



Registered Analyst Scheme

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THE INTERNATIONAL ASSOCIATION FOR THE ENGINEERING ANALYSIS COMMUNITY



NAFEMS Registered Analyst Scheme (The Scheme) is aimed at engineers/analysts using numerical analysis in design, simulation and product verification who wish to have their competence in the workplace assessed independently and certified.

It is based on the accumulation of workplace experience in the specification, planning, execution and interpretation of numerical analyses, and on performance in executing these functions to a high standard. It requires also that the engineer/analyst acquires background theoretical knowledge to support his/her use of numerical analysis in practice and sufficient product knowledge to understand the context of his/her analysis work.

The Scheme is open to both the experienced engineer/analyst and those in the early stages of their professional career. It is intended to provide a high standard of qualification irrespective of the country or industry in which the applicant is employed.

The Scheme has benefits for both individuals and employers.

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## BACKGROUND

NAFEMS, a non-profit making organisation funded by membership subscription, was founded in 1983 with a specific objective: -

To promote the safe and reliable use of finite element analysis and related technology .

The initial focus of NAFEMS' activities was accuracy of finite element analysis codes and much of its early effort was concentrated on developing standard 'Benchmarks' against which codes could be tested. The software industry quickly adopted the tests as a means of improving and verifying the accuracy of codes.

In parallel, NAFEMS sought to extend its interests into other fields of numerical analysis and to increase awareness of the capabilities, benefits and, equally importantly, limitations of analysis tools through: -

- ¥ Seminars
- ¥ BENCHmark Magazine
- ¥ Textbooks & Training Materials

In more recent times NAFEMS has also focused attention on activities to promote best practice and adoption of standards.

NAFEMS' Registered Analyst Scheme has arisen out of a need identified in the analysis community to define standards for competence, experience and underpinning knowledge that lead to the award of a formal qualification.

# 1. Introduction

## The need for the Registered Analyst Scheme

The need for such a scheme was identified in the analysis community in general and subsequently confirmed by a survey carried out within NAFEMS' membership.

## Background Work

NAFEMS' Quality Assurance Working Group and Education and Training Working Group carried out the background work necessary to establish the objectives and structure of the Scheme.

## The Scope

The Scheme is broad-based and designed to cover numerical analysis of any description used in engineering design, simulation and product verification.

## The Concept

The Scheme is based on the simple concept that the qualification Registered Analyst (RA) is achieved by an independent assessment of workplace competence, which may be at two levels, either 'Standard' or 'Advanced'.

The Scheme requires the accumulation of 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 requires also the accumulation 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.

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

## The Register

NAFEMS maintains a Register of Analysts, recording entries as "Trainee Analyst" for those pursuing a structured training programme or "Registered Analyst (Standard) / Registered Analyst (Advanced)" for those assessed and certified to meet the Scheme requirements. The Register of Analysts is the exclusive and confidential property of NAFEMS. Prospective employers of analysts may obtain confirmation of an individual's status under the Scheme from NAFEMS.

# 2. Scheme Objectives

The Scheme has been designed to satisfy a number of objectives: -

- To provide a framework within which individual engineers/analysts can enhance their competence in numerical analysis applied to design, simulation and product verification.
- To recognise and record a high standard of achievement by award of a formal qualification following an independent assessment of workplace competence.
- To assist companies in demonstrating the competence of staff to external organisations.
- To promote best practice in engineering analysis.
- To increase the pool of competent engineering analysts, thereby enhancing the competitiveness of industry.

# 3. Who is the Scheme Aimed at?

- Designers who carry out analysis.
- Specialist analysts.
- Engineers who are design signatories.
- Engineers who approve safety critical numerical analysis.
- The Scheme is aimed at both the experienced engineer/analyst and the newcomer to analysis.

## 4. Benefits of the Scheme

The Scheme has benefits for both employer and employee. It records, verifies and assesses independently an analyst's skills and competence and therefore worth to a company, and demonstrates simultaneously that company's commitment to quality standards.

**For the individual, the benefits include: -**

- A distinctive qualification.
- Increased value to employers.
- Enhanced prospects of promotion.
- A personal copy of NAFEMS' BENCHmark magazine.

**For the trainee analyst the structured requirements for training result also in the benefits of: -**

- Enhanced analytical skills.
- Increased confidence.
- Improved self-motivation.

**For the company, the benefits include: -**

- Enhanced employee's skills which result in
  - ¥ higher productivity.
  - ¥ less supervision.
  - ¥ reduced risk of error.
  - ¥ more innovative solutions.
  - ¥ more up-to-date knowledge, retaining competitive edge.
  - ¥ improved staff motivation.
- A formal record of staff competence and training which satisfies the requirements of ISO 9001.
- Evidence of independent assessment of staff competence which results in :-
  - ¥ presentation of high quality staff to market.
  - ¥ increased customer confidence.
- Easier recruitment of high calibre staff.
- Reduced risks when employing consultants and sub-contractors whose staff are Registered Analysts (RAs).

## 5. Registered Analyst - Requirements and Standards

Personnel engaged in numerical analysis shall have qualifications, training and experience appropriate to the scope, importance and complexity of the analysis application.

Candidates must therefore satisfy requirements with regard to: -

- Formal academic or professional qualification (see 5.1).
- Product qualification experience (see 5.2).
- Numerical analysis experience - that is relevant experience in the specification, planning, execution and interpretation of numerical analysis applied to design, simulation or product verification (see 5.3).
- Familiarity with, and appreciation of, the limitations of the particular software employed (see 5.4).
- Training in background theory to underpin the engineering application of numerical analysis (see 5.5).

The level of certification, 'Standard' or 'Advanced', demands a minimum level of achievement in Product Qualification, Numerical Analysis and training in background theory.

## 5.1 Academic Qualifications

Candidates shall 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.

## 5.2 Product Qualification Experience

The candidate must be fully conversant with the implications of the design requirements, codes of practice, quality requirements and the analysis and design standards that pertain to the product type. (For product type see Appendix A.)

The candidate must demonstrate proficiency in obtaining information necessary to plan an analysis and prepare a thorough analysis specification that addresses all relevant design and analysis requirements, and must comprehend the use to which the results will be put.

**Note:** Special provision is made for new fields of design where no company or analyst reasonably be expected to meet these requirements. Project or research work carried out at universities, which can also be shown to be directly linked to industrial end-user requirements, may also meet this requirement.

The candidate must have a minimum level of experience in the qualification of products falling within the scope of the assessment.

The amount of experience depends on both the 'category of importance' of the analysis content (see 6.2 Experienced Analyst – Accumulated Points Route) and the time spent in performing the analysis.

## 5.3 Numerical Analysis Experience - Modelling and Problem Solving

The candidate must have a minimum level of numerical analysis experience, established separately for each analysis type. (For analysis type see Appendix A.)

It must be emphasised that no analysis should be undertaken without a sufficient understanding of the relevant background theory. For the newcomer to analysis, this requirement may have to be met by additional, in-service training. For the experienced analyst it may be met by accumulated experience in the relevant type of analysis.

For the advanced level of certification, the candidate must demonstrate also knowledge of the management and quality procedures of numerical analysis.

## 5.4 Analysis Software Experience

The candidate must have undergone formal training and/or on-the-job familiarisation with running the analysis software, totalling at least four man-months.

The candidate must be familiar with, and have demonstrated an understanding of, the software documentation and limitations relevant to the scope of the analyses.

## 5.5 Training in the Engineering Application of Analysis

Candidates must possess the foundation knowledge of a first degree or equivalent (see 5.1). They 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 Scheme.

## 6. Routes to Certification

There are three routes to certification, one available to the Trainee Analyst and two to the Experienced Analyst.

**Trainee Analysts** - those wishing to enter a structured training programme, usually at or near the beginning of their professional career.

**Experienced Analysts** - those who have accumulated substantial expertise and knowledge of numerical analysis in an engineering environment.

### 6.1 Trainee Analyst

The trainee should obtain and complete the appropriate “NAFEMS Registered Analyst Scheme” application form and submit it together with a current curriculum vitae and the application fee to NAFEMS. The application fee is a one-off fee for entry to the Scheme.

If the applicant has the necessary academic qualifications (see 5.1), he/she will be entered on the Register of Analysts as a “Trainee Analyst” and invoiced for the first year annual fee for maintaining their entry on the Register.

Once accepted into the Scheme, the trainee analyst works under the guidance of an Industrial Mentor of professional standing. In circumstances where individuals cannot identify a suitable Industrial Mentor, normally a Registered Analyst, assistance may be provided by contacting NAFEMS. NAFEMS may nominate an Industrial Mentor outside the applicants’ organisation.

The Industrial Mentor monitors the analyst’s accumulation of workplace experience and, equally importantly, the analyst’s accumulation of background, underpinning knowledge (see 5.5).

The trainee analyst is required to keep a logbook to record the accumulation of workplace experience and the corresponding accumulation of background knowledge. The Industrial Mentor, or a nominated referee, must attest each entry in the logbook. It is required that the referee (or referees) must be of professional standing and familiar with the analyst’s work and training.

When the Industrial Mentor considers the trainee analyst to have accumulated sufficient experience to qualify for certification, the trainee analyst applies for assessment by submitting the logbook for examination by the NAFEMS’ Assessment Panel and by paying an assessment fee. NAFEMS’ assessors have the right to contact the Industrial Mentor or referees to question any entry in the logbook.

The level of accumulated experience necessary for certification is illustrated in the next section describing the ‘Accumulated Points Route’ available to the experienced analyst.

If the applicant is successful, he/she will be entered on the Register of Analysts as either “Registered Analyst (Standard)” or “Registered Analyst (Advanced)” and awarded a Certificate of Competence which states the analysis and product types assessed.

They will then be invoiced for the first year annual fee for maintaining their entry on the Register as a Registered Analyst.

### 6.2 Experienced Analyst

Experienced analysts, who expect to meet the required standards, are permitted to enter the Scheme without having to undertake a structured training programme. They should obtain and complete the appropriate ‘NAFEMS Registered Analyst Scheme’ application form and apply for assessment by submitting it to NAFEMS, together with the required documentation (including a current curriculum vitae) and application fee.

The required documentation depends on the route to certification. Two routes are available – either the ‘Accumulated Points Route’ or the ‘Essay plus Interview Route’. Both routes require that referees attest entries. The application fee combines a one-off fee for entry to the Scheme and an assessment fee. Two different application forms are in use – the first for the experienced analyst applying for certification following the Accumulated Points Route and the second for those wishing to follow the Essay plus Interview Route.



## Accumulated Points Route

Candidates apply to enter the Scheme by submitting an application form and a CV. The CV must contain as a minimum: -

- details of higher education.
- confirmation of achievement of the required academic standard for entry.
- details of employment record and steps in professional career.
- details of referees able to attest the above entries.

The application form records the accumulation of points in the three areas A, B, C, below, which determine the level of certification.

**A. Product qualification experience** - measured as the number of months of workplace experience in the responsible conduct of design, simulation or product verification analyses, multiplied by an 'importance factor' derived from the importance of the analyses.

When assessing the candidate's experience, recognition will be given to the importance of the analysis to the overall design or product qualification process. Experience of product qualification in which analysis plays an integral role will be rated more highly than experience in which analysis provides only indirect support. Importance of analysis ranges from -

**Non-strategic** - analysis of an advisory nature, analysis supported by corroborative tests, research investigations and all analysis in which results will not provide directly the basis for strategic technical or commercial decisions.

to

**Strategic** - either falling into Analysis Category 1 or Category 2 (as defined in Appendix B) or analysis not backed-up by corroborative tests in direct support of manufactured products that hold a significant position in their market sector and/or where their value is in excess of £1m per annum (e.g. certain automobile components, consumer products).

Correspondingly, the "importance factor" will range from 5 (non-strategic) to 10 (strategic). For importance factors greater than 7, the applicant should provide corroborating information.

Points will be accumulated according to (months experience) x (importance factor).

**B. Numerical analysis experience** - measured as the number of months of workplace experience in the responsible application of numerical analysis to problem solving, multiplied by a 'complexity factor' derived from the complexity of the analysis.

If a team conducts the analysis, the applicant's contribution will be measured according to the extent of his/her involvement, both in the depth and importance of decisions for which he/she is responsible and the time contributed to the analysis project (the 'equivalent months').

Complexity of analysis ranges from simple to complex; correspondingly the 'complexity factor' ranges from 40 (simple) to 80 (complex). For complexity factors greater than 50, the applicant should provide supporting information.

Points will be accumulated according to (equivalent months experience) x (complexity factor).

Note: Months of product qualification experience may be included within months covered in numerical analysis experience and vice versa.

**C. Formal training** - In many cases in-service training is required to extend the foundation knowledge of a first degree (or its equivalent) to provide background and technical knowledge to underpin the application of numerical analysis in practice.

Formal training is provided via recognised courses covering general background knowledge and application of numerical analysis, measured in proportion to the hours of instruction or hands-on training.

Note: This generally excludes code specific training courses, unless relevant background material is included alongside code specific material.

Points are allocated for both relevant academic and in-service training in the basics of numerical methods (finite elements, boundary elements etc.) and the technical domains (structural mechanics, CFD etc.) as follows:

Per hour of	- Course with Examination	4.0
	- Course (without examination)	2.0
	- Interactive Workshops	2.0
	- Seminars and Conferences	1.0
	- Private Study	1.0

A maximum of 50 points will be granted to a first-degree course containing structural mechanics. Further academic points may be accumulated at post-graduate level by identifying the relevant course(s).

Relevant published papers and chapters in books will also count towards the training experience points total. A substantial, reviewed article published in a professional journal will carry 75 points.

The planning, preparation and delivery of teaching and training courses in, or very closely related to, numerical analysis theory and its application to practical engineering problems will also carry points thus-

Per hour of	- Course planning	0.5
	- Course preparation	2.0
	- Course delivery	2.0 (but not for repeats of the same course)

If claiming private study points, applicants must outline the scheme of study undertaken.

**Recording Experience.** Details must be presented on the application form to provide objective evidence of workplace experience and performance, and the training to provide underpinning knowledge.

**Recording Workplace Experience** - the linchpin of the Scheme is assessment of performance in the workplace. Applicants must provide suitable documentary evidence of workplace achievement wherein all elements for which points are claimed must be attested by a referee or referees.

**Recording Training** - the completion of appropriate training courses earns the applicant points towards the final accreditation score. Recognition is also given to private study. For all applicants, the Scheme requires that attendance at lecture courses, workshops and seminars is recorded and attested by a referee or referees.

**Points requirement.** The points required to merit Standard and Advanced levels of certification are-

Certification Level	Total Points Required	Minimum Product Qualification Experience	Minimum Numerical Analysis Experience	Minimum Formal Training
Standard	1000	250	400	150
Advanced	1500	375	600	225

If the applicant is successful, he/she will be entered on the Register of Analysts as either 'Registered Analyst (Standard)' or 'Registered Analyst (Advanced)' and awarded a Certificate of Competence that states the product and analysis types assessed, and which has currency for three years.

They will then be invoiced for the first year annual fee for maintaining their entry on the Register as a Registered Analyst.

## Essay Plus Interview Route

This route has been introduced as a result of feedback from Registered Analysts and potential applicants to the Scheme. Candidates apply to enter the Scheme by submitting the appropriate application form and three key documents.

The first is a CV summarising the steps in an applicant's career sufficient to justify his/her entry to the Scheme. As a minimum it:

- gives details of higher education.
- confirms achievement of the required academic standard for entry.
- gives details of employment record and steps in professional career.
- gives details of background training.
- gives details of referees able to attest the above entries.

Again, referees must be of professional standing who know the candidate sufficiently well to attest the entries.

The second is an essay describing a selection of analyses performed by the applicant. These should confirm the acquisition of product qualification experience, numerical analysis experience and training in the engineering application of analysis as described in Sections 6.2A, 6.2B and 6.2C, but without entering a points total.

The third is an essay describing in depth and detail a recent analysis with emphasis on the importance and complexity of the analysis.

It is required that the applicant nominates a referee(s) of professional standing to attest the content of the essays.

Following submission of these documents, NAFEMS' Assessment Panel will call the candidate for interview. The candidate will be questioned in depth on the subjects of the two essays and in general on related technical issues.

If not completely satisfied with any information given in the CV or essays, NAFEMS has the right to approach any nominated referee for substantiation.

If the applicant is successful, he/she will be entered on the Register of Analysts at the discretion of the Assessment Panel as either "Registered Analyst (Standard)" or "Registered Analyst (Advanced)" and awarded a Certificate of Competence that states the product and analysis types assessed.

The applicant will then be invoiced for the first year annual fee for maintaining their entry on the Register as a Registered Analyst.

## 7. Referees

Although referees currently working in the same organisation as the applicant are acceptable, it is strongly recommended that at least one outside referee be nominated. Referees must attest academic qualifications and each entry on the application form, CV, logbook or essay of which they have knowledge.

For the experienced analyst whose career spans several companies, he/she should nominate sufficient referees in order that academic qualifications and all entries of workplace experience 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.

## 8. Maintenance and 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.

## 9. Registered Analyst Code of Conduct

### **Guiding Principle for the Code of Conduct for Registered Analysts**

Registered Analysts shall carry out their work in a professional manner, with integrity and impartiality, paying attention to the interests of the people and the organisations with which they interact.

Any Registered Analyst that is found by NAFEMS to be in breach of this code of conduct will be removed from the register maintained by NAFEMS.

### **Specific Duties of All Registered Analysts**

All Registered Analysts shall take reasonable steps to maintain appropriate professional competencies.

Registered Analysts shall take appropriate steps to inform an employer, contractor, or client of any conflict between their personal interest and service to the employer or client.

Registered Analysts shall take due care and attention for the effects of their work on the health and safety of individuals and society.

Registered Analysts shall only accept and perform work for which they are qualified and competent to undertake, and shall seek and obtain whatever advice and assistance that may be required to carry out their duties.

Registered Analysts shall take due account of disaster prevention and mitigation whilst performing their duties.

Registered Analysts shall advocate the principles and practices of sustainable development.

A Registered Analyst found to have been guilty of improper conduct, will be liable to be penalised.

## 10. RA Scheme Appeals Procedure

Applicants who are dissatisfied with the decision about their application or who have been removed from the register may appeal within a period of 30 days from receipt of written confirmation.

Prior to an appeal being made, applicants are encouraged to resolve the issues through discussion with the Registered Analyst Scheme Co-ordinator.

All documentation will be made available to the Appeals Committee. In the case of an application they will carry out a review of the application and any additional information supplied by the applicant or their sponsors. In the case of removal from the register they will examine the evidence that led to the removal and any additional information supplied by the applicant or their sponsors.

Any appeal shall include the grounds on which it is made and any written supporting evidence, and shall be submitted in writing to the Chief Executive within 30 days of receipt by the applicant of the notification from NAFEMS.

The Chief Executive (or, in the Chief Executive's absence, a member of the NAFEMS Council of Management) shall review the appeal within 30 days of its receipt to decide if a case exists to review the decision.

If a case is deemed not to exist, the appeal shall be rejected. The applicant shall be informed of this within 30 days of receipt by NAFEMS of the appeal.

If a case is deemed to exist, the appeal shall be referred to the Appeals Committee. The appeal shall be considered by the committee following the referral. The committee shall report its decision to the Council of Management.

The Appeals Committee will consist of the Chief Executive, the Chairman of the Education and Training Working Group and a member of the Council of Management.

The final decision on the appeal shall rest with the Council of Management. The Chief Executive shall inform the applicant of the outcome of the appeal within 30 days of the decision of the Council.

# Appendix A: Analysis Scope Classification

The scope of analysis experience should be defined in terms of product types and analysis 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.

## Product Types

## Analysis Types

### Vehicle Group

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

Acoustics  
Contact/Friction  
Dynamic response, linear/non-linear  
Fluid-Structure interaction  
Fracture mechanics  
Linear eigenproblems,  
buckling/vibration  
Static, linear/non-linear  
geometry/material  
Seismic/spectral response  
Thermal, linear/non-linear  
Thermo-mechanical  
Optimisation

### 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

### General/Consumer Products Group

Bio-mechanical  
Containers  
Domestic machinery (white goods)  
Furniture and fittings  
Industrial machinery  
  
Composite structures  
Elastomers

# Appendix B: Product Qualification Categories

## B.1 Category 1 - Vital (Public Disaster)

To fall into this category, two major conditions must be satisfied. This product itself must be such that its malfunction or failure is certain to place human life in danger or to endanger property or the environment on the scale of a public disaster.

The analysis must be an integral part of the integrity demonstration such that, in its absence, there would be no reasonable cause for the contractor to claim full discharge of his legal obligations.

### B.1.1 Examples of products and failure situations common within Category 1.

- Structural failure of ships or aircraft leading to sinking, disintegration or crash landing.
- Collapse of bridges, buildings or other major public works that pose an immediate threat to life.
- Explosion, disintegration or leakage from pressure vessels such as directly to threaten human life or to release physically or chemically harmful substances beyond clearly designated containment areas.
- Failure due to earthquakes of dams, pipes, supply lines etc. so as to release water, gases, electricity, etc. on such a scale as to cause extensive and direct threat to property or life.
- Collapse of major public works (e.g. tidal barrage, breakwater etc.) such as to cause direct or consequential damage beyond the limits of liability of the contractor.

### B.1.2 Examples where analysis forms an integral part of the demonstration

- Integrity is demonstrated by analysis alone, i.e. in the absence of approved (or in compliance with) detailed Codes of Practice or supporting tests.
- Analysis is used as the main link to relate the behaviour of the product as a whole to tests that demonstrate the integrity of the details.
- Analysis is used to extend accepted design practices into areas where there is no approved body of design experience.

## B.2 Category 2 - Important

This category may be defined in one of two ways:-

- The product itself may be such that its failure would at least pose a serious danger to human life or cause direct or consequential damage beyond the contractor's normal limits of liability.
- The product failure itself may be "Vital", but the analysis is not an exclusive part of the integrity demonstration.

### B.2.1 Examples of Category 2 failure situations.

- Failure of personal vehicles (e.g. family motor cars etc.) which might pose a threat to life
- Specific types of failure (such as an aircraft fatigue) of major transportation systems or public works, which can normally be contained by accepted safety procedures but which cause major disruption to services.
- Major plant or construction works whose failure would not directly endanger human life but which would demand reconstruction or replacement whose costs could not normally be borne by the contractor (e.g. unattended or adequately contained manufacturing plant).

### B.2.2 Examples of partial reliance on analysis

It is possible that products, which undoubtedly fall within the definition of Category 1, may downgrade to Category 2 if the analysis is not an irreplaceable part of the demonstration. This may arise if: -

- The analysis is performed independently of an established Code of Practice (e.g. for buildings, shipping etc.) which is normally accepted as basis of safe design.
- The analysis is backed up by a comprehensive programme of full-scale testing to the satisfaction of an appropriate Safety Authority.
- The analysis is only being used for the initial design or for specific investigation purposes and will be supplemented by independent, approved design procedures.

### B.3 Category 3 - Advisory

This category is applied to all situations not covered by the previous demonstrations, but where the analysis contributes significantly to demonstrate integrity of the product and where failure would cause financial embarrassment to the contractor or disruption of services.









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