

Course: **Introduction to Engineering**

Unit: **Staffing for Engineering Projects**

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TABLE OF CONTENTS

1. INTRODUCTION	3
1.1 IMPORTANCE OF STAFFING FOR ENGINEERS	3
1.2 SCOPE OF THIS LECTURE	3
2. JOB ANALYSIS AND -SPECIFICATION	3
2.1 JOB ANALYSIS	3
2.1.1 <i>Reasons for Job Analysis</i>	3
2.1.2 <i>Defining the Job Type and Job Title</i>	5
2.1.3 <i>Determining Job Content</i>	5
2.1.4 <i>Objective Assessment of the Vacancy</i>	6
2.1.5 <i>The Bigger Picture</i>	7
2.2 JOB SPECIFICATION	7
3. RECRUITMENT AND SELECTION	10
3.1 RECRUITMENT	10
3.1.1 <i>Recruiting Suitable Candidates</i>	10
3.1.2 <i>Internal Recruitment</i>	11
3.1.3 <i>Methods of Recruiting</i>	11
3.2 SELECTING THE RIGHT PEOPLE	12
3.2.1 <i>Introduction</i>	12
3.2.2 <i>Selection Tools</i>	12
3.2.3 <i>Different Interview Methods</i>	13
3.2.4 <i>The Structured or Patterned Interview</i>	14
4. PERFORMANCE APPRAISAL.....	15
4.1 PURPOSE OF PERFORMANCE APPRAISALS	15
4.2 MAIN AREAS ADDRESSED DURING PERFORMANCE APPRAISAL	16
4.3 IMPORTANT ISSUES IN PERFORMANCE APPRAISAL	17
4.4 GUIDELINES FOR EFFECTIVE PERFORMANCE APPRAISAL	18
5. TRAINING	19
5.1 IMPORTANCE OF TRAINING.....	19
5.2 TYPES OF TRAINING.....	19
5.3 IMPORTANT ISSUES IN TRAINING	19
5.4 TRAINING TO HELP NEW EMPLOYEES SETTLE IN	20
6. REFERENCES	20
7. SELF-ASSESSMENT	22
7.1 TRUE / FALSE QUESTIONS.....	22
7.2 MULTIPLE CHOICE QUESTIONS	22
7.3 ESSAY QUESTIONS (20 MARKS).....	25

1. INTRODUCTION

1.1 IMPORTANCE OF STAFFING FOR ENGINEERS

- Engineers will either be employed, or will be employers.
- Therefore it is important for engineers to a basic understanding of staffing issues.
- The topics addressed in this lecture will also assist young graduates to better prepare themselves for job interviews, and for performance appraisals.

1.2 SCOPE OF THIS LECTURE

Staffing covers all activities involved in filling and keeping filled the positions established in the organisational structure. (Staffing is sometimes considered to be the final part of the *organising* element of management.) Staffing includes defining the extents of different jobs in the organisation, recruiting and selecting suitable candidates, training new candidates and existing incumbents to accomplish their tasks effectively, appraising performance, compensating, and redeployment or termination when the organisational position or the incumbent is no longer necessary. This module provides students with a high-level overview of the following aspects of staffing for an engineering project:

- **Job analysis and -specification**, addressing job analysis, definition of job scope, and compiling a job specification.
- **Recruitment and selection**, addressing selection tools, interview types, and guidelines for conducting an interview.
- **Performance appraisal**, addressing the purpose of performance appraisal, the appraisal process, guidelines for effective performance appraisal, and follow-up after the appraisal.
- **Training**, addressing the importance of training, types of training, and the role of training in helping new employees to settle.

2. JOB ANALYSIS AND -SPECIFICATION

2.1 JOB ANALYSIS

2.1.1 Reasons for Job Analysis

- Different organisational structures are possible; and three of the most commonly used ones are: the functional- (figure 1), the project- (figure 2), and the matrix structure (figure 3).
- (Refer to YOKER 1977 or STUCKENBRUCK 1981 for more detailed discussions on these structures and their pros and cons.)

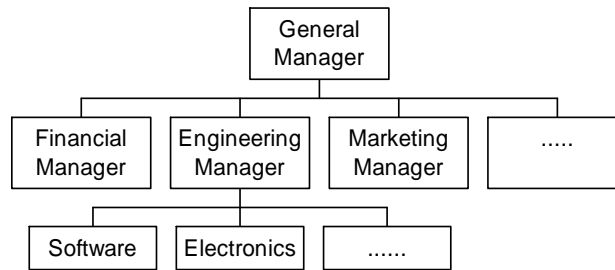


Figure 1: Typical Functional Structure

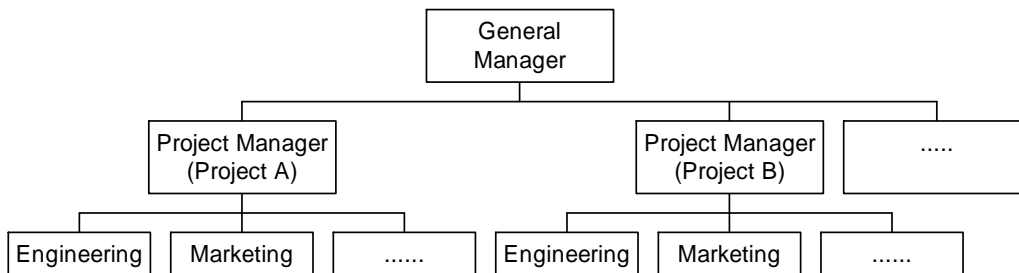


Figure 2: Typical Project Structure

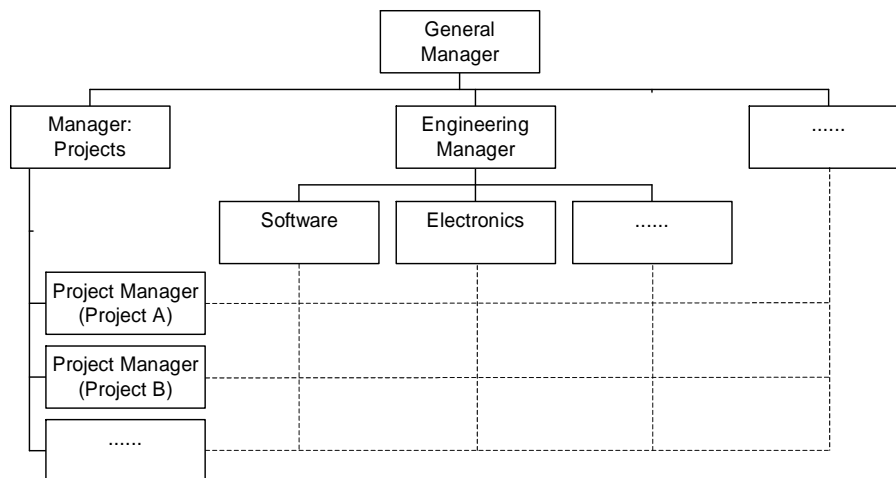


Figure 3: Typical Matrix Structure

- Once a suitable organisational structure had been defined (e.g. by means of methods as described by ROWBOTTOM & BILLIS 1987), the positions in this structure need to be filled by *suitable* personnel.
- In order to decide whether a candidate is “suitable” for a specific job, it is necessary to first analyse the job in terms of its content and scope (FINE & CRONSHAW 1999), and then to compare the candidate’s current and potential abilities with the job requirements.
- Goal setting is a fundamental part of management, and job analysis is the goal setting part of staffing, through systematic identification of key tasks and required skills and abilities.

- Without job analysis, someone not suited to a specific job might be appointed - and this can lead to inefficiency and to severe frustration.
- (Also refer to CLARK 1986 and LANDAU & ROHMERT 1989 for discussions on job analysis.)

2.1.2 Defining the Job Type and Job Title

- The first step in job analysis is to define the *type* of job, and the job *title*.
- By first defining job type and -title, the job analysis process becomes focused (SCHEIN 1994).
- In engineering there are many job types, each including a vast variety of possible job titles - all very much depending on the type of organisation and the terminology used by it.
- Examples of typical job types (and job titles) in an engineering organisation are:
 - * Engineer (System Engineer, Electronics Design Engineer, Test Engineer, Embedded Software Design Engineer, Test and Evaluation Engineer, Maintenance Engineer, etc.).
 - * Technicians (Electronics Prototyping Technician, Test Station Operator, Webmaster, etc.).
 - * Tradesmen (Fitter and Turner, Mechanic, Printed Circuit Board Maker, Electrician, etc.).
 - * Project Managers (Software Project Manager, Manager: 'Project X', etc.).
 - * Technical Managers (Technical Director, 'Product X' Development Manager, Maintenance Manager, etc.).
 - * Scientists (Computer Scientist, Mathematician, Physicist, etc.).
 - * Programmers (Simulation Programmer, Embedded Software Programmer, Test Software Programmer, etc.).
 - * Analysts (Mathematical Modeller, Operational Scenarios Analyst, etc.).
 - * Support Staff (Secretary, Configuration Controller, Documentation Controller, Typist, etc.).

2.1.3 Determining Job Content

- Once focus had been gained by defining job type and -title, the next step is to define *job content*.
- Job content can be defined in terms of *key performance areas* and *job scope*.

2.1.3.1 Key Performance Areas

- In order to define a job's content, the following broad questions must first be answered:
 - * What are the major responsibilities (key performance areas) associated with this job?
 - * What are the sub-tasks within each of these areas?
- Any job should be well focused. Therefore responsibilities should be grouped into about three key performance areas, each with not more than five sub-tasks.
- If a job consists of numerous small and vaguely related responsibilities, it can become very difficult for the person who must do the job and for his/her manager to keep track of what needs to be done.
- Different methods can be used to assist with determining job content, e.g.:
 - * Questionnaires to existing employees in similar positions (e.g. McCORMICK 1989).

- * Checklists for existing employees to mark what they are doing.
- * Detailed diaries kept by existing employees for one or more weeks.
- * Observation of employees in their daily activities.
- * A group conference, where existing employees, or a group of experts, explain what the specific job entails.
- * Work participation by the job analyst - to see for him-/herself what the job entails.

2.1.3.2 Job Scope

- The scope of a job can be defined in terms of the level of abilities required to execute each of the key performance areas and each of the sub-tasks in these areas.
- Each task can be classified as a low, medium or high scope – but keep in mind that job scope can remain constant, can grow, or can decline with time.
- It is thus important to define a job's initial scope and its expected trend, in order to:
 - * Compare it with other jobs within the organisation. If a job's current or future scope is vastly different from the scope of other jobs in the team, it might be difficult to manage.
 - * Select a candidate that will suit the job, and allow potential candidates to match their own ambitions and expectations with the available job. It is disastrous to appoint someone whose abilities are vastly different from the job's scope, or without the ability to adapt to future trends in the job scope.
 - * Determine an appropriate remuneration level for the job.
- The following are examples of questions which can be asked for each key performance area, in order to define a job's current and future scope:
 - * What specific qualifications, skills and intellectual abilities are required (now and later)?
 - * How much routine work is involved (now and later)?
 - * How much responsibility is attached (now and later)?
 - * What personality traits and social skills are required (now and later)?
 - * What other specific abilities (e.g. verbal communication, numeracy, colour perception, etc.) are required (now and later)?
- Note that it is important to not only focus on skills and qualifications, but also on personality traits and other abilities.
- Examples of tasks of different scope are:
 - * High scope tasks: software development, strategic planning, general management, etc.
 - * Medium scope tasks: testing of electronic assemblies, quality inspections, etc.
 - * Low scope tasks: handling and sorting electronic components, filing, etc.

2.1.4 Objective Assessment of the Vacancy

- Once a job's key performance areas and scope had been defined, an objective assessment of the vacancy to be filled is necessary.

- This step further helps the job analyst to fully understand the job and the reasons for its existence.
- Some of the most important questions, to be asked as part of a job assessment, are:
 - * Is this a new job or an existing one that has (or will) become vacant?
 - * If this is a new job, is it:
 - ♦ To relieve existing staff from work overload?
 - ♦ To reduce work back-logs?
 - ♦ To execute new responsibilities within the organisation?
 - ♦ To bring in new skills?
 - ♦ Sustainable on the long run?
 - * If it is an existing job:
 - ♦ Why will (or has) it become vacant?
 - ♦ How often does it become vacant; and is this frequency acceptable?
 - * Is this job really necessary?
 - * What will happen if the vacancy is not filled?
 - * Is the marginal benefit of this job likely to be more than the marginal cost? [Refer to *marginal analysis* in the *Introduction to Engineering Economics* module.]
 - * Can the work not perhaps be divided and assigned to existing team members?
- If an existing job often becomes vacant, it indicates that there is a problem with this specific job; and the root causes of such a problem must be sought and rectified.
- If a job is not really necessary, or if its marginal cost is more than its marginal benefit, it should rather be abandoned.

2.1.5 The Bigger Picture

- If the objective assessment shows that the job is really necessary and worthwhile, the next step is to ascertain that this job fits into the organisation's bigger picture (vision, goals, etc.).
- Important questions that can help with this process, are:
 - * Is this job aligned with the organisation's vision and goals?
 - * Does this job require a member of staff, or can it be contracted out?
 - * Is this a full-time or part-time job?
 - * Does the job require a permanent- or a temporary staff member?

2.2 JOB SPECIFICATION

- Once it had been determined what a job entails, that it is really necessary, and how it fits into the organisation's bigger picture, a job specification (or *job description*) must be compiled - refer to GALIAS 1992 or GRANT 1989.
- A job specification should be:
 - * A concise statement, quantifying the key performance areas demanded by the job.

- * Compiled without a specific person in mind.
- * Specifying **what** must be done, and not **by whom** it should be done.
- * Realistic. Do not overspecify by giving an impossible to achieve “wish list”.
- As far as possible, the job specification should not specify **how** the job must be done - except if very specific procedures must be followed. Normally, the *how* will largely depend on the specific person appointed.
- An example of a job specification (to be tailored to suit specific requirements), compiled in tabular format, is shown below:

JOB SPECIFICATION	
Organisation	KBX Helicopter Corporation
Department	Flight Control Department
Job Type	Line Manager in an Engineering Organisation
Job Title	Manager Autopilot Design Section
Job level	Senior Engineer (at least 8 years experience)
Educational requirements	Bachelors degree in Engineering (Mechanical / Electrical / Electronic / Aeronautical)
Further education (desirable, but not essential)	<ul style="list-style-type: none">• Masters degree in Engineering or Ph.D.• MBA
Previous experience required	<ul style="list-style-type: none">• Digital control system analysis and design• Management role in the aviation industry
Further experience preferred (not essential)	<ul style="list-style-type: none">• Project management• Design of avionic control systems
Special skills required	<ul style="list-style-type: none">• Computer literacy• Management skills (Planning, Organising, Staffing, Leading and Control)• Knowledge of System Engineering and Software Engineering
Skills expected to be gained on this job	<ul style="list-style-type: none">• Business Process Re-engineering• Marketing to outside organisations
Aptitudes required:	<ul style="list-style-type: none">• Good team worker• Social skills to handle a team with diverse personalities• Good project documentation skills
This position reports to	Manager Flight Control Department
Type of position	Permanent full-time / Permanent part-time / Long-term contract / Short-term contract
Number and type of persons reporting to	3 x Control System Design Engineers 2 x Simulation Software Developers

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JOB SPECIFICATION	
this position	3 x Embedded Software Developers 3 x Computer Hardware Developers 1 x Secretary
Organisational diagram	<i>(Draw an organisational diagram here to show where the position currently fits into the organisation)</i>
Key Performance Areas	<ol style="list-style-type: none"> 1. Section Management <ul style="list-style-type: none"> • Plan and allocate work assigned to the section. • Adapt section structure as and when necessary. (Grow the section steadily to become a department, consisting of four sections (Autopilot Control System Design; Autopilot Simulation Software Development; Autopilot Embedded Software Development; and Autopilot Computer Hardware Development), within two years.) • Keep the section's organisational positions filled; conduct regular performance appraisals; and arrange extra training for personnel when necessary. • Provide leadership to section personnel: Instil enthusiasm, act as the interface between them and clients, and create a comfortable work environment for them. • Control work performed by section's personnel to ensure delivery on schedule, within budget, and satisfaction of clients' technical requirements. 2. Quality Assurance: <ul style="list-style-type: none"> • Ensure that design and technical reviews and software inspections are regularly held, in order to ensure technical quality. • Regularly audit the level of the section's product documentation and configuration management, and ensure that standards are continually met. • Ensure that the section stays current with technological developments. 3. Marketing: Collaborate with the marketing department in order to offer autopilot design services to other aircraft manufacturers.
Job scope	High – requiring extensive intellectual abilities, ambition, hard work, commitment, ability to manage others, and team work. The job has very limited routine work, and has a high level of responsibility attached to it.
Job scope trend	It is expected that this job will grow steadily over the next two years - such that its incumbent will become a department manager at the same

JOB SPECIFICATION	
	level as the one to which this position currently reports. (I.e. the position will move up one layer in the organisational hierarchy.)
Notes / Comments	<ul style="list-style-type: none">• This job does not entail extensive travelling.• It is not the policy of KBX Helicopter Corporation to require continuous overtime work from employees. However, longer than normal working hours might be necessary occasionally. (Extra time worked can be accumulated, and taken as extra leave later.)

- It is very important to use the above framework for a job specification only as a guideline. It must be tailored to suit each organisation's specific needs and culture.
- Compiling such a job description is essential for the organisation to understand its needs, before trying to satisfy these needs by means of recruiting, interviewing, and appointing somebody to fill the position.

3. RECRUITMENT AND SELECTION

3.1 RECRUITMENT

3.1.1 Recruiting Suitable Candidates

- Managing people is made much easier if the *right people* are appointed in the first place.
- The right people can only be appointed if the right people had been recruited. (Recruitment methods are discussed by DAWSON 1999; DEEMS 1998; HARRIS & BRANNICK 1999; and MAITLAND & MAITLAND 1996.)
- Recruitment is aimed at finding a number of potential candidates for a vacancy, so that the most suitable candidate to fill the vacancy, can be chosen.
- An organisation can use different methods to recruit suitable candidates, such as:
 - * Advertisements on internal notice boards, on the organisation's computer network, and by word-of-mouth.
 - * Asking existing employees to tell their friends and acquaintances about vacancies. If the existing employees are happy to work for the organisation, this recruitment method can be very effective.
 - * Advertisements in widely read newspapers, and in technical magazines.
 - * Advertisements on an internet website.
 - * Advertisements on university notice boards.
 - * Making use of a recruitment agency, who advertises the job specification, and then does a preliminary screening of candidates.

- * *Head-hunting*, where specific candidates are identified and approached directly with job offers.

3.1.2 Internal Recruitment

- It is important to first look inside the organisation for someone with the potential to be promoted or transferred into the vacant position.
- The main advantages of such an internal promotion or transfer are that the person already knows the organisation; and that good workers get the chance for promotion.
- However, it is essential not to promote someone merely in order to fill the vacancy or only to create an opportunity for promotion. The person must be suitable for the job.
- Many organisations make the mistake to promote a good engineer, for example, into a management position, merely for the sake of promoting the person, and not because he/she has management potential.
- Often people accept such promotions, even when they realise that it is a wrong move, because of the higher status or the higher remuneration attached to the new job.
- The result of such a promotion is often that the organisation loses a good engineer, while failing to gain a good manager.
- This often leads to severe frustration with both the organisation and the employee who had been promoted into the wrong position.
- Many modern engineering organisations address this problem by having different career paths, e.g. technical, line management, project management, system engineering, etc.
- These different career paths enable employees to grow in the direction for which they are best suited and to be promoted in that career path, instead of being forced into a direction merely because there are better promotion opportunities in that direction.

3.1.3 Methods of Recruiting

- Whatever method is used for recruiting, the first aim is to convince the most suitable persons to apply for the position.
- The recruitment advertisement should not be so vague that it attracts unsuitable applicants; neither should it be so specific that it scares potentially suitable persons.
- The advertisement should give a summary of the job description, i.e.:
 - * The organisation, what it does, and where it is.
 - * What the job involves.
 - * The skills and abilities required.
- The advertisement should also provide other details such as:
 - * The rewards offered.
 - * Whether the organisation must be contacted directly, or via a recruitment agency.
 - * Contact person.

- * The application procedure, e.g.:
 - ♦ **Standard application forms.** This method ensures that applicants provide most of the information necessary to make a preliminary choice reduction. The information provided here can also be used as the basis for discussion during personal interviews.
 - ♦ **Personal letters** – by post, fax, or e-mail. The main disadvantages are that candidates might not provide enough information about themselves, and that it is difficult to initially compare different applicants when each one provides different information. The main advantage is that a lot can be learned about someone from the style and grammar used in a personal letter.
 - ♦ **Telephone calls.** With this method, initial screening can be done as part of the application process; but it can become very time consuming.

3.2 SELECTING THE RIGHT PEOPLE

3.2.1 Introduction

- Once a number of potential candidates to fill a vacancy had been identified, one of them must be selected.
- The objective during the staff selection process is to match a person's abilities, ambitions and expectations with the job's scope and scope trend.
- It must be remembered that not every job has the potential to grow into something big. Similarly not everyone wants to "reach the top".
- Employees should never be forced beyond their level of competence. Mismatches occur when a high (or low) ability individual is matched with a low (or high) scope job.
- An interviewer who selects only high ability individuals can end up with a flock of high-performers, for whom there are not enough high scope jobs available on the team.
- This will lead to frustration, low job satisfaction, low productivity, and high staff turnover.

3.2.2 Selection Tools

- Various aids can be used to assist the selection process, such as:
 - * Application forms filled in by the applicants.
 - * References, whose names are provided by the applicant, and who are then contacted by the interviewer. (The applicant's consent should always be obtained before references are contacted.)
 - * Personal interviewing.
 - * Personality tests.
 - * Aptitude (ability) tests.
 - * Assessment centres (combination of above).
- The following criteria should be used for choosing an appropriate selection method:

- * **Validity.** The method used must be accurate (related to the job); and reliable (consistent and repeatable).
 - * **Fairness.** It should not discriminate against some applicants on grounds not related to the job. E.g. if the job does not require any computer skills, it is unfair to use a complex computer-based assessment tool.
 - * **Cost.** It should be affordable to use the method.
 - * **Applicability.** The method should be suitable for the type of vacancy to be filled. E.g. to appoint combat soldiers requires different selection tools than to appoint software developers.
- The following table compares the different selection tools in terms of the above criteria:

Selection Tool	Validity	Fairness	Cost	Applicability
Application forms	Moderate, because candidates can leave out or overemphasise some information.	Can be biased against those who don't have good writing skills.	Once-off initial cost to develop the form; then low cost to use.	Wide.
References	Low, because existing employers can say unfounded things about a candidate in an attempt to let someone else hire him/her; or to prevent him/her from finding another job.	Can be biased - e.g. if the reference is a close friend of the applicant.	Low – a few telephone calls and a bit of time.	Wide.
Interviews	Moderate, because candidates tend to give acceptable answers; and some interviewers “hear only what they want to hear”.	Can be biased on grounds of personal appearance of the candidate.	Low – only the interview time.	Wide.
Personality tests	High for personality requirements of the job; low for other aspects.	High, since these tests are conducted by professional psychologists.	High, since a psychologist is required.	Limited.
Aptitude (ability) tests	High for aptitude requirements of the job; low for other aspects.	Can be biased.	High.	Limited.
Assessment centres	High, since it combines all the above methods.	High, since more than one assessor are involved.	High.	Wide.

3.2.3 Different Interview Methods

- Personal interviews are still the most widely used selection tool.
- However, research shows that the correlation between actual performance and interviewers' assessments during interviews, is rather low.
- Some reasons for differences between a manager's belief about his/her ability to select the “right” people, and research results indicating the opposite, are:
 - * Interviewees often give “desirable answers” to the interviewer.
 - * Some interviewers “hear only what they want to hear”.
 - * If the appointed candidate fits the job (not necessarily completely) the interviewer considers it a successful appointment. Appointees who do not fit in, often leave again, without it becoming generally known that they did not fit in. The impression is often that they did fit in, but that they

had merely found a better opportunity elsewhere.

- There are three main types of interviews:
 - * **Nondirective interviews**, where interviewers handle the interview in an unstructured manner. Different applicants are asked different questions – and this makes comparison very difficult.
 - * **Problem interviews**, where a case study is given to the applicant, or where group interviews are held, in order to evaluate individual performance in a group. This is normally experienced as very stressful by candidates.
 - * **Structured or Patterned interviews**, which is the recommended approach - as described in section 3.2.4 below.

3.2.4 The Structured or Patterned Interview

3.2.4.1 Preparing for the interview

- Review the job specification and determine what type of person is sought.
- Review all applications which were received, and do a preliminary choice reduction.
- Invite suitable candidates for an interview. Do this in a way which will make the candidates look forward to the interview, and not in the form of a “summons” to attend a court hearing.
- Write down four or five open-ended questions (where “yes” or “no” will not suffice as an answer) that will help to evaluate the candidate’s abilities, growth potential, needs, ambitions, and other aptitudes - e.g. “Please tell me about your university courses”, instead of “Did you graduate ?”.
- Arrange for a comfortable location, away from distractions.

3.2.4.2 Conducting the interview

- Using more than one interviewer can help to increase the accuracy of the decision.
- However, it is best to conduct interviews one-to-one - i.e. rather let each interviewer have a short individual discussion with the applicant instead of creating a situation where many interviewers “interrogate” a single applicant. With more than one interviewer present, an interview can become intimidating for the candidate.
- Get away from interruptions (telephone, etc.).
- The opening minutes are crucial, since both parties are forming first (and lasting) impressions.
- Establish rapport and trust by discussing one or two common points of interest (determined from the application); and then start with a general question before proceeding to more specific questions and discussions.
- Talk in a relaxed manner; and conduct the interview as a discussion rather than a question and answer session.
- Ask open-ended questions that allow the applicant to do a lot of the talking.
- Also use specific questions, such as “How many subordinates do you currently manage?”, or “What is the value of your department’s annual turnover?”.
- Ask each candidate the same questions, and keep short notes so that different interviewers’

impressions and different candidates can be compared later.

- Make sure that the exact meaning of an answer is understood by both parties.
- Allow the candidate to talk about him-/herself, and give positive strokes when possible, e.g. "You did very well on project X. Tell me more about your role in it."
- Give the candidate the opportunity to ask questions about the position and the organisation, and use these questions to further direct the interview. Don't talk too much about the job before this stage, since that might pre-empt the candidate to tailor answers to better suit the job.
- At this stage the job specification can be reviewed with the candidate, and his/her matching or mismatching with it can be pointed out and discussed further.
- Make notes during the interview and record important answers given.
- End the interview by telling the candidate the time schedule for hiring and when and who will get back to him/her.

3.2.4.3 After the interview

- Summarise the interview while the answers and impressions are still fresh in your mind.
- Schedule a meeting with other interviewers to compare notes.
- Make a decision on whom to appoint, and make him/her an employment offer which fits into the current personnel structure. It can be very upsetting for the organisation if a new employee is appointed at a higher salary than that of existing employees with similar responsibilities.
- Even when one candidate stands out head and shoulders above the rest, the decision can be difficult, since that candidate might be too good for the job - i.e. the job won't offer enough scope, which will lead to frustration.
- (However, if such a *too good* candidate is appointed, he/she might create new scope for the position, and thereby pull the organisation up with him/her. Such an appointment might just be the boost required by the organisation, in order to greatly improve itself.)
- When more than one suitable candidate had been identified, some value system must be used in order to make the final decision. (Refer to CLEMEN 1996, GOUWS 2000, HAMMOND *et al* 1999, or KEENEY & RAIFFA 1993 for discussions on value systems and decision-making techniques.)
- Also send follow-up letters to the unsuccessful candidates (a personal letter, rather than a generic one). Remember to maintain proper public relations in this regard. Don't leave victims or enemies when rejecting some applicants.

4. PERFORMANCE APPRAISAL

4.1 PURPOSE OF PERFORMANCE APPRAISALS

- Management requires regular feedback in order to ensure that actual performance meets the desired performance.
- Performance appraisal is the measurement tool which makes feedback possible in the staffing

element of management.

- The primary function of a performance appraisal is to determine how well an employee is performing in terms of the key performance areas listed in his/her job specification.
- If there are areas in which an employee's performance is not as desired, the reasons for this can be searched, and corrected.
- In summary, the purpose of performance appraisal is to assess employees' performance individually, in order to:
 - * inform employees on their performance;
 - * provide employers with information for personnel decisions; and
 - * identify training/development needs.
- (Refer to GROTE 1996; SACHS 1992; and SMITHER 1998 for discussions on performance appraisals.)

4.2 MAIN AREAS ADDRESSED DURING PERFORMANCE APPRAISAL

- Job performance is mainly influenced by:
 - * the individual's personality, skills, qualifications, and needs,
 - * the job requirements,
 - * the work environment,
 - * the general socio-economic environment, and
 - * the employee's domestic circumstances.
- Broadly, the above factors can be combined into four categories of employees:
 - * The **willing and able** – wants to work, can do the work, and is in an environment which encourages good performance.
 - * The **willing, but unable** - wants to work, but cannot do the work, either for lack of personality, skills or qualifications, or for experiencing external hindrances.
 - * The **unwilling, but able** - does not want to work, despite being able to do the work, and despite being in an environment which encourages good performance.
 - * The **unwilling and unable** - does not want to work and cannot do the work.
- Performance appraisal can help determine in which category an employee falls, and whether something can be done to move him/her to the *willing and able* category.
- The employer has the biggest direct influence on the work environment, and can ensure that this area promotes good performance.
- The employer can usually do little about the general socio-economic environment.
- The employer can, to a large extent, ensure that working conditions do not impact negatively on the employee's domestic circumstances. (This point is often neglected by employers - to their own disadvantage. E.g. if regular overtime work is required, it might upset an employee's family, which can have a negative impact on the employee's job performance.)

- Neither the employer nor the employee can change much about the employee's personality. Problems in this regard should only be discussed during a performance appraisal, if they make it impossible for the employee to perform as required. In such cases it might be better for the employer and employee to mutually agree on termination of the appointment, or on redeployment of the employee.
- Individual needs can be addressed by the employer and by the employee, by openly discussing it, and by matching it with the work environment.
- Only skills and qualifications can be improved through training - addressed briefly in chapter 5.
- The other areas require an *organisational behaviour* (sometimes called *industrial psychology*) approach, which falls beyond the scope of this module. (Refer to BENNET 1994 or TSOUKAS 1994 for discussions on this topic.)

4.3 IMPORTANT ISSUES IN PERFORMANCE APPRAISAL

- Performance appraisals can be very stressful for both the employee and the evaluator.
- Many reviews are negatively oriented - it is often perceived as confrontational, punishment, and a negative reinforcer.
- It seems like a simple task, but it is a highly sensitive issue.
- Most managers have no training in staff evaluation, and they don't feel comfortable with doing it.
- Consequently, many reviews are avoided, or only good things are said.
- As it is usually done, performance reviews can do more harm than good.
- One study showed that 84% of reviews are ego-deflating for the employee / the evaluator / both (MONEYSMITH 1984).
- The appraisal process should determine an individual's efficiency in terms of agreed-upon key performance areas; and should be used as:
 - * the basis for corrective actions if the performance is inadequate, or
 - * to extend the scope of the job if the performance is consistently higher than what is expected.
- Everyone benefits from an honest evaluation, since without performance appraisal, neither an employer nor an employee will know how well they satisfy each other's needs. The saying "*to measure is to know*" (attributed to the astronomer Kepler) is very appropriate here.
- It is important to come to terms with the fact that reviews are difficult, but that they have to be done in order to close the feedback loop of staff management, by helping:
 - * employees to become better workers, through realistic, constructive and fair feedback and criticism; and
 - * employers to determine what to change in order to ensure better performance from their workers.

4.4 GUIDELINES FOR EFFECTIVE PERFORMANCE APPRAISAL

- Make employee evaluations an ongoing process:

- * Don't accumulate things done wrong during the year and then dump it all at once on the employee during the review.
- * Tell employees immediately when they do something wrong or right.
- * Use the review as a formal recap of the ongoing communication with employees.
- Evaluate behaviour, not personality:
 - * Evaluate employees according to what they do, instead of what they are.
 - * To say "you lack initiative" or "you lack ambition" cannot be quantified. However, saying "you've only reached 80% of your sales target" is quantitative.
 - * To do this, an agreed-upon description of what is expected (job description) is essential.
- Be candid:
 - * Never lead someone to think he/she is doing a great job, when it is not the case.
 - * A harsh message can often be conveyed by using the correct choice of words - but make sure that the desired message is conveyed.
- Be specific:
 - * Don't ask for improvement in performance without saying exactly what is required.
 - * Make it clear what the consequences will be of specific improvements, and also if those improvements are not made.
- Criticise and compliment as necessary:
 - * Don't focus on only positive or only negative aspects, but concentrate on what had been done well, since that is what is wanted more of.
 - * Don't merely say "you're doing fine", but be specific when praising an employee.
- Don't be afraid of dialogue:
 - * Every employee needs an opportunity to put his / her case.
 - * Encourage bi-directional communication.
 - * Provide feedback to, and get feedback from the employee.
- Try turning the tables occasionally:
 - * Ask employees what you are doing as a manager that helps them, and what you're doing that doesn't.
 - * (Don't do this during or directly after a review, otherwise it can seem like an apology.)
- Let employees rate themselves too:
 - * The reviewer evaluates the employee, and then compares it with the employee's own perception.
 - * Differences can be a valuable starting point for discussion.
- Draw definite conclusions and make recommendations:
 - * The performance appraisal must lead to conclusions about satisfaction of performance goals.
 - * The employee's performance per key performance area is either inadequate, adequate, or better than expected. "Maybe" is not an appropriate answer here.
 - * Appropriate corrective actions - e.g. training - should be defined explicitly.
- Encourage employees and set realistic future goals:

- * Employees must be encouraged to want to succeed.
- * Most employees accept realistic goals, and are motivated by these.
- Follow up afterwards:
 - * Any recommendations flowing from the performance appraisal should be followed up visibly.
 - * Recommendations not followed up lead to frustration and lack of confidence in the appraisal process.
- (Refer to SWAN 1991 for further guidelines on how to do a performance appraisal.)

5. TRAINING

5.1 IMPORTANCE OF TRAINING

- In section 4.2 it was stated that only skills and qualifications can be improved through training.
- However, skills and qualifications often have a large influence on an individual's ability to work.
- Therefore training is a very important part of the staffing function.

5.2 TYPES OF TRAINING

- For engineering projects, the types of training relevant for the personnel are typically:
 - * Formal education - e.g. obtaining a university degree in engineering.
 - * Vocational (*on-the-job*) training - gaining experience in an engineering organisation.
 - * Refresher courses – e.g. on new technology, at universities or at product suppliers, or in-house training.
 - * Specialised training - e.g. courses in management, problem solving, or decision making.
 - * Seminars and conferences.
- Remember that it is not only technical and management staff that requires training, but also the support staff.
- Vocational training can only be effective if there is proper communication in the organisation, and if new employees are actively involved in the organisation's activities.
- Continued education needs are often identified during performance appraisals, in order to rectify specific performance problems.
- (Refer to CARNEVALE *et al* 1991; GALAGEN & CARNEVALE 1994; SCHMIDT 2000; and VAN MERRIENBOER 1997.)

5.3 IMPORTANT ISSUES IN TRAINING

- When choosing a training program, do not merely follow the available technology stream, or the current fashion, or what the competitors are doing.
- The following issues are very important when training is planned:
 - * A skills gap or inadequate performance does not imply that it can be rectified with training.

- * Job analysis should always be used as the basis to determine the required training for a specific job.
- * Training programs should be fit for purpose, i.e. designed to suit the type of personnel to be trained – e.g. artisans shouldn't be trained with university text books, and engineers cannot be trained in an apprentice school.
- * All training must be evaluated in terms of the trainees' reactions to the training, behavioural and performance changes due to the training, etc.

5.4 TRAINING TO HELP NEW EMPLOYEES SETTLE IN

- Besides improving specific skills and qualifications, training can also be a very effective way of helping new employees to settle in.
- However, this aspect is often neglected, and new employees are merely “thrown in at the deep end”.
- The latter approach mostly leads to financial losses - either in the form of unproductivity of new employees, or of new employees becoming unhappy and leaving again after a while.
- There are various reasons why new employees are often *left in the dark*, e.g.:
 - * Existing employees feel threatened by newcomers.
 - * The job is not really necessary (refer to section 2.1.4), and therefore it is not realised when the new employee is unproductive.
 - * Lack of management commitment to the job.
- Training for new employees need not be an expensive exercise, but it can produce excellent results in terms of employee satisfaction, and smoothing a transitional situation.

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7. SELF-ASSESSMENT

7.1 TRUE / FALSE QUESTIONS

Indicate which of the following statements are TRUE and which are FALSE.

1. An organisational structure can only be defined once the staff had been appointed.
2. In engineering there are many job types, each including only one or two possible job titles.
3. Job content can be defined in terms of key performance areas and job scope.
4. Job scope will always grow with time.
5. If an existing job often becomes vacant, it indicates that the organisation is dynamic and growing.
6. Recruitment is aimed at finding a number of potential candidates for a vacancy, so that the most suitable candidate to fill the vacancy, can be chosen.
7. The objective during the staff selection process is to match abilities with ambitions.
8. Any interviewer should only select high ability individuals.
9. Personal interviews are still the most widely used selection tool.
10. Research shows that the correlation between actual performance and interviewers' assessments during interviews, is rather low.
11. Performance appraisal is the measurement tool which makes education possible.
12. The primary function of a performance appraisal is to determine how much to pay an employee.
13. The employer has the biggest direct influence on the socio-economic environment, and can ensure that this area promotes good performance.
14. Things done wrong during the year should be dumped on the employee during performance appraisal.
15. Any recommendations flowing from the performance appraisal should be followed up visibly.
16. Training is an optional part of the staffing function, which can be done if there is money for it.
17. Vocational training relies on proper communication in the organisation.
18. When choosing a training program, current fashion, what the competitors are doing, and available technology are important factors.
19. A skills gap or inadequate performance can always be rectified with training.
20. Training can be a very effective way of helping new employees to settle in.

7.2 MULTIPLE CHOICE QUESTIONS

Choose the one correct answer for each of the following questions:

1. In order to decide whether a candidate is "suitable" for a specific job, it is necessary to:
 - a. Analyse the job in terms of its content and scope.
 - b. Compare the candidate's potential with the job content and scope.
 - c. Neither (a) nor (b).
 - d. Both (a) and (b).

2. In order to define a job's key performance areas, the following is the most important question:
 - a. Is the job well focused ?
 - b. What are the major responsibilities associated with this job ?
 - c. What are the subordinates doing ?
 - d. What are existing employees doing in similar positions ?
3. One method to determine job content is:
 - a. Checklists on which job applicants can mark what they want to do.
 - b. Observation of employees in their daily activities.
 - c. A group conference to decide what a specific job might possibly entail.
 - d. Reading a good handbook on the topic.
4. The most important question to be asked as part of a job assessment, is:
 - a. Is this job really necessary ?
 - b. What is the marginal benefit of this job ?
 - c. What is the marginal cost of this job ?
 - d. For how long can a decision on filling the vacancy be postponed ?
5. A job specification should be:
 - a. An elaborate statement, quantifying every detail aspect of the job.
 - b. Compiled with a specific person in mind.
 - c. Specifying **what** must be done, and not **by whom** it should be done.
 - d. Giving a difficult to achieve "wish list", which can be scaled down later.
6. Examples of the most commonly used method used to recruit suitable candidates are:
 - a. Advertisements.
 - b. Asking existing employees to tell their friends and acquaintances about vacancies.
 - c. Recruitment agencies and *head-hunting*.
 - d. All the above.
7. Recruitment advertisements should give details about:
 - a. The organisation, and what it does; what the job involves; and the person required.
 - b. Rewards offered; and application procedures.
 - c. Neither (a) nor (b).
 - d. Both (a) and (b).
8. The primary objective during the staff selection process is to match:
 - a. Personalities of employees with those of managers.
 - b. A candidate's financial requirements with a suitable salary offer.
 - c. A candidate's abilities, ambitions and expectations with the job's scope and scope trend.
 - d. None of the above.
9. An assessment centre used as an aid to assist the selection process typically uses:
 - a. Application forms and References.
 - b. Personal interviewing and Personality tests.
 - c. Aptitude (ability) tests.
 - d. All the above.

10. The recommended type of interview is:
 - a. Nondirective interviews.
 - b. Problem interviews.
 - c. Structured or Patterned interviews.
 - d. All the above.
11. The purpose of performance appraisal is to assess employees' performance, in order to:
 - a. Inform employees on their performance.
 - b. Provide employers with information for personnel decisions.
 - c. Identify training/development needs.
 - d. All the above.
12. Job performance is not largely influenced by:
 - a. The age of the employing organisation.
 - b. The socio-economic environment.
 - c. The employee's domestic circumstances.
 - d. The individual's skills and qualifications.
13. The following are categories of employees:
 - a. The **willing and able** - who wants to work, but is prevented to do so.
 - b. The **willing but unable**, which is the same as the **unwilling, but able**.
 - c. The **unwilling and unable** - who does not want to work and who cannot do the work.
 - d. All the above.
14. Employee evaluation should be a process, involving:
 - a. Accumulation of things done wrong during the year, and dumped during the review.
 - b. Not telling employees immediately when they do something wrong or right.
 - c. Using the review as a formal recap of the ongoing communication with employees.
 - d. All the above.
15. Communication is an important part of performance appraisals, since it:
 - a. Gives employees the opportunity to put their case.
 - b. Encourages bi-directional information exchange.
 - c. Provides feedback to, and gets feedback from the employees.
 - d. All the above.
16. Types of training for engineering projects are:
 - a. Informal education.
 - b. Completing school education.
 - c. On-the-job training and continued education.
 - d. Specialised training in arts and culture.
17. The following are necessary conditions to decide on a training programme:
 - a. Job analysis.
 - b. What competitors are doing.
 - c. What universities are doing.
 - d. None of the above.

18. All training must be evaluated in terms of:
 - a. The trainees' reactions to the training.
 - b. Behavioural and performance changes due to the training.
 - c. Neither (a) nor (b).
 - d. Both (a) and (b).
19. Besides improving specific skills and qualifications, training can also be a very effective way of:
 - a. Helping new employees to settle in.
 - b. Keeping employees busy.
 - c. Fulfilling social responsibilities.
 - d. All the above.
20. Reasons why new employees are often not properly trained, include:
 - a. Existing employees feel threatened by newcomers.
 - b. The job is not really necessary.
 - c. Lack of management commitment to the job.
 - d. All the above.

7.3 ESSAY QUESTIONS (20 MARKS)

Write an essay of 300 to 400 words on one of the following topics. Do not merely copy the course notes, but write the essay **in your own words** such that your understanding of the topic becomes clear.

1. Discuss the major issues involved in staffing an engineering project.
2. Discuss job analysis and job specification in terms of its importance and how it should be done.
3. Discuss the best practices for recruiting staff for an engineering organisation.
4. Discuss the importance of performance appraisal and the best way to do it.
5. Discuss training in an engineering organisation.
