Applying for

ise

International Simulation Engineer

NAFEMS

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. The 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, the ISE enables individuals to achieve various 'levels' as their competence is established and developed. Individuals who successful 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.

Introduction

This document contains all of the necessary information in order to apply for the ISE (International Simulation Engineer) qualification. It is important that applicants understand the current requirements for becoming an International Simulation Engineer. Applicants should be confident that they meet these requirements before making an application. These guidance notes will clearly outline what is required and will provide useful examples for applicant's reference.
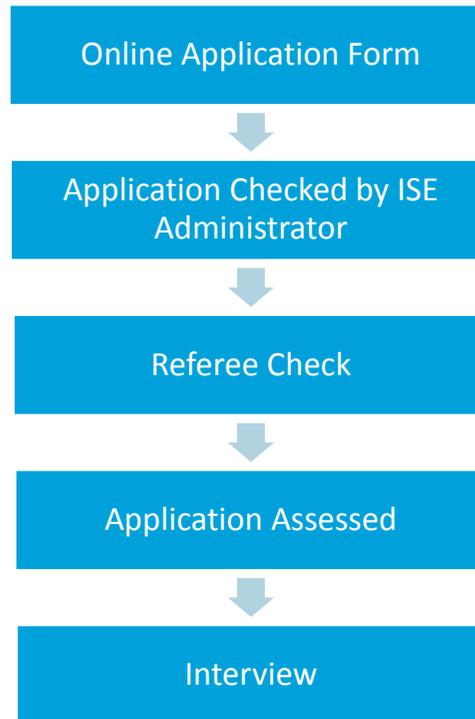
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In summary the application process is as follows:

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2. ISE Online Form

The sections below detail the various items of information that applicants must supply within the online form in order to demonstrate the appropriate ISE competencies.

2.1.   Personal Information

Applicants are required to provide the following personal information:

- Surname (Family Name)
- Other Names (Forenames)
- Title (please select from the drop down list provided)
- Date of Birth
- Home Address
- Home telephone number
- Cell / Mobile phone number
- Personal email address
- Nationality
- Gender

Applicants are required to provide current employment details including:

- Position currently held
- Organisation / company name
- Business postal address
- Business telephone number
- Work email address

2.2.   Referees

It is the applicant's responsibility to secure the consent of at least two referees, to their names being given before the application is submitted. The given referees will be attesting to the acquisition of competencies.

For the experienced analyst whose career spans several companies, applicants should nominate sufficient referees in order that academic qualifications and all entries of workplace competencies and performance are attested.

Referees must be of high professional standing. As an example, in Europe the professional qualification Eur. Ing., in the USA professional engineer P.E., and in Canada professional engineer P. Eng or their equivalent would be appropriate.

For each referee the following is required:-

- Full name of the referee.
- Any academic qualifications gained during the referee's lifetime.
- Any professional qualifications gained during the referee's lifetime.
- State the relationship between yourself and the referee.
- Full postal address of referee, *including contact telephone number and email address* (*important – must be completed*).

The referees provided in the International Simulation Engineer application may be contacted by the NAFEMS office and asked to confirm that they are aware of your application and that they are able to attest relevant details and competencies provided in the application.

2.3.   Education

Applicants should normally possess the foundation knowledge of a first degree or equivalent. **In the case that an applicant does not possess a degree, the interview and assessment process will be more rigorous**. Applicants are generally expected to have undertaken a minimum level of further training and attendance at courses, seminars and workshops aimed at increasing general background engineering knowledge and, especially, the knowledge of the theory associated with numerical analysis and its application to practical engineering problems.

Recognising that some academic institutions give relevant courses at undergraduate and postgraduate level covering basic aspects of the theory associated with numerical analysis and its application to practical engineering problems, the scheme allows an applicant to claim recognition of such courses.

Through the breadth and depth of their experience some analysts may well prove they have an adequate understanding of underlying theory, thus meeting this fundamental requirement of the ISE.

The following information is required:-

- Title of award, e.g. BSc Hons, Dipl. Ing, BTec, etc.
- Subject title of degree/diploma, etc.
- Grade or class of degree/diploma, etc.
- Date the award was completed/given
- Name of the establishment who granted the award

## 2.4.	Professional Qualifications

When stating membership of a professional body or association, the following information is required:-

- The name of the professional body, e.g. AIAA (The American Institute of Aeronautics and Astronautics) , **I**MechE (Institution of Mechanical Engineers) VDI (Verein Deutscher Ingenieure – the Association of German Engineers) etc.
- The grade of membership, e.g.P.E, C.Eng, Fellow
- Provide the date that membership was confirmed.
- State the method of entry, i.e. normal admission, special examination, exemption, etc.)
- If an examination took place, please provide details of the subjects covered in the examination.
- Please provide the number of referee that can be contacted for attestation of the professional qualifications gained.

2.5. Training

Applicants should normally be qualified to first degree or equivalent standard in engineering, physics, computing or mathematics based sciences or by professional qualification and standing that is recognised by the relevant professional body as equivalent. If the academic or professional equivalent does not specifically include engineering applied mechanics, then at least one year's experience (or formal conversion training) in the relevant engineering field is required.

This qualification is mandatory and is independent of the scope and level of certification.

Providing and attaching a university transcript will strengthen the application, but is not mandatory.

The following education and details must be provided:-

- Dates attended at institution.
- Title of qualification gained.
- Principal subjects/occupational skills covered by the qualification.
- Name of organisation or institution providing education and training.
- Type of organisation providing education and training (University, College, Institution, Training Consultancy, Internal on-the-job training, etc.).
- Level in national or international classification, if applicable.
- Provide details of the method of verification that this information is correct, i.e. how the degree/diploma can be proved – university transcript, certificate supplied, referee attestation, etc.
- Where referee attestation is stated as the method of verification, please state the contact number of referee for attestation.

2.6.   Career Summary

A summary of the applicant's career is also required, including:

- Date started in the role to date, left the position, or state 'to date' for current role.
- The job title, occupation or position held during that time.
- A brief list of bullet points detailing the main activities and responsibilities, whilst holding this position, during this time.
- Organisation / company name.
- Type of business / industry sector.
- Employer postal address.
- Employer telephone number.
- Company website.

Add separate entries for each relevant post occupied, starting from the most recent position.

2.7. Simulation Experience

Applicants should complete the table, noting that there is a requirement to make the link between analysis type and product type (see appendix) and the level claimed in simulation areas.

Please note the following when completing this table:-

The ISE system requires the applicant to be competent in the analysis types included, the product types covered and the analysis types used. At the heart of the system is a requirement that these competences have been developed in an industrial environment.

- The information supplied in this table should be sufficient to satisfy the assessors that the competencies claimed by the applicant are reasonable in terms of:

   - **Analysis Type (from list below)**

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

   - **Software used**
   - **Product types worked with.**

- Client details do not have to be divulged if confidentiality is an issue.

- This table directly links to your requested competencies claimed. Your competencies claimed should not contain any analysis types not covered in this table, for example.

- Given the competences required for the various analysis types, it is not expected that an analysis type be included in the competencies claimed, purely on the basis of a single project, lasting a few weeks, for example.

- The point above also applies for both product type and software tools, where competencies are being claimed.

2.8.   Competencies Claimed

Click the dropdown box to select the module, then the level being claimed and then choose the appropriate statements – this will then be your competencies claimed for this particular simulation area.

Please note that competencies claimed should be advised for simulation areas, generic product types and software tools, by selecting the appropriate competence statements.

GENERIC STATEMENTS (applicable to all analysis types included within competencies claimed)

- The following competences (sections 3-5) will provide the basis for the NAFEMS International Simulation Engineer qualification.

- At the present time, the various competences of the scheme will be attested to by suitable referees supported by online interview. In the future, these competences may also be assessed by formal examination.

3. ISE Analysis Type Competence Statements

PASS_ATS1	**For the range of analysis types covered by your *competencies claimed,*** employ available software tools in an effective manner, under the supervision of a person(s) with appropriate competence in these analysis and product types.	Supervised	Referee-attestation
PASS_ATU1	**For the range of analysis types covered by your requested *Competencies claimed,*** have sufficient knowledge and comprehension of theory to allow safe and effective use of application software tools, as specified by the competence statements at STANDARD and ADVANCED level in the relevant Educational Base module(s).	Unsupervised	Self-attestation
PASS_ATU2	**For the range of analysis types and product types covered by your *Competencies claimed,*** employ available software tools in a safe and effective manner, without supervision.	Unsupervised	Referee-attestation
PASS_ATU3	**For the range of analysis types and product types covered by your *Competencies claimed,*** conduct appropriate engineering analysis of the results from simulation, without supervision.	Unsupervised	Referee-attestation
PASS_ATU4	**For the range of analysis types and product types covered by your *Competencies claimed,*** plan analysis strategies and validation studies for simulation, without supervision.	Unsupervised	Referee-attestation

PASS_ATA1	**For the range of analysis types covered by your requested *Competencies claimed*,** have sufficient knowledge and comprehension of theory to allow safe and effective use of application software tools, as specified by the competence statements at ADVANCED level in the relevant Educational Base module(s).	Advisor	Self-attestation
PASS_ATA2	**For the range of analysis types and product types covered by your *Competencies claimed*,** employ available software tools in a safe and effective manner, without supervision.	Advisor	Referee-attestation
PASS_ATA3	**For the range of analysis types and product types covered by your *Competencies claimed*,** conduct appropriate engineering analysis of the results from simulation, without supervision.	Advisor	Referee-attestation
PASS_ATA4	**For the range of analysis types and product types covered by your *Competencies claimed*,** plan analysis strategies and validation studies for simulation, without supervision.	Advisor	Referee-attestation
PASS_ATA5	**For the range of analysis types covered by your *Competencies claimed*,** provide effective advice on all aspects of simulation, including theory, application, hardware & software infrastructure and staff development.	Advisor	Referee-attestation

4. ISE Product Type Competence Statements

PASS_PTU1	**For the range of product types covered by your *Competencies claimed*,** have sufficient knowledge and comprehension of system components, operating environments and manufacturing methods to allow safe and effective use of application software tools, without supervision.	Unsupervised	Referee-attestation
PASS_PTU2	**For the range of product types covered by your *Competencies claimed*,** have sufficient knowledge and comprehension of relevant design codes and procedures to allow safe and effective use of application software tools, without supervision.	Unsupervised	Referee-attestation
PASS_PTA1	**For the range of product types covered by your *Competencies claimed*,** have sufficient knowledge and comprehension of system components, operating environments and manufacturing methods to allow safe and effective use of application software tools, without supervision.	Advisor	Referee-attestation
PASS_PTA2	**For the range of product types covered by your *Competencies claimed*,** have sufficient knowledge and comprehension of relevant design codes and procedures to allow safe and effective use of application software tools, without supervision.	Advisor	Referee-attestation
PASS_PTA3	**For the range of product types covered by your *Competencies claimed*,** provide effective advice on all aspects of simulation, including compliance with relevant design standards	Advisor	Referee-attestation

5. ISE Software Tool Competence Statements

PASS_STS1	**For the software tools listed on your *Competencies claimed*,** have sufficient competence in the use of these tools, to build models on receipt of advice and to produce results for subsequent analysis and assessment.	Supervised	Referee-attestation
PASS_STS2	**For the software tools listed on your *Competencies claimed*,** to know when and where to seek advice.	Supervised	Referee-attestation
PASS_STU1	**For the software tools listed on your *Competencies claimed*,** have sufficient competence in the use of these tools, to decide modelling strategies, to build models, to produce results and to carry out analysis and engineering assessment.	Unsupervised	Referee-attestation
PASS_STA1	**For the software tools listed on your *Competencies claimed (if any)*,** have sufficient competence to provide advice in the use of these tools, in deciding modelling strategies, in building models, in producing results and carrying out analysis and engineering assessment.	Advisor	Referee-attestation

6. Assessment

Once applicants have completed and returned the ISE application form, the NAFEMS ISE Administrator will then check the application form for completeness and consistency. Applicants will receive a note from the NAFEMS office confirming receipt of your form and advising you of the approximate timeline for your application.

The Administrator will check with the referees supplied that they are aware of applicant's submission and support their application to the NAFEMS International Simulation Engineer qualification.

Applications will be forwarded to two independent ISE Assessors who will assess the competencies claimed against the experience noted. Assessors will check the matrix linking competencies claimed and experience, however the referees supplied in the application will be attesting to the relevant high level competence statements.

An interview may then be arranged by the NAFEMS Administrator, with the applicants and the assessors, at a convenient time. This interview may be undertaken by telephone, video call over the web, or in person where possible.

Following the interview, the assessors will make their final recommendation regarding the ISE application and this will then be discussed with the NAFEMS ISE Coordinator. NAFEMS will be advised of the results and applicants will receive notification accordingly. If successful, applicants will receive a certificate, including details of competencies gained and assessed and their name will be entered into the NAFEMS ISE register.

The certificate will be current for 3 years, at which time applicants will be required to update your application form and renew their ISE qualification.

7. The Interview

Interviews are a vital part of the International Simulation Engineer qualification. The purpose of the interview is to give the NAFEMS Assessors a chance to assess applicants suitability for the qualification at the level applied for and the competencies claimed.

Once applications are processed by NAFEMS, applicants may be invited to attend an interview. The NAFEMS ISE Administrator will contact you to arrange a convenient time.

7.1. What is it?

The interview is based on the information provided in the online application and is used to determine the level of competence demonstrated. Applicants should prepare for the interview by reading through their application form thoroughly.

The interviewers will focus on the most recent and relevant experience. Judgements will be based solely on the information provided in the application form and the applicant's performance and discussions during the interview.

7.2. Who will be there?

Two trained and experienced NAFEMS Assessors will conduct the interview. The NAFEMS ISE Administrator will also be present. ISE Assessors are experts in numerical analysis over a broad range of topic areas and disciplines. They will be professionals with many years of experience in FEA, CFD and related disciplines. They may not necessarily be matched to the applicant's industry sector or area of expertise, but will give a very brief introduction of themselves for the applicant's benefit before the interview.

The NAFEMS ISE Administrator is an experienced representative assisting with the co-ordination of your application and the smooth running of the interview process. They will ensure that standards are maintained and interviews are conducted fairly and consistently. The ISE Administrator will have been in contact with applicants prior to interview and will answer any questions they have regarding the process.

You can take your mentor along to the interview. Your mentor is not allowed to participate, but their attendance may have a number of benefits. Having your mentor present means you can get objective feedback on your interview and personal presentation skills. Your mentor may also find that attending your interview can be part of their continuing professional development; supports their own understanding of the process; and helps them to prepare future candidates.

7.3.   How long does it take?

The interview will take approximately 45 minutes.

7.4.   What is the format?

The interview may take place by teleconference call, via video call over the web or in person, depending on the location of the applicant.

The interview is a discussion between peers, designed to evaluate and assess your level of competence. As in any interview, there are no trick questions based on your individual contribution opposed to the overall contribution of a team department.

Applicants are expected to play a leading role in the discussion, and provide detailed and specific answers about actual events to demonstrate the competences. They may also be asked to expand on some of their answers, and highlight how processes or tasks might have been done differently.

Applicants are encouraged to develop answers and explain things clearly and concisely. Answers should be structured to demonstrate good communication skills. Applicants should also avoid the use of acronyms, company jargon or slang.

Applicants can expect a level of technical questioning. Interview panel members may take the opportunity to develop a particular technical issue or aspect of their responsibilities. This could take the form of an in-depth question-and-answer exchange of the engineering principles involved, or the development of an innovative process review to establish applicants' theoretical understanding of the issues involved.

Applicants can bring supporting evidence to back up any discussion, but should be aware of the time constraints. They may find items such as technical drawings, photographs, sketches, calculations and design drawings can quickly clarify a technical point.

Applicants may wish to also provide samples of work at interview; this will supply the basis for exploring experience. The relevant scope statement, analysis types and level (supervised, unsupervised and expert) will provide the basis for theoretical understanding. Interview questions will be based on any of the detailed module competencies claimed.

NAFEMS recognises that there is an increasing use of technology within the engineering industry. When assessing someone who employs a significant amount of technology in their role, interviewers will seek evidence that the resultant technology, program or software is being applied in an engineering environment. For example, design engineering, testing and assessment of equipment or processes, product development. In this case it is essential that the evidence supports the application of engineering, skills and expertise to develop the product or process. Examples can include CAD and CAE engineers, computer modellers, IT engineers, CFD specialist and stress, metallurgical or thermodynamic analysts.

The final few minutes of the interview are thrown open to applicants. This is their opportunity to talk about anything that they think is important to their application that has not yet been mentioned.

7.5.   What happens next?

The ISE assessors will make one of three recommendations. These are: recommend successful application and grant qualification; defer with guidance regarding submission; or reject application at this time.

Neither the Administrator nor the Assessors are able to advise applicants about the decision that they make, as their recommendation must be approved by the ISE Coordinator.

If applicants are successful, they will receive a letter and a certificate from the NAFEMS Chief Executive confirming their achievement. Their name will then be included in the NAFEMS Register of Experts, located on the NAFEMS website.

Unsuccessful applicants will be written to with an explanation and reason for the decision. They will also be given some guidance as to how they may wish to address the concerns raised, in order to resubmit your application at a later date.

Any applicant can request a copy of their interview paperwork, scores and feedback.

NAFEMS has an arbitration and appeals process, whereby applicants who are dissatisfied with the process may appeal within a given timeframe. All documentation will be made available to the Arbitration Panel for their consideration. More information about this process is available on request.

8. Maintenance & Renewal

Any assessment resulting in certification has limited currency. It is recommended therefore that an up-date assessment be made after three years, either to reflect competence in new product or analysis types or, where applicable, to upgrade the level of certification.

Appendix: Product Types

The scope of analysis experience should be defined in terms of product types. Some examples are given below, but this is an incomplete list and candidates are strongly advised to specify categories that better define their activities.

Vehicle Group

Aircraft
Engine & propulsion system
Fixed track transport
Mechanical transmission system
Road & land vehicles
Spacecraft
Submersibles
Surface ships

Public Utilities Group

Bridges
Building/frames/masonry
Chemical plant/containment/machinery
Dams
Docks and harbours
Highways and tunnels
Nuclear plant/containment/machinery
Offshore structures
Power generating machinery
Pressure vessels