**SCHEDULE OF TECHNICAL DATA**

**FOR OUTGOING PANEL**

**WAPDA/NTDC SPECIFICATIONS (P-44:96)**

BID/ TENDER NO. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**General**

1. Manufacture’s Name  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Designation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Circuit Breaker**

1. Manufacture’s Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Circuit Breaker Type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Type Designation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Suitability for Three Phase

Operation and Rapid Reclosing

For Outgoing Feeders \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Class (Indoor or Outdoor) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Test Report Certificates No and Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Rated Voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Rated Insulation Level
5. Rated Lightning impulse withstand voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Rated One Minute Power Frequency withstand Voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Rated Frequency \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. Rated Normal Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. Rated Short Time Withstand Current
10. Duration of Short Circuit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. Rated Short Circuit Making Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. Rated Transient Recovery Voltage For Terminal Fault \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
13. Maximum Ambient Temperature Range \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. Temperature Rise at Normal Rated Current:
15. Contracts \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
16. Terminals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
17. Other Metal Parts \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
18. Rated Operating Sequence \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
19. Opening Time and Break time \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
20. Closing time and make time \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
21. Dead time \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**OPERATING MECHANISM**

1. Type of Operating Mechanism \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Rated Voltage
3. Closing Coil \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. DC Trip Coil \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Rated Power Consumption of
6. Closing Coil \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Trip Coil for DC Trip Coil \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. Motor for Spring Change Mechanism
9. Rated Voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. Rated Consumption \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

26. Time Required for Motors to Recharge the Closing Spring \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

27. Auxiliary Contacts

i) Total Numbers \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ii) Number of Spare Contacts Available \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Constructional Features**

28. Mass of Complete Circuit Breaker \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

29. Mass of Sf6 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

30. Recommended Quality of Oil \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

31. Number of Breakers Per Pole \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

32. Number of Pole \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

33. Number of Close Open Operations Possible with This

Stored Voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

34.Minimum Clearance in Air \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a) Between Poles \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) To Earth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Enclosure**

35. Type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

36. Standard& Specifications \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

37. Thickness of Sheet \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

38. Degree of Protection \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

39. Dimension of Panel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Bus Bar**

40. Material of Busbar with Electrical Conductivity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

41. Size of Bus Bars \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

42 i) Rated Normal Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ii) Rated Short Time Withstand Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

iii) Duration of Short Circuit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

iv) Rated Peak Withstand Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

43. Temperature Rise for Rated Current

a) Main Busbar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) At Joints \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Position of Bus Bars**

44. Height of The Lowest Phase of The Busbars in The Panel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

45. Phase to Phase Clearance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

46. Distance of The Front Phase of The Bus Bar From

Instrument Compartment Side of The Panel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Relays**

47. Manufacturers Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

48. Type & Designation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

49. Type of Characteristics \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

50. No of Elements \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

51. Setting Range Of

i) Over Current Elements (Idmt) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ii)Earth Fault Elements (Idmt) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

52. Setting Range of Instantaneous Element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

53. Operating Voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

54.i) No of Contacts \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ii) Contacts Rating \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

55.Dimensions (Attach Drawings) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

56.Weight \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Miniature Circuit Breaker**

57. Make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

58. Type & Designation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

59. Rated Voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

60. Rated Normal Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

61. Rated Breaking Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

62. Operating Time at Rated Breaking Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Supervision Relay**

63. Make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

64. Type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

65. No of Contacts & Rating  
a) Continuous \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
b) Make/ Break \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

66. Dimensions (Attach Drawing) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

67. Weight \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Current Transformer**

80. Manufacturer’s Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

81. Type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

82. Standard \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

83. Transformation Ratio:   
i) For Overcurrent Protection and Metering \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
ii) For Differential \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

84. Rated Burden and Accuracy For Core 1 And 2:  
i) For Protection Service \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
ii) For Metering Service \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

85. Rated Burden and Accuracy for Differential \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

86 Rated Short Time Thermal Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

87. Rated Insulation Level:  
i) Lighting Impulse Withstand Voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
ii) One Minute Power Frequency Withstand  
Voltage, Primary \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
iii) One Minute Power Frequency Withstand  
Voltage, Secondary \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

88. Class of Insulation Level \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

89. Dimension (Attached Drawings)

1. Protection Ct \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Metering \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Differential \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

90. Weight

1. Protection C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Metering \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Differential \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Instrument Voltmeter P.F Meter**

104. Manufacturer’s Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

105. Type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

106. Standard \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

107. Size \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

108. Accuracy Class \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

109. Scale Range \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Meters**

Kwh/ Kvarh Meter With M.D.I

110. Make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

111. Type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

112. Range \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

113. Accuracy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

114. Burden

i) Voltage Coil \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ii) Current Coil \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

115. Dimensions (Attached Drawing) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **SURGE ARRESTERS**
2. Make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Rated voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Nominal Discharge Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Maximum Residual Voltage at Impulse

Current Of

1. 5 KA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. 10 KA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. 20 KA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. 40 kA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Earthing**

121. Dimension of Common Earthing Strip \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

122. Dimension of Flexible Earthing Parts of Hinged Parts \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

123. Size of Earthing Terminal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

124. Short Time Withstand Current for Earthing Circuits \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

125. Duration or Short Time Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

126. Peak Withstand Current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Weights and Dimension**

127. Weight Of Trolley With Circuit Breaker For  
 i) Incoming Panel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 ii) Outgoing Panel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 iii) Bus Coupler Panel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

128. Weight Of Complete Panel  
 i) Incoming Panel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 ii) Outgoing Panel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 iii) Bus Coupler Panel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_