

BANGLADESH RURAL ELECTRIFICATION BOARD

PBS INSTRUCTION 100-23

**SYSTEM PLANS AND CONSTRUCTION WORK PLANS
FOR ELECTRIC NETWORK SYSTEMS**

BANGLADESH RURAL ELECTRIFICATION BOARD
PBS INSTRUCTION 100-23

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**SUBJECT: SYSTEM PLANS AND CONSTRUCTION WORK PLANS FOR
ELECTRIC NETWORK SYSTEMS**

I. PURPOSE

To provide guidance to BREB engineers and PBS on the preparation, use and approval of construction work plans for electric network systems by PBS own fund, specially, which are not included in running and upcoming projects.

II. GENERAL

- A. Construction work plans are the action phase of system planning. Each plan should provide system management with a coordinated construction program for the coming one or two years, as well as basic data for use in preparation of that part of the annual budget pertaining to capital expenditures for utility plant. A work plan is a convenient means of informing BREB of plans for construction in the immediate future and for obtaining BREB approval of such plans. After obtaining approval of plan prepared under this instruction from BREB, will be implemented following PBS Instruction 100-41 and 100-42.
- B. Electrical network system is developing in a PBS through one or more project. Apart from this round the year one or more projects are running in each PBS. But some necessary and urgent works may not be included in these projects. As a result those works can not be done instantaneously under running project. To do this type of works, new plans are required. This type of plan can be divided into three categories- (a) Short-range

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plan, (b) Medium-range plan and (c) Long-range plan.

In electric network system, technology and load pattern are changing rapidly. More over within short time total electrification will be completed. That results long-range plan are not valid in most cases. Under short-range plan system up-gradation, system improvement, small extension, equipment change etc. can be done by PBS financing, where as, more financial support is required for implementing medium-range plan. In most cases PBS can't provide huge amount of financial support to implement medium-range plan. Medium-range plan can be implemented by BREB under GOB and/or development partner's financing project.

For this purpose, PBS will send proposal for Short-range plan to Program Planning Directorate through PBS Monitoring and Management Operation Directorate. Before sending proposal a meeting will be conducted for finalizing proposal between Sr. GM/GM of PBS, Executive Engineer of BREB, RE/PE of consultant. Program Planning Directorate of BREB will develop DPP in normal process upon request of PBS(s). Short-range plan will be approved by BREB with the recommendation of sub-committee. Obtaining approval from BREB, short-range plan will be implemented by PBS with it's own fund, but PBS can request zonal Superintending Engineer to implement short-range plan, specially for difficult works, utilizing PBS own fund.

- C. PBS Instruction 100-21, "Engineering and Staking Manual for Electric Distribution Systems", provides technical information which will be helpful in preparing the proposed Plan. Along with this proposed plan provisional budget for capital expenditure for utility plant and services for improvement of existing system and extension/expansion, taking into consideration inflation and contingency figures to be prepared by the PBS. Such Propose Plan and Budget prepared well in advance will provide BREB strong support in securing fund from GOB, Donors and Development Partners.

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III. THE PROPOSED WORK PLAN REPORT

Each construction work plan should be a separate engineering report. Exhibit-I is a suggested table of contents. Detailed calculations and engineering analysis need not be included in the report. They should be retained by the PBS/Consultant and made available upon request as required.

A. SYSTEM ANALYSIS

The analysis of the performance of the existing system will be a key indicator, where system improvements are needed and is an important part of the report. This section should summarize and discuss the performance of the system in respect to the following:

1. System, substation, and circuit capacity and loading.
2. Voltage conditions.
3. System loss.
4. Service reliability.
5. Adequacy of line sectionalizing.
6. Other factors substantially influencing the quality of service or the cost of providing service.

The use of tables, graphs, diagrams and sketches to show the performance of the existing system and trends, along with the necessary discussion, should be included.

B. CONSTRUCTION PROGRAM

1. The construction work plan should contain year wise tabulation of the system's construction requirements of the following:
 - (a) New consumer installations.
 - (b) Line extension plan.

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- (c) Facilities to serve new large power loads.
- (d) System up-gradation/improvement:
- (1) Tie lines & feeder bifurcation.
 - (2) Conversion of lines in respect to voltage level.
 - (3) Reconductoring of lines and removal of related lines sections.
 - (4) Increased capacity of existing distribution transformers and services.
 - (5) Substations & switching stations capacity enhancement & augmentation.
 - (6) Addition/ Relocation/ Up-gradation of sectionalizes.
 - (7) Other additions or changes to the system not included elsewhere.
- (e) Conversion of substation and switching station.
- (f) Voltage drop calculations.
- (g) Circuit loading and projections.
- (h) Circuit Diagram including existing and planned system.
- (i) Key Maps and Detail Maps.
- (j) Cost Estimates and Bill of Materials.

This tabulation should give a brief description, the location (reference to circuit diagram), and the estimated cost of each major item. Any major construction, conversion or line changes to be performed on energized facilities should be identified by the engineer. Facilities that are to be installed underground should also be identified. A brief description and cost estimate should also be included for each group of the minor items that are not easily identified by a reference to a circuit diagram, such as the costs for increasing the capacity of existing transformer installations and services.

2. To facilitate use of the construction work plan for loans support, a summary of the

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proposed construction should be included in the report.

C. DISCUSSION OF CONSTRUCTION PROGRAM

A discussion on the need and justification of major improvement items and groups of other items should be included in the construction work plan. Quality of service, including service reliability and adequate voltage, should be discussed. Recommendations on scheduling of the proposed construction should be included.

D. EXHIBITS

1. Each construction work plan report should include a circuit diagram. The circuit diagram should show:
 - (a) Present electric network system and proposed network facilities.
 - (b) The results of measured voltage and current investigations, especially when direct comparison may be made with the voltage drops calculated in the previous construction work plan (if any).
 - (c) The facilities proposed for construction within the work plan period, again by color coding, bold lines, or notes. The diagram should show calculated voltage drops resulting from the projected loads being applied to the system before the facilities proposed are constructed and after they are constructed. It may be appropriate that this information be shown on a second circuit diagram, especially if the proposed facilities involve new substations, consolidation of metering points, etc., in the course of changing existing substation or metering point circuits and areas. The boundaries of the area served by each substation or metering point should also be shown.
 - (d) The transmission lines, existing and proposed, of the power supplier in or near the system's service area. The voltage level of each transmission line should be indicated.

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