USAID
FROM THE AMERICAN PEOPLE

SARI / Energy

SOUTH ASIA REGIONAL INITIATIVE FOR ENERGY **(SARI/Energy)**

INTERACTIVE APPROACH FOR CAPACITY BUILDING IN AFGHANISTAN POWER DISTRIBUTION SECTOR

8th August '09

THE POWER SECTOR

SECTORAL COMPONENTS AND THE WORK AREAS

PRIMARY	- Generation - Transmission - Distribution
SERVICE	- Grid Operation and Grid Management - Energy Conservation / Demand Side Management - Power Trading - Power Exchange
SUPPORT	- Regulation - Legislation - Financing - Communication / Awareness
FUTURE AREAS	- Decentralized Distributed Generation - Entrepreneurship development - Integrated application of Information Technology

CAPACITY BUILDING IN POWER DISTRIBUTION

Need to institutionalize Capacity building in Distribution to cater to training & development of Managerial and Technicians level employees at varied levels :

Fresh cadre development : Primary education for qualification at entry level

Induction Level : At entry level for orientation towards specific works requirement / needs of the organization.

Trait Specific specialization : Specific work field

Development programs : Varied levels / Short to Medium to Long term

Research & Development : New technology and practices.

AFGHANISTAN POWER SECTOR CAPACITY BUILDING PROGRAM

FIRST PHASE	AUGUST – OCTOBER '09
SECOND PHASE	NOVEMBER '09 – JANUARY '10
THIRD PHASE	FEBRUARY '10 AND BEYOND

COVERAGE, TO START WITH IN PHASE I & II :

	Induction Level	Development programs	Trait Specific Programs
# Managerial Cadre	I - August '09	IV - October '09	II - August '09 III - September '09

FIRST PHASE

I - P.G. Program in Operation & Maintenance in Transmission & Distribution

II - Short term program in Regulations in Power Distribution & Commercialization of Distribution Utilities

III - Short term program in Operation & Maintenance of Sub Stations

IV - Training of Trainers program in Distribution System Management for Engineers

	Induction Level	Development programs	Trait Specific Programs
# Non Managerial Cadre			V
		VI	
		VII	

SECOND PHASE

- V - Short term program in Metering Technology & Revenue protection
- VI - Training of Trainers program in Metering, Billing & Collection
- VII - Training of Trainers program in Distribution System Operations for Technicians

I - P.G. PROGRAM IN OPERATION & MAINTENANCE IN TRANSMISSION & DISTRIBUTION

3rd August '09 – 29th January '10 (6 months) at Bangalore, India

Program Objective

To create technically trained manpower for power utilities in operation and maintenance of Transmission and Distribution as well as to enhance competency level of working engineers in the field.

Targeted Audience

Electrical Engineering graduates who have to take up responsibility for electrical systems/ subsystems with proficiency in spoken and written English.

Program coverage

Program subdivided in 20 broad modules covering aspects of Transmission and Distribution covering the design and installation of the Equipment and their operation and maintenance. The participants are also exposed to State of Art technology practices in IT applications with a good mix of theory cum on-field orientation.

7 Afghan engineers from DABS are presently undergoing the Program

II - REGULATIONS IN POWER DISTRIBUTION & COMMERCIALIZATION OF DISTRIBUTION UTILITIES

8th – 13th August ’09 – at Kabul, Afghanistan

Program Objective

Understanding of the power distribution, its issues and challenges, Reforms in distribution, Regulations, Commercialization in power distribution utilities including Distribution franchising

Targeted audience

Utility’s and Ministry’s officials engaged in Policy making and Management

Course contents

- **Overview of the Sectoral issues and challenges**
- **Regulatory approaches and Rationale**
- **Roles and responsibilities of Stakeholders.**
- **Management aspects and practices in Distribution utilities.**
- **Management / Technical / Commercial features of electricity distribution business**
- **Franchising at last mile end – the models, practices and operation.**

III – OPERATION & MAINTENANCE OF SUB STATIONS

14th – 19th September ’09 – at Faridabad, India

Program Objective

To expose and familiarize the working engineers to technological advances through interface directly with Equipment Manufacturers.

Targeted audience

Engineers engaged in Substations Operation and Maintenance.

Course contents

Surge Arresters/Metering/Distribution transformers/Switchgear & Controlgear - each Module to cover general aspects of Installation, Operation & Maintenance, Trouble shooting aspects etc. of respective products.

Nominations solicited by 2nd week of August ’09.

IV- TRAINING OF TRAINERS PROGRAM IN DISTRIBUTION SYSTEM MANAGEMENT FOR ENGINEERS

5th – 31th October '09 – at Faridabad, India

Program Objective

To create the resource base from amongst the working engineers by exposing them to soft skills development required for the Trainers and enhancing their competency in their work field through exposure to latest technology and practices.

Targeted audience

Working engineers in the Utilities with experience on field including the Trainers for augmenting their skills.

Course contents

- ***Soft skills developments*** - **Personality development / Communication skills/ Presentation techniques / Time Management / Team building / Inter personal skills etc.**

(Contd….)

(…..Contd.)

- *Sectoral subjects*	-	**Power System studies / Distribution Planning / Technical, Management and Commercial aspects of Distribution business / Quality of Supply / Metering, Billing and Collection/ Technical and Commercial losses/ Preventive Maintenance / Customer Relationship Management**
- *Product exposure by Equipment manufacturers*	-	**Surge Arrestors/ Metering / Distribution Transformers/ Switchgears / Controlgears / Circuit Breakers/ CTs, CVTs, LAs etc.**

Nominations solicited by last week of August ’09.

ACTION PLAN FOR THE NEXT LEVEL (THIRD PHASE)

PROGRAM BASKET : THE CONVENTIONAL PROGRAMS

\# For Engineers/ Managerial Cadre Short term and Training of Trainers programs on following themes :

- Substation Operations and Management
- Protection system in Distribution
- Technical and Commercial Loss reduction
- Commercial Operation in Distribution utilities
- Metering Technology/ Billing and Collection
- Financial Planning, Accounting and Management
- Customer Relations Management and Consumer services etc.

Proposed to conduct back to back training programs by Afghan Faculty trained in TOT programs, which will be mentored by the Indian Training Institutes.

(Contd….)

(…..Contd.)

Short term and Training of Trainers programs for Technicians level employees on following themes:

- **Metering , Billing Collection**
- **Substation Equipment Operation and Maintenance**
- **Lines laying, operation and maintenance**

Unlike the strategy adopted for Engineers training, considering dearth of good faculty and lack of working knowledge amongst the Trainers, the Short term programs first to be conducted in Kabul and shortlisted responsive participants exposed to TOT development program in Indian Training Institutes/ Utilities.

THOUGHT FOR EXPANDING THE REACH AND COVERAGE ACROSS THE COUNTRY THROUGH DISTANCE LEARNING

Focused programs in power distribution developed in India through an Open University : IGNOU (A premier distance learning Institute in India)

- For Engineers – Advanced Certificate in Power Distribution Management

- For Technicians – Certificate of Competency in Power Distribution

- Both are 6 months Programs delivered through multimedia of Printed Books, Virtual classes and Contact programs at Local Study Centers (Technician program has additional component of practicals).
- Program presently in English, which can be translated and printed in local languages.

- **The take off Strategy**

  - **IGNOU has it's Study Centre in Kabul but considering that it will need even the Resource persons (who can only be sourced from Utilities) – Preferred to establish Study Centre within Utility (Agreeable to IGNOU since both the faculty and participants to be sourced from Utilities)**

    - **The broad requirements forwarded by IGNOU.**

- **Start off with the developed ACPDM program for Engineers in English, and as confidence level develops the Program may be translated and subsequently even modified.**
- **Consider CCPD program for Technicians in local languages after the strategy successfully gets implemented for ACPDM.**

THANK YOU

OUR CONTACT DETAILS :

AFGHANISTAN

Hayatullah Piaweray, Technical Coordinator, SARI/Energy	piaweray@yahoo.com	0093 (0) 786 191 146

INDIA

Michael Ellis, Chief of Party, PA Consulting	michael.ellis@paconsulting.com	
Sabyasachi Pattanaik, Sr. Technical Adviser, PA Consulting	Sabyasachi.Pattanaik@paconsulting.com	+91 9818066004
Sudhir Vadehra, Sr. Consultant, SARI/Energy	sudhirvadehra@gmail.com	+91 9810410884

Backup to slide no. 8

CONTENTS OF THE MODULES

1. Energy Meter

- Metering Applications & Key Features Requirement
- Role of Communication Technology in Energy Metering
- Installation Audits Requirements
- Field Testing Requirements
- Growing Metering Technologies Methods
  - Revenue protection
  - Regulatory requirements
  - Remote Meter Reading Concept
  - Complete System planning requirements
- Prepayment Technologies
- Load Management

2. Capacitor

- Introduction to Reactive Power Management,
- Definition and origin of low Power factor
- Power factor improvement concept
- Reactive Power flow analogy
- Types of power factor
- Effects of harmonics on Power factor
- Reactive Power, Inductive loads, Capacitive loads etc.
- Benefits of Adding Capacitors to power suppliers and users:
- VAR Support or Power Factor Correction
- Selection of Capacitor, Testing and Quality control,
- Erection & Commissioning, Installation of APFC panel, Maintenance, Capacitor failure, Overloading of capacitor, Failure of capacitor unit / bank
- Harmonics, Effects of harmonics on Capacitors, Resonance / amplification of harmonic currents
- Benefits of Power Factor Correction

(Contd….)

Backup to slide no. 8

(…..Contd.)

3. Surge Arrester

- Concepts on Metal Oxide Arresters, polymer arresters, zinc oxide varistors
- Selection of Application of Surge Arrester upto 420 kV
- Testing Aspects,
- Field maintenance aspects and quality checks for surge arresters,
- Design of station class arresters upto 420 kV
- Arresters for transmission line protection
- Pollution behavioural aspects of metal oxide arresters
- Quality assurance from raw material to final stage to guarantee final product

4. Distribution Transformers

- Specification and Selection of DTs,
- Design and Performance characteristics calculation
- Testing & Quality Control
- Erection & Commissioning
- Operation & Maintenance
- Types of transformers and functions

5. Instrument Transformers

- Capacitor voltage transformers (CVTs)
- Inductive Voltage transformers (IVTs)
- Current transformers (CTs)

To cover Construction types, Design, Insulation design concepts, Quality checks, Tests, Erection and Commissioning, Operation and Maintenance, Failure Analysis, Benefits

(Contd….)

Backup to slide no. 8

(…..Contd.)

6. Electrical cables

- Manufacturing Process of Electrical Power Cables
- Emphasis on Design, Conductor, Insulation, Armouring, Outer Sheathing,
- Emphasis on Quality, R.M. Testing
- Cable laying & installation
- Cable drums and pulling of cables
- Bird caging
- Cable accessories
- Cable Joints
- Terminations & Cable Basics
- Underground cable construction
- Electrical stress
- Electrical stress control
- Generalized Installation

7. Insulators

- Types of Insulators
- Components and Manufacturing
- Testing (Mechanical, Electrical, Thermal and other tests)
- Insulator selection, handling & installation
- Troubleshooting

Training for SARI Program at NPTI, India
5th October 2009 to 31st October 2009
Training of Trainer program on Distribution System Management

Backup to slide no. 10

FIRST WEEK

Time	Session and Topic
5.10.2009 9.30 -10.00	Registration & Inauguration
10.00 – 13.00 (11.30–11.45 Tea Break)	Personality Development - Self Management - SWOT Analysis, Knowing yourself, Knowledge Management, Tools for success
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break)	Communication Skill - Communication Process, Barriers to communication, 7Cs of Communication, Effective communication, Body language & postures, Listening, Oral Expression, Oral Comprehension, Speech Clarity, Active Listening,
6.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Presentation Techniques, Report writing
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break)	Motivation - Self Motivation, Theories in motivation, Motivation for success, Strategic and Lateral thinking – Creativity & Innovation
7.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Time Management – Time Management Skill, Ten commandments of Time Management, Avoid procrastination, Preparing time logs, Creating efficiency etc.
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break)	Leadership Development – Overview - Theories & Methods of leadership, Managers vs Leaders, Competencies/Traits, Leadership Factors, Leadership Roles and Tasks Team Building- Role plays & team building activities,

Training for SARI Program at NPTI, India
5th October 2009 to 31st October 2009
Training of Trainer program on Distribution System Management

Backup to slide no. 10

Time	Session and Topic
8.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Decision making- Styles & Methods, Steps for better Decision making, Quick Decision,
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break	Inter Personal Skills – Attitude - Positive Attitude, Assertive behavior, Attitudinal re-orientation
9.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Stress Management - Positive and Negative Stress, Stress and Health, Cost of mis-managed stress, Worry and Fear, Anger Management
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break	Description of 500 MW Fossil fuel Simulator - Cold Start up to Synchronisation - Boiler Light up, Turbine Lubrication System & Vacuum pulling. Boiler pressure raising, charging of LP-HP Bypass system, Turbine Rolling & Synchronisation. Description and demonstration of Combined Cycle Gas Turbine Operation
10.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break	Industrial Visit to 33 kV/11 kV Sub station Switchyard Scheme for 33 kV and 11 kV system, Equipment demonstration, Operation of Sub-station
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break	Industrial Visit to 33 kV / 11 kV Sub station

SECOND WEEK

Time	Session and Topic
12.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Power Sector Structure & Overview : Generation, Transmission, Distribution, Power Distribution description, Advantages of Power Distribution System, Components of Power Distribution System
	Lunch Break
13.00 - 17.00 (15.30 – 15.45 Tea Break)	Power System Studies : Introduction, Load Flow Studies, Power System Stability.
13.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Distribution Reforms: Issues, Opportunities & Challenges, Social ,Economic & Legal Rationale for Regulation, Regulatory Approaches & Related International Experience.
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break)	Electricity Act : Legal and administrative requirements, Key issues & Challenges before Distribution Utilities, Key Problems in the Power Distribution Sector, Case Study
14.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Distribution Planning : Introduction (Objective) , Planning Processes, Study of existing system, Principal area of activity, Case study.
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break)	Management, Technical and Commercial Features of Distribution Business - Understanding of various Technical Aspects of Distribution Business

Training for SARI Program at NPTI, India
5th October 2009 to 31st October 2009
Training of Trainer program on Distribution System Management

Backup to slide no. 10

Time	Session and Topic
15.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Quality of supply and Services in Distribution System, - Metering & Billing, Revenue Collection, Emerging Trends in Metering Technology
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break	AT & C Losses in Distribution. Reasons attributed to high Distribution losses. Reduction of Technical & Commercial Losses, Theft Control Strategies, Loss Réduction
16.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Operation and Maintenance Policy in Distribution: Introduction, Corrective maintenance, Statutory maintenance, Routine & Preventive maintenance,
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break	Condition Based Maintenance (CBM), Management Issues & Maintenance Strategy
17.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break	Visit to Distribution Utility
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break	Visit to Distribution Utility

THIRD WEEK

Time	Session and Topic
19.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	CRM : - Customer Relationship Management (CRM). Customer Relationship Management (CRM). Grievance Redressal Mechanisms in a Distribution Utility.
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break)	CRM, Consumer Cells Establishment
20.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	CRM, Consumer Cells Establishment
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break)	CRM
21.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Electrical cables : Manufacturing Process of Electrical Power Cables , Emphasis on Design, Conductor, Insulation, Armouring, Outer Sheathing, Emphasis on Quality, R.M. Testing, Cable laying & installation, Cable drums and pulling of cables, Bird caging, Cable accessories, Cable Joints , Terminations & Cable Basics, Underground cable construction, Electrical stress, Electrical stress control, Generalized Installation
(Lunch Break in between)	
14.00 - 17.00 (15.30 – 15.45 Tea Break)	

Training for SARI Program at NPTI, India
5th October 2009 to 31st October 2009
Training of Trainer program on Distribution System Management

Backup to slide no. 10

Time	Session and Topic
22.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Surge Arresters – Conceptual understanding, System Surges-Overvoltages in electrical system, protection, basic principles & evolution of surge arresters, Applications, prevention of Transformer and equipment damages etc.,
	Lunch Break
14.00 - 17.00(15.30 – 15.45 Tea Break	Cost of Arrester Vs damage - comparisons, Arcing horns, Types of Arresters - SiC Arresters, Metal-oxide Arresters, Arrester classification, Surge Arrester - Major components, Arresters -Standards & Revision of Standards, Arrester selection, Testing of Surge Arresters, Influence of Surge Arrester placement, Surge Arresters - failures
23.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Metering – History of Energy Metering, Metering Applications & key feature requirements, Single phase Metering, Key areas in Metering, Features, Three phase Metering, Features, Three phase Commercial / Industrial & Feeder metering, CT / VT Operational features
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break	Integrated solutions for Bulk Power Metering, Grid Metering & features, Three phase LT Consumer / Distribution transformer metering & associated scheme, LT CT Segment Metering, traditional meter reading, constraints for large revenue consumers / Feeder monitoring, Remote Meter reading, GSM technology, advantages of GSM, Intelligent GSM model, AMR-GSM model
24.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break	Visit to Consumer Cell
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break	Visit to Consumer Cell

FOURTH WEEK

Time	Session and Topic
26.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break) (Lunch Break in between) 14.00 - 17.00 (15.30 – 15.45 Tea Break)	Distribution Transformers - Transformer specifications & understanding associated with specific requirements, Transformer Design, manufacturing & quality control, Testing at works & standards, Routine tests, Type tests, Special tests, Transportation, Erection at site etc. Testing at Site, Commissioning, Maintenance, recommended maintenance schedule, troubleshooting - necessary actions thereof, failure analysis - failure in magnetic circuits, electrical , dielectric circuits & structural or other reasons, new developments in transformer technology Substation Equipment
27.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break) (Lunch Break in between) 14.00 - 17.00 (15.30 – 15.45 Tea Break)	Switchgear & Controlgear Installation, Operation, Preventive maintenance and Trouble shooting for Control, Relay and Circuit Breakers etc. Installation, Operation, Preventive maintenance and Trouble shooting for Control, Relay and Circuit Breakers etc.
28.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break) (Lunch Break in between) 14.00 - 17.00 (15.30 – 15.45 Tea Break)	Capacitor Introduction to Reactive Power Management, Definition and origin of low Power factor, Power factor improvement concept, Reactive Power flow analogy, Types of power factor, Effects of harmonics on Power factor, Reactive Power, Inductive loads, Capacitive loads etc., Benefits of Adding Capacitors to power suppliers and users , VAR Support or Power Factor Correction, Selection of Capacitor, Testing and Quality control, Erection & Commissioning, Installation of APFC panel, Maintenance, Capacitor failure, Overloading of capacitor, Failure of capacitor unit / bank, Harmonics, Effects of harmonics on Capacitors, Resonance / amplification of harmonic currents, Benefits of Power Factor Correction.

Training for SARI Program at NPTI, India
5th October 2009 to 31st October 2009
Training of Trainer program on Distribution System Management

Backup to slide no. 10

Time	Session and Topic
29.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Instrument Transformers : Capacitor voltage transformers (CVTs), Inductive Voltage transformers (IVTs), Current transformers (CTs) To cover Construction types, Design, Insulation design concepts, Quality checks, Tests, Erection and Commissioning, Operation and Maintenance, Failure Analysis, Benefits
(Lunch Break in between)	
14.00 - 17.00 (15.30 – 15.45 Tea Break	
30.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Insulators: Types of Insulators, Components and Manufacturing, Testing (Mechanical, Electrical, Thermal and other tests) Insulator selection, handling & installation, Troubleshooting
(Lunch Break in between)	
14.00 - 17.00 (15.30 – 15.45 Tea Break	
31.10.2009 10.00 – 13.00 (11.30–11.45 Tea Break)	Course Feedback and Valediction
	Lunch Break
14.00 - 17.00 (15.30 – 15.45 Tea Break	Course Feedback and Valediction

ADVANCED CERTIFICATE IN POWER DISTRIBUTION MANAGEMENT

Backup to slide no. 10

A DISTANCE LEARNING PROGRAM

In order to address the general concerns and issues in electricity distribution and inculcate awareness and exchange good practices amongst distribution companies, specifically the engineers and officers at level of JE/ AE and equivalent, a distance learning program on Power Distribution Management has been launched by IGNOU under DRUM program. It is a six month program, to be conducted twice in a year. The program has interactive video conferencing sessions delivered at Study Centres of IGNOU spread across the country.

Objectives

- To disseminate information about the current developments and reforms in the power distribution sector,
- To generate awareness about the applications of emerging technologies and trends in the sector, and
- To educate personnel employed in the sector about various aspects of power distribution management.

		Power Distribution Sector	6 Credits
Course contents	:	Energy Management and IT Applications	4 Credits
		Management of Power Distribution	6 Credits

Programme Duration : 6 Months

Eligibility : Engineering graduates/ Engineering Diploma holders
OR
Science/ Commerce/ Arts graduates or equivalent with 2 years experience in power utilities or the electricity sector.
The program is also open to non sponsored eligible applicants too.

COURSE -I: POWER DISTRIBUTION SECTOR (6 Credits)

Backup to slide no. 13

Block 1: Sectoral overview and enabling framework

Unit 1: Power Sector in the Country
- Power scenario
- Key issues and challenges before the distribution sector

Unit 2: Acts and Policies: the salient features
- Energy Conservation Act, 2001
- Electricity Act 2003
- National Electricity Policy
- Tariff Policy

Unit 3: Distribution Reforms: Changing perspective / role of stakeholders
- Role of State governments in distribution reforms
- Role of regulators and different stakeholders during and after the reforms
- Legal and administrative requirements
- Experiences and feedback of the States on restructuring/ unbundling SEBs

Block 2: Operation and Maintenance

Unit 4: Introduction to Power Distribution System
- Power Distribution System description
- Distribution system planning
- Operation & Maintenance philosophy and practices
- Load scheduling, Load balancing and grid management

Unit 5: Substation Equipments and Distribution lines
- Breakers, isolators, auxiliary devices, capacitors
- Poles, stays, insulators, etc.
- Cable-types, joints, etc.
- Hot line maintenance, etc.
- Length of LT lines, HT:LT ratio and impact on losses and voltage

Unit 6: Distribution Transformer
- Transformer selection (technology, size etc), and placement
- Ways of enhancing transformer life and efficiency
- Causes of transformer failures
- Testing of insulation
- Testing of insulating oil

Block 3: Quality of Supply and Service

Unit 7: Performance Benchmarking
- Importance, Purpose & Benefits
- Performance parameters
- Customers' perspective
- Regulatory requirements

Unit 8: Key Performance Indicators (KPIs)
- Concepts & meaning of KPIs as related to Utilities/Discoms
- KPIs for the following functions
  - Technical
  - Commercial
  - Financial
  - Employee Productivity
  - Customer Services
- Data availability & data management

Unit 9: Performance improvement and operation management
- Implementation & monitoring of KPIs
- Management approach for improving & sustaining KPIs
- Dissemination and sharing of information on KPIs with other Discoms, utilities, customers, and public in general

Backup to slide no. 13

Block 4: Distribution Loss Reduction and efficiency improvement
Unit 10: Concepts and Principles of Distribution Losses • AT&C losses definition and assessment • Technical losses • Commercial losses
Unit 11: Technical Loss Reduction • Distribution network • Transformers • Conductor size • Low voltage supply • Power factor • End-use efficiency • Other factors (workmanship, improper joints, etc.)
Unit 12: Commercial Loss Reduction • Illegal connections / tapping • Power pilferage • Meter tampering
Unit 13: Metering & Billing System • Metering technologies and techniques • Calibration and Testing of Energy meters and meter laboratory • Metering standards • Meter installations practices and field testing • Revenue protection and technology interventions in metering and billing.

COURSE -II: ENERGY MANAGEMENT & IT APPLICATIONS (4 Credits)

Backup to slide no. 13

Block 1: Energy Conservation, Audit & Accounting

Unit 1: Energy Accounting
- Energy accounting to assess losses

Unit 2: Demand Side Management
- Tools and Techniques
- Organizational Issues
- Applications

Unit 3: Energy Conservation
- Energy conservation measures and applications

Unit 4: Energy Audit
- Energy audit to identify measures to reduce losses.

Block 2: Electricity Safety and Disaster Management

Unit 5: IE Rules, Safety and Protection
- Electricity Rules and Manuals
- Earthing Practices
- Safety Procedures
- Accident and Fire Prevention
- Protection of equipments

Unit 6: Disaster Management
- Institutional set up for disaster management
- Impact of different types of disasters
- Trigger mechanisms and warning systems
- Check lists and preparedness to address disasters
- Development of an On-Site and an Off-Site Disaster Management Plan
- First Aid Techniques

Unit 7: Impact of Disaster
- Analyzing short and long term financial impact
- Cost recovery mechanism
- Role of regulators in the context of disasters and accidents

Block 3: IT applications in Distribution Business Management

Unit-8 Overview of Distribution Business and Information Technology
- Need for IT based interventions and applications,
- Organizational Change Management to IT Applications
- IT applications in Project Management.
- IT applications in Financial Management
- Software based distribution network analysis.

Unit-9 IT Systems applications in the network
- Indexing of all feeders and transformers,
- IT based surveillance for detecting pilferage of power,
- Asset Management
- GIS applications in distribution system management.

Block 4: IT interface in Customer services

Unit-10 Customer Information & Satisfaction
- Customer benefit applications,
- Interactive Web-site with customers,
- Interactive Voice Response Systems,
- Online billing for customers,
- Customer care / Call Centers,
- Customer Analysis Tools,

Unit-11 Metering, Billing, Collection: the issues and innovations
- Automatic Meter Reading system
- Billing: Spot billing/ hand held metering / online billing
- Collection: Online payment.

COURSE -III: MANAGEMENT OF POWER DISTRIBUTION (6 Credits)

Backup to slide no. 13

Block 1: Principles of Management

Unit-1 Aspects of Management
- Projects and contracts management,
- Managing Materials and Supply Chain,
- Human Resource and Industrial relations management,
- Performance management

Unit-2 Customer Relations Management
- Elements of Better Customer Relation Management (CRM),
- CRM Tools and Techniques and Measuring Customer Satisfaction,
- Customer Participation for building Customer Confidence,
- Customer Satisfaction Survey and Analysis,
- Customer Indexing

Unit-3 Customer involvement & participation
- Non payment of bill – peer pressure
- Consumers' groups for billing & collection
- Franchisee models at delivery end.

Unit-4 Conflict Management
- Functional and Dysfunctional Conflict,
- Types and forms, sources, process and style of conflict management.

Block 2: Change Management in Power Distribution

Unit-5 Change Management Concepts and Process
- Understanding change management, types of change, models of change management, skills to manage change, Group based change.

Unit-6 Change Requirements
- Key roles in managing change, role of leadership, Intervention and evaluation of change.

Unit-7 People Change Management
- Resistance to change, Managing resistance to change, Role of change agents, skills to mange change, Group based change.

Unit-8 Emerging Developments
- Emerging Organizational forms and structures,
- Mergers and acquisitions,
- Turn around management,
- Managing Transition.

Block 3: Project Development and Implementation

Unit-9 Project Development and project management
- Scheme development and considerations for project identification and selection.
- Tools for project management.

Unit-10 Turnkey contracts and Unit rate contracts.
- Fundamentals of the Turnkey contract.
- Advantages and requirements of Turnkey contract vis a vis Unit rate contract.

Unit-11 DPR preparation and appraisal
- Factors in DPR preparation
- Field study, data collection, consolidation, analysis and applications.
- Consolidation of DPR components and cost estimation.
- Project investment, payback period and return on investment.

COURSE -III: MANAGEMENT OF POWER DISTRIBUTION (6 Credits)

Backup to slide no. 13

Block 4: Communication Skills and Motivation

Unit-12 Communication: Issues and Aspects

- Communication models,
- Feedback systems and processes.
- Corporate communication and strategies

Unit-13 Motivation: Issues & Aspects

- Concept and theories of motivation,
- Motives and managerial behaviour
- Goal setting,
- Morale development.

Unit-14 Developing Communication Skills

- Communication effectiveness,
- Factors Effecting Communication
- Communicating with impact,
- Organizational communication,
- Building interpersonal relationship and Team Work.

Block 5: Financial Management

Unit-15 Accounting Principles

- Accounting principles
- Accounting Standards

Unit-16 Financial Statements

- Construction of Trading Account,
- Profit & Loss Account
- Balance Sheet and Adjustment Entries.

Unit-17 Financial Analysis

- Ratio Analysis,
- Leverage Analysis,
- Budgeting & Budgetary Control and
- Investment Appraisal Methods.

Unit-18 Cost Management

- Understanding and Classifying Costs,
- Costing Methods,
- Cost Volume Profit (CVP) Analysis,
- Variance Analysis.

CERTIFICATE OF COMPETENCY IN POWER DISTRIBUTION

Backup to slide no. 13

In order to enhance capability of technicians in power sector, a six months comprehensive distance learning program has been developed by IGNOU. It is implemented in partnership with NPTI so as to cover technicians/ linesmen in the distribution utilities across the country. The program is open for general public also.

Course contents :

OEE-001: Electricity & Safety Measures
BLOCK 1: Elementary Electrical and Exposure to Tools
BLOCK 2: Earthing and Protection
BLOCK 3: Electrical Safety Measures
OEE-002: Power Distribution System
BLOCK 1 : Overview of Distribution System
BLOCK 2: Transformer & Substation Equipment
BLOCK 3: Metering/ Billing Technology & Theft Protection
OEEL-001: Practicals in Power Distribution
Activity No. 1: Practice for digging holes and erection of poles
Activity No. 2: Practice of fixing different fittings on poles such as cross-arms, insulators, stay-wire, guy rods/wires
Activity No. 3: Practice of stringing and sagging in overhead line conductors
Activity No. 4 Practice of jointing overhead line conductors
Activity No. 5: Practice of installation of overhead service line
Activity No. 6: Practice of identification of cable jointing kits and terminations
Activity No. 7: Practice of measuring the earth resistance
Activity No. 8: Practice of inspection and routine maintenance activity of a transformer
Activity No. 9: Practice of trouble shooting and maintenance activity of switch gears
Activity No. 10: Practice of installation and sealing of energy meters
Activity No. 11: Practice of testing of domestic wiring installations
Activity No. 12: Practice of identification and location of various faults in house wiring and their rectification

Methods of Instruction	The following methods will be used to impart instructions in this programme: a) Print material: Course materials in the form of printed booklets will be sent by post. b) Counselling /Contact Classes: Face–to-face contact classes for the two theory courses will be conducted for 30 hours in total, at training centers. c) Hands-on/Laboratory Work: 3-4 Weeks (full day) d) Assignments: These are provided with self instructional material e) Tele-conferencing: 10 hours (as required), the schedule for tele-conferencing will be communicated after the finalization of admissions.
Programme Duration	6 Months
Eligibility	•Technicians/Trade men working in power sector, sponsored by utilities. or •Non-sponsored general candidate at least 8th pass.
Medium of Instructions	English & Hindi (Material in regional languages is being developed progressively).

IGNOU PROGRAM IN POWER SECTOR

Backup to slide no. 14

sudhir vadehra <sudhirvadehra@gmail.com> **Thu, Jul 9, 2009 at 3:23 PM**

To: snanda@ignou.ac.in, silim@rediffmail.com

Kindly recall my meeting with you last month wherein I had indicated two programs viz. ACPDM and CCPD initiated by IGNOU with Ministry of Power and being conducted by School of Engineering and Technology, IGNOU. The enclosed details were forwarded to your Study centre at Kabul with the relevant details of the program which I am enclosing herewith.

The CCPD program which is for Technicians need facilities for practicals thus in priority this program should be taken up later. ACPDM is a well knit program for Engineers and other officers in the Power distribution utilities and quite relevant to even the fresh engineering graduates thus is proposed to be taken up initially.

We have a capacity development program to help Afghanistan utilities in power distribution and this program merges well with their requirement, particularly since they are restructuring their utilities. I am not keen on Bakhtar University because of the issues as discussed in case you think right we can approach the Utility named DABS directly which will ensure participation as well as it will be a good initiative where we can think of even having a IGNOU Study centre within the Utility.

Regards,

Sudhir Vadehra
Mob.: 9810410884

IGNOU PROGRAM IN POWER SECTOR

Backup to slide no. 14

Kamal Dev <kamaldev@ignou.ac.in> **Sat, Jul 11, 2009 at 3:20 PM**

To: sudhirvadehra@gmail.com
Cc: S Nanda <snanda@ignou.ac.in>

Dear Sh. Sudhir

Thank you very much for your e-mail message dated 9/7/2009 regarding collaboration with IGNOU to offer its academic programmes in Kabul.

In this regard, we are please to attach herewith a detailed format for submitting the proposal for establishing a Partner Institution of Indira Gandhi National Open University, New Delhi , India in Kabul, Afghanistan. The proposal along with the copies of the following documents may be forwarded to this office for consideration.

1. Permission / NOC from the Ministry of Higher Education or equivalent body of the state to offer foreign degree programmes in the respective country.
2. Copy of the institutional profile along with its registration details.
3. Infrastructure for running the Partner Institute (including built-up area, number of classrooms, furnishing amenities etc.
4. Computer Lab facility available for the students (including number of systems with their configuration etc.).
5. Library facility for the students;
6. Faculty and staff strength along with their qualifications and experience in teaching Higher Education, and
7. Details of programmes likely to be offered in the state

With regards,

Yours sincerely,

(Silima Nanda)
Director, International Division

Backup to slide no. 14

Name of the country	

BASIC INFORMATION
ABOUT THE ESTABLISHEMENT OF IGNOU PARTNER INSTITUTION OUTSIDE INDIA

1.	Name and Address of the proposed host Institution	
2.	Name of the Head of the Institution	
3.	Name of the Management Governing Body.	
4.	Year of Establishment	
5.	Is the Institution Affiliated to any Distance Learning Institution / University	Yes / No If yes, please attach a copy of the same.
6.	Whether the Institution has permission/NOC from the Ministry of Higher Education to offer foreign degree programmes in that country.	Yes / No If yes, attach a copy of approval
7.	Type of Institution	a) Govt. b) Private c) Autonomous / University
8.	Location of the Institution in the country	1. Centrally located 2. On the outskirt 3. Other (Please specify)
9.	Nearest Airport and total distance from air port to the place of institution.	
10.	Geographical Situation (attach the map)	
11.	Area likely to be covered by the proposed centre.	
12.	Approximate population to be benefited by the Centre	

13.	Number of institutions of Higher Education in the area. (Please provide separate list)	
14.	Nearest IGNOU Partner Institutions and its distance from the place (if your country already has an IGNOU PI)	
15.	Potential Sources of enrollment for IGNOU	1. 2. 3. 4.
16.	Name of programmes intended to be offered through the proposed Partner Institution.	
17.	Teaching Faculty and Administrative staff : (Please attach separate statement for more detailed information along with the CVs of potential academic counselors for IGNOU Programmes) a) Faculty: b) Administrative Staff	No. of teachers Arts : Science : Commerce : PG Classes : To handle: Admissions : _____ Accounts : _____ Others : _____
18.	Total no. of students registration with the Institution	
19.	Physical facilities available with the Institution such as: a) Total no. of Classrooms and the covered area. b) Examination Hall c) Library (no. of books) d) Computer Lab (no. of computers along with their configuration etc) (Please attach photos of Institution & physical facilities)	

20.	Name proposed for appointment of the Coordinator. (Please enclose the CV of the officer)	
21.	What are your strength on the basis of which you fee that you will be capable of providing the learner support services desired of a Partner Institution.	
22.	Application Fee (Non-refundable)	i) INR 1.50 lacs for SAARC Countries ii) USD 5,000/- for Non-SAARC Countries
23.	Security Deposit (After signing of LoI / MoU with IGNOU)	i) INR 8.00 lacs for SAARC Countries ii) USD 20,000/- for Non-SAARC Countries

SIGNATURE OF HEAD OF THE INSTITUTION

Name :
Designation :