be most appropriate. Examples are as follows:

Outcomes 1 & 2 It is recommended that an assignment is set here whereby the candidate carries out practical exercises and provides evidence of recording and processing the relevant data.

RECOGNITION Many SQA NC units are recognised for entry/recruitment purposes. For up-to-date information see the SQA guide 'Recognised and Recommended Groupings'.

REFERENCES

1. Guidelines for Module Writers.
2. SQA's National Standards for Assessment and Verification.
3. For a fuller discussion on assessment issues, please refer to SQA's Guide to Assessment.
4. Procedures for special needs statements are set out in SQA's guide 'Students with Special Needs'.

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