

IGEM/TD/102
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Competence framework



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SECTION 1 : INTRODUCTION

1.1 This Guidance is part of a series of Institution of Gas Engineers and Managers (IGEM) publications, for all sectors of the gas industry providing practical guidance to support the Gas Safety (Management) Regulations (GS(M)R), Gas Safety (Installation and Use) Regulations (GS(I&U)R) and the Pipelines Safety Regulations (PSR). The Guidance also supports engineers in carrying out their work in achieving their company's business objectives. It has been drafted by an IGEM Working Group, which included representatives of all the gas distribution networks, the association of independent gas transporters (AIGT), BG Group, Energy and Utility Skills (EU Skills) and independent consultants, appointed by IGEM's Gas Transmission and Distribution Committee, and has been approved by IGEM's Technical Co-ordinating Committee on behalf of IGEM's Council.

1.2 This Guidance is the basis for good practice for the industry, including but not limited to:

- Gas transmission and storage companies
- Gas distribution network companies
- Independent gas transporters
- Liquid Natural Gas (LNG) storage and transmission companies
- Liquid Petroleum Gas (LPG) storage, transmission and distribution companies
- The nominated contractor
- Health and Safety Executive (HSE)
- Office of Gas and Energy Markets (Ofgem)
- Individuals who are or aspire to be employees in the industry.

1.3 The relevant parts of this Guidance may be cited in a gas transporter's (GT's) Safety Case.

1.4 This Guidance makes use of the term "must". The term "must" identifies a requirement by law in GB at the time of publication.

Such a term may have different meanings when used in legislation, or Health and Safety Executive (HSE) Approved Codes of Practice (ACoPs) or guidance, and reference needs to be made to such statutory legislation or official guidance for information on legal obligations.

1.5 The Competence Framework, developed by IGEM and supported by EU Skills, is intended to provide a means that companies may use to determine competence requirements for particular roles and assess whether individual employees meet those requirements. The Competence Framework may also be used by individual employees or those aspiring to roles in the industry to understand and seek to demonstrate the relevant competence.

The Guidance associated with the Competence Framework includes a process that may be applied to all roles within the scope set out in Section 2 but the detailed supporting information in Appendix 3 has been compiled from an existing asset management model and is not currently comprehensive for all industry roles. It is intended that the contents of Appendix 3 will be reviewed regularly by IGEM, revised in the light of feedback from those who have used the Competence Framework and extended where appropriate to include additional categories and subject areas identified by users.

- 1.6 New and improved practices may be adopted prior to this Guidance being updated. Amendments to this Guidance will be issued when necessary and their publication will be announced in the Journal of IGE and elsewhere as appropriate.
- 1.7 Requests for interpretation of this Guidance in relation to matters within its scope, but not precisely covered by the current text, should be addressed to Technical Services, IGE, IGE House, High Street, Kegworth, Derbyshire, DE74 2DA. Such requests will be submitted to the relevant Committee. Any advice given by or on behalf of IGE does not imply acceptance of any liability, and does not relieve any party of their obligations.
- 1.8 This Guidance was published in June 2012.

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SECTION 2 : SCOPE

2.1 The purpose of this Guidance is to provide a recognised industry framework that will enable businesses to sustain the management and supervisory technical competences required to carry out their work and assist to achieve their business objectives.

2.2 Competence is defined as the ability, appropriate training, knowledge and experience to carry out the work being undertaken against defined standards, assessed consistently, over time, in the workplace.

2.3 The term 'Competent Person' (CP) occurs frequently in the safety Regulations. Clarification of the definitions of competence has been established through case law brought under these Regulations.

"A Competent Person should have practical and theoretical knowledge as well as sufficient experience of the particular machinery, plant or procedure involved to enable them to identify defects or weaknesses, and to assess their importance in relation to strengths and functions of the machinery." (Taken from *Brazier v. Skipton Company* (1962) His Lordship Winn).

For the purposes of this Guidance, a competent person is defined as a person having the ability, appropriate training, knowledge and experience to supervise or carry out work being undertaken in a safe and proper manner (see IGEM/G/4).

2.4 This Guidance is targeted at the transmission, storage and distribution sector of the gas industry, which includes Natural Gas (NG), LNG and LPG installations, but could be applied to other parts of the industry if required.

2.5 This Competence Framework may be used for any engineering specialist or first line and above, engineering manager within the gas industry. It is a generic framework, but may be built upon for particular specialist roles by adding competence requirements that apply to these roles as necessary.

2.6 It is intended that application of the Competence Framework will enable gas industry companies to demonstrate the competence of their engineering specialists, such as planners and network analysts and engineering managers, through a systematic process. The outcomes that may be obtained through implementation of this framework are:

- to enable companies to comply with statutory obligations for competence, in order to maintain the licence to operate
- to assure the public and other gas industry stakeholders that the industry is being managed by competent people and companies
- a comprehensive competence matrix for all engineering specialists and managers in scope
- individual competence profiles for each engineering specialist and manager
- a suitable means of assessment
- a training needs analysis that enables appropriate action planning
- to plan and budget for training provision
- demonstrably competent post holders
- to inform workforce planning strategies
- to inform the planning of engineering succession
- provide employees with career path navigation routes
- to provide a basis for individuals to demonstrate competence
- to assist the development of individual engineers
- to inform strategies for the development of professional engineers
- to provide a link to registration routes.

SECTION 3 : CONTEXT

- 3.1 Gas transportation is a high hazard industry (see Note) and, as a consequence, is more heavily regulated than other utilities and other construction industries. Regulations impose explicit duties on gas transporters to ensure that people are competent to carry out a range of work. Specific competence obligations in Regulations have recently been reinforced by changes in corporate accountabilities for safety management. Technical capability is essential for gas transportation businesses to discharge these duties and meet their obligations to shippers, gas consumers, shareholders and members of the public.

Note: High Hazard Industries were defined by HSE in their policy statement on permissioning regimes as those where there "are significant risks of multiple fatalities from a single or linked series of event(s) and/or there are risks of widespread and significant adverse effects on human health".

- 3.2 All recognised management system standards include requirements for training or competence. Nevertheless, there are no recognised standards for competence management systems and the United Kingdom Accreditation Service (UKAS) considers that competence is a recurring problem with certification of management systems of all types.
- 3.3 Some gas industry companies base their competence assurance on internal systems that are not related to defined occupational standards and do not include formal methods of assurance that demonstrate "the ability, appropriate training, knowledge and experience to carry out the work being undertaken, assessed consistently, over time, in the workplace", as defined by the UK system of vocational education and training.
- 3.4 Other high risk industries have different approaches to competence assurance. The civil aviation industry has rigorous systems for training and competence assurance, which date back to 1944 when international standards were established. There are no formal systems of licensing of operational personnel in the nuclear power industry. Some roles have formal periodic competence performance assessments but, as with the gas transportation industry, general competence assessment forms part of an organisation's safety management system. The arrangements in the offshore industry are similar. Competence assessment forms part of an organisation's safety management system but there are industry guidelines for the regular validation and authorisation of some safety critical roles.
- 3.5 The gas industry is diverse and is managed and operated by a range of asset owners and their supply chain partners. This disaggregated structure has many positive elements, but also creates the potential for inconsistent approaches to ensuring the competence of specialist engineers and engineering managers in the industry.
- 3.6 The Competence Framework, developed by IGEM and supported by EU Skills, is intended to provide a means that companies may use to determine their competence requirements for particular roles. Having determined the specific requirements for a role, the Framework then supports the assessment of evidence that an individual meets those requirements.
- 3.7 It is now widely accepted that the majority of accidents in industry generally are in some measure attributable to human as well as technical factors in the sense that actions by people initiated or contributed to the accidents, or people might have acted in a more appropriate manner to avert them.

It is therefore necessary to give proper consideration to the management of these human factors and the control of risk. To assist in this, it is recommended that due regard be paid to HSG48 and HSG65.

SECTION 4 : LEGAL AND ALLIED CONSIDERATIONS

4.1 GENERAL

4.1.1 This Guidance is set out against a background of legislation in force in GB at the time of publication. The devolution of power to the Scottish, Welsh and Northern Ireland Assemblies means that there may be variations to the legislation described below for each of them and consideration of their particular requirements must be made. Similar considerations are likely to apply in other countries where reference to appropriate national legislation is necessary.

4.1.2 All relevant legislation must be applied and relevant Approved Codes of Practice (ACoPs), official Guidance and referenced codes, standards, etc. will be taken into account.

Note: Appendix 2 is relevant in this respect.

4.1.3 Health and safety legislation must be observed, especially those requirements which are concerned with the duties of Employers, not only to their own employees, but also to members of the public who may be affected.

4.1.4 Unless otherwise stated, the current editions of legislation and standards apply.

4.1.5 In the absence of specific legislation, it is essential that installations are designed, constructed, installed, operated and maintained so as to be safe.

4.1.6 The legislation appropriate to any installation will depend largely upon its location. Advice will need to be sought from the relevant Authorities.

4.1.7 Where British Standards, etc. are quoted, equivalent national or international standards, etc. equally may be appropriate.

4.1.8 The primary responsibility for compliance with legal duties rests with the Employer. The fact that certain employees, for example 'responsible engineers', are allowed to exercise their professional judgement does not allow Employers to abrogate their primary responsibilities. Employers must:

- have done everything to ensure, so far as is reasonably practicable, that there are no better protective measures that can be taken other than relying on the exercise of professional judgement by people in roles that are expected to exercise that professional judgement
- have done everything to ensure, so far as is reasonably practicable, that people in roles that are expected to exercise professional judgement have the skills, training, experience and personal qualities necessary for the proper exercise of their professional judgement
- have systems and procedures in place to ensure that the exercise of professional judgement is subject to appropriate monitoring and review
- not require people in roles that are expected to exercise professional judgement to undertake tasks which would necessitate the exercise of professional judgement that is not within their competence. There should be written procedures defining the extent to which people in roles that are expected to exercise professional judgement can exercise such professional judgement. When people in roles that are expected to exercise professional judgement are asked to undertake tasks which deviate from this they should refer the matter for higher review.

4.1.9 Safety Case duty holders are required to put in place a competence assurance system that includes competence standards, assessment and reassessment. The HSE also requires duty holders to link safety critical activities, work roles and responsibilities with a comprehensive management system.

4.2 PRIMARY LEGISLATION

The Primary Legislation that applies to the gas industry includes:

- Gas Act
- Environmental Act
- Environmental Assessment (Scotland) Act
- Environmental Protection Act
- Health and Safety at Work etc. Act
- New Roads and Street Works Act (NRSWA)
- Oil and Pipelines Act
- Town and Country Planning Act
- Town and Country Planning (Scotland) Act
- Traffic Management Act.

4.3 SECONDARY LEGISLATION

The Secondary Legislation that applies to the gas industry includes:

- Construction (Design and Management) Regulations (CDM)
- Control of Major Accident Hazard Regulations (COMAH)
- Gas Safety (Management) Regulations (GS(M)R)
- Gas Safety (Installation and Use) Regulations (GS(I&U)R)
- Management of Health and Safety at Work Regulations (MHSWR)
- Pipelines Safety Regulations (PSR)
- Pressure Systems Safety Regulations (PSSR)
- Provision and Use of Work Equipment Regulations (PUWER)
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR).

SECTION 5 : COMPETENCE FRAMEWORK

5.1 COMPETENCE, DEFINITION AND ASSESSMENT

The Competence Framework recommends that the competence requirement for each task allocated to a person deemed by a company to be within scope is specified in terms of theoretical knowledge, practical knowledge and sufficient experience, and its assessment is carried out by someone who has demonstrated their competence in both the task and in assessment through reviewing and confirming evidence under these categories, and gives examples of typical evidence.

5.2 OUTLINE OF THE COMPETENCE FRAMEWORK

5.2.1 The Framework (see Figure 1) is based on a competence matrix (see Appendix 3) that defines the requirements for activities within the following categories:

- Safety, Environmental and Regulatory Management
- Business Management
- Information Management
- Risk Management
- Leadership
- Create and Acquire Assets
- Operate and Maintain Assets
- Dispose of/Renew Assets.

The matrix has been compiled from an existing asset management model containing these categories. Additional categories may need to be included when the approach is applied in other industry contexts.

Each category consists of a number of subject areas for which requirements related to three levels of proficiency are set out. These levels of proficiency are defined as follows:

- **Foundation:** is able to communicate on the subject clearly and when required select from a variety of options and explain the most appropriate, thus demonstrating an understanding of effects and consequences. Is able to carry out work with supervision from someone more proficient
- **Professional:** demonstrates the competence to select the most appropriate option to improve effectiveness and efficiency. Where required, links across different aspects of topic thus creating integrated solutions. Is able to carry out work without supervision from someone more proficient
- **Mastery:** when dealing with conflicting objectives, uses the optimum integrated option to promote long-lasting achievement. Creating innovative step performance changes which may rely on a new approach. Is able to train and assess others.

By using the matrix categories and subject areas, together with the levels, each specific engineering specialist and manager role within an organisation may be plotted by companies and a profile produced. This then enables a mapping exercise to be carried out with each individual post holder, to determine alignment between the individual's competence profile and the template.

- 5.2.2 Following this mapping exercise, any gaps identified may be analysed to produce a plan with appropriate actions initiated to close the gaps.

A chart illustrating the process is shown in Figure 1 and the matrix is in Appendix 3.

5.2.3 **Assessment of Evidence**

In line with best practice, any assessment of evidence has to adopt the following principles:

- the assessor is objective and independent
- the assessor is vocationally competent
- the assessor is qualified to assess
- the assessor has no conflict of interest in the outcome
- all evidence is validated as authentic
- the assessment process is independently verified
- all evidence is current (usually defined as not more than three years old).

5.2.4 **Recording of Evidence**

It is important that evidence gathered and used to determine competence is collected and stored using appropriate media, to provide an auditable trail. This composite record, which is "owned" by the individual it relates to, provides valuable information for a range of purposes including:

- job transfer or change of role
- indication of capability to undertake specific projects or tasks
- demonstrating active CPD.

Typical sources of evidence that may be captured include:

- job records
- project reports
- witness statement
- technical Papers
- presentations
- commendations from external sources
- qualifications
- training Certificates
- seminar or relevant conference attendance.

Note: The above two lists are not exhaustive.

5.2.5 **How to use the Framework**

The process is illustrated in Figure 1. Some activity boxes that warrant supporting comments have been numbered and are elaborated in clause 5.2.6.