



Arrangements for:

International Vocational Award (IVA) in

Hydrocarbon Process Operations

(SCQF level 5)

Group Award Code: G900 45

Validation date: March 2008

Date of original publication: July 2008

Version: 02

Acknowledgement

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of International Vocational Group Awards.

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1 Introduction

This is the Arrangements Document for the new International Vocational Award in Hydrocarbon Process Operations, at SCQF level 5, which was validated in March 2008. This document includes: background information on the development of the Group Award, its aims, guidance on access, details of the Group Award structure, and guidance on delivery.

This is a new International Vocational Award (IVA) at SCQF level 5.

It has been developed by the Qualification Design Team (QDT) in response to an identified market need from a variety of locations across the world (including Kuwait, Saudi Arabia and Africa) for a knowledge-based qualification, based on the existing SVQ (level 2) in Processing Operations: Hydrocarbons, which would ensure that successful candidates are equipped with the knowledge and understanding to allow them to gain employment or to progress to a higher level qualification in the Oil and Gas sector.

This IVA is based on the:

- ◆ knowledge and understanding component of the Processing Operations: Hydrocarbons award at SVQ level 2
- ◆ the identified Systems/Processes approach in the Processing Operations: Hydrocarbons award at level 2

2 Rationale for the development of the Group Award

Many countries which have oil and gas resources have, hitherto, had to rely on foreign nationals to undertake the work required to exploit those resources. The reasons for this are many but, in the main, a lack of a trained and skilled indigenous workforce allied to a new found wealth arguably put some of the countries and their governments in something of an economic comfort zone. Many countries (eg United Arab Emirates and West Africa) have recently concluded that it would be more beneficial, in terms of both economic strength and social cohesion, to have an indigenous workforce which can replace the foreign nationals over a period of time. This approach is enshrined in policy and now these countries are looking to develop routes into the workforce for all levels. This IVA is one such route.

Similarly, new areas of discovery and production (eg Equatorial Guinea and Venezuela) can only be exploited if a percentage (sometimes up to 90%) of the workforce is made up of the indigenous population.

Philip Andrews (CEO of Getenergy) said recently in The Times (supplement on 27 Feb 2008):

‘to secure the (*oil production*) business, international companies must sign up to this undertaking, which, if they deliver, brings engineering and technical training to thousands of people who may never have seen an oil installation, let alone operated one. It also creates huge opportunities for universities, technical colleges and training firms involved in delivering skills on behalf of companies’.

Many people in these countries (particularly Africa and South America) have had little or no formal education and will be trained by staff of the operating companies seeking to exploit the oil/gas reserves. This initial training/education should ideally lead onto further training/education which reflects the practicalities of the jobs for which they will be expected to fill. This IVA satisfies all of the requirements in terms of:

- ◆ the clear relationship with the SVQ in Processing Operations: Hydrocarbons (level 2) award
- ◆ the potential for progression onto a full SVQ in Processing Operations: Hydrocarbons level 2 and level 3)
- ◆ the flexible training centre delivery approach which may allow candidates to ‘walk the line’ ie to tour the production facility and identify key components and processes
- ◆ the straightforward and flexible approach to assessment as outlined in each Unit specification
- ◆ detailed learning Outcomes which are recognisable to centres, candidates, employers and professional bodies
- ◆ a response to training, educational and industry needs, adaptable to the local environment
- ◆ preparation for employment (candidates will be ‘industry-ready’)
- ◆ a contribution to the skills, knowledge and understanding required to underpin relevant National Occupational Standards (NOS) and SVQs
- ◆ a focus on the development of candidates practical skills, knowledge and understanding which underpins performance in the workplace

3 Aims of the Award

3.1 Specific

The specific aims of the IVA are to:

- ◆ allow operators to make a positive contribution to the policy on development of the indigenous workforce
- ◆ allow candidates the opportunity to understand the science, technology, systems and processes associated with the processing of oil/gas ie make them ‘industry-ready’
- ◆ contribute to the development of indigenous talent that will eventually be competent to work as production operators in an oil and gas processing facility
- ◆ act as a stepping stone to the full SVQ in Processing Operations: Hydrocarbons at level 2 and/or 3

3.2 General

The general aims of the IVA are to develop candidates:

- ◆ practical skills
- ◆ ability to solve problems
- ◆ transferable skills
- ◆ ability to be flexible and work cooperatively with others in a safety critical environment
- ◆ responsibility for own development
- ◆ planning and organisational skills
- ◆ basic technical skills
- ◆ oral, written and communication skills
- ◆ flexibility, knowledge, skills and motivation as a basis for progression and employability

3.3 Target groups (indigenous)

- ◆ school leavers
- ◆ adults returning to education
- ◆ employed candidates wishing to enhance career prospects
- ◆ unemployed candidates wishing to enhance their job prospects

4 Access to Group Award

Access to the IVA is at the discretion of the centres who may undertake an interview and assessment process based primarily on a candidate's ability to communicate in English and their capacity to understand the basic science and technology within the IVA requirements.

5 Group Award structure

The IVA consists of seven (SCQF level 5) mandatory Units:

Unit	Unit code	Title	SCQF level	Credit
1	F3PP 45	Hydrocarbon Process Operations: Science and Technology	5	1
2	F3PR 45	Hydrocarbon Process Operations: Health, Safety, and the Working Environment	5	1
3	F3PS 45	Hydrocarbon Process Operations: Well Operations	5	1
4	F3PT 45	Hydrocarbon Process Operations: Gas Processing Operations	5	1
5	F3PV 45	Hydrocarbon Process Operations: Oil and Gas Separation Operations	5	1
6	F3PW 45	Hydrocarbon Process Operations: Water Injection Operations	5	1
7	F3PX 45	Hydrocarbon Process Operations: Utility Operations	5	1

5.2 Mapping information

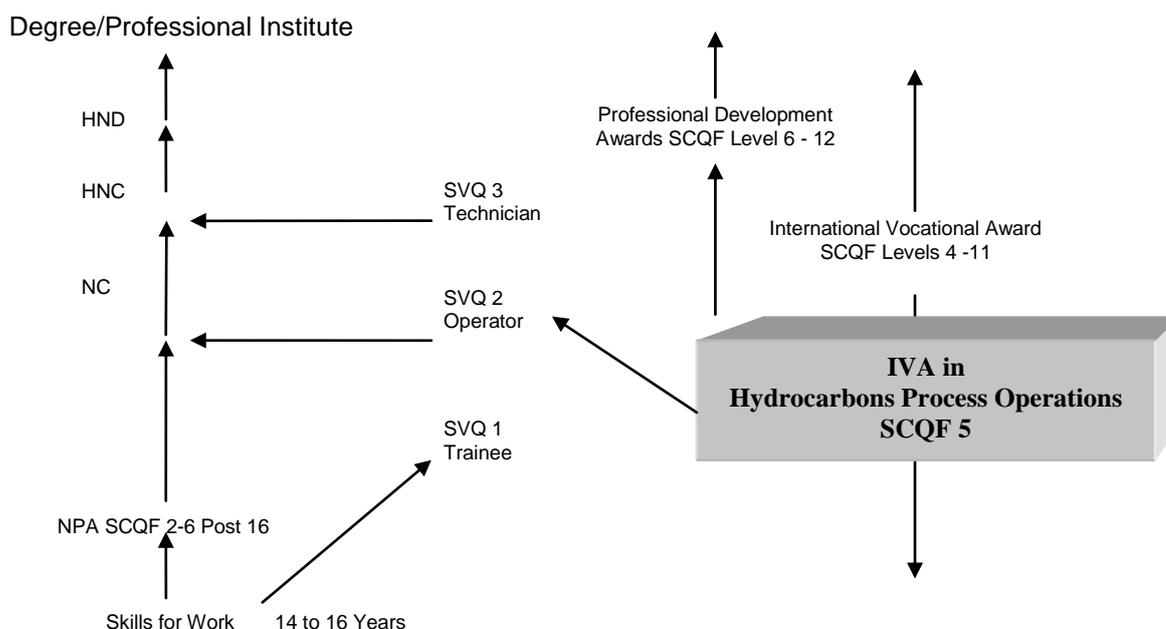
The content of the IVA has been deliberately linked to the suite of SVQs in Processing Operations: Hydrocarbons. The systems and processes which form the titles of the five main ‘technical’ Units used are identical to those identified within the SVQ suite. The knowledge component of each of the relevant NOS in that suite has been combined and included within the Evidence Requirements section of each of the individual Units within the IVA.

This IVA assesses all of the knowledge relevant to the SVQ in Processing Operations: Hydrocarbons (level 2) and provides a platform for progression to the full SVQ level 2 and or 3.

SSC Ref	SVQ Unit Ref	SVQ Unit title	Mapping to IVA Unit
C1	B5K9 04	Contribute to the Health and Safety of the Working Environment	1–7
C4	AT0W 04	Contribute to the Control of Emergencies and Critical Situations	1–7
C6	F22A 04	Establish and Maintain Effective Relationships with Others	2
PT2.1	F22L 04	Prepare and Start Up Process Systems	3–7
PT2.2	D9P2 04	Operate and Monitor Process Systems	3–7
PT2.3	F22H 04	Prepare And Shut Down Process Systems	3–7
PT2.4	F22B 04	Isolate and Reinstatate Process Plant and Equipment	3–7

5.3 Articulation, professional recognition and credit transfer

The IVA supports candidate development and progression in accordance with the Oil and Gas Qualification Progression Model.



6 Approaches to delivery and assessment

Each Unit Specification includes guidance on delivery and assessment.

Suitable training centre or workshop facilities will be necessary for the delivery of this award as well as suitable materials, tools and equipment. A reasonable library should be available with good resources for knowledge and understanding.

Centres should, as a minimum, be able to provide suitable facilities for the delivery of the knowledge component and for the workshop practical component. It is understood that centres may have varying levels of access to live plant and equipment and that this access may be impacted upon by health and safety considerations.

It should be noted that the term ‘workshop practical’ component in the case of this IVA covers a potentially wide range of activities which may include the following examples:

- ◆ undertaking individual or group desk-based exercises to show an understanding of the application of knowledge eg:
 - use of Piping and Instrument Diagrams (P&IDs) to design process/plant isolations
 - use of process flow diagrams and P&IDs to identify flow paths and key components of process systems
- ◆ visiting workshop areas or simulated or live plant where there is a requirement to wear personal protective equipment (PPE)
- ◆ access to working models or examples of some of the components of plant and equipment associated with the processing environment eg valves, small pumps/compressors, metering equipment, etc

Each centre will be required to outline how it will implement the award and the nature of the assessment tools to be used to cover ‘workshop practicals’.

6.1 Delivery

The award could be offered fulltime, part-time, block release, day release or evening. Combination of delivery is also a possibility. Such combined study may enable candidates to complete the award within a shorter time period than any single flexible learning approach.

Delivery of the course will be determined by the prevailing local requirements. Another variable may be the access to production plant afforded to each training centre.

It is recommended that the following Units of this IVA are delivered first in any programme of delivery

- | | |
|---------|--|
| F3PP 45 | <i>Hydrocarbon Process Operations: Science and Technology</i> |
| F3PR 45 | <i>Hydrocarbon Process Operations: Health, Safety, and the Working Environment</i> |

However centres can decide the order, in which Units are delivered, based on candidate recruitment patterns, mode of delivery, resource issues and logical progression dictated by topics and Unit content and level.

While the use of case study material is particularly recommended for both the learning and teaching components of this award, other suggested learning and teaching methods for this award could include: the use of visual aids, information communication technology (ICT), group lectures and discussion, practical demonstrations, question and answer sessions, directed study, industrial/site visits, laboratory assignments, workshop tasks and simulation.

Formative work for the award could specifically include group discussion and role play emphasising workplace health and safety issues and events specific to the oil and gas sector. Such an approach could be particularly beneficial to candidates with no industrial experience.

6.2 Assessment

Assessment guidance is provided in each Unit descriptor. Throughout all Units emphasis should be placed where appropriate on the application of Health & Safety and sustainability issues. Safe working practises should be looked at in accordance with current safety codes of practise and regulations. Sustainability should include reference to criteria affecting the impact of non-compliance on the environment.

Centre developed tools for assessment will be considered during the centre approval process. SQA will provide centres with information based on the knowledge and understanding component of the NOS which make up the Processing Operations: Hydrocarbons (level 2), which can be used to develop an Assessment checklist. This information is in two parts:

- ◆ that which addresses the technical Units (ie Units 1, 3–7) — see Appendix 1
- ◆ that which addresses the ‘non-technical’ Unit (ie Unit 2) — see Appendix 2

The IVA will be assessed by questions (eg multi-choice assessment) and/or workshop practicals.

Evidence of candidate responses, whether in response to written questions or in workshop practical exercises, must be signed by the assessor as confirmation of achievement and retained by the centre.

Where candidates require re-assessment there should be a different set of questions available for that re-assessment.

Assessors should be:

- ◆ Competent in the subject/occupational area to a level appropriate to the qualification
- ◆ Competent in assessment of the type involved in the qualification
- ◆ Familiar with the procedures and documentation for the qualification

Internal Verifiers must be either working in the appropriate sector itself or they must be able to demonstrate they possess practical and up-to-date knowledge of current working practices appropriate to the sector in which they are carrying out verification practices; and appointed by an approved centre. They must have a working knowledge of the award they are internally verifying and be competent in internal verification of the type involved in the qualification.

This should be demonstrated through the provision of details of **all** staff, including qualifications and experience, who will be assessors and/or internal verifiers in relation to the Units for which they are responsible.

7 General information for centres

Candidates with disabilities and/or additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* (www.sqa.org.uk).

Internal and external verification

All instruments of assessment used within this/these Group Award(s) should be internally verified, using the appropriate policy within the centre and the guidelines set by SQA.

External verification will be carried out by SQA to ensure that internal assessment is within the national guidelines for these qualifications.

Further information on internal and external verification can be found in *SQA's Guide to Assessment and Quality Assurance for Colleges of Further Education* (www.sqa.org.uk).

8 General information for candidates

The International Vocational Award (IVA) in Hydrocarbon Process Operations is designed to equip you with the knowledge and understanding to allow you to gain employment or to progress to a higher level qualification in the Oil and Gas sector.

The award will allow you the opportunity to develop an understanding of the science, technology, systems and processes associated with the processing of Oil and Gas. The award will also give you an opportunity to develop your knowledge and understanding of the Health, Safety and Working Environment issues associated within this safety critical industry.

Access to the IVA is at the discretion of the centre that may want to interview and assess potential candidates based primarily on a candidate's ability to communicate in English and their capacity to understand the basic science and technology within the IVA requirements.

To achieve the award you will need to successfully complete 7 mandatory 1.0 credit Units.

Unit	Unit code	Title	SCQF level	Credit
1	F3PP 45	Hydrocarbon Process Operations: Science and Technology	5	1
2	F3PR 45	Hydrocarbon Process Operations: Health, Safety, and the Working Environment	5	1
3	F3PS 45	Hydrocarbon Process Operations: Well Operations	5	1
4	F3PT 45	Hydrocarbon Process Operations: Gas Processing Operations	5	1
5	F3PV 45	Hydrocarbon Process Operations: Oil and Gas Separation Operations	5	1
6	F3PW 45	Hydrocarbon Process Operations: Water Injection Operations	5	1
7	F3PX 45	Hydrocarbon Process Operations: Utility Operations	5	1

You will be assessed on your knowledge and understanding developed in each Unit. The assessment may take a number of forms, including multiple choice questions, practical tasks with checklists or other practical activities when working in teams.

Successful achievement of this IVA will facilitate progression to the full S/NVQ Process Operations: Hydrocarbons at level 2 or 3 and may allow access to a suitable National Certificate or Higher National Certificate in a related discipline.

9 Glossary of terms

SCQF: This stands for the Scottish Credit and Qualification Framework, which is a new way of speaking about qualifications and how they inter-relate. We use SCQF terminology throughout this guide to refer to credits and levels. For further information on the SCQF visit the SCQF website at www.scqf.org.uk

SCQF credit points: One SCQF credit point equates to 10 hours of learning. Units at SCQF levels 2-6 are worth 6 SCQF credit points, Units at level 7 are worth 8 SCQF points.

SCQF levels: The SCQF covers 12 levels of learning. International Vocational Group Awards are available at SCQF levels 4-11.

Qualification Design Team: The QDT works in conjunction with a Qualification Manager/Development Manager to steer the development of the Award from its inception/revision through to validation. The group is made up of key stakeholders representing the interests of centres, employers, universities and other relevant organisations.

Consortium-devised National Certificates/National Progression Awards are those developments or revisions undertaken by a group of centres in partnership with SQA.

10 Appendices

Appendix 1: Further Guidance to centres (Units 1, 3–7)

Appendix 2: Further Guidance to centres (Unit 2)

Appendix 1: Further Guidance to centres (Units 1, 3–7)

This information can be used by centres to set up a checklist for Assessment on **Units 1 and 3-7**.

- 1 How to use 'Safe Systems of Work' processes to identify hazards and mitigate or reduce risks to as low as reasonably practicable (ALARP).
- 2 How to select, use and care for Personal Protective Equipment (to include sight/hearing protection, coveralls, coveralls, gloves, footwear, hard hats, respirators).
- 3 The implications of statutory and organisational requirements.
- 4 How to access and interpret operational requirements (eg Policies, procedures, instructions, codes of practice, standards, schedules).
- 5 Sources of information and interpretation of drawings and manuals regarding the plant.
- 6 The nature of information required (eg oral, written, equipment status, process status, handover reports).
- 7 How to access and interpret (oral and written) operational instructions (to include sequence of shutdown, recommended rate of shutdown, work activity briefing provided to others, clarification of operational instructions, work activity recording, safety, downtime, integration of processes, reinstatement completion details).
- 8 How to access and interpret instructions (to include process system specification, production schedule, covering different plant and equipment).
- 9 Work area hazards (to include spillages, uncontrolled emissions, H₂S and other toxic substances, extreme weather conditions).
- 10 Plant layout and its connection with other systems.
- 11 How to access and interpret drawings and manuals regarding the plant.
- 12 The effects of changes in ambient conditions on plant operation.
- 13 Who to deal with (to include co-workers, supervisors, managers, workers of other disciplines).
- 14 How to work with and within the Safe Systems of Work system.
- 15 The limits of your own responsibilities.
- 16 How to identify faults (to include damage, wear, malfunction, process deviations, service defects).
- 17 The appropriate action to take on identification of faults in the plant and utilities how to achieve optimum processing.
- 18 Equipment internals and their function.
- 19 Functioning of process control including instrumentation and logic.
- 20 Normal plant conditions and the tolerances within which they operate.
- 21 Composition and properties of feedstock (to include toxicity, flammability, S G and temperature).
- 22 Reactions taking place, conditions and effects of changes (to include chemical and physical properties).
- 23 The effects of changes of ambient conditions on plant operation.
- 24 Hydrocarbon hydrate formation — prevention — dispersion.
- 25 Effects of Emergency Shut Down control systems.
- 26 Effects of Fire and Gas control system.
- 27 Effects of loss of any utility and its reinstatement.
- 28 How to identify and deal with critical situations (to include process deviations, extreme weather conditions, spillages, uncontrolled emissions).

- 29 How to deal with process system throughput (to include increase/decrease throughput, specified sequence, recommended rate).
- 30 How to identify process system faults (to include lack of services and supply, variances in services, mechanical and electrical breakdown, process and utility setting deviations).
- 31 The actions appropriate to critical situations (to include quick shutdown, return process with safe parameters, operate standby equipment).
- 32 What steady state conditions are and how they are achieved.
- 33 Types and causes of deviations and the relevant actions (to include report, record, adjust) to take when they occur.
- 34 How to perform leak testing and sampling and how to interpret results.
- 35 Equipment internals and their function.
- 36 Functioning of process control including instrumentation and logic.
- 37 The real and potential shutdown hazards (to include standby equipment operational, vents, noise, heat).
- 38 How to input and set shutdown settings, process variables and services.
- 39 The real and potential shutdown hazards (to include standby equipment operational, vents, noise, heat).
- 40 How to isolate plant and utilities from operating sources.
- 41 The factors impacting upon optimising performance (to include layout, tools and equipment required, purging medium required).
- 42 How to identify hazards (to include spillages, uncontrolled emissions, extreme weather conditions).
- 43 The principles of de-isolation.

Appendix 2: Further Guidance to centres (Unit 2)

This information can be used by centres to set up a checklist for Assessment on **Unit 2**.

- 1 How to use 'Safe Systems of Work' processes to identify hazards and mitigate or reduce risks to as low as reasonably practicable (ALARP).
- 2 How to select, use and care for PPE (to include sight/hearing protection, coveralls, coveralls, gloves, footwear, hard hats, respirators).
- 3 The implications of statutory and organisational requirements
- 4 How to interpret operational requirements (eg relevant policies, procedures, instructions, codes of practice, standards, schedules).
- 5 How to obtain and interpret information on safety.
- 6 Your own responsibilities as they relate to Organisational Safety Policy, Workplace Safety Policy, Evacuation Procedures, Fire Procedures, the Classification, Packaging and Labelling of Dangerous Substances Regulations; Environmental Protection Act.
- 7 How to implement workplace reporting procedures.
- 8 How to access fire protection, first aid and survival equipment.
- 9 How to deal with materials (eg flammable, toxic, corrosive, explosive, cryogenic, radioactive).
- 10 How to use safe lifting and handling techniques.
- 11 Emergency procedures relevant to the workplace.
- 12 The operation of and potential implications of Emergency Shutdown systems.
- 13 The principles and operation of Fire and Gas control systems.
- 14 The internals of equipment and their function and operation.
- 15 The installation/site layout.
- 16 The effect and potential implications of loss of any utility and its reinstatement.
- 17 How to react appropriately (eg make safe; isolate; shutdown; evacuate the work area).
- 18 How to treat others in a manner which promotes and maintains goodwill.
- 19 The requirements of workplace practices relating to visitors.
- 20 Who to refer visitors to when they require information that is not within the individuals job responsibility.
- 21 Appropriate responses to make, when dealing with work related difficulties or breakdowns in relationships.
- 22 Workplace reporting procedures.
- 23 Emergency procedures.
- 24 Who to seek clarification from when communications cannot be clearly understood.
- 25 Where to obtain operational policies, procedures, instructions, code of practice, standards and schedules from, and how to implement them.
- 26 The importance of passing on information that is accurate and complete, and the need at times, to clarify information that is received.
- 27 Methods for passing on accurate and complete information.
- 28 The nature of work area hazards, and ways to control and/or minimise risks.