

Introducing



International Simulation Engineer

*The ISE (International Simulation Engineer) qualification allows engineers and analysts within the international simulation community to demonstrate and record skills acquired throughout their professional career. Independently assessed by NAFEMS, the international association of the engineering analysis community, the qualification enables individuals to gain recognition for their level of competence and experience as well as enabling industry to identify suitable and qualified personnel.*

*The qualification incorporates an extensive range of competencies across various analysis types. Furthermore, it is multi-level, supporting the philosophy of lifelong learning. ISE is therefore suitable for both experienced engineers/analysts and those in the early stages of their professional career.*

*Striving to provide a standard of competence for the international simulation community, ISE enables individuals to achieve various 'levels' as their competence is established and developed. Individuals who successfully apply for the scheme will receive recognition as an International Simulation Engineer (ISE) at a specified grade which will be updated as they progress through the various levels.*

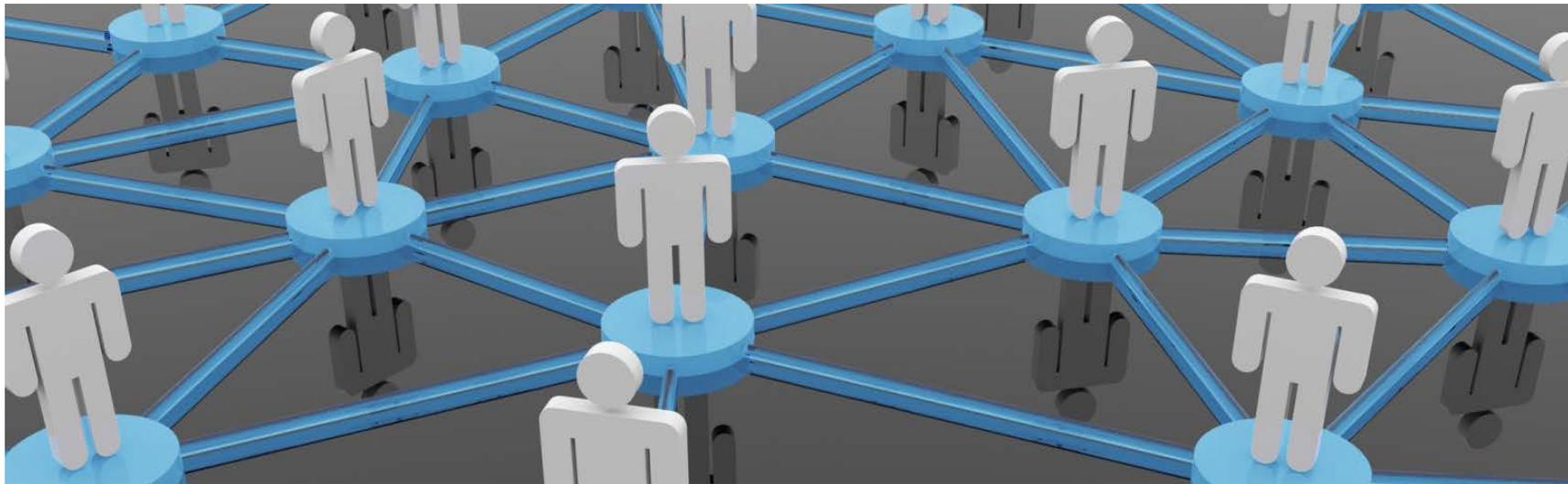


## Background

As part of NAFEMS' mission to 'promote the safe and reliable use of finite element analysis and related technology', a need has emerged to define and record standards for competence within the engineering analysis community.

The ISE qualification has been developed as part of the EASIT<sup>2</sup> project which set out the knowledge and skills that a competent simulation engineer should possess. As part of the project, a series of competency statements have been developed forming the basis of ISE. Successful qualification as an ISE (International Simulation Engineer) will enable engineers and analysts to demonstrate their level of competence as they progress throughout their career.

As an international association, NAFEMS realises the requirement for an international standard which provides transparency of competencies throughout the whole engineering simulation community. This requirement is central to the ISE Framework.



## The ISE Standard

ISE is based on the simple concept that the qualification 'International Simulation Engineer' is achieved by an independent assessment of workplace competence.

The qualification requires the accumulation of competencies in workplace experience in the specification, planning, execution and interpretation of numerical analysis applied to design, simulation or product verification, and adequate performance in executing these functions to a high standard. It also requires competence of an appropriate level of underpinning theoretical knowledge and sufficient product knowledge to enable the analyst to understand the context, purpose and value of his/her analysis work.

ISE targets both the experienced analyst and the newcomer to simulation. The experienced simulation engineer is required to present documented and attested evidence of academic and workplace competence to gain entry to ISE. An appropriately qualified newcomer to simulation is expected to follow a structured training programme under the guidance of a suitably qualified Industrial Mentor.

### ISE Objectives

ISE has been designed to:

- Provide a framework within which individual engineers/analysts can track and enhance their competence in numerical analysis applied to design, simulation and product verification.
- Recognise and record a high standard of achievement by award of a formal qualification following an independent assessment of workplace competence.
- Assist companies in demonstrating the competence of staff to external organisations
- Promote best practice in engineering analysis.
- Increase the pool of competent engineering analysts, thereby enhancing the competitiveness of industry.
- Provide an international standard of competence for the international simulation community to adhere to.

## Technology Areas Covered

ISE is broad-based and designed with the long term aim of covering numerical analysis of any description used in engineering design, simulation and product verification. Currently, the scheme covers the following technical areas:

- An Introduction to Finite Element Analysis for Structures
- Mechanics, Elasticity and Strength of Materials
- Materials Modelling, Characterization and Selection
- Fatigue
- Flaw Assessment and Fracture
- Nonlinear Geometric Effects
- Beams, Membranes, Plates and Shells
- Dynamics, Vibration and Seismic
- Optimisation
- Plasticity
- An Introduction to Computational Fluid Dynamics
- Thermo-Mechanical Behaviour
- Simulation Management
- Buckling and Instability
- Multi-physics Analysis
- Composite Structures
- Fundamentals of Flow, Porous Media, Heat Transfer
- Creep and Time-Dependency
- Multi-Scale Analysis
- Probabilistic Methods
- Noise Acoustics and Vibro-Acoustics
- Electromagnetics
- Multi-body Dynamics

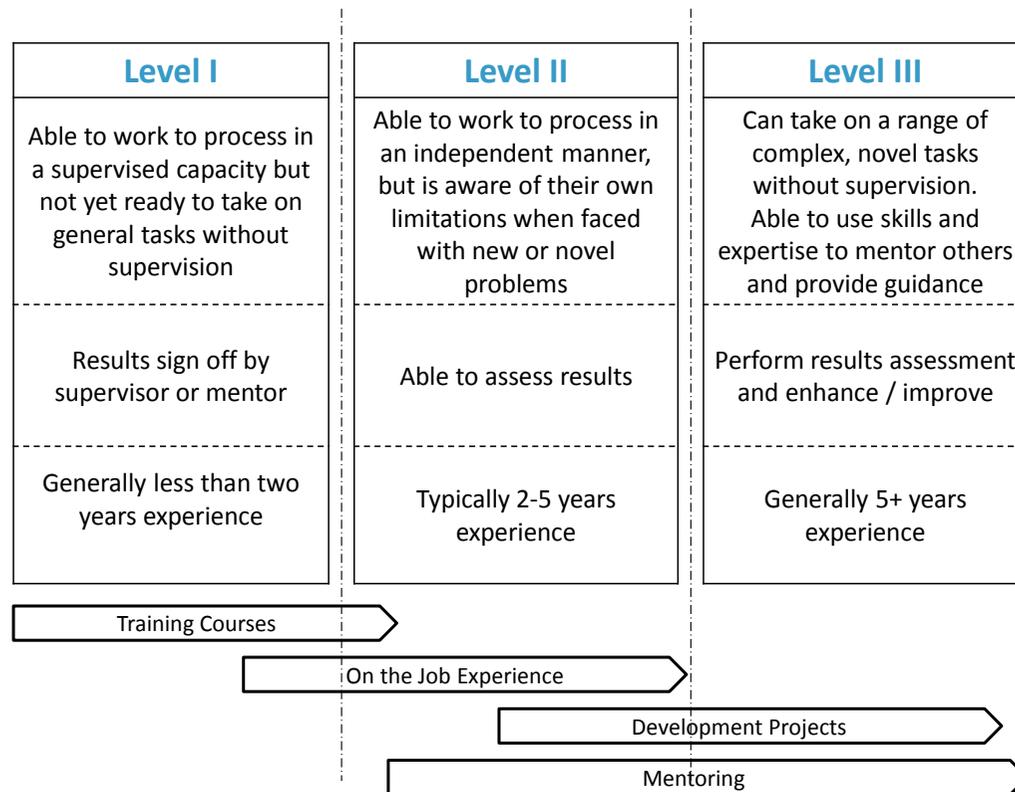
Applicants can apply claiming competence in one or more of these technical areas. For each technical area in which they claim competence, they will be asked to state:

- Their level of competence
- Workplace experience and/or training relating to the claimed competence
- Software system(s) they gained their experience with
- Product types they have practical knowledge of and have applied their stated competencies to

The assessment process is limited to the technical knowledge and expertise claimed. Experience of various software types and product types will not be explicitly mentioned on any certificate that is issued, but will be duly noted in the documentation that accompanies the certificate.

## Level of Qualification

ISE applicants can seek qualification in any number of the technical areas given in that section. For each technical area, competence can be claimed at one of the following levels:



## ISE Register

Once the declared competencies have been assessed and certified to meet the ISE qualification requirements, NAFEMS maintains this information within the '*Register of International Simulation Engineers*', recording the current level of competence for those assessed. This is updated as individuals achieve new areas and level of competence.

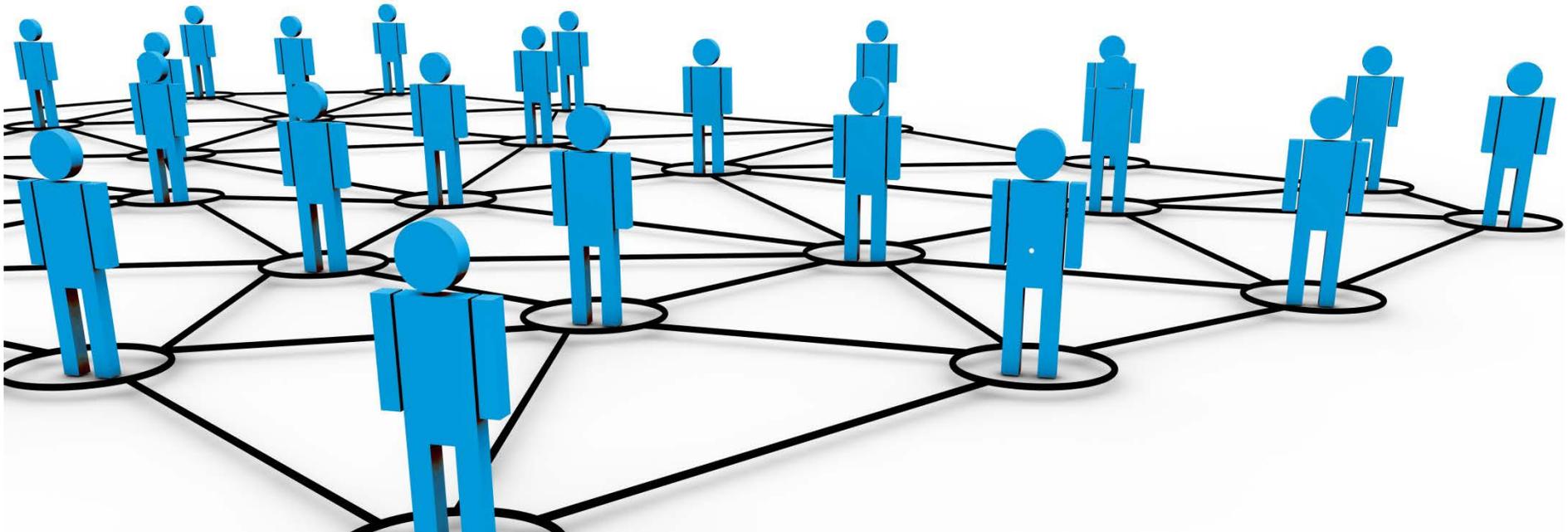
Prospective employers of simulation engineers may obtain confirmation of an individual's status and current competence level from NAFEMS.

## Who Should Apply?

The ISE qualification is designed for individuals who fit one or more of the following the criteria:

- Designers and engineers who carry out simulation to investigate product performance.
- Professional simulation engineers and engineering analysts.
- Engineers who are design signatories.
- Engineers who approve numerical analysis.

The qualification is appropriate for analysts/simulation engineers at any point in their career. As the qualification is multi-level, it is suitable for experienced analysts and those who are newcomers to analysis.



## Benefits of ISE

The International Simulation Engineer qualification records, verifies and independently assesses an analyst's skills and competence. This makes the qualification extremely beneficial for individuals and companies.

### Benefits for Individuals

For individuals some of the benefits of ISE include:

- Achievement of distinctive and internationally recognised qualification
- A clear path for career and skill progression
- Increased value to current and future employers
- Enhanced analytical skills
- Increased confidence
- Improved self-motivation



### Benefits for Companies

ISE also has a number of benefits for companies whose analysts are ISEs (International Simulation Engineers). These benefits include:

- A clear way to demonstrate the company's commitment to quality standards
- A formal record of employee competence and training satisfying the requirements of ISO 9001
- Easier recruitment of high calibre staff
- Reduced risks when employing consultants and sub-contractors whose staff are International Simulation Engineers (ISEs)
- Increased employee motivation
- Creating and maintaining competitive edge

The logo for 'ise' features a stylized 'i' on the left, which is a sphere with two curved lines (one blue, one white) wrapping around it. To the right of the 'i' are the lowercase letters 'se' in a bold, blue, sans-serif font.