introducing

PSE CERTIFICATION

Professional Simulation Engineer Certification

NAFEMS

PSE
CERTIFICATION

PSE (Professional Simulation Engineer) Certification allows engineers and analysts within the international simulation community to demonstrate competencies acquired throughout their professional career. Independently assessed by NAFEMS, the international association of the engineering analysis, modelling and simulation community, the certification enables individuals to gain recognition for their level of competency and experience as well as enabling industry to identify suitable and qualified personnel.

The Certification incorporates an extensive range of competencies across various analysis types. It is multi-level, supporting the philosophy of lifelong learning and continuous professional development. PSE Certification is suitable for both experienced engineers/analysts and those in the early stages of their professional career.

Providing a standard of competency for the international simulation community, successful applicants receive recognition as a Professional Simulation Engineer (PSE) at Entry, Standard or Advanced Level. As competencies are developed, PSEs will advance to the next level.

apply online today **www.nafems.org/pse**

background

NAFEMS' mission is to promote the safe and reliable use of analysis and simulation related technology. PSE Certification has been developed by NAFEMS to address an emerging need from the community for independent verification of workplace competency.

PSE Certification provides independent assessment of PSE Competencies. Defining the competencies that a good analysis and simulation engineer should possess, these competencies have been peer-reviewed over several years by NAFEMS' technical working groups and external experts and incorporate thousands of statements of competency at various levels.

Successful Certification as a PSE (Professional Simulation Engineer) will enable engineers and analysts to demonstrate and gain recognition for their competency level.

the PSE certification standard

PSE Certification is based on the simple concept that the 'Professional Simulation Engineer' certificate is achieved by an independent assessment of workplace competency.

The Certification requires the accumulation of competency 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 competency 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.

PSE Certification 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 competency to become certified. An appropriately qualified newcomer to simulation is expected to follow a structured training programme under the guidance of a suitably qualified Industrial Mentor.

PSE Certification has been designed to:

- Recognise and record achievement by award of a formal certification following an independent assessment of workplace competency
- Assist companies in demonstrating the competency 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 a standard of competency for the international simulation community

technology areas covered

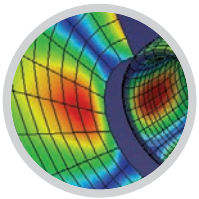
PSE Certification is broad-based and designed with the long term aim of covering numerical analysis of any description used in engineering design, simulation and product verification. Currently, certification covers the following technical areas:

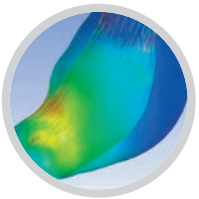
- Core Finite Element Analysis
- Mechanics, Elasticity and Strength of Materials
- Materials for Analysis and Simulation
- Fatigue
- Flaw Assessment and Fracture Mechanics
- Nonlinear Geometric Effects and Contact
- Beams, Membranes, Plates and Shells
- Dynamics and Vibration
- Optimisation
- Plasticity
- Core Computational Fluid Dynamics
- Thermo-Mechanical Behaviour
- Management General
- Verification and Validation
- PLM Integration and CAD-CAE Collaboration
- Simulation Process & Data Management
- Buckling and Instability
- Multi-physics Analysis
- Composite Materials and Structures
- Fundamentals of Flow, Mass and Heat Transfer
- Creep and Time-Dependency
- Multi-Scale Analysis
- Probabilistic Analysis
- Noise, Acoustics and Vibro-Acoustics
- Electromagnetics
- Multi-body Dynamics

There are two core modules – **Core Finite Element Analysis** and **Core Computational Fluid Dynamics**. For applicants applying for certification in these modules, they must demonstrate an understanding of the fundamental principles of the topic and how these principles can be applied to solve practical problems. Each core module should be considered as a building block which can serve as a foundation to the other modules within PSE Certification that relate to more specific applications of FEA or CFD.

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

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





level of certification

Applicants can gain certification in any number of technical areas.

For each technical area, competency can be claimed at one of the following levels:

entry level

- Employs available software tools in an effective manner
- Able to work in a supervised capacity when provided with clear guidelines
- Doesn't take on general tasks without supervision
- Typically applies to trainees and/or technician level staff working under the supervision of a person(s) with appropriate competence who will sign off the results

standard level

- Has sufficient knowledge and comprehension of theory to employ available software tools in a safe and effective manner
- Able to work in an independent manner without supervision
- Conducts appropriate checks on results
- Plans analysis strategies and validation studies
- Is aware of their own limitations when faced with new or novel problems
- Observes professional practices

advanced level

- Can take on a range of complex, novel tasks without supervision
- Able to use skills and expertise to mentor others
- Provides effective advice and guidance
- Acknowledged as an expert

benefits of PSE Certification

Professional Simulation Engineer Certification records, verifies and independently assesses an analysis and simulation engineer's skills and competency. This makes the qualification extremely beneficial for both individuals and companies.

for individuals....

For individuals some of the benefits of PSE certification 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**

for companies....

PSE also has a number of benefits for companies whose analysts are certified PSEs (Professional Simulation Engineers). These benefits include:

- **A clear way to demonstrate the company's commitment to quality standards**
- **A formal record of employee competency 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 Professional Simulation Engineers (PSEs)**
- **Increased employee motivation**
- **Creating and maintaining competitive edge**

who should apply?

PSE certification 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
- Simulation engineers and engineering analysts
- Engineers who are design signatories
- Engineers who approve numerical analysis

The certification 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.

PSE record

Once the declared competencies have been assessed and certified to meet the PSE certification requirements, NAFEMS maintains this information within the 'Record of Professional Simulation Engineers', recording the current level of competency for those assessed. This is updated as individuals achieve new areas and level of competency.

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

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PSE
COMPETENCY TRACKER

PSE Certification complements the PSE Competency Tracker – An Online Competency Framework and Management System for Simulation Engineers. Applicants can use the Tracker to plan their competency development to prepare and support their application.

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