To: All DEWA's Customers/Consultants/Contractors Date: 4 December 2006

Circular

Distribution Network Design Requirements & Guidelines for MV Supply

In line with DEWA's power distribution network design, the following guidelines shall be followed strictly:

1. Ring Supply consisting of two feeders (two-feed ring) is mainly granted for power supply as normal feeding arrangement. Three-feed ring arrangement may be accepted for cases where all MV switchgears/RMUs are installed in one location to ensure the specific supply reliability.

2. For reliable power supply, N-1 criteria is considered. Hence, in case of power failure in one of the feeders, the other feeder should be capable to meet whole demand until the repair work is completed (6 hours).

3. DEWA's Standard 11 kV cable size is 3/C, 240mm^2 XLPE Copper or Aluminum.

4. The Maximum two-feed ring summer capacity is 320A (for Copper cables) normally should be divided equally between the feeders. For each copper feeder maximum sustained load should not exceed 160A under normal operating conditions.

5. The Maximum two-feed ring summer capacity is 280A (for Aluminum cables) normally should be divided divided equally between the feeders. For each Aluminum feeder maximum sustained load should not exceed 140A under normal operating conditions.

6. For bulk loads such as furnaces or district cooling loads requiring direct HV supply (private equipments), space for metering units at party's premises/substation to be considered. Necessary documents, drawings, SLD shall be submitted for DEWA's comments and approval at design stage.

7. Single unit load demand shall not exceed the maximum sustained current of DEWA's 11 kV cable/feeder, which is 160A. Hence, single unit load is limited to 160A (2.7 MW).

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8. Voltage drop shall not exceed 5% during normal operation at medium voltage level. For HV motors operating at 3.3kV, 6.6kV, 11kV voltage, voltage dip calculations during motor starting must be prepared by party along with motor specification, starting characteristics, drawings, SLD, etc for DEWA's comments and approval at design stage.

9. For loads that may inject harmonic to DEWA's network, harmonic study shall be prepared by party and approved by DEWA at the design stage, whereas, the Total Harmonic Distortion (THD) shall be within:

- 5% for voltage and individual harmonic distortion to be within 3%.
- 5% and 8% when $I_{s.c}/I_{load}$ is less than 20 and (21-50) respectively. Other cases are subject to DEWA's approval.

10. Maximum allowable number of cables per trench for Copper & Aluminum cables is 16, and 12 respectively in maximum two layers (2.5 meter trench width close to 132/11 kV S/S and 2.0 meter elsewhere).

11. Horizontal spacing between cables is 150mm (edge to edge) and vertical spacing between cables is 100mm (edge to edge).

12. Separate corridor should be allocated for 11 kV cable laying within party's premises along the road to ensure avoiding crossing between 132kV and 11kV cables.

13. Special backfilling to be used for 11 kV cables with soil resistivity below 1.6 °C-m/ W.

14. Single Line Diagram illustrating the protection schemes along with relay setting calculation shall be submitted for DEWA's comments and approval at design stage.

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