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ENGINEERS REGISTRATION BOARD

PRACTICAL TRAINING GUIDELINES FOR ELECTRONICS & TELECOMMUNICATIONS ENGINEERS

A: INTRODUCTION

(a) Subject to the contents of these practical training guidelines, every trainee in the Telecommunications engineering discipline shall complete training in the types of works specified for a minimum period of three years or as specified in the Engineers Registration Board Regulations 1999.

(b) In the case of research workers and other specialists, where the nature of work renders it impracticable to adhere to the requirements set out in the contents of these practical guidelines, the Board shall evaluate each individual's case separately having due regard to the practical training approved for the time being by the Board.

(c) The main thrust for professional and technician engineer trainees is as follows:-

(i) Professional engineers:-

The main thrust is on knowledge, understanding subject matters, analysis and methods. Professional engineers must have analytical capabilities, adaptability to varying situations, ability to identify, rectify and design solutions, management capabilities, power and communication skills, adherence to the professional ethics and conduct as specified in the Engineers Registration Board Regulations1999 and as amended from time to time.

(ii) Technician engineers:-

The main thrust is on know-how of subject matters. Technician engineers must have independent judgement within the field, top class engineering applications, development of cost effective systems and safe procedures, applications of appropriate mathematics, science and related subjects, team and resource management.

B: CONTENTS OF PRACTICAL TRAINING

(a) Systems engineering

Every trainee shall work under the supervision of a registered professional Telecommunications engineer for a minimum period of 6 months or as determined by the Board in accordance with the Engineers Registration Regulations during which time knowledge and experience should be acquired in most of the following areas:

- Estimation of the demand for telecommunications services using standard demand forecasting procedures.
- Telecommunications Systems Planning including site selection, radio path calculations, received signal level calculations, signal quality calculations, system availability and reliability calculations, digital signal processing, digital transmission standards, digital signal hierarchies and overall performance criteria; for those specializing in transmission.
- Switching Philosophy, matrices, statistical multiplexes, digital switching, digital signal standard bit rates and interface signal levels; for those specializing in switching.
- Preparation and interpretation of block schematic representation of telecommunications systems including standard symbols and standard signal transmission levels.
- Knowledge and ability to apply and interpret telecommunications design objectives and standards, particularly the ITU-T and the ITU-R Recommendations.
- Ability to relate the design objectives to system specifications.
- Ability to prepare system specifications for any or all of the telecommunications system units of the block schematic depending on specialization. Those specializing in transmission systems shall demonstrate an ability to prepare specifications for radio systems and those specializing in switching shall demonstrate the ability to prepare specifications for switching multiplex systems.
- Estimation of quantities and costs of the elements making up a telecommunications system.
- Preparation of tender documents.
- Preparation of Contract Documents.
- Environmental impact assessment and management.

(b) Installation of telecommunications systems

Every trainee shall work under the supervision of a registered professional Telecommunications engineer for a minimum period of one year or as determined by the Board in accordance with the Engineers Registration Regulations during which time knowledge and experience should be acquired in most of the following areas:

- Participation in radio propagation survey and site selection.
- Participation in installation site preparation.
- Preparation and implementation of rollout plans.
- Preparation of installation testing and acceptance data forms.
- Participation in installations testing including in-station tests, hop tests, system end-to-end tests, commissioning and acceptance testing. In this respect the aspiring professional engineer shall demonstrate a knowledge and understanding of standard test procedures and test equipment.
- Staff and Labor relations.

(c) Maintenance

Every trainee shall work under the supervision of a registered professional Telecommunications engineer for a minimum period of one year or as determined by the Board in accordance with the Engineers Registration Regulations during which time knowledge and experience should be acquired in most of the following areas:

- Determination of maintenance requirements using the Mean Time Between Failures (MTBF) and the Mean Time To Restore (MTTR) criteria.
- Use of MTBF and MTTR to report on system availability and reliability.
- Demonstrate an understanding of routines and routine maintenance procedures.
- Preparation of routine maintenance schedules.
- Participation of major overhaul and or retrofitting.
- Estimation of maintenance requirements in terms of manpower, test equipment, spare parts and transport.
- Generation of maintenance reports and fault statistics.
- Staff and Labor relations.
- Customer relations.

(d) General management

Every trainee shall work under the supervision of a registered professional Telecommunications engineer for a minimum period of 6 months or as determined by the Board in accordance with the Engineers Registration Regulations during which time knowledge and experience should be acquired in most of the following areas:

- General office routine procedures/administration.
- Organization structures and their translation in practice.
- Communication skills.
- Staff regulations and labor laws.
- Materials and equipment procurement, management, storage and handling.
- Safety procedures and practices.
- Tendering procedures including tender preparation, tender evaluation and international tendering procedures and practices.
- Contract administration, knowledge of various types of contracts and the applicable conditions.
- Regulatory practices.
- Quality of service measurement procedures and reporting.