

POWER GRID COMPANY OF BANGLADESH LTD.
QUALITY MANUAL
REVISION HISTORY

REVISION DETAILS				REVISION STATUS	
SL. #	Referred Section	Revision. #	Change Details	Date of Amendment	Approval
1	QM-03	01	List of controlled copy holders is increased	12/12/12	12/12/12
2	QM-04	01	Introduction: 1. From 31-12-2012 Status of ownership changed. BPDB retaining 76.25% share. The rest is owned by private investors. 2. OFCL Client list is incorporated 3. Scope of business is expanded 4. Abbreviation used in the quality management system is updated 5. Power system development plan of the government up to year 2015 is updated 6. Process Structure of Power Grid Company of Bangladesh Ltd. is updated. 7. Control of documents is updated 8.	12/12/12	12/12/12
3	QM-05	01	1. Description in para Customer focus is updated. 2. Quality Planning Format is updated. 3. Responsibility Matrix is updated 4. New Management Representative is appointed. The paragraph is updated accordingly.	12/12/12	12/12/12
4	QM-07	01	1. Fibre Optic Commercial Leasing department is in action. The paragraph for Product Realization is updated accordingly.	12/12/12	12/12/12
5	QM-08	01	1. In the paragraph of Monitoring and Measurement of Products, Procedure for Design Control (QP-DGN-1) was not mentioned. It is updated. 2. Both the Procedures for Corrective Action, QP-CAC-1 and Preventive Action QP-PAC-1 is replaced by the Procedure for Nonconformance, Corrective and Preventive Action QP-NCP-1. The reference is corrected accordingly.	12/12/12	12/12/12

Reviewed by

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL		
		ENDORSEMENT						
Document No.:	QM-01	Revision No.:	01	Effective Date:	12/12/12	Page:	1	of 1

Power Grid Company of Bangladesh Ltd. (PGCB) is responsible for Operation, Maintenance and Development of the transmission system of the Country. PGCB is also fully responsible to construct new electrical transmission lines and grid sub-stations.

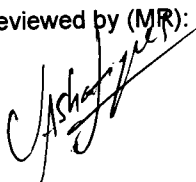
The strategic management for PGCB involves the establishment of long-term Vision, Mission and identification of the near-term objectives of PGCB. The 'Quality Policy'; 'Core Values' of the company and the future strategies for PGCB to achieve its goal have also been determined.

The strategies have keep the company focused on its Vision, Mission, Policy and help achieving its objectives. Successful implementation of these strategies will enhance the performance and image of PGCB.

PGCB has established a Quality Management System incorporating the requirements of ISO 9001: 2008. This Quality Manual (QM) is an overview of the Quality Management System (QMS) of PGCB. Details of inside view of the quality system and commitment, which PGCB has been pursuing, are shown in this manual. This quality manual is the sole property of PGCB. Updating of the manual is done as per the Document and Data Control procedure of the Quality Management System. Customer who has been provided with controlled copies of this manual will be informed whenever an amendment in the Quality Manual is made.

Distribution of the CONTROLLED copies of this manual is limited within the List of Controlled Copy Holders of the Quality Manual. CONTROLLED/UNCONTROLLED copy of the manual can be made available to the Customers and any distinguished personality with the written permission of the Managing Director.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.					QUALITY MANUAL			
		TABLE OF CONTENTS								
Document No.:	QM-02	Revision No.:	01	Effective Date:	12/12/12		Page:	1	of	1

TABLE OF CONTENTS

Doc. No.	Document	Pages
QM-01	ENDORSEMENT	1
QM-02	TABLE OF CONTENTS	1
QM-03	LIST OF CONTROLLED COPY HOLDERS	2
QM-04	QUALITY MANAGEMENT SYSTEM	12
QM-05	MANAGEMENT RESPONSIBILITY	8
QM-06	RESOURCES MANAGEMENT	3
QM-07	REALIZATION OF PRODUCTS	8
QM-08	MEASUREMENT, ANALYSIS AND IMPROVEMENT	5

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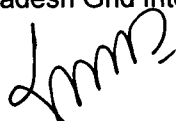
Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.					QUALITY MANUAL		
		LIST OF CONTROLLED COPY HOLDERS							
Document No.:	QM-03	Revision No.:	01	Effective Date:	12/12/12	Page:	1	of	2

LIST OF CONTROLLED COPY HOLDERS

1. Managing Director
2. Director Finance
3. Director HRM
4. Director Planning & Development
5. Director Operation & Maintenance
6. General Manager Planning & Design
7. General Manager Projects
8. General Manager Transmission -1
9. General Manager Transmission -2
10. General Manager System Operation
11. General Manager Personal & Administration
12. General Manager Finance
13. Company Secretary
14. Deputy General Manager Finance
15. Deputy General Manager Audit
16. Deputy General Manager HRM
17. Deputy General Manager Service
18. Deputy General Manager Planning
19. Deputy General Manager Design
20. Deputy General Manager Procurement & Stores
21. Deputy General Manager System Protection & Metering
22. Deputy General Manager (Grid Circle) Dhaka North
23. Deputy General Manager (Grid Circle) Dhaka South
24. Deputy General Manager (Grid Circle) Comilla
25. Deputy General Manager (Grid Circle) Chittagong
26. Deputy General Manager (Grid Circle) Bogra
27. Deputy General Manager (Grid Circle) Khulna
28. Deputy General Manager Research & Technical Services
29. Deputy General Manager Load Dispatch Circle
30. Deputy General Manager Communication
31. Deputy General Manager SCADA
32. Deputy General Manager FOCL
33. Deputy General Manager Aminbazar-Old Airport TLP
34. Deputy General Manager Substation Construction and Extension with Transmission Line facility
35. Deputy General Manager Aminbazar-Meghnaghat 400 kV TLP
36. Deputy General Manager Siddhirganj-Maniknagar 230 kV TLP
37. Deputy General Manager Transmission Efficiency Improvement Project
38. Deputy General Manager Biniyana- Comilla 230 kV TLP
39. Deputy General Manager Biniyana-Kaliakoir-Fenchuganj 400 kV TLP
40. Deputy General Manager Kulaura-Sherpur TLP
41. Deputy General Manager Bhola-Barisal 230 kV TLP
42. Deputy General Manager India-Bangladesh Grid Interconnection Project

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	LIST OF CONTROLLED COPY HOLDERS								
Document No.:	QM-03	Revision No.:	01	Effective Date:	12/12/12	Page:	2	of	2

LIST OF CONTROLLED COPY HOLDERS

43. Management Representative
44. Deputy Management Representative, Dhaka
45. Deputy Management Representative, Chittagong
46. Deputy Management Representative, Comilla
47. Deputy Management Representative, Bogra
48. Deputy Management Representative, Khulna
49. Deputy Management Representative, Faridpur
50. Deputy Management Representative, Project
51. Deputy Management Representative, NLDC
52. Deputy Management Representative, Head Office
53. Reserved for Auditors
54. Reserved for Auditors
55. Reserved for Auditors
56. Reserved for Auditors
57. Reserved for Auditors
58. Reserved for Auditors
59. Reserved for Auditors
60. Reserved for Auditors
61. Reserved for Auditors
62. Reserved for Auditors
63. Reserved for Auditors

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Quality Management System	POWER GRID COMPANY OF BANGLADESH LTD.					QUALITY MANUAL		
	QUALITY MANAGEMENT SYSTEM							
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	1	of 12

1 INTRODUCTION

i. Background of PGCB:

Before creation of Power Grid Company of Bangladesh Limited (PGCB) the Bangladesh Power Development Board (BPDB) was responsible for operation & maintenance of transmission system & its development throughout the country together with Generation and Distribution System. With the objective mentioned in Power sector vision statement and policy of the Government in page 4 of 12 of this section of Quality Manual, PGCB was created on 21st November 1996 under the Power Sector Reforms Programme. PGCB is a Public Limited Company registrar with the Register of the Joint Stock Companies and firms & controlled by Companies Act. PGCB is operating as per Company Act, 1994. As of 31-12-2012 BPDB own 76.25% share. The rest is owned by private investors. The Board of Director of PGCB shall be formed as per Articles of Association, revisable as required. At present, Managing Director, PGCB is the only representative from PGCB In the PGCB Board. Rest members, including the Chairman of the Board, are nominated by Power Division, MoPEMR, Government of Bangladesh.

PGCB is responsible for Operation, Maintenance and Development of the transmission system of the Country. PGCB is also fully responsible to construct new electrical transmission lines and grid sub-stations. In this connection transmission assets have already been transferred to PGCB from Bangladesh Power Development Board and Dhaka Power Distribution Company (DPDC).

ii. PGCB has been operating as an wheeler of electricity and receiving wheeling charge from distribution entities.

iii. PGCB's present customers are:

- BPDB
- DPDC
- DESCO
- Palli Biddyt Samities (PBS)
- West Zone Power Distribution Company Limited

iv. PGCB is commercially leasing out its dark Optical Fibres to various commercial and non-profit entities of the country such as:

- | | | |
|------------------|-------------------------|---------------------------------|
| 1. Grameenphone | 3. Orascom (Banglalink) | 5. BTCL |
| 2. Axiata (Robi) | 4. Citycell | 6. University Grants Commission |

PGCB mainly plays the role of an network infrastructure provider and by meeting the obligation as per contract, receives rent / charge from the customer.

The purpose of PGCB is reflected in its Vision, Mission, Policy and it objectives (Document no. QD-CMP-01, Company Policy), has already been outlined and is an important characteristics of the organization.

1.1 GENERAL

This Quality Manual has been prepared to describe the requirements and structure of the Power Grid Company of Bangladesh Ltd. (PGCB) quality management system. The PGCB quality management system is based on, and has been developed to satisfy the requirements of the Standard for quality management systems (ISO 9001: 2008).

For easy reference, the section headings of the Standard (from Section 4.0 onwards) have been adopted and are used for the documents' numberings of this Quality Manual.

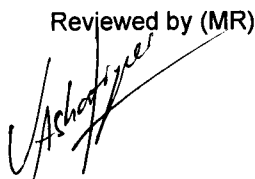
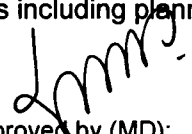
1.2 SCOPE

The PGCB quality management system shall apply to all the functions that engage PGCB within the Area of its jurisdiction.

Functions of PGCB: plan, promote, develop, operate and maintain an integrated and efficient power transmission system network in all its aspects including planning, investigation,

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Quality Management System	POWER GRID COMPANY OF BANGLADESH LTD.						QUALITY MANUAL			
	QUALITY MANAGEMENT SYSTEM									
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	2	of	12	

research, design and engineering, preparation of preliminary feasibility and detailed project reports, construction operation and maintenance of transmission lines, substations, load dispatch centres and communication facilities and appurtenant works, co-ordination of integrated operation of regional, national and international grid systems, providing consultancy services in power systems field, execution of turnkey jobs for other utilities/organization, wheeling of power, purchase and sale of power.

1.3 OBJECTIVES

Company objectives are formulated by top management to define the business goals and to provide the necessary direction to the organization. The objectives are defined in Document no. QD-CMP-01 Company Policy.

1.4 APPLICATION

1.4.1 Procedure

The PGCB quality management system is relevant to the nature of the organization, the service it delivers, and to customer and regulatory requirements. For this purpose, those requirements of the Standard that do not apply to PGCB are excluded from the scope of the PGCB quality management system.

The procedure for applying exclusions to the PGCB quality management system is listed below:

- I. A requirement of the Standard may be excluded only when both of the following conditions are met:
 - ♦ The requirement must be within Section 7, "Realization of Product", and
 - ♦ The exclusion may not affect the Company's ability, nor absolves the Company from the responsibility to provide a service that meets customer and applicable regulatory requirements.
- II. The Management Representative shall be responsible for identifying those requirements of the Standard that do not apply to PGCB and the service it provides, and to propose exclusions of such requirements from the scope of the quality system.
- III. Top management has the responsibility and authority for evaluating whether proposed exclusions are appropriate, and for approving them. Evaluation and approval of exclusions are conducted within the framework of management reviews of the quality management system (see Section 5.6)
- IV. Exclusions taken are documented in this section of the Quality Manual. The excluded requirements are precisely identified with reference to specific sections and/or statements in the Standard. There is also a brief justification why the exclusion is taken and why it is appropriate.

1.5 NORMATIVE REFERENCE

The following normative document applies to this Quality Manual and the PGCB quality management system as defined in the Quality Manual.

- ISO 9001:2008, Quality management systems - Requirements

1.6 TERMS AND DEFINITIONS

For the purpose of this Quality Manual, the terms and definitions given in ISO 9001:2008, Section 3 applies.

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Quality Management System	POWER GRID COMPANY OF BANGLADESH LTD.					QUALITY MANUAL		
	QUALITY MANAGEMENT SYSTEM							
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	3	of 12

Abbreviation used in the quality management system:

AC : Accounts	MIS : Management Information Service
ADM : Administration	MD : Managing Director
ADT : Internal Financial Audit	MHRD : Manager Human Resource Development
AM : Assistant Manager	MR : Management Representative
AMR : Assistant Management Representative	MT : Metering
ASST : Assistant	NLDC : National Load Dispatch Centre
BPDB : Bangladesh Power Development Board	NOD : Network Operation Division
CBA : Collective Bargaining agent	OFCL : Fibre Optic Commercial Lease
CMP : Company	OPN : Operation
COM : Commercial	P : Project
COMM: Communication	PA : Personnel & Administration
CPTU : Central Procurement Technical Unit	PBS : Palli Bidyut Samity
CS : Company Secretary	PD : Project Director
DF : Director Finance	P&D : Planning and Development
DGM : Deputy General Manager	PEC : Project Evaluation Committee
DGN : Design	PIM : Project Implementation
DM : Deputy Manager	PL : Planning
DMR : Deputy Management Representative	PO : Purchase Order
DPP : Development Project Proposal	PPL : Project Planning
DO&M : Director O&M	PROC : Procurement
DP&D : Director P&D	PROT : Protection
E : Efficiency	QCC : Quality Control Circle
EC : Engineer Incharge	QF : Quality Forms
EMD : Energy management Division	QM : Quality Manual
EM : Energy Manager	QMS : Quality Management System
ENGR : Engineer	QP : Quality Procedures
FIN : Finance	QWI : Quality Work Instruction
FM : Foreman	REB : Rural Electrification Board
GOB : Government of Bangladesh	RTS : Research & Technical Service
GRID : Grid	SA : System Analysis
GM : General Manager	SCADA: Supervisory Control & Data Acquisition System
GMD : Grid Maintenance Division	SCE : Shift Charge Engineer
HRD : Human Resource Development	SCH : Schedule
HRM : Human Resource Management	SK : Store Keeper
ICT : Information & Communication Technology	SO : System Operation
IMD : Information Management Division	SPL : System Planning
IPP : Independent Power Producers	SPM : System Protection & Metering
IMP : Implementation	SS : Sub Station
JAM : Junior Assistant Manager	STR : Store
LDC : Load Dispatch Circle	TRAN : Transmission
M : Manager	WZPDCL: Western Zone Power Distribution Company Ltd
MPEMR: Ministry of Power, Energy and Mineral Resources	

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL			
		QUALITY MANAGEMENT SYSTEM							
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	4	of	12

2 RESOURCES

2.1 THE PEOPLE AND STRUCTURE OF PGCB:

The salient features of the organogram (refer Document no. QD-HRM-01) of the Power Grid Company of Bangladesh Ltd. approved by the Board on 25/05/05 are as follows:

1. Total Manpower is1935
2. No. of Officers1326
3. No. of staff589
4. There are 8 divisions namely
 - i. Planning and Development
 - ii. Transmission-1
 - iii. Transmission-2
 - iv. System Operation
 - v. Projects
 - vi. Financial Audit
 - vii. Finance & Accounts
 - viii. Personnel and Administration

Each division is headed by General Manager except in System Protection and Metering.

Other than these divisions, following departments are directly under the supervision of Managing Director.

- i. Financial Audit &
- ii. Company Secretariat headed by Deputy General Manager.
5. Managing Director is empowered to make adjustment in different establishment as per need maintaining the total manpower strength fixed.

In the organogram, there is limited provision of sweeper, mali, etc. In most of the cases outside service providers will be contracted to provide the above-mentioned services.

2.2 PHYSICAL FACILITIES:

Physical Assets of the company is documented in Document no.

2.3 MACHINERY & EQUIPMENT:

PGCB installed machinery and equipment in different sub-stations, load dispatch centers, and others of various types to cater the needs for transmission of power from generating stations to the receiving ends of customers. A list of machinery is given in Document no.

Availability of machinery and equipment is ensured through preventive maintenance.

3 Market:

Power sector vision statement and policy of the Government

- Buyer purchases all the required power from the generators based on economic load dispatch and sells to different distribution companies.
- Transmission system should be expanded in tandem with generation capacity expansion on one hand and growth of demand on the other. Network development, expansion and management should be designed and implemented in such a manner that it is capable of accessing the most efficient supply of power and transport it to customers at the cheapest way. Resources, domestic and foreign have to be arranged for these purposes.
- Segregation of power generation, transmission and distribution functions into separate services.
- The transmission network will be owned, operated, planned and developed by a corporatised entity in the public sector.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL			
		QUALITY MANAGEMENT SYSTEM							
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	5	of	12

The broad features of the emerging structure of the industry have also been generally agreed. To start with, a single buyer model may be adopted where the Buyer purchases all the required power from the generators based on economic load dispatch and sells to different distribution companies.

Power system development plan of the government up to year 2015:

Sl. No	Description Year	Year		
		2011	2012	2015
1	Installed Capacity (MW)	7,500	8,315	16,000
2	Peak Demand (MW)	5,800	6,300	10,300
3	Net Generation (MkWh)	40,200	42,424	84,000
4	Transmission Line (km)	4,768	4,824	6,713
5	Grid Sub-Station Capacity (MVA)			
6	230/132 kV	7,225	7,225	14,915
7	132/33 kV	10,642	11,157	17,606
8	400/132 kV			3,720

Power Sector Business in Bangladesh

- Trading with electricity may take the shape of usual market scenario like other products (Power Market).
- Consumers will not be interested in what is delivered at present. They will play a role in the way business operates.
- Competition
- Fair practice by regulatory commission and protection of consumers' right.
- Consumers in power sector
 - Dhaka Power Distribution Company (DPDC)
 - Dhaka Electric Supply Company Limited (DESCO)
 - Polli Biddyt Samity (PBS) of Rural Electrification Board (REB)
 - Distribution zones of Bangladesh Power Development Board (BPDB)
 - Western Zone Power Distribution Company Ltd
 - Future Power Distribution Companies
 - Large Individual Company requiring considerable large demand
 - Etc.

Turnover:

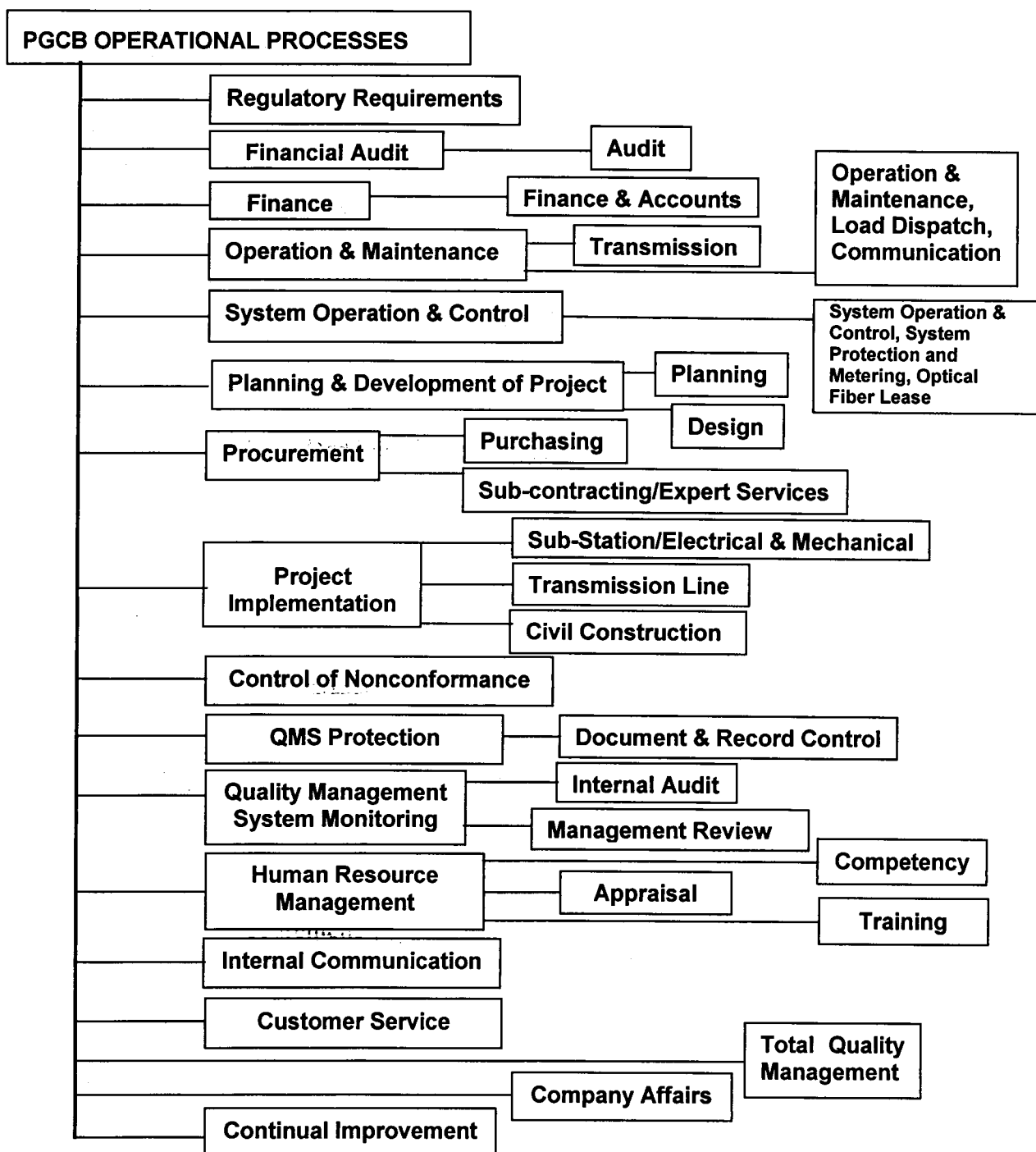
Turn over of the company during the year 2011-12 was around Taka 7,142.21 Million only.

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4 PGCB QUALITY MANAGEMENT SYSTEM

Process Structure of Power Grid Company of Bangladesh Ltd.



4.1 GENERAL REQUIREMENTS

The PGCB quality management system has been established to cover the various processes as required by the International Standard (ISO 9001: 2008), and of those identified and required by PGCB. Where appropriate, the processes, as listed under this section, are described in documented procedures.

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	QUALITY MANAGEMENT SYSTEM								
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	7	of	12

For easy reference, and where applicable, the relevant procedures are mentioned below for each relevant processes.

Procedures required by "the Standard":

1. Document Control as required and defined in Section 4.2.3.
2. Control of Quality Records as required and defined in Section 4.2.4.
3. The internal audit process as required by Section 8.2.2.
4. Control of Nonconforming Products as required and defined in Section 8.3.
5. Corrective Action as required and defined in Section 8.5.2.
6. Preventive Action as required and defined in Section 8.5.3.

Procedures required by PGCB:

1. The Management Review process as defined in Section 5.6.
2. The system and project planning and development process as defined in Section 7.3 and the same as that applied for the PGCB development process
3. The project implementation process as defined in Section 7.3 and the same as that applied for the PGCB construction process.
3. The procurement process as defined in Section 7.4.1.
5. The operation & maintenance, dispatch and communication processes as defined in Section 7.5.1.
6. The System Protection and Metering as defined in Section 7.5.1.
6. The power system control, system protection and metering (monitoring), measuring, analysis and continual improvement processes as required and defined in Section 8.
7. The human resource development process as defined in Section 6.2.
8. The legal and company affairs process of PGCB.
9. Internal Financial Audit process of PGCB.
10. Total quality management (TQM) covering quality circle, 5S, kaizen as defined in Section 7.5.1.

The process for Accounts & Finance is guided and followed by Accounts Manual (Document no. QD-FIN-01) and that for Human Resource Development by procedure no. QP-HRM-1 and Documents no. QD-HRM-01, QD-HRM-02 & QD-HRM-03.

The applicable process procedures describe the relationship and interaction between processes and between the relevant sections/departments to ensure that the required interaction is understood, implemented and maintained. However a responsibility matrix, given in page 6 of 9 QM-05, shows the relationship.

Procedures define the relevant resources, human and other, that would be required for executing and maintaining the applicable processes.

Departmental managers and section heads are responsible to implement and maintain all the procedures that apply to the relevant processes. They are required to continuously monitor, measure and analyse the respective processes to ensure that it is and remains effective and that objectives are being achieved.

Departmental managers and section heads are required to implement and maintain the necessary and relevant actions that are required to ensure continual improvement of the processes.

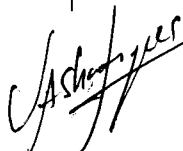
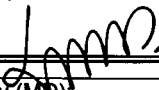
PGCB is delivering products (power through transmission) to its customers. The effectiveness of these products will be measured on customer satisfaction.

PGCB is commercially leasing out its dark Optical Fibres to various commercial and non-profit entities of the country and delivering products (connectivity through Optical Fibres) to its customers. The effectiveness of these products will be measured on customer satisfaction.

Customer satisfaction is defined as the customer's perception of the degree to which his/her requirements or needs have been fulfilled.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL			
		QUALITY MANAGEMENT SYSTEM							
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	8	of	12

The following table identifies customers' needs together with the satisfaction measurement criteria that are applied by PGCB:

CUSTOMER	CUSTOMER NEEDS	SATISFACTION MEASUREMENT
Buyer of Power	1. Meeting the existing standards/ codes of the country, Regulatory requirements 2. Meeting the obligation as per contract with customer 3. Satisfaction of customer after effective power transmission	1. Periodic progress report and progress meetings 2. Monthly progress report and progress meetings 3. Survey of customers' satisfaction
Lease of Dark Optical Fibre	1. Meeting the obligation as per contract with customer 2. Satisfaction of customer after effective power transmission	1. Periodic progress report and progress meetings 2. Survey of customers' satisfaction

Top management holds periodic review meetings to ensure that appropriate interaction between processes is maintained and to review the overall effectiveness of the processes (Section 5.6).

PGCB has planned, mobilised human and material resources and established the sequence of processes to realize the products. It also established and maintains a Quality Management System and continually improves its effectiveness in accordance with the requirements of ISO-9001: 2008 standard. The Quality Manual includes the details of QMS, references to documented procedures and a description of the interactions between the following processes.

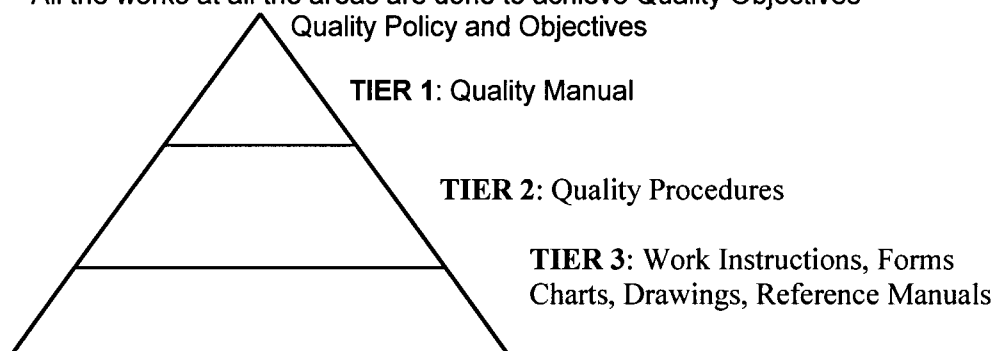
- a. Procurement: dealing with purchase/procurement of materials, sub-contractors
- b. Stores: dealing with storage, handling and safekeeping of materials and products
- c. The processes involved for transmission of the electric energy are the following,
 - i. Planning and Development (including design where applicable) of Projects,
 - ii. Project Implementation,
 - iii. Transmission System Operation & Control
 - iv. Maintenance of Transmission Line and Sub-Stations
 - v. System Protection and Metering
 - vi. Total Quality Management (TQM)-Quality circle, 5S, Kaizen
- d. Human Resource Management
- e. Finance and Audit
- f. Company Affairs

These are included in the QMS. The Quality Manual of Power Grid Company of Bangladesh Ltd. is a direct collection of QMS documents with references to documented procedures.

PGCB has a three-tier documentation, Quality System with Quality Policy and Objective being at the tip. Quality Manual, which is the highest level or Apex Manual, is at the Tier-1. Quality Procedures are at the Tier-2. Tier-3 contains Work Instructions, Formats, Charts, drawings, and reference manuals/documents.

The documentation is used to ensure that:

- The service conforms to specified requirements
- Customer satisfaction is achieved as per Quality Policy
- All the works at all the areas are done to achieve Quality Objectives



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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL		
		QUALITY MANAGEMENT SYSTEM						
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	9	of 12

A mapping of the quality management system involving the major processes has been given in the page following next page (page 10 of 12 of this document no. QM-04).

4.2 DOCUMENTATION AND RECORDS

4.2.1 General

The PGCB quality management system consists of several documents that are required by the Standard, and shall include the following documentation:

- a) PGCB's quality policy as required and defined in Section 5.3, and PGCB's quality objectives as required by and listed under Section 5.4.1
- b) A Quality Manual, this document, as required by Section 4.2.2
- c) Documented quality procedures (with the procedure number in brackets) that are specifically required by the Standard, namely:
 - (i) Procedure for Document Control [QP-DCL-1]
 - (ii) Procedure for the Control of Records [QP-DCL-2]
 - (iii) Procedure for Internal Quality Audit [QP-IQA-1]
 - (iv) Procedure for the Control of Non-conforming Products, [QP-CNP-1]
 - (v) Procedure for Nonconformance, Corrective and Preventive Actions [QP-NCP-1]

In addition following procedures (with the procedure number in brackets) have been established to make the system more effective and dynamic.

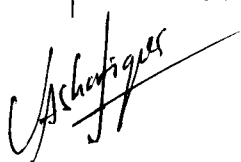
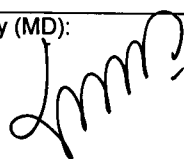
- i. Procedure for Management Review [QP-MNG-1]
- ii. Procedure for Procurement [QP-PRO-1]; Procedure for Store [QP-STR-1]
- iii. Procedure for Design Control [QP-DGN-1]
- iv. Procedures for Project Planning [QP-PPL-1] and System Planning [QP-SPL-1]
- v. Procedure for Project Implementation [QP-PIM-1]
- vi. Procedure for Power System Operation & Control [QP-PSO-1], Procedure for Telecommunication Equipment Maintenance [QP-TRU-01] and Procedure for Telemetry and SCADA Equipment Maintenance [QP-SMD-01]
- vii. Procedure for Optical Fiber Lease, Bill Calculation and Prepare of Bill for Client [QP-FCL-1]
- viii. Procedure for Information and Communication Technology [QP-ICT-01]
- ix. Procedure for Sub-Station Operation [QP-SSO-1], Sub-Station Maintenance [QP-SSM-1], Transmission Line Maintenance [QP-TLM-1], Surveillance Inspection of sub-stations [QP-SIS-01], System Protection and Metering [QP-SPM-1]
- x. Procedure for Human Resource Development [QP-HRM-1]
- xi. Procedure for Company Affairs [QP-CMP-1]
- xii. Procedure for Financial Affairs [QP-FIN-1]
- xiii. Procedure for Financial Audit [QP-ADT-1]
- xiv. Procedure for Management Information System [QP-MIS-1]
- xv. Procedure for Research and Technical Services [QP-TSS-1]
- xvi. Procedure of Total Quality Management [QP-TQM-1]

All these procedures are listed under Master List of Procedures (ref. QF-DCL-01).

- d) The processes that are required by the PGCB quality management system are defined under Section 4.1(a), and includes references to the applicable process procedures that are required to ensure the effective planning, operation and control of the processes.

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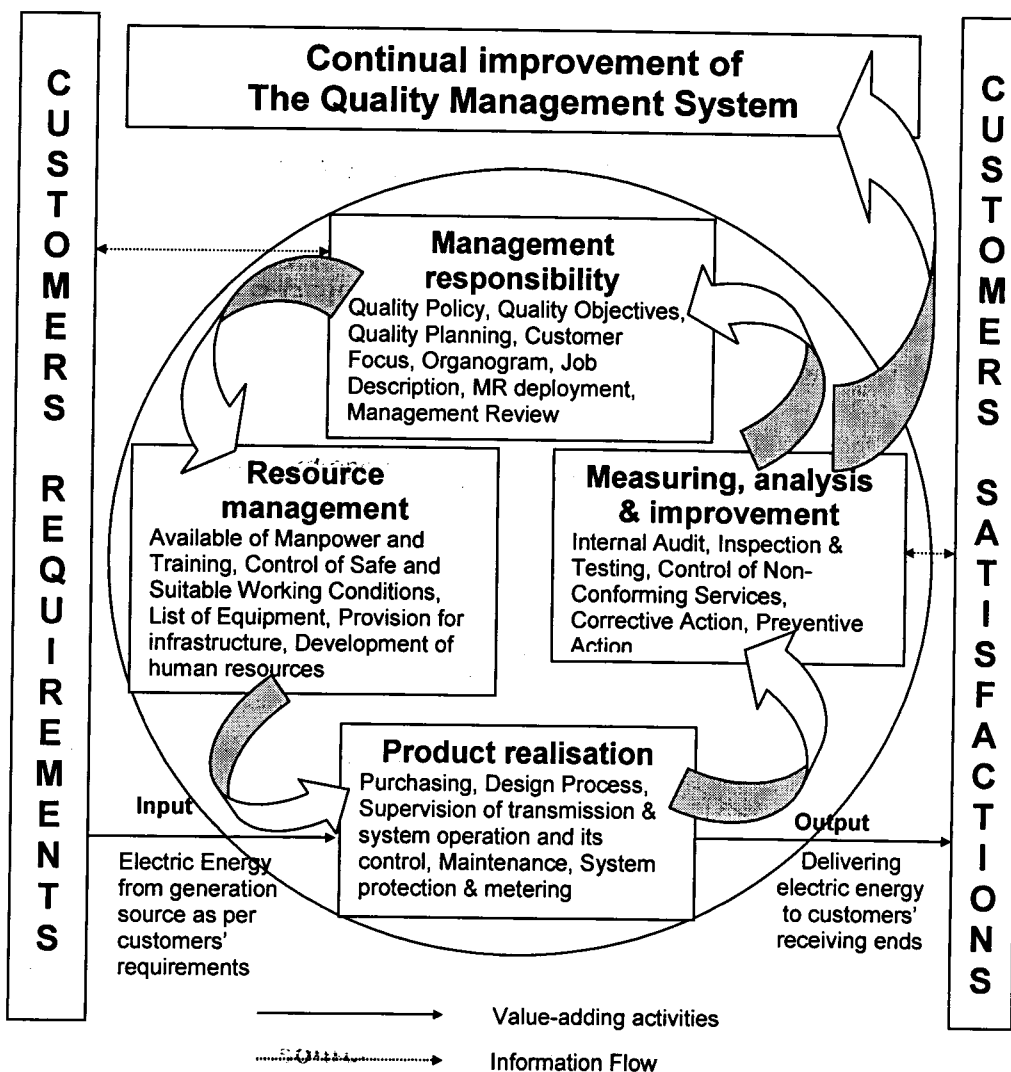
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		QUALITY MANAGEMENT SYSTEM					
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	10 of 12

e) All the relevant records that are generated through the applicable processes in accordance with the requirements of the Standard and as required by PGCB are listed under Master List of Forms (ref. QF-DCL-03).

QUALITY MANAGEMENT SYSTEM MAPPING



4.2.2 Quality Manual

a) The PGCB Quality Manual defines the scope of the PGCB quality management system. The scope includes all of PGCB's activities, which are described as:

- The efficient and effective planning & development (also design where applicable) of projects as per requirements of market and customers and also of existing standards/codes
- The efficient and satisfactory supervision works of projects, transmission and operation system of power transmission with monitoring system
- The maintenance of transmission line and substations which includes buildings, equipment, electrical and mechanical equipment, computer network and systems
- Training and skills development
- General office administration, and
- Financial and Audit management
- Company Affairs and Legal Matters

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		QUALITY MANAGEMENT SYSTEM							
Document No.:	QM-04	Revision No.:	01	Effective Date:	12/12/12	Page:	12	of	12

4.2.4 Control of Records

Records are established and maintained to provide the evidence of conformity to the Standard requirements and to demonstrate the effective operation of the PGCB quality management system. Maintaining records, that represents a clear history of what happened during a relevant process, also provides the means of tracing the origins of problems that enables it to be rectified and recurrence prevented.

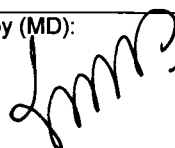
PGCB has established a documented procedure [QP-DCL-2] Procedure for Control of Quality Records] that defines the controls that are employed for identification, storage, protection, retrieval, retention time and disposition of all records.

All divisional and sectional heads shall be responsible to index, file and store the applicable records in designated storage areas. Management and other applicable legal requirements shall determine the retention time of the records.

Records shall be stored as such, that it is readily identifiable and easily retrievable for immediate access when required.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL		
		MANAGEMENT RESPONSIBILITY						
Document No.:	QM-05	Revision No.:	01	Effective Date:	12/12/12	Page:	1	of 8

5 MANAGEMENT RESPONSIBILITY

Management is responsible for the development and improvement of the Power Grid Company of Bangladesh Ltd. quality management system. Therefore, management responsibility includes, defining the quality policy, providing the necessary resources, assigning responsibilities and authorities and regularly reviewing the quality management system.

5.1 MANAGEMENT COMMITMENT

Management commitment is necessary to demonstrate that top management has adopted the quality management system and that they believe in the benefits it holds for the organization and its customers.

The top management of PGCB is committed to develop, implement and maintain the PGCB quality management system and also committed to improve its effectiveness through continual improvement.

Management demonstrates their commitment to the development and implementation of the PGCB quality management system, by:

- Establishing a quality directive through its statement of Vision of future role, Mission, Quality Policy (ref. Document no. QD-CMP-01)
- Continuously communicating to its employees the importance of meeting customer as well as statutory and regulatory requirements (ref. Section 5.5.3)
- Establishing clear, identifiable and measurable quality objectives (ref. Section 5.4.1)
- Conducting regular management review meetings to ensure the effectiveness of the processes and to ensure continual improvement (ref. Section 5.6)
- Ensuring that the necessary resources are available for all processes (ref. Section 6)

5.2 CUSTOMER FOCUS

(a) Customers of PGCB are identified as:

- BPDB
- WZPDCL
- DPDC
- DESCO
- Palli Biddyt Samities
- Large Consumers
- Etc.

PGCB has identified the requirements of customers. The electrical energy is sourced from the following feeders:

- Generators of BPDB
- IPP Generators
- APSCL
- EGCB

PGCB has identified the two criteria for the customers' requirements:

- Frequency control: PGCB has to maintain system frequency 50Hz \pm 1% to ensure quality power to the customer.
- Voltage Control: PGCB has to maintain the customer end voltage (230 kV/ 132 kV/ 33 kV) at \pm 10% of the rated voltage to ensure quality power at customer end.

(b) Customers of PGCB (receiving connectivity through Optical Fibres) are identified as:

- Grameenphone
- Axiata (Robi)
- Orascom (Banglalink)
- Citycell
- BTCL
- University Grants Commission

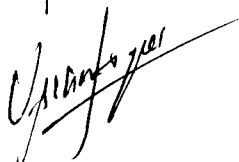
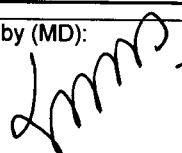
Contract process with Bangladesh Army and NTTN license holders are in progress.

PGCB has identified the two criteria for the customers' requirements:

- connectivity uptime: PGCB has to maintain 100% connectivity uptime to ensure quality service.
- Link Availability: PGCB has to meet the obligation as per contract with customer.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL		
		MANAGEMENT RESPONSIBILITY						
Document No.:	QM-05	Revision No.:	01	Effective Date:	12/12/12	Page:	2	of 8

New requirements will be constantly monitored and will be included in development programme for further actions. Customers' requirements and customer satisfaction will be the main focus of PGCB's activities.

Customer satisfaction is defined as the customers' perception that their needs and expectations have been met. Top management shall ensure customer satisfaction, through implementing and maintaining the PGCB quality management system. Top management has identified and recorded the customer needs and expectations in the Quality Manual (ref. Section 4.1).

Management shall communicate with its customers to ensure that it understands their needs and expectations and to ensure that it is being met. Management shall also communicate the customer needs and expectations throughout the organization, and ensure that the targets and goals of the organization are linked to the customer needs and expectations.

Management shall systematically manage customer relations and ensure that customer satisfaction is being measured and shall continually strive towards improving it.

5.3 QUALITY POLICY

The top management of PGCB is committed to implement, maintain and continuously improve the PGCB quality management system.

Management shall communicate the quality management principles of customer focus, leadership, people involvement, process and system approaches, continual improvement, factual decision-making and mutual beneficial supplier relationships, to all levels of the organization and ensure that it is understood and applied.

The Quality Policy of PGCB has been established (ref: Document no. QD-CMP-01 Management Policy). Quality Policy embraces all functions of PGCB. The Policy reflects the commitment of PGCB in meeting the requirements of the customer. The Quality Objectives consistent to Quality Policy has been defined (ref: Document no. QD-CMP-01 Company Policy). The QMS includes commitment to review the policies and objectives for continuing suitability and improvement. PGCB ensures that Quality Policies and Objectives are understood at all levels through briefing sessions, training and on job performance.

PGCB is committed to delivering quality services, that complies with the terms and conditions of the contractual requirements of customers, that meets the requirements of the Standard for Quality Management Systems, and that meets or exceeds customer needs and expectations.

PGCB shall periodically (at least once a year) review its quality policy to ensure that it remains suitable and relevant.

5.4 PLANNING

Quality objectives are established to support and implement the quality policy and to ensure continual improvement. Quality planning materialises through defining, the PGCB quality management system processes (including any exclusions allowed for by the requirements of the Standard), and the applicable resources needed to achieve quality objectives.

5.4.1 Quality Objectives

PGCB documented its processes to define objectives, and established a measurement structure that would be regularly reviewed to ensure objectives are being met.

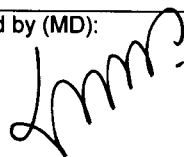
Measurable quality objectives are established at the relevant functions and levels within the organization, which are consistent with the quality policy. Quality objectives must ensure that process and customer requirements are achieved.

Quality objectives also define the direction and priorities for continual improvement. Use of quality objectives for facilitating continual improvement is explained in Section 8.5.

PGCB has established Quality objectives for the various processes of the quality management system have been (ref: Document no. QD-CMP-01).

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL		
		MANAGEMENT RESPONSIBILITY						
Document No.:	QM-05	Revision No.:	01	Effective Date:	12/12/12	Page:	3	of 8

5.4.2 Quality Management System Planning

a) Quality management system elements and processes are planned to ensure that the system is appropriate for the scope of the Company, and that it is effective and efficient. The purpose of the quality management system is to:

- achieve the quality policy
- ensure and demonstrate that PGCB has the ability to provide a consistent service that meets customer, statutory and regulatory requirements
- ensure a high level of customer satisfaction
- facilitate continual improvement, and
- comply with the requirements of the Standard

The output of quality management system planning is documented in this Quality Manual, in associated Process Procedures and in other referenced documents. Together, these documents identify and define all elements and processes of the quality management system.

b) Improvements and changes to the quality management system are planned within the framework of management reviews. The output of this planning is expressed in the form of quality system objectives as defined earlier in this Section QM-05, in para 5.4.1 above and in Section QM-08, in para 8.5.1.

To explain the requirements of quality and how it is met with the Quality System, quality planning is made. The planning process takes care of the various activities that are essential to meet the specified requirements for services offered by PGCB and to ensure customer satisfaction. The quality-planning format is documented and available in pages 4 & 5 of 8 of this section QM-05.

Interlink of responsibilities between different functions in relation to different activities of Quality Management System has been shown in matrix format in page 6 of 8 of this section QM-05.

5.5 RESPONSIBILITY, AUTHORITY AND COMMUNICATION

Responsibilities and authorities are defined and communicated within the organization. Appropriate internal communication processes are established to ensure that regular communication takes place through all levels of the organization to ensure that the effectiveness of the quality management system are maintained and improved.

5.5.1 Responsibility and Authority

An organizational structure (Organogram) of the company has been given in Service Rule (Document no. QD-HRM-02). The company has formerly issued it. Responsibility and Authority of the personnel who are important for the Quality Management System and who can manage, perform and verify the work affecting quality are also defined in the same document. Quality Management System Mapping shown in page 10 of 12 of document QM-04, Quality Planning Format shown in pages 4 & 5 of 8 of this document QM-05 and Responsibility Matrix shown in page 6 of 8 of this document QM-05 shows clearly the inter-departmental relationships.

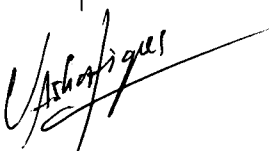
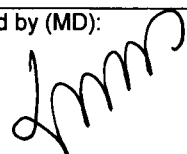
Job-descriptions have been established (ref. in Service Rule, Document no. QD-HRM-02) and are available for all staff designations, which define the relevant functions, duties, responsibilities and levels of authorities.

Top management explains and issues job-descriptions to their respective staff members and ensures that they understand their duties, responsibilities and authorities. Management monitors their staff for compliance with their job-descriptions, which shall form the basis of annual performance appraisals.

Top management ensures that job-descriptions are maintained and regularly reviewed to ensure that it remains relevant.

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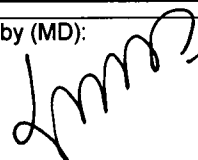
Quality Management System	POWER GRID COMPANY OF BANGLADESH LTD.					QUALITY MANUAL		
	MANAGEMENT RESPONSIBILITY							
Document No.:	QM-05	Revision No.:	01	Effective Date:	12/12/12	Page:	4	of 8

QUALITY PLANNING FORMAT

Activity	Procedure/Other Reference	Responsibility	Reference Documents	Quality Records
Document and Data Control	QP-DCL-1	MR	Lists of Procedures/ Work Instructions/ Formats/Tags/Register/ Specifications	
Control of Quality Records	QP-DCL-2	Do	List of Records	All Quality Records as per List of Records
Management Review	QP-MNG-1	MD, MR	Internal Audit Summary, Customer Complaints Summary, Corrective and Preventive Actions, Recommendation of Improvement	Management Review Records
Competancy & Training	QD-HRM-1 QD-HRM-2 QD-HRM-3	DHRM GMP&A	Assessment of Competency, Training Needs and Plan, Appraisals	Training Records, Evaluation Reports
Suitable and Safe Working Conditions		GMSO, MGMD, AM/DM GSS	Check Lists, Fire Drill Records	Fire Drill Records, Inspection Report on Accidents
Contract Review	QP-PPL-1 QP-SPL-1 QP-DGN-1	GMP&D	Market Survey & Forecast, Customers' query & feed back, Product Specifications, Power Availability Reports, Tariff Approval	Contract Review and Amendment Records, Offers, Invoices.
Planning and Design	QP-PPL-1 QP-SPL-1 QP-DGN-1	GMP&D	Plan, Design Drawings, input, output, review, verification, validation,	Design drawings, design review, reports of verification, validation, tender documents
Project Implementation	QP-PIM-1	GMP	Relevant document of sub-contracts,	Records for Construction,
Procurement	QP-PRO-1	DGM PRO GMP&D	Specifications of Products/ Sub-contract Documents, Limits of Authority, Procurement Manual	Supplier Approval Records, Purchase Orders
System Operation and Load Despatch	QP-PSO-1 QP-SSO-1	GMSO		Log Sheets & other records
System Protection and metering	QP-SPM-1	DO&M		
Sub-station Maintenance	QP-SSM-1 QP-TLM-1	DGM(Grid)	Annual Maintenance Plans, Monthly Maintenance Plan Machine History Card	Break Down Record, Annual/Monthly Maint. Record, Machine History card
Monitoring and Inspection	QP-PSO-1 QP-SPM-1	DGM, M concerned	Quality Manual	Records & Registers
Identification and Traceability		MSPMD concerned	Relevant documents	Tags, levels, etc.

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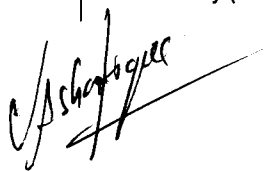
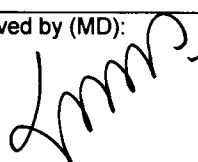
Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL		
		MANAGEMENT RESPONSIBILITY						
Document No.:	QM-05	Revision No.:	01	Effective Date:	12/12/12	Page:	5	of 8

QUALITY PLANNING FORMAT (CONTD.)

Activity	Procedure/Other Reference	Responsibility	Reference Documents	Quality Records
Customer Supplied Product	Not Applicable			
Preservation of Product	QP-STR-1	DGMP&S MGMD	Receipt of materials	Safe keeping, stock records
Control of Inspection, Measuring and Test Equipment	QP-SPM-1	MSPMD concerned	Quality Manual	Calibration Records
Internal Quality Audits	QP-IQA-1	MR, DMR	Checklists, QMS documents, records of processes	Nonconformity Reports, Audit Analysis
Control of Nonconforming Products	QP-CNP-1	GMSO, MGMD, AM/DM GSS	Monitoring and Inspection Procedure, Raw Material, and Product Specification	Monthly Analysis of Product Non-conformity
Statistical Techniques		All Functional Heads of the Quality System	Records of processes, Data of Corrective and Preventive Actions	Quality Records
Non-conformance, Corrective and-Preventive Action	QP-NCP-1	-do-	Monthly Analysis of Nonconforming Products, Internal Audit Reports Summary, Customer Complaints, Statistical Analysis Reports.	Monthly Analysis of Customer Complaints, Minutes of Corrective Action Team, Audit Analysis, Statistical Report Inferences.
Finance and Accounts	QD-FIN-01 QD-FIN-02 QP-FIN-1	DFIN GMF, DGMFIN, MFIN, MACC	Financial and Accounts transactions, Budget, Tariff approval and book keeping,	Financial and Accounts Records
Financial Audit	QP-ADT-1	DGMADT	Organization chart (changes in officers, duties, and others), Methods of operations, Periodic financial reports submitted to higher management, Substations or offices, Others.	Records of Audit Findings, Audit Objections, Internal Financial Audit Reports, Audit Analysis
Company Affairs	QP-CMP-1	CS	Decisions of Board of Directors & AGM, Company Legal documents, Share documents	Documents, minutes of meeting, contract agreement, company documentation

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.						QUALITY MANUAL			
		MANAGEMENT RESPONSIBILITY									
Document No.:	QM-05	Revision No.:	01	Effective Date:	12/12/12		Page:	6	of	8	

RESPONSIBILITY MATRIX

Clause No.	Title of requirement	MD	DF	D HRM	D O&M	D P&D	GM F	GM T-1	GM T-2	GM SO	GM P&D	GM P	GM P&A	GM ADT	CS	MR	SK
4.0	Quality Management System	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4.2.3	Procedure for Document Control	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4.2.4	Procedure for Control of Quality Records	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5.6	Management Review Procedure	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6.2.2	Training of Employees	□	■	■	■	■	■	■	■	■	■	■	■	■	□	■	■
6.4	Suitable and Safe Working Environment	□	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7.2.2	Contract Review	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7.3	Procedure for Design Control	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7.4	Purchasing Procedure	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7.5.1	Procedure for Power Transmission Control	□	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Procedure for Maintenance	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7.5.3	Identification and Traceability	■	□	□	□	■	■	■	■	■	■	■	■	■	■	■	■
	Inspection and Test Status	■	■	■	□	□	■	■	■	■	■	■	■	■	■	■	■
7.5.4	Customer Supplied Product	NOT APPLICABLE															
7.5.5	Preservation of products	NOT APPLICABLE															
7.6	Control of Inspection, Measuring and Test Equipment	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
8.2.2	Procedure for Internal Audits	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
8.2.3	Inspection and Testing	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■
8.3	Procedure for Control of Nonconforming Product	□	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■
8.4	Statistical Technique	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
8.5.2	Procedure for Non-conformance, Corrective and Preventive Action	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

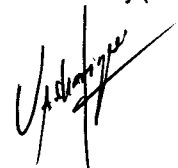
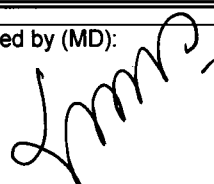
Legend:

■: Direct Responsibility

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		MANAGEMENT RESPONSIBILITY						
Document No.:	QM-05	Revision No.:	01	Effective Date:	12/12/12	Page:	7	of 8

5.5.2 Management Representative

Top management has appointed and authorized Engr. Quazi Ahsan Shafique, GMP&D the PGCB Management Representative (MR), to be responsible for implementing and maintaining the PGCB quality management system. In addition to his present responsibilities, the management representative shall be responsible to:

- Ensure that the processes that are required by the PGCB quality management system, and that are defined in the Quality Manual, Section 4.1, are established, implemented and maintained and to ensure that the necessary resources are identified to be made available
- Ensure that management reviews are performed and to regularly report to top management on the performance of the quality management system, which shall include any need to improve the PGCB quality management system
- Establish internal communication and training structures to promote and ensure staff from all levels of the organization has an awareness of the needs of PGCB customers
- Where relevant communicate with external parties on matters related to QMS

Considering the distance between audit points and limitations in travel time, top management has appointed NINE Deputy Management Representatives (DMR) in PGCB for (i) Dhaka (ii) Chittagong (iii) Comilla (iv) Bogra (v) Khulna (vi) Faridpur (vii) Project (viii) NLDC and (ix) Head Office & Biddyt Bhaban, Engr. Mir Motaher Hossain, Manager (Attached to MD) in addition to his present official responsibilities, he will carry out the work of DMR Head Office and shall also assist MR with the assignments as designated to him by MR, Engr. Debashis Das, DGM, Procurement and Stores, has been appointed by top management as one of nine DMR of PGCB.

5.5.3 Internal Communication

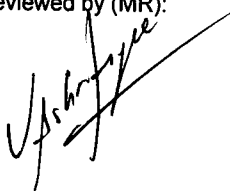
Internal communication is an integral and important part of the PGCB quality management system. It is required to ensure that information is available, timely and at appropriate levels of the organization, and to ensure that customer, statutory and regulatory requirements are understood at all levels of the organization.

Top management has established an internal communication structure that ensures that information regarding the effectiveness of the PGCB quality management system is available and shared at the appropriate levels.

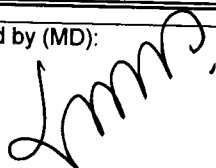
The internal communication structures that are established and maintained in PGCB includes:

- Holding formal and informal meetings within departments/sections, and also between different departments/sections. Minutes are kept and maintained of formal meetings to record discussions and to follow-up on decisions and actions taken. Informal meetings are conducted as-and-when required to communicate with staff in the day-to-day execution of duties.
- Distributing and displaying notices and memoranda. Relevant notices and memoranda are distributed and displayed on notice boards at the various work-areas for general staff information, these include, i.e., staff promotions and changes, public holidays and rest days, working hours, training schedules, etc.
- Preparing and distributing progress-reports. All process departments/sections have to prepare periodic progress reports on their activities and performance towards meeting their objectives. These reports are submitted and distributed at the appropriate levels of the organization for information and the necessary action.
- For meeting the emergency actions, personnel at required levels are provided with necessary wireless walkie-talkie, mobile and land phones, fax machine and e-mail facility

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.				QUALITY MANUAL		
		MANAGEMENT RESPONSIBILITY						
Document No.:	QM-05	Revision No.:	01	Effective Date:	12/12/12	Page:	8	of 8

5.6 MANAGEMENT REVIEW

5.6.1 General

Management review enforces the commitment of top management to implement and maintain the quality management system.

Management has established a formal management review meeting, at planned intervals, which shall not be further than three (3) months apart, to review the PGCB quality management system and to ensure that it remains suitable, adequate and effective. The management review also includes the assessment of appropriate opportunities for improvement and possible needs for changes to the PGCB quality management system.

Minutes of the management review meeting and other appropriate review records, such as, internal quality audit reports, etc., are being kept and maintained by the MR.

5.6.2 Review Input

Management must ensure that they gather adequate, sufficient and appropriate information to enable them to take informative decisions. Therefore, management has established relevant documents, to utilize in its review on the effectiveness of the PGCB quality management system.

Management considers and uses the following for their review:

- Follow-up actions and progress reports on actions that were prompted by previous management reviews
- Internal and external quality audit reports, which includes corrective actions taken and results of audit reviews
- Feedbacks that are received from the various customers, such as, minutes of meetings, complains, customers' satisfaction survey and other relevant customer correspondence
- Performance indicators and progress reports from the various processes, which shows if objectives are being achieved
- Performances on quality of power in terms of voltage and frequency and reports on actions taken on non-conformity of products/services
- Reports on required preventive and corrective actions, which shows the current status of the actions being taken
- Proposed changes and suggestions (both positively and negatively) that could affect the PGCB quality management system
- Review on suitability of quality policy
- Any proposed recommendations received, to improve the PGCB quality management system

5.6.3 Review Output

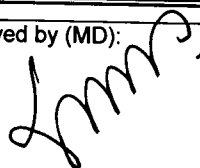
The management review materialises in a clearly defined, appropriate and sensible output, which are easily being directed for execution. The minutes of the management review meeting shall serve as the medium to communicate the review output through the appropriate levels of the organization for information and action, and includes all relevant decisions and actions pertaining to:

- The improvement of the relevant processes and overall improvement of the PGCB quality management system to enhance its effectiveness
- The improvement of the delivered services to enhance the satisfaction of PGCB customers
- The analyses of resources needs and actions that is required to satisfy those needs

PGCB has established Procedure no. QP-MNG-1 for Management Review.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH LTD.					QUALITY MANUAL		
		RESOURCE MANAGEMENT							
Document No.:	QM-06	Revision No.:	01	Effective Date:	12/12/12	Page:	1	of	3

6 RESOURCE MANAGEMENT

6.1 PROVISION OF RESOURCES

Resources are the basic inputs to processes that have to be managed for product realization (transmission of electric energy).

Resources could normally be divided into the following three distinct categories, namely:

- Human resources, e.g. people: where the physical and mental talents and skills of people are employed to create a product or deliver a service
- Capital resources, e.g. manmade goods: which are those resources that were created and are then employed to make it possible to deliver a final product or service. Capital resources usually have a long working life, and are used over and over again. Examples include things like, equipment, office buildings, furniture, computers, vehicles, etc.

- Other resources

With most capital resources, PGCB has determined and provided the other relevant resources that are required by it to achieve its objectives. These resources include inter alia, the essential equipment as listed and procured in accordance with the requirements of construction process and all the human resources that are required by PGCB to ensure that:

- a) The PGCB quality management system is implemented and maintained, and that its effectiveness is continually improved
- b) The needs of its customer's are being met, and their satisfaction are being enhanced

6.2 HUMAN RESOURCES

6.2.1 General

The human resources management has been identified as a process that is required by PGCB to deliver its products (see Section 4, page 6 of 12 of QM-04).

The human resources process is applied and used to provide the necessary and competent employees that are required by PGCB to provide the products in accordance with its scope and to maintain the manning levels. PGCB has identified the requirements of human resources and provided them. For any further requirements, it will be identified and provided.

The organogram (refer Company Structure Document no. QD-HRM-01) illustrates the organizational structure of PGCB's top management:

6.2.2 Competence, Awareness and Training

Competency and awareness are basic needs with regards to human resources.

PGCB shall ensure that all its staff are trained to a level of competency enabling them to perform their required duties, and shall maintain and enhance that competency through a staff development training programme.

PGCB ensures competency and awareness through the following means:

- a) A competency record for each post is maintained in an approved form titled "Assessment of Competence to Perform Tasks" (ref. form no. QF-HRD-03). The DGM HRM uses this competency record as a basis to find suitable candidates and assess their competencies accordingly, where necessary, through interviews, before appointments are made.
- b) "In-service" training programmes are being implemented and are being maintained to ensure that employee competency are maintained and continuously improved.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH				QUALITY MANUAL		
		RESOURCE MANAGEMENT						
Document No.:	QM-06	Revision No.:	01	Effective Date:	12/12/12	Page:	2	of 3

Three types of "in-service" training programmes are distinguished, namely:

- (i) Skills transfer training programme is used to enable the enhancement of skills of staff with in-house resources or from out-sources
 - (ii) Specialist training programmes, where the training services of "Specialists" are procured, which include inter alia, first aid training, hazard tackling training, special computer application programmes training etc.
 - (iii) Other training programmes, which include inter alia, awareness of health and safety, awareness of quality, quality management systems, procedures and internal quality audits, the use of portable fire extinguishers, vehicle driving skills, various engineering test methods, use of special equipment, such as, various construction, quality testing equipment, rescue and fire fighting equipment, etc.
- c) The effectiveness of the training programmes are the responsibility of Deputy General Manager HRM and/or section head and/or trainer, and are measured and evaluated by suitable and appropriate means.
- PGCB has established Training Policy (ref. Document no. QD-HRM-02) to maintain and improve the process of training.
- d) The head of the HRM division (DGMHRM) is responsible to ensure that all employees, once appointed, be given a copy of their respective job-descriptions and instructed therein to ensure that their duties and responsibilities are fully understood.

Managers and section heads are further responsible to ensure that all their employees are aware of:

- The relevance and importance of their duties and activities
 - The importance of the interaction between different departments and sections
 - The importance of customer's requirements
 - How all employees contributes towards the achievement of PGCB's quality objectives
- e) Records of all personnel of PGCB are kept in an approved form titled "Record of Human Resources" (ref. form no. QF-HRM-02). Copies of appropriate and relevant educational certificates, training records and/or certificates, and proof of skill development actions are kept on the individuals' personnel files, which are being maintained by the HRM section.

PGCB shall ensure that all its staff are trained to a level of competency enabling them to perform their required duties, and shall maintain and enhance that competency through a staff development training programme.

6.3 INFRASTRUCTURE

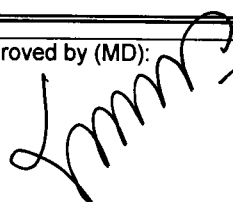
PGCB has identified and established required facilities to achieve conformity of the product. Adequate workspace, machinery and instruments are available to provide the required services as per required specification. Care is taken to assess the needs of the facility and technology from time to time to cope with the changing need of the customer and accordingly plans are made to include those.

These are

- a. Equipment and Machinery (Document no.)
- b. Work Space and associated facilities (Document no.)

Reviewed by (MR):

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Quality Management System		POWER GRID COMPANY OF BANGLADESH				QUALITY MANUAL		
		RESOURCE MANAGEMENT						
Document No.:	QM-06	Revision No.:	01	Effective Date:	12/12/12	Page:	3	of 3

6.4 WORK ENVIRONMENT

The needs of PGCB employees include being able to work in a good work environment. A good work environment positively contributes towards boosting and maintaining employee morale, which in turn contributes to the achievement of quality objectives.

A safe and sustainable work environment must be created for PGCB employees. PGCB has developed, implemented and are maintaining a process of health and safety management within its scope of activities (refer Document no.)

The Health and Safety Plan will materialize in:

- providing safe, healthy and hygienic working conditions for all employees
- creating general safety awareness amongst all employees
- reducing incidents and accidents that results in material damages and injuries

All levels of management are actively involved with the health and safety programme, and where improvements can be made, it is the duty of the respective divisional/departmental managers and/or section heads to implement such improvements.

Training is an essential element for a safe work environment. Health and safety awareness does not come naturally and management continuously teaches, motivates and sustains employee health and safety knowledge and awareness to prevent injuries. Health and safety is also a condition of employment and every employee must assume personal responsibility for working safely at all times.

PGCB has established physical factors and work environment needed to achieve product conformity. These include

I. Physical factors

1. Heat

Excluding areas where necessary (specially control rooms of substations where a controlled temperature of $25 \pm 2^{\circ}\text{C}$ is required)) the ambient temperature to be maintained is around $30 \pm 5^{\circ}\text{C}$. If necessary proper air circulation with exhaust fan are maintained

2. Light level

300~500 lumen as per workstations requirements

3. Cleanliness

Total cleanliness in work area

4. Air flow

Well ventilation are provided at the work area, exhaust fans are provided where cross ventilation is absent

5. Hygiene

Cleanliness is maintained through out the work area as it is the prime object for a Good hygiene practice, first-aid boxes are available at appropriate locations of work areas, safe drinking water is supplied, good number of clean toilets are made available at appropriate locations. Medical service is available from the local hospital/clinic.

II. Human factors

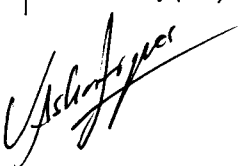
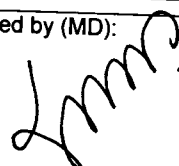
6. Safety

All working places are marked with red line for safe walking passage, all moving parts are covered with safety covers, all protruding edges etc. are marked for safety first. All the gates are kept clean for emergency exits. Regular fire drills are maintained. Sufficient numbers of fire extinguishers are available inside the projects. Safe drinking water is available in all projects. First aid boxes are made available at appropriate locations.

These are monitored and recorded once every month.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH.				QUALITY MANUAL		
		REALIZATION OF PRODUCTS						
Document No.:	QM-07	Revision No.:	01	Effective Date:	12/12/12	Page:	1	of 8

7 REALIZATION OF PRODUCTS

7.1 PLANNING OF PRODUCT REALIZATION

PGCB has planned and developed the processes that are needed for the realization of its products (a. transmission of electrical energy, b. Lease out dark / unused Fibre Optic). The "PGCB required" processes, as listed in Section 4.1 (a), defines the process procedures that are followed by PGCB to deliver its products and meets its objectives.

PGCB carries out the transmission operation of electrical energy from generation point to customers' receiving point. For this it carries out some planning and execution of new projects like substations, transmission line etc. considering the requirements of its customer and national policy for energy. System Planning and Project Planning under Planning and Development department do the planning and arrange to obtain approval from ECNEC, development partner/banks/bodies. The Design section does the necessary formalities for preparation of tender documents, invitation & receiving of tender, preparation of Contract documents and does the design works where necessary. Project offices perform the supervision and execution of the new projects. For the existing installation, concerned head of the zone has the same responsibility of execution.

The transmission process involves Load Despatch Centre (LDC) where generation planning, system operation and control of the whole system of transmission is carried out. Daily demand plan on the basis of generation plan and also a load control/shedding is also planned. The operation of the system runs on this plan and on the major quality criteria of voltage and frequency of the electrical energy (specified in Grid Code of BERC) to be distributed to the customers. Additionally System Protection and Metering provide necessary supports for protection scheme of all the equipment.

All these activities are managed and controlled as per established procedures QP-PSO-1: Procedure for Power System Operation and Control and QP-SPM-1: Procedure for System Protection and Metering.

Maintenance is vital for keeping the line and equipment/accessories always ready for use. Schedule (both monthly and annual) maintenance, breakdown maintenance and emergency maintenance are carried out as per established system. Proper safety measure prior to start of maintenance job and during maintenance jobs are ensured. Procedure no. QP-TLM-01 gives details of the Transmission Line Maintenance and QP-SSM-01 of Sub Station Maintenance.

PGCB is commercially leasing out its dark Optical Fibres to various commercial and non-profit entities of the country and delivering products (connectivity through Optical Fibres) to its customers. PGCB mainly plays the role of a network infrastructure provider and by meeting the obligation as per contract, receives rent / charge from the customer. These activities are managed and controlled as per established procedures QP-FCL-1: Procedure for Fibre Optic commercial leasing.

Maintenance is very important for keeping the connectivity always ready for use. Maintenance is carried out as per established system. Proper safety measures in all maintenance jobs are ensured. Procedure no. QP-TRT-1 gives the details of it.

7.2.2 REVIEW OF REQUIREMENTS RELATED TO THE PRODUCTS

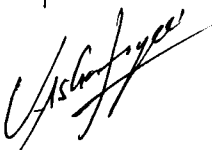
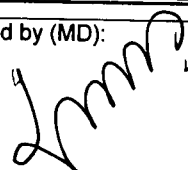
The requirements of customers, both existing and future, are identified during the stage of system and project planning along with the facilities available at the point of customers.

PGCB has been explicitly established and constituted to execute the Contract of Customers, on agreed terms and conditions.

PGCB shall review and accept the Contract Agreement of the Customers before acceptance of customers' order.

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Quality Management System	POWER GRID COMPANY OF BANGLADESH					QUALITY MANUAL		
	REALIZATION OF PRODUCTS					Page: 2 of 8		
Document No.:	QM-07	Revision No.:	01	Effective Date:	12/12/12			

Considering the electric energy that PGCB delivers to its customers, is directly dependant on the contract term, it is therefore assumed that the requirements of the individual customers are fixed and would remain unchanged, only variation will be on total demand which can be accommodated on the situation of the time of consideration.

PGCB's commitment to deliver quality energy is documented in the agreement with the customers. The Director Technical reviews the PGCB performance pledges on periodical basis, to ensure that it remains relevant.

When reviewing the requirements of its Customers, PGCB shall ensure that:

- The enegy requirements, quality criteria and maximum demand, are defined
- New requirements that differs from previously expressed requirements are resolved for mutual understanding and satisfaction
- It has the ability to meet the defined requirements

Should PGCB be required to review its customer's requirements, as a result of the statement above, it shall maintain records of the results of the reviews and actions that might arise from it.

PGCB shall ensure that the same alteration/amendment(s) has been agreed and signed, as proof of acceptance of the new requirements.

Where the requirements are changed, PGCB shall ensure that the relevant documents are amended and that the relevant personnel are made aware of the applicable changes.

7.2.3 CUSTOMER COMMUNICATION

PGCB has established effective communication arrangements with its customers, to ensure that relevant information is shared regarding the delivery of its services.

When communicating with its customers, due consideration is given regarding the following:

- Information that pertains to the services that are delivered, i.e. through its agreed periodical review with the customers
- In-process enquiries and proposed amendments, i.e. through periodic progress meetings and reports, where applicable
- Customer feedback, including complaints, i.e. through the "Customer Service" line, and the progress meetings where applicable

7.3 DESIGN AND DEVELOPMENT

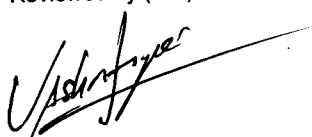
PGCB shall do the designs with regards to the structures and others within the purview of PGCB and also supervise of the construction works as required by design outputs. Sub-station requirements of design is carried out by sub-contractor who are selected by PGCB through its selection procedure as defined by established procedure for Design Control no. QP-DGN-1, when the design submitted by the sub-contractor are checked and approved for carrying out the project works. Additionally, the identification and planning proposal of new projects as carried out by System Planning (ref. Procedure no. QP-PPL-1) and by Project Planning (ref. Procedure no. QP-PPL-1) will be taken up Planning and Development

7.3.1 Planning

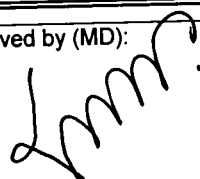
Grid Network Planning:

For meeting the requirements of customers in new locations and also to mitigate the problems in existing network, System Planning office collects information from offices of BPDB and PGCB, existing Power System Master Plan, existing system parameters, generation expansion plan & retirement, schedule prepared by System Planning (BPDB), MIS data from different Grid Circle of PGCB, MIS data from Efficiency Division LDC, enquiry by the distribution agencies & some specific bulk consumer, enquiry from GC & Project offices for network/capacity modification and enquiry from LDC in the form of problem in system operation.

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Quality Management System	POWER GRID COMPANY OF BANGLADESH				QUALITY MANUAL			
	REALIZATION OF PRODUCTS				Page:	3	of	8
Document No.:	QM-07	Revision No.:	01	Effective Date:	12/12/12			

Planning of network expansion is performed considering the generation expansion plan, generator retirement schedule, addition of bulk consumer and expansion in distribution agencies etc. Network analysis is done by Load Flow study using customized software and the study report is then analyzed to validate the fulfillment of the requirements while keeping the voltage, loading of lines & transformers within allowable range. A report is prepared based on the study with necessary recommendation.

Planning of reactive power compensation requirement is performed considering some specified aspects. In house study for network expansion plan will be performed that will include technical viability through Load Flow study, time frame of expansion by the growth rate of demand, preliminary estimated cost from documented records and/or estimated cost from different suppliers. After verification of this house study for network expansion plan, the study report it will be sent for the approval of the Director (Planning and Development) / Managing Director. Then the in house study report will be sent to project planning for further action. Feasibility study for network expansion plan will be performed. After verification of the feasibility study report it will be sent for the approval of the Director (Planning and Development) / Managing Director. Then the feasibility study report will be sent to project planning for further action. Procedure no. QP-SPL-1 gives details of the System Planning.

Project Planning office then initiates planning of Development Projects of PGCB by preparing Development Project Proposal (DPP). All the key information in the In-house Study Report are used for the preparation of the DPP. Information regarding cost of different studies and the quantity & cost of land/land development and the cost of other non-residential civil works is collected from the Project Director's office. Information regarding price schedule for materials & installation, consultancy services, Tools & Plants and training-cost etc is collected from GM (P&D). CDVAT on the total C&F value of materials & equipment are then computed. Information regarding year wise phasing of the total cost of the project is then collected from the Project Director's office. Cost-Benefit analysis are computed. DPP is then forwarded to Chairman, PGCB through Manager, PP; PD, P&D/DGMDGN, Director (Planning and Development) & MD, PGCB. Six copies of the DPP along with the relevant information as required by the "Manpower" approval committee are sent to Power Division, MPEMR for getting approval of manpower to be required for execution of the proposed project. On getting approval of manpower for project execution, the DPP is then recast accordingly. Two copies of recast DPP are forwarded to Power Division, MPEMR for the recommendation of Secretary for ECNEC approval. The DPP may once again be required to recast incorporating the decisions taken in the meeting of 'Project Evaluation Committee (PEC)' headed by Member, Concerned Sector Division; Planning Commission.

On getting the approval from ECNEC, necessary procurement procedure is followed for getting the work done. The assigned Project office then takes up the job for executing to final stage i.e. ready for operation. Procedure no. QP-PPL-1 gives details of the Project Planning

PGCB has the resources and "in-house" competencies to address certain extent of design requirements. In-house requirement of building structures are met by planning and development division starting from design to the supervision of completion of the building. For design purpose software STADPRO is used in design section. Procedure no. QP-DGN-1 gives details of the design and development activities.

Fibre Optic Network Planning:

Fibre Optic Network expansion is achieved only by expansion of power transmission network. As a result no separate expansion plan for Fibre Optic Network expansion is performed. However, for meeting the requirements of customers seeking new dark fibres and also to mitigate the problems in existing network, OFCL office collects information from offices of respective Client and PGCB, Fibre Optic network expansion plan, existing system parameters and enquiry by the prospective clients. As PGCB mainly provide connectivity through its

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Quality Management System	POWER GRID COMPANY OF BANGLADESH					QUALITY MANUAL		
	REALIZATION OF PRODUCTS					Page:	4	of 8
Document No.:	QM-07	Revision No.:	01	Effective Date:	12/12/12			

Optical Fibre network infrastructure to its customers, planning for suitable maintenance is prepared and the activities are managed and controlled as per procedure QP-TRT-1.

7.3.2 Design Input

Where applicable for in-house building structures (mainly substation expansion, accommodation of employee and offices), PGCB determines the relevant inputs that are required for the designs/planning of projects.

As appropriate, the designated person(s) of the section will:

- Review the requirements and other relevant documentation to ensure that customer's requirements are achieved with regards to functionality and performance
- Consider the relevant statutory and regulatory requirements that applies to the engineering works
- Consider any information that are derived from previous similar designs/planning, where applicable
- Consider any other requirements that are essential for the design

The information is put into the software and input printout is taken for review and approval, to ensure that it is adequate to complete the various stages of the design.

7.3.3 Design Output

The output of the relevant designs is provided by the software along with the calculation sheet in defined format that enables verification against the design input, and ensures that the authorized person approves it before it is released.

The GMP&D ensures that the design output:

- Meets the input requirements for the relevant design
- The output of the relevant designs is approved prior to release
- Provides appropriate and sufficient information for the procurement of applicable products, goods and/or services
- Contains or refers to applicable acceptance criteria that relates to the engineering works
- Specifies the characteristics of the engineering works that will render the works in a safe, reliable and serviceable condition

7.3.4 Design Review

The GMP&D must satisfy himself that the planned activities and stages of the design are meeting the specified requirements, by having systematic design reviews performed at suitable stages.

The review is done by the concerned staff engaged with the specific design and by DGMDGN & MDGN. They will:

- Evaluate the ability of the results of design to meet specified requirements
- Identify any problems experienced in the design process and propose necessary actions to be taken

The results of the design reviews and any necessary actions that may be required are recorded, as appropriate.

7.3.5 Design Verification

Design verification is performed by concerned staff in design in accordance with planned arrangements, to ensure that the design output is meeting the design-input requirements.

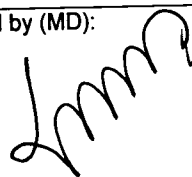
The verifier will be an independent person deputed by DGMP&D, who has the necessary experience to review the design output with reference to the stated design requirements and design input data.

The results of the verification and of any necessary actions that may be required are recorded.

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Quality Management System	POWER GRID COMPANY OF BANGLADESH				QUALITY MANUAL			
	REALIZATION OF PRODUCTS							
Document No.:	QM-07	Revision No.:	01	Effective Date:	12/12/12	Page:	5	of 8

7.3.6 Design Validation

The DGMDGM or his deputed person is responsible to perform design validation on designs, in accordance with the planned arrangements, to ensure that the resulting works is capable of meeting the requirements for the products and others.

The results of the design validation are recorded on check certificates that are kept and maintained by the office of the Coordinating Architect.

7.3.7 Control of Design Changes

Design changes may originate from a number of sources, which include:

- (i) PGCB changing their requirements
- (ii) Changes in design standards
- (iii) Changes that were prompted by design reviews
- (iv) Changes that were prompted by user's request

Design changes are identified and recorded on the design checklists. DGMDGN is responsible to ensure that design changes are reviewed, verified and validated, as appropriate, and approved by DGMDGN before implementation.

The review of the design changes shall include an evaluation of the effects that the changes may have on the existing works, the available resources, costs and other relevant implications.

7.4 PURCHASING

7.4.1 Purchasing Process

PGCB ensures that purchased products and goods conform to specified purchase requirements. Also PGCB ensures the services required from suppliers/sub-contractors conform with the requirements of jobs to be performed by the designated suppliers/sub-contractors. The type and extent of control applied on the suppliers/sub-contractors and the purchased products or goods/performed jobs shall be dependent upon the effect the purchased products or goods/performed jobs have on the subsequent products that are realized.

PGCB evaluates and selects suppliers/sub-contractors based on their ability to supply/perform products and goods/jobs in accordance with its requirements. Criteria for selection, evaluation and re-evaluation are established.

Records of the results of evaluations and any necessary actions arising from the evaluation are kept and maintained.

Appropriate documented purchasing procedures have been established to address the product and goods needs of PGCB in terms of its quality management system (ref. QP-PRO-01: Procedure for Purchase and also QP-DGN-1 Procedure for Design Control).

7.4.2 Purchasing/Sub-contracting Information

Purchasing/sub-contracting requisitions are established to provide the information required describing the product or goods/jobs to be purchased/availed, including where appropriate:

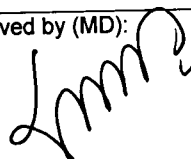
- a) The requirements for approval of the product or goods/jobs, applicable procedures and processes
- b) The requirements for qualification of personnel, specifically with regards to technical requirements
- c) The requirements as defined in the PGCB quality management system

The procurement section shall ensure that specified purchase/sub-contract requirements are adequate prior to communicating to the supplier/sub-contractor.

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Quality Management System	POWER GRID COMPANY OF BANGLADESH					QUALITY MANUAL		
	REALIZATION OF PRODUCTS					Page:	6	of 8
Document No.:	QM-07	Revision No.:	01	Effective Date:	12/12/12			

7.4.3 Verification of Purchased Product

PGCB establishes and implements the inspection or other activities necessary for ensuring that purchased products and goods/jobs meets the specified requirements.

PGCB states the intended verification arrangements and method of product release in the purchasing information and may include customers, if desired, in the process. Procedures QP-PRO-01: Procedure for Purchase and also QP-DGN-1 Procedure for Design Control identifies the methods and process of verification of purchased products.

7.5 PROVISION FOR PRODUCTION/SERVICES

7.5.1 Control of the Provision of Products

PGCB is engaged with the transmission of electric energy from generation source to customers' receiving point and has developed the transmission and delivery processes as defined in Section 4.1. PGCB has further developed and implemented process procedures (see Section 4.1) that describe how the electric energy will be received and transmitted to customers to ensure that it achieves its objectives in accordance with the PGCB quality management system.

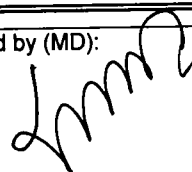
The wheeling process of electrical energy requires planning, operation and control. Initial stage of planning involves the planning of generation considering the economic order (based on variable cost of the generating units. Planning of IPP operation is made on weekly basis. A generation schedule is made everyday morning on hourly basis of economic order and on the basis of information available from the units on available, probable, limitation of generation/limitation on variation of load etc.

A daily demand planning is made to facilitate the preparation of generation schedule and load shed planning. A load shed planning is made on the basis of generation and demand in the system, limitation in the transmission network (if any) and probable voltage problem in a zone due to MVAR demand, etc. Based on this probable total load shed in the system is estimated and distributed among the nine distribution zones in proportionate to the demand of the respective zones as per load shedding chart and/or as directed time to time. Planning of natural gas requirement for next 60(Sixty) months is made on the basis of estimated maximum generation (hourly) in MWh, in the system, estimated maximum generation (for 24 hour) in MWh, in the system considering appropriate load factor. On these criteria probable natural gas requirement of individual machine/power station in the system is calculated/estimated, generators are then grouped according to their probable gas supplier entity. Probable total natural gas requirement from individual gas supplier entity is then calculated, for satisfying both hourly maximum MWh and 24 hour maximum MWh generation demand, in MMCFT.

The controlling process of the transmission system involves frequency control, load control (load shedding), schedule outage, emergency outage and development program outage. Records of these activities are maintained. Due to internal or external fault automatic disconnection (Tripping) of live equipment and/or line and/or generating unit from the system. PGCB has established system manage this tripping under two categories, minor tripping and major tripping. For minor tripper, the system despatcher handles the situation on specified guidelines and for major tripping system despatcher informs the situation to Manager (LDD), DGM (LDC) and concerned high officials and follows their instruction. During the operation process of transmission, established system of monitoring and reporting is carried out Necessary data recording, as per established system, is carried at specified intervals and records are maintained as evidence of conformity to the requirements. Procedure no. QP-PSO-01 gives details of the Power System Operation & Control.

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Quality Management System	POWER GRID COMPANY OF BANGLADESH					QUALITY MANUAL			
	REALIZATION OF PRODUCTS								
Document No.:	QM-07	Revision No.:	01	Effective Date:	12/12/12	Page:	7	of	8

Where applicable, the process procedures also describe, inter alia, the relevant controlled conditions, that includes:

- Applicable reference documents, purpose of the procedures, and other relevant information that describes the characteristics of the services that are to be delivered
- Detailed works procedures with defined responsibilities, interfaces with other parties, and detailing how the transmission process are to be realised
- The availability and uses of suitable facilities and equipment
- The availability of monitoring and measuring devices, as necessary
- The implementation of monitoring and measurement activities
- Any other relevant customer service activities

To monitor the activities of the substations senior management members are visiting the substations as per established procedure no. QP-SIS-1 and the records of such visits are maintained.

7.5.2 Validation of the Service Provision Processes

PGCB validates the processes for the provision of electric energy transmission where the resulting output cannot be verified by subsequent monitoring and measurement. This includes any process where the deficiencies are only discovered after the customers have chosen to provide appropriate feedback relating to the deficiencies.

The validation demonstrates that the applicable process has the ability to achieve planned results.

Where applicable, PGCB establishes arrangements for these processes, through the management review process, that would include:

- Defining criteria for the review and approval of the processes
- Approving appropriate equipment and qualification of personnel
- Using specific methods and procedures
- Keeping record of these validations, which shall be in the form of the minutes of the management review meeting
- Revalidating the process, as appropriate

Process Control in PGCB starts from marketing department with the receipt of different feedback from customers and market survey. These are analyzed to plan and design different projects. These are then placed in the plan for the product realization. At all the stages required checking and testing is ensured including final checking. These processes are long established by PGCB for its customers in general.

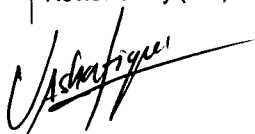
7.5.3 Identification and Traceability

Due to the nature of the product (electric energy), it is very difficult to identify the product during the process of transmission which is a continuous one. PGCB has established identification methods and steps for identification of other purchased products, etc. by its own unique name/or number. Also all the components are identified by the designations appropriated in design drawings, documents etc.

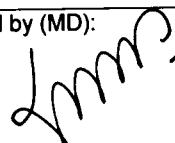
7.5.4 Customer Property

PGCB receives no customers' supplied materials to be used for wheeling of electrical energy. As such it has no function about the Customer Property.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH				QUALITY MANUAL			
		REALIZATION OF PRODUCTS							
Document No.:	QM-07	Revision No.:	01	Effective Date:	12/12/12	Page:	8	of	8

7.5.5 Preservation of Product

PGCB establishes system and steps to safe guard the system of transmission so that the quality of electric energy remains till it delivers the electric energy to customer. Necessary security people are provided to ensure the security of the installations of PGCB.

Delivery of the electric energy, where required, is done as per established system of the organization and following instruction given by Customer.

PGCB also ensures preservation of all the materials or items at its disposition as per necessity.

7.6 CONTROL OF MONITORING AND MEASURING DEVICES

PGCB determines the monitoring and measurement to be undertaken and the monitoring and measuring devices needed to provide evidence of conformity of products to pre-determined requirements.

PGCB establishes processes, see Section 8, to ensure that monitoring and measurement can be carried out and are carried out in a manner that is consistent with the monitoring and measurement requirements.

Where necessary to ensure valid results, measuring equipment shall:

- Be calibrated or verified at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards, where no such standards exist, the basis used for calibration or verification shall be recorded
- Be adjusted or re-adjusted as necessary
- Be identified to enable the calibration status to be determined
- Be safeguarded from adjustments that would invalidate the measurement result
- Be protected from damage and deterioration during handling, maintenance and storage

In addition, PGCB shall assess and record the validity of the previous measuring results when the equipment is found not to conform to requirements. The LDC and sub-stations controlling officers shall take appropriate action on the equipment and any variation of electric energy affected. The concerned locations shall maintain records of the results of calibration and verification.

When used in the monitoring and measurement of specified requirements, the ability of computer software to satisfy the intended application shall be confirmed. The Systems Manager shall confirm this prior to the initial use and reconfirm it as necessary.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH				QUALITY MANUAL			
		MEASUREMENT, ANALYSIS AND IMPROVEMENT							
Document No.:	QM-08	Revision No.:	01	Effective Date:	12/12/12	Page:	1	of	5

8 MEASUREMENT, ANALYSIS AND IMPROVEMENT

8.1 GENERAL

PGCB has developed and implemented appropriate monitoring, measurement, analysis and improvement processes that are needed to:

- Demonstrate conformity of its supplied electric energy
- Ensure conformity of the quality management system
- Continually improve the effectiveness of the quality management system

8.2 MONITORING AND MEASUREMENT

Customer satisfaction is the principal objective of the quality management system, and the level of customer satisfaction is the most important measure of the effectiveness of the system. Customer satisfaction is measured by collecting and analysing direct customer feedback, and by measuring secondary indicators of customer satisfaction. Management uses customer satisfaction data to identify opportunities and priorities for improvement.

All activities and areas relevant to the quality management system are audited at least twice a year.

Internal audits are scheduled on the basis of the status and importance of the activity. Internal auditors are independent of those having direct responsibility for the audited activity. Identified non-conforming conditions are brought to the attention of the responsible managers and corrective actions are implemented in response to the audit findings.

8.2.1 Customer Satisfaction

PGCB has identified and defined suitable criteria for satisfaction measurement for all of its customers (see Section 4.1, page 7 Of 12 of QM-04), and has developed appropriate methods for collecting and analysing the pertinent data.

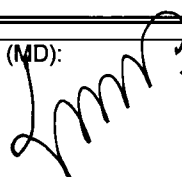
Information and data pertaining to customer satisfaction are collected from various sources, i.e.:

- Customer feedback received through correspondence. Top management, usually responds and replies to formal letters that are received from customers. The necessary actions that are prompted by this correspondence are then delegated to the appropriate levels for information and execution.
- Customer feedback received through the "Customer Service" line. The telephone operator records any feedback, which could include, complaints, spontaneous expressions of satisfaction, and other unsolicited customer feedback, that are received via the "Customer Service" line, in the Customer Service office.
Service Register. The register kept at site of each project, must be submitted to the Project Leader after every workday for information and comments. Should any action be required, then the Project Leader shall instruct the relevant person(s), as appropriate.
- Customer feedback received through appropriate meetings. DGM NLDC is responsible for having meetings with the relevant customers, to discuss and record issues. Minutes are being kept of these meetings and distributed for action as appropriate.

The resulting data is periodically analyzed by GMSO, and is presented and discussed at management review meetings.

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Quality Management System	POWER GRID COMPANY OF BANGLADESH				QUALITY MANUAL			
	MEASUREMENT, ANALYSIS AND IMPROVEMENT							
Document No.:	QM-08	Revision No.:	01	Effective Date:	12/12/12	Page:	2	of 5

8.2.2 Internal Audit

The Quality Assurance Manager has established an internal audit plan and schedule in accordance with Quality Procedure, QP-IQA-1, Procedure for Internal Quality Audit. Every relevant process is audited at least once a year. Certain selected processes are audited more frequently, depending on their importance and quality performance history.

Only personnel independent of the audited process are assigned to conduct internal audits. Management Representative is responsible for managing and conducting the audit process.

Auditors prepare for audits by reviewing applicable standards and procedures, analyzing quality records, and establishing questionnaires and checklists. The selection of auditors and preparation for the audit are explained in Quality Procedure, QP-IQA-1, Procedure for Internal Quality Audit.

Conducting the audit, the auditors seek objective evidence indicating whether:

- The audited processes comply with the requirements of the PGCB quality management system and the Standard
- The PGCB quality management system is effective

Evidence of conformance is obtained through the information that is gathered by observing, interviewing personnel and examining records.

Audits are conducted in a way that minimises disruption of the audited processes.

Non-conforming conditions are documented and recorded using the audit non-conformance report form.

When non-conforming conditions are identified, the manager responsible for the concerned area or process is requested to propose and implement a corrective action. Implementation and effectiveness of the action are verified by a follow-up audit. The audit non-conformance report is used for monitoring and recording the implementation of the corrective actions.

For each audit, a comprehensive audit report is prepared, containing all relevant records, including audit non-conformance reports, which is submitted to top management for information.

When the auditing cycle is completed, all audit reports that were compiled during the cycle are analyzed and are presented at the management review meeting by the concerned Deputy Management Representative (DMR) and MR.

8.2.3 Monitoring and Measurement of Processes

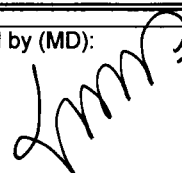
Processes of the PGCB Quality management system are monitored by a variety of approaches and techniques, as appropriate for a particular process and its importance. These techniques include:

- Conducting internal audits of the quality management system
- Monitoring trends in corrective and preventive action requests
- Analyzing electric energy conformity and other quality performance data and trends
- Measuring and monitoring customer satisfaction
- Monitoring other processes like finance, financial audit, human resource developments, procurement

When a quality management system process does not conform to requirements, MR may request the concerned responsible for the process to implement corrective action, as appropriate.

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Quality Management System	POWER GRID COMPANY OF BANGLADESH					QUALITY MANUAL			
	MEASUREMENT, ANALYSIS AND IMPROVEMENT								
Document No.:	QM-08	Revision No.:	01	Effective Date:	12/12/12	Page:	3	of	5

8.2.4 Monitoring and Measurement of Products

Where electric energy required by customers in the realization processes in the PGCB quality management system, it shall be monitored and measured to ensure that electric energy requirements are met.

Depending on the specific criteria of electric energy, the designated and authorized person(s) shall monitor all incoming electric energy from generation sources and necessary records are maintained. These are normally performed as detailed in procedures QP-PSO-1, Procedure for Power System Operation and Control and QP-SPM-1, Procedure for System Protection and Metering.

Procedure has been developed and implemented to procure and verify products/services, as appropriate and suitable, required for the new projects, existing installations and transmission lines. The procedures set forward detailed rules for performing the receiving and quality control inspections on purchased products/services. Listed below are the procedures as applicable:

QP-PRO-1, Procedure for Procurement;

QP-DGN-1, Procedure for Design Control

Appropriate records shall be kept and maintained as evidence of conformity with the acceptance criteria, and indicating the person(s) who has/have accepted the products or goods. These records shall typically be in specified format, duly signed and dated together with any applicable notes and substantiating documents.

8.3 CONTROL OF NON-CONFORMING PRODUCTS

PGCB is providing products (electrical energy) and are measured against set criteria. Non-conformities in the products are divided into three categories, namely:

- (i) Those non-conformities that applies to the electrical energy that were needed by realization processes to achieve its objectives
- (ii) Those non-conformities that applies to the execution of the Operation and Maintenance process procedure
- (iii) Those non-conformities that applies to the electrical energy, which are measured historically through customer feedback and satisfaction, as appropriate

As the transmission process is continuous one and the energy is consumed immediately after it reaches customers' receiving points, it is very difficult to control the delivered electrical energy with non-conformity. PGCB shall ensure that electrical energy that does not conform to the requirements are identified and controlled to prevent its unintended transmission. The controls and related responsibilities and authorities for dealing with non-conforming products are defined in the documented procedure QP-CNP-1, Procedure for Control of Non-conforming Product.

Non-conformities that occur during the execution of the transmission are typically identified, recorded and addressed.

The methods for determining customer satisfaction are described in Section 8.2.1.

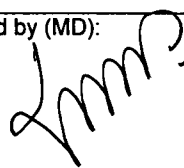
In order to deal with non-conformities that applies to the products, PGCB is applying one or more of the following ways:

- a) By taking appropriate action to eliminate detected non-conformities, including action appropriate to the effects or potential effects of the non-conformity. Possible non-conformities' causes could include, i.e. incoming electrical energy from generation sources, transmission-line problems, sudden overload in the line or system, fluctuation of loads, breakdown in the system.
- b) By taking appropriate preventive action to ensure that non-conformities are prevented from occurring

Records of the nature of non-conformities and of any subsequent actions taken, including changes to process procedures, are being kept and maintained, as appropriate.

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Quality Management System		POWER GRID COMPANY OF BANGLADESH				QUALITY MANUAL			
		MEASUREMENT, ANALYSIS AND IMPROVEMENT							
Document No.:	QM-08	Revision No.:	01	Effective Date:	12/12/12	Page:	4	of	5

8.4 ANALYSIS OF DATA

PGCB shall determine, collect and analyze appropriate data to demonstrate the suitability and effectiveness of the quality management system of PGCB and to evaluate where continual improvement of the effectiveness of the quality management system can be made.

Appropriate data concerning customer satisfaction, as a measure of demonstrating the achievement of quality objectives, is collected by means of customer feedback as defined in Section 8.2.1.

Data is also generated as a result of the monitoring and measurement of applicable processes as defined in Section 8.2.3.

Data is also generated as a result of the monitoring and measurement of electrical energy as defined in Section 8.2.4.

Data is continuously analyzed and confirmed during management review (see Section 5.6), and provide appropriate information relating to:

- Customer satisfaction, which is the principal objective of the quality management system
- Conformity to the requirements related to the delivery of the applicable services
- Characteristics and trends of processes, including opportunities for preventive actions
- Characteristics and trends of electrical energy, including opportunities for preventive actions
- Suppliers and their contribution to the products of PGCB

The information so gathered and analyzed is used for improving the effectiveness of the PGCB quality management system.

8.5 IMPROVEMENT

8.5.1 Continual Improvement

PGCB shall continually improve the effectiveness of the quality management system through the use of the quality policy, its quality objectives, internal audit results, analysis of data, corrective and preventive actions and management review, all as defined in the Quality Manual.

8.5.2 Corrective Action

PGCB shall take action to eliminate the cause of non-conformities in order to prevent recurrence.

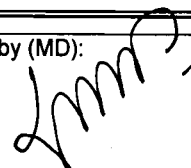
Corrective actions shall be appropriate to the effects of the non-conformities encountered.

The corrective action procedure that is followed by the quality management system is as defined below:

- The General Managers, and/or other management members, as directed, shall review the identified non-conformities, as described in Section 8.3, including customer complaints
- Then determine the causes and principle contributing factors that led to the occurrence of the nonconformities
- Evaluate the need for action to ensure that non-conformities do not recur
- Together with the relevant department manager or section head, determine, prioritize and implement the appropriate action that is needed to address the non-conformity
- Keep and maintain records as appropriate to the non-conformity:
 - Corrective action required with regards to procured products, is recorded on the delivery notes

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Quality Management System		POWER GRID COMPANY OF BANGLADESH				QUALITY MANUAL			
		MEASUREMENT, ANALYSIS AND IMPROVEMENT							
Document No.:	QM-08	Revision No.:	01	Effective Date:	12/12/12	Page:	5	of	5

- (ii) Corrective action required with regards to non-conformities that were identified during internal audits, is recorded by the relevant department manager or section head in the "work copy" of the audit report that is submitted to the Quality section after completing the corrective actions
- (iii) Corrective action required as a result of management reviews is recorded in the minutes of the management review meeting
- f) Corrective action taken is reviewed as appropriate to the non-conformity:
 - (i) Corrective action required with regards to procured products, is reviewed by the procurement department
 - (ii) Corrective action required with regards to non-conformities that were identified during internal audits, is reviewed by the Quality section
 - (iii) Corrective action required as a result of management reviews is reviewed in subsequent management review meetings by top management

PGCB has established a procedure no. QP-NCP-1 to pursue the above actions.

8.5.3 Preventive Action

PGCB shall determine action to eliminate the causes of potential non-conformities in order to prevent their occurrence. Preventive actions shall be appropriate to the effects of the potential problems.

The preventive action procedure that is followed by the PGCB quality management system is as defined below:

- a) The Quality Assurance Manager, and/or other management members, as directed, shall determine potential non-conformities and their causes, in accordance with the potential categories as described in Section 8.3
- b) Evaluate the need for action to prevent occurrence of non-conformities
- c) Together with the relevant department manager or section head, determine and implement the appropriate action that is needed to prevent the occurrence of non-conformities
- d) Keep and maintain records as appropriate to the non-conformity:
 - (i) Preventive action required with regards to procured products, is recorded on the delivery notes, to be taken into consideration during subsequent purchase orders
 - (ii) Preventive action required with regards to non-conformities that were identified during internal audits, is recorded by the relevant department manager or section head in the "work copy" of the audit report that is submitted to the Quality section after completing the corrective actions
 - (iii) Preventive action required as a result of management reviews is recorded in the minutes of the management review meeting
- e) Preventive action taken is reviewed as appropriate to the non-conformity:
 - (i) Preventive action required with regards to procured products, is reviewed by the procurement section and Finance and Admin Manager
 - (ii) Preventive action required with regards to non-conformities that were identified during internal audits, is reviewed by the Quality Assurance Manager or other staff from the Quality section, as appropriate
 - (iii) Preventive action required as a result of management reviews is reviewed in subsequent management review meetings by top management

Procedure QP-NCP-1 has been established by PGCB to pursue the above actions

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