

| Competency Level (characteristic) | Description  | Knowledge   | Supervision   | Responsibility                                  | Summary  |
|-----------------------------------|--|---|---|---|--|
| <b>Awareness (probation)</b>      | This level is for new or inexperienced individuals with no competencies, and individuals (such as senior managers) who only want an 'awareness' of a competency. These individuals can be considered in a 'probation' or 'awareness' period, where time is allowed for a job holder to demonstrate basic understanding of the job competencies, but is not required to carry out work without close and continuous supervision in all of the tasks associated with the competency. |   |   |   | Can interpret and evaluate the knowledge, and can both communicate it and present coherent arguments.  |
| <b>Foundation (knowledge)</b>     | Understanding of effects and consequences.   | Knowledge and understanding of best practice <sup>[1]</sup> .   | Is able to carry out work <b>with supervision</b> . | The Practitioner/ Expert supervises their work. | Critical understanding and analysis of the knowledge, and able to <b>apply the knowledge</b> .   |
| <b>Practitioner (application)</b> | Demonstrates competence to select the most appropriate options.  | Aware of current developments, and has demonstrated experience <sup>[2]</sup> , and can apply knowledge to new situations.                              | <b>No supervision required.</b>                     | Can supervise Foundation Level.                 | Able to self-manage, with a critical and systematic understanding of the knowledge, and can <b>make judgements and propose solutions</b> .   |
| <b>Expert (creation)</b>          | Breadth of experience and knowledge. Deep understanding of best practices.   | Demonstrated managerial skills to undertake overall responsibility of a function, and can apply new knowledge to new situations, and deliver solutions. | <b>Can train and assess others.</b>                 | Can supervise Practitioner Level.               | A self-learner with a critical awareness of current and complex issues and best practices, and is able to do original work, deal with multiple problems; able to explain theoretical bases and weaknesses, and can propose new solutions. <b>A subject matter expert<sup>[3]</sup></b> . |

[1] 'Good practices' are practices, documents, and guidelines produced by: government departments; standards-making organisations (e.g. ISO, ASME, CEN); trade federations; professional institution; etc.. They are readily available, and recognized as current practice. They can be considered 'minimum' requirements. 'Best practice' goes beyond these 'good practices', and would be expected to be the best available practice, supported by other practices that give a measured and demonstrable improvement. Being 'the best' and 'best practices' are not the same thing. A 'best practice' may have been accepted by the profession or industry, but there may well be a better practice in existence somewhere in the world, which eventually will be accepted as the new best practice, but in the meanwhile, it is reasonable to continue with the existing best practice, and it is not necessary to search for this more novel best practice<sup>1</sup>

[[2] 'Experience' is work activity accomplished under the direction of qualified supervision, but excluding time spent in organized training programs<sup>2</sup>. It indicates the workplace experience required to demonstrate competency. This will include years of experience, level of experience, and type of experience. Experience is the process of obtaining knowledge and skills from doing and/or participating in relevant projects, and the accumulation of knowledge and skills leads to a competency.

[3] A subject matter expert (SME) is often quoted in the literature and regulations. The USA Department of Transportation (which regulates pipelines) defines 'subject matter expert' as<sup>3</sup> 'An individual recognized as having a special skill or specialized knowledge of a process in a particular field, or of a piece of equipment.' It is likely that a subject matter expert will need at least 10 years of relevant experience<sup>4,5</sup>, although some caution is needed with older engineers: 'Old-timers have the wisdom... but are at risk if they don't keep up with the scientific and technical knowledge of the profession.'<sup>1</sup>

<sup>1</sup> P Strahlendorf, "'Reasonably Practicable" in Health, Safety and Environmental Legislation', Report for Natural Resources Canada. Toronto University, Canada. 30th June, 2016.

<sup>2</sup> Anon., 'Pipeline Transportation Systems for Liquids and Slurries', American Society of Mechanical Engineers. ASME B31.4-2016. 2016.

<sup>3</sup> [https://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline%20Training/OQ%20Guide/e\\_Chapter\\_II.pdf](https://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline%20Training/OQ%20Guide/e_Chapter_II.pdf)

<sup>4</sup> S Little, T Ray, 'Managing Knowledge', 2nd Edition. Open University. Sage Publications. London. 2011.

<sup>5</sup> Anon., 'Cathodic protection - Competence levels and certification of cathodic protection personnel'. BS EN 15257:2006 (EN15257). December, 2006