Institut Latihan
Lembaga Letrik Negara

KURIKULUM

KURSUS UNTUK PEMBANTU TEKNIK

Institut Latihan Lembaga Letrik Negara

KURSUS-KURSUS UNTUK PEMBANTU TEKNIK

KOD	NAMA KURSUS
6611)	Amalan Pembahagian
6612)	(Talian Atas, Kabel Bawah Tanah, Binaan
6613)	& Senggaraan Pencawang 11(kV)
6611X	Teknologi AMKA-T
6631	Kendalian Pencawang 11 kV

KURIKULUM

PEMBANTU TEKNIK PEMBAHAGIAN
AMALAN PEMBAHAGIAN ELEKTRIK
6611, 6612, 6613

OBJECTIVES

COURSE GOALS

Upon completing the course, the participant must be able to:

- *have a sound working knowledge of the technical aspects of L.V. overhead lines including services, cable construction, joints and terminations in general use by the NEB.*

- *have experience of present methods of carrying out work on overhead lines and underground cables sufficient for appraisal and supervision of the work of NEB teams and cable laying contractors.*

- *have a sound working knowledge of the design, construction and maintenance of a substation.*

- *carry out estimates for overhead lines, underground cables and substation projects.*

COURSE ELIGIBILITY

- *Technical Assistants (Distribution) having one year experience or less on overhead line, underground cable, and substation.*

COURSE DURATION

- *Five weeks*

CURRICULUM
TECHNICAL ASSISTANTS (ELECTRICAL)
DISTRIBUTION PRACTICE

6611
6612
6613

5 Weeks

OVERHEAD LINES

77 Periods

- Overhead Line Specifications
  - . Poles
  - . Conductors
  - . Stays
  - . 5-foot way mains
  - . Accessories
- Overhead Line Construction Procedure
  - . Pegging
  - . Transport
  - . Pole dressing
  - . Excavation and pole erection
  - . Stays
  - . Conductor erection
  - . 5-foot way mains
  - . Accessories
- Safety Rules and Regulations

- Estimating for L.V. Overhead Line Projects

  . Materials

  . Transport

  . Salaries

  . Contract work

UNDERGROUND CABLES

68 Periods

- Cable Construction and Design

  . L.V./M.V. cables

  . PVC insulated cables

  . 4-core paper insulated L.V./M.V. belted cables

  . Multicore paper insulated cable for translay

  . 11 kV paper insulated belted cables

  . Screened cables

  . Oil-filled cables

- Cable Joints and Terminations

  . Definition and use

  . 11 kV joints and terminations

  . L.V./M.V. joints and terminations

  . Methods of jointing and terminations

- Cable Jointing

  . Tools, materials and equipment

- Cable Laying

  . Contractors

  . Preparation

  . Removal of top surface

- . Trench excavation
- . Laying cables in ducts
- . Bedding for cables
- . Pulling in cables
- . Laying OFF and positioning cable in trench
- . Protection of cable ends
- . Sand covering and bricks
- . Reinstatement
- . Security at site
- . Cable records

- Cable Testing
  - . Instruments
  - . Tests

- Cable Estimates

- Safety Rules & Regulations
  - . Authorisation and competency
  - . Isolation of L.V./M.V. cables
  - . Earthing and discharging
  - . Cable spiking
  - . Permit to work

SUBSTATION
(CONSTRUCTION AND MAINTENANCE)

51 Periods

- Substation Layout (Engineering Standard)
  - . Pole mounted
  - . Outdoor
  - . Indoor
- Substation Earthing and Earth Testing
- Installation of Switchgears and Ancillaries
  - . OLU/HFU
  - . SO-HI
  - . BVP
  - . VSI
  - . L.V. Board
  - . Transformer
- Substation Maintenance
  - . Routine maintenance
  - . Switchgear overhaul
  - . Transformer overhaul

- Substation Instruments

  . Insulation megger and earth megger

  . Voltage and current recorder

  . Phase rotation meter

  . Ampere tong

  . Phasing stick

MWCS & CWA

15 Periods

- Project Documents

- Flow and Approval

  . Minor works cost sheet

  . Capital works authorization

- Completion Certificates

- Exercises in Filling Relevant Forms for Estimates

ARTIFICIAL RESPIRATION

6 Periods

- Mouth to Mouth Method
- Mouth to Nose Method
- Holdger-Nielson Method
- Silvester Method
- External Heart Compression

KURIKULUM
JURUTEKNIK, PEMBANTU TEKNIK
TEKNOLOGI AMKA-T
6611x , 5511x

OBJECTIVES

COURSE GOALS

Upon completing the course, the participant must be able to:

- *plan, estimate and supervise the construction and maintenance of AMKA-T and SAXKA cables.*

COURSE ELIGIBILITY

- *Technicians and Technical Assistants (in Distribution and BELB) who have not been exposed to the new technology AMKA-T and SAXKA cables.*

COURSE DURATION

- *One week*

CURRICULUM

TECHNICIANS AND TECHNICAL ASSISTANTS DISTRIBUTION

(AMKA-T & SAXKA CABLES)

5511X
6611X

1 Week

1. AMKA-T

- Cables
- Electrical Properties of AMKA-T
- Accessories
- Tools and Equipment
- Construction of Lines
- Clearances and Crossings
- Stays and Struts
- Connection of AMKA-T to Existing System and Accessories
- Overload and Short Circuit Protection

- Planning and Estimating

- Maintenance

2. SAXKA CABLES

- Cables

- Accessories

- Tools and Equipment

- Installation

- Joints and Terminations

KURIKULUM

PEMBANTU TEKNIK
KENDALIAN PENCAWANG 11kV
6631

OBJECTIVES

COURSE GOALS

Upon completing this course, the participant must be able to:-

- *adopt the recommended methods of operating the switchgears and associated ancillaries.*
- *be conversant with the safety regulations and procedures.*
- *follow shutdown procedure and ascertain that the installation can be commissioned.*
- *locate cable faults.*
- *do artificial respiration and first aid.*

COURSE ELIGIBILITY

- *Technical Assistants (Distribution - Operation) who have the relevant diplomas (from the Mara Institute of Technology or from the University of Technology Malaysia)*

- *Technical Assistants with working experience in sub-station work, intended for authorization.*

COURSE DURATION

- *Two Weeks*

CURRICULUM

TECHNICAL ASSISTANTS DISTRIBUTION

SUBSTATION OPERATION 11 KV

6631 — 2 Weeks — 94 Periods

1. SWITCHGEAR OPERATION

- OLU/HFU
- VSI
- BVP
- SO-HI

2. CERTIFICATION SYSTEM

- Officer in control
- Authorized person
- Competent person
- Officer-in-charge
- Permit to work
- Authorization
- Sanction

3. SAFETY REGULATIONS

- Safety regulations for working on H.V. system and L.V. system
- Working safety

4. H.V. AND L.V. SYSTEM OPERATIONAL PROCEDURES

- Shutdown of supply for H.V. system
- Shutdown of supply for L.V. system

5. RELAY FOR 11 KV DISTRIBUTION SYSTEM

- Translay
- O/C and E/F
- Solkor
- Directional O/C
- R.E.F.
- Standby E/F

6. DIAGNOSIS OF FAULT FOR DISTRIBUTION

- Fault on underground cable
- Fault on transformer
- Fault on O/H lines

7. CABLE FAULT LOCATION

- Analysis of fault
- Megger insulation tester
- Cambridge fault localiser
- Capacitance bridge
- Bridge megger
- Cable locator

8. PRECOMMISSIONING TEST FOR 11 KV S/S

- Procedure for precommission test
- Phasing
- Pressure testing

9. TAP CHANGER OPERATION

- Principles
- Operation

10. FIRST AID AND ARTIFICIAL RESPIRATION

- Mouth to mouth
- Holger Neilson
- Syvester
- Cardiac massage
- First aid