

Competence Profiles – Guidance for applicants and assessors

PART 2 – INDUSTRY CLASSIFICATION (V) – AUTOMOBILE INDUSTRY

1 Summary

Employers of Automotive Product Development engineers include vehicle manufacturers, component and system suppliers and consultancies. Companies vary in size from "household name" car makers with thousands of employees, to small consultancies. Most automotive companies have adopted flat management structures in design and development and therefore experienced engineers may have significant professional responsibility without necessarily having a senior grade. In order to assess professional engineering responsibilities against such a varied and changing background, it is now necessary to judge an individual's competences against the Engineering Council's UKSPEC criteria for Professional Registration as a Chartered or Incorporated Engineer. The method of assessing the various elements of competence within sections A to E, in accordance with the benchmark profile for Membership and Professional Registration (normally a minimum of three sections at level 3 plus two sections at level 2), is fully explained.

Senior Management posts within the Automotive Industry with responsibilities for resources (both financial and manpower) and also have wide understanding of strategic, commercial and financial issues are likely to meet the requirements for the class of Fellow. Such candidates are likely to be experts in their particular fields, and "champions" for their directorate, company or industry sector. In addition, depending on the precise level of responsibility and the technical and managerial content, it is possible that heads of departments within such areas (such as Chief Engineers) and in some cases their first line managers, may meet the requirements for Fellow.

2 Table of Contents

| | | |
|----------|--|----------|
| 1 | SUMMARY | 1 |
| 2 | TABLE OF CONTENTS..... | 1 |
| 3 | INTRODUCTION | 2 |
| 4 | REQUIREMENTS FOR MEMBERSHIP AND PROFESSIONAL REGISTRATION | 2 |
| 4.1 | DEPARTMENTAL MANAGERS AND FIRST LINE MANAGERS | 3 |
| 4.2 | PROFESSIONAL AND TECHNICAL STAFF | 3 |
| 5 | ASSESSMENT OF COMPETENCE | 4 |
| 5.1 | COMPETENCE STATEMENTS A AND B..... | 4 |
| 5.2 | COMPETENCE STATEMENT C..... | 5 |
| 5.3 | COMPETENCE STATEMENT D..... | 5 |
| 5.4 | COMPETENCE STATEMENT E..... | 6 |
| 6 | REQUIREMENTS FOR FELLOWSHIP | 6 |

3 Introduction

Employers of Automotive Product Development engineers include vehicle manufacturers, component and system suppliers and consultancies. The size of the companies varies from "household name" car makers with thousands of employees, to small consultancies. Grading systems and salary scales vary between these different types of company and so cannot be used as broad indicators of professional engineering responsibility.

Technological and commercial factors over the last 10-15 years have resulted in changes in the nature of automotive development, particularly with greatly reduced product cycle times and increased use of computer modelling techniques. A larger proportion of engineers are involved in advanced computer modelling and predictive work and often these engineers are engaged in work that is highly technical, with little general managerial content.

Most automotive companies have introduced flatter management structures in design and development, although this varies from one company to another. Therefore, experienced engineers may have significant professional responsibility without necessarily having a senior grade. In addition, supporting roles traditionally carried out by such engineers may be undertaken by skilled non-professional staff.

In order to assess professional engineering responsibilities against such a varied and changing background, it is now necessary to judge an individual's competences, as described in section 4, as distinct from investigating time spent in designated posts previously deemed to meet the Institution's requirements for Membership and the Engineering Council's requirements for Professional Registration as a Chartered or Incorporated Engineer. The method of assessing the various elements of competence within sections A to E, in accordance with the benchmark profile for Membership and Professional Registration (normally a minimum of three sections at level 3 plus two sections at level 2), is fully described section 5.

4 Requirements for Membership and Professional Registration

Specific job titles have been avoided in the following description since experience shows that similar levels of professional responsibility in different companies often have very different titles, and conversely the same title often has a very different meaning.

Automotive product development in a modern manufacturer, supplier or consultancy, is likely to include some or all of the following broad functions:

- Engineering test, validation and development
- Engineering design
- Computer aided modelling and analysis
- Manufacture
- Engineering business planning and organisation
- Human Resources
- Finance & Procurement
- Quality engineering
- Research and advanced engineering
- Control systems and strategy development

The first five functions will incorporate a significant engineering content. In a large company it is likely that Engineering will be divided into broad divisions such as Powertrain, Electrical, Vehicle, Body & Chassis Engineering each with numerous departments carrying out the various functions indicated above.

4.1 Departmental Managers and First Line Managers

The heads of such departments will normally have a number of first line managers or team leaders, each of whom are typically responsible for an engineering attribute, vehicle system or group of components. The departmental heads and their first line managers may be expected to fulfil the Institution's requirements for Membership, and quite possibly Fellowship, as discussed later.

In smaller companies, those heading up the departments may have smaller budgets than managers with similar job titles in larger companies. However, managers in small companies often have significant spans of control with less resources to cover them. It is therefore still probable that they would satisfy the requirements of Member. Such companies may omit the first level of management altogether.

Increasingly, companies operate matrix management structures that separate functional and line management responsibilities. For example, an engineer may report to a Chief Engineer within Powertrain but operate on a day to day basis for a Vehicle Programme Manager developing a new product. Engineers are also frequently seconded to teams tackling specific projects or problems. These flexible management structures will not influence an engineer's suitability for Membership, providing the individual can provide evidence that the required competencies are being met.

4.2 Professional and Technical Staff

The first line managers, or possibly (as discussed) the departmental heads in smaller companies, will normally have a team of subordinate professional and technical staff reporting directly to them, under the following main categories:

- Engineers in charge of entire projects, attributes, systems or groups of components
- Engineers responsible for a 'sub-set' of the above
- Support technical and administrative staff
- Support manual staff

In some companies, support staff will be managed separately as a common resource for a number of departments. The distinctions between the various engineering and support categories are less clear-cut than hitherto and all staff are often on a single salary structure and common terms of employment.

Engineers in the first category would generally be expected to fulfil the Institution's requirements for Membership. This is not however automatic because this grade is also used in instances where the responsibilities are still considerable but not of a nature to satisfy the Institution's requirements. Furthermore, there may be candidates at this grade who have followed a career path that did not incorporate the traditional degree and professional training. Such individuals would need to demonstrate alternative means of having fulfilled the Institution's academic requirements and Initial Professional Development.

It is particularly difficult to generalize about the second category of engineers, where individual circumstances will determine suitability for Membership. For example, the ability to demonstrate technical and commercial leadership will depend on the role the engineer is fulfilling. This category will include younger engineers who are likely to move later into the first category and who are working towards a level of responsibility appropriate to that of Member. Other longer established engineers in this category may have reached their career plateau and have competences that are not likely to move beyond a level appropriate to associate membership, although each case should be considered on its individual merits.

Support technical staff are, in most cases, likely to have responsibilities appropriate to associate membership. In certain cases, however, the responsibilities may approach Member level.

In all cases Membership can be achieved at either Chartered or Incorporated Engineer level, depending on the competencies of the individual and their academic background. The former would be more likely to be involved in the optimizing of a technology, the latter in its application. For example, a Test Engineer who supervises emissions test work on an engine may be an Incorporated Engineer; one who develops new test procedures for emissions may be Chartered. However, as before, the individual circumstances will override any generalization such as this.

Parallel to the first line managers and their teams, some automotive companies have established a technical career path where engineers may develop specialist expertise and assume technical responsibilities beyond those normally expected in the first category discussed above, without necessarily having managerial responsibilities. Such engineers would normally fulfil the Institution's requirements for Membership

5 Assessment of competence

Professional mechanical engineering responsibilities for the positions described above will depend to a large extent on the nature of the company and structure of the department in which the engineer works. Levels of responsibility in the test, design and analysis functions may be reflected in supporting areas such as planning. This reinforces the importance of carefully assessing applicants' personal responsibilities and competences, together with their direct input to projects in their work area and their degree of supervision. In addition, clear and comprehensive organisation charts, along with clear explanations, will be a key aspect in the appraisal process. It will no longer be appropriate to recommend election to Member on the basis of job title or grade.

5.1 Competence statements A and B

Successful applicants will be able to demonstrate their use of a combination of general and specialist engineering knowledge and understanding to optimise (Chartered Engineer) or apply (Incorporated Engineer) existing and emerging technology in their chosen field within the automotive industry. If appropriate, candidates may choose to present evidence of competence at interview, including drawings, design studies, data sets, calculations, reports of defect or failure investigations, project schedules, computer programs and models, brochures and photographs.

Applicants engaged primarily in project management should provide, and assessors should seek, evidence of responsibility for technical specifications, technical risk management, evaluation of technical solutions and monitoring against technical performance standards.

Examples of situations or activities that may give automotive engineers the opportunity to achieve and demonstrate professional competence in these areas include:

- Participation in the design, modelling, development or manufacture of automotive components or systems, including test and verification.
- Investigation and solution of design or operational problems with automotive components or systems, involving theoretical or structured analysis, in a design, development, simulation or manufacturing environment.
- Secondments to other engineering or manufacturing areas would also be expected to provide opportunities for the development of professional engineering expertise and technical judgement.

Where, because of the diversity of services offered by their employer, applicants work in areas of engineering other than automotive, their technical competence may be better judged by reference to the appropriate industry competency profile. For example a noise and vibration consultancy with automotive clients may also work in other industries such as aerospace and power generation.

5.2 Competence statement C

As the work of professional engineers in the automotive industry varies from highly technical to highly administrative, applicants are not necessarily expected to have line management responsibility or experience in order to meet the required level of competence in this section. Engineers who have highly specialist technical roles may have minimal direct management responsibilities but will frequently demonstrate management skills by leading teams in design or problem investigation activities, for example. Furthermore, such applicants would be expected to have a high degree of autonomy in planning and monitoring their activities and care should be taken to explore the interface between them and their colleagues and supervisors.

Examples of situations or activities that may give engineers the opportunity to achieve and demonstrate competence in these areas include:

- The planning, personal supervision or active participation in team based activities, such as design reviews, task forces or problem investigations. Such teams are likely to be multi-disciplinary and may include personnel from outside companies, such as suppliers and consultancies.
- Project planning, management or implementation responsibility, including technical assessment, resource allocation, timing and budgetary control.
- The in-house training and development of technicians and skilled craftsmen, possibly on a project-by-project basis.

5.3 Competence statement D

Communication and interpersonal skills should be assessed by consideration of both the Professional Review Report and interview performance. Assessors should look out for a report which has a logical structure, clearly aimed at providing a portfolio of evidence against each of the five competence statements, while providing a qualitative description of activities and achievements.

Assessment of verbal communication skills should analyse the ability to give clear, concise and relevant answers which address the question without undue digression and provide sufficient but not superfluous detail.

Additional evidence of competence in this area may be sought by investigating:

- Whether the applicant routinely makes presentations to in-house management at various levels, outside clients and contractors; subjects could include project plans, business plans, etc.
- Whether the applicant is involved in contract liaison and negotiations - systems, procedures, method statements, safety, etc.

- Evidence of the writing and presentation of technical papers to external conferences or learned societies.
- Other written reports and verbal presentations that the applicant routinely makes.

5.4 Competence statement E

The observance of safe working procedures, including compliance with internal and national codes of practice, is inherent in virtually all engineering activities in automotive product development and manufacture. Similarly, there are codes that cover the design and manufacture of automotive products. Applicants should be able to demonstrate their commitment to observing and promoting the use of any such codes that are relevant. Evidence of awareness of environmental, legislative and sustainable development issues (for example, automotive recycling and emissions requirements) is valuable in demonstrating an engineer's awareness of societal issues.

Evidence of professional integrity and commitment should include a Self-Development Action Plan, in any convenient format, outlining how the applicant intends to maintain and enhance competence through personal development. The Plan should include short, medium and long-term goals and explain how these are likely to be achieved. Assessors should be aware that UKSPEC interprets Continuing Professional Development (CPD) as commencing at the point where Chartered status is attained; therefore applicants are not required to provide a record of courses attended, etc., when applying for corporate membership and professional registration.

Examples of CPD activities recognised by the Institution as acceptable include:

- Extra qualifications such as an MBA, Diploma in Engineering Management
- Any relevant technical or business courses
- Conducting or attending workshops
- Attending, presenting or participating in seminars and conferences
- Presenting or attending lectures
- Writing technical papers
- Reading technical articles and journals
- Distance or open learning
- Secondments and job rotation
- Updating in own and other fields of work
- Institution meetings or events
- Active IMechE committee work
- Learning a foreign language
- Involvement in government activities
- Community and charity work
- Activities indicating actions to keep abreast of current and emerging technologies

6 Requirements for Fellowship

Applicants will generally have significant responsibilities for resources (both financial and manpower) and also have wide understanding of strategic, commercial and financial issues. They are likely to be experts in their particular fields, and "champions" for their directorate, company or industry sector.

The following senior engineering posts within a large automotive company should be considered as generally likely to meet the requirements for the class of Fellow:

- Director
- Head of an entire division such as Powertrain or Vehicle Engineering

In addition, depending on the precise level of responsibility and the technical and managerial content, it is possible that heads of departments within such areas (such as Chief Engineers) and in some cases their first line managers, may meet the requirements for Fellow.

Valid applications for election or transfer to Fellow may be received from other engineers with (a) senior management and commercial responsibilities or (b) established reputations in important positions of responsibility in engineering science or practice. Applicants would be expected to participate in external forums, for example by promoting the importance of engineering issues in debate with Government and other bodies, via the Institution. In any case, an involvement in the professional development of young engineers would be expected, as would documentary evidence of Continuing Professional Development.

Further examples of suitable CPD activities not covered under the requirement for Competence Statement E above include:

- MPDS mentoring
- Acting as an IMechE Membership Panel interviewer or assessor
- Active participation in Institution committees

For candidates applying directly for the class of Fellow, a detailed CV would be required in addition to an interview. In particular, this report must contain additional supporting evidence detailing:

- The position of senior engineering responsibility held by the applicant
- The applicant's contribution to the professional development of young engineers
- How the applicant intends to keep up to date regarding developing technologies, from both a technical and a commercial standpoint.

Applicants should consider the 5 UK-SPEC competences when compiling their CV to ensure all competences are covered with evidence at the correct level.

Finally evidence of CPD would be required from applicants applying for Fellow, either in the form of a Development Action Plan for applications direct to Fellow or included in the CV submission for existing Members.