# SCHEDULE OF TECHNICAL DATA

# FOR INCOMING PANELS

# 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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. RATED ONE MINUTE POWER FREQUENCY

WITHSTAND VOLTAGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. RATED FREQUENCY \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. RATED NORMAL CURRENT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. RATED SHORT TIME WITHSTAND CURRENT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. DURATION OF SHORT CIRCUIT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. RATED SHORT CIRCUIT MAKING CURRENT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. RATED TRANSIENT RECOVERY VOLTAGE FOR

TERMINAL FAULT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. MAXIMUM AMBIENT TEMPERATURE RANGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. TEMPERATURE RISE AT NORMAL RATED CURRENT: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. CONTRACTS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. TERMINALS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. OTHER METAL PARTS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. RATED OPERATING SEQUENCE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. OPENING TIME AND BREAK TIME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. CLOSING TIME AND MAKE TIME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. 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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**INDUSTRIAL 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 CLEARENCE IN AIR \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-BETWEEN POLES \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-TO EARTH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ENCLOSURE**

35. TYPE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

36. STANDARD& SPECIFICATIONS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

37. THICKNESS OF SHEET \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

38. DEGREE OD 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. TEMPRATURE RISE FOR RATED CURRENT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A) MAIN BUSBAR \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B) AT JOINTS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**POSITION OF BUS BARS**

44. HIEGHT OF THE LOWEST PHASE OF THE BUSBARS

IN THE PANEL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

45. PHASE TO PHASE CLEARENCE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

46. DISTANCE OF THR 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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

47. MANUFACTURERS NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

48.TYPE & DESIGNATION \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

49. TYPE OF CHARACTERISTICS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

50. NO OF ELEMENTS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

51. SETTING RANGE OF

I) EARTH FAULT ELEMENTS (IDMT) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

52.SETTING RANGE OF INSTANTANEOUS ELEMENT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

53. OPERATING VOLTAGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

54 I) NO OF CONTACTS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

II) CONTACTS RATING \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

55.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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SUPER VISION RELAY**

63. MAKE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

64. TYPE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

65. NO OF CONTACTS & RATING  
A) CONTINOUS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
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. DIMENSIONA (ATTACHED DRAWINGS) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. PROTECTION CT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. METERING \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. DIFFERENTIAL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

90. **WEIGHT**

1. I) PROTECTION CT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. METERING \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. DIFFERENTIAL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**VOLTAGE TRANSFORMER**

91. MANUFACTURER’S NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

92. TYPE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

93. STANDARD \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

94. RATED PRIMARY VOLTAGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

95.RATED SECONDARY VOLTAGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

96. RATED SECONDARY OUTPUT AT   
 0.8 POWER FACTOR (LAGGING) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

97. STANDARD ACCURACY CLASS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

98. RATED ONE MINUTE POWER FREQUENCY   
 WITHSTAND VOLTAGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A) PRIMARY \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B) SECONDARY \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

99. RATED LIGHTING IMPULSE WITHSTAND VOLTAGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

100. RATED VOLTAGE FACTOR

A) CONTINUOS DUTY \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B) 30SEC DURATION \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

101. SHORT CIRCUIT WITHSTAND CURRENT ON  
 SECONDARY TERMINATION (ONE SECOND) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

102. DIMENSIONS (ATTACH DRAWING) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

103. WEIGHT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**INSTRUMENT VOLTMETER P.F METER**

104. MANUFACTURER’S NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

105. TYPE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

106. STANDARD \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

107. SIZE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

108. ACCURACY CLASS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

109. SCALE RANGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**METERS**

KWH METER WITH M.D.I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

110. MAKE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

111. TYPE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

112. RANGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

113. ACCURACY \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

114. BURDAN

I) VOLTAGE COIL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

II) CURRENT COIL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

115. DIMENSIONS (ATTACHED DRAWING) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**KWH METER**

116. MAKE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

117. TYPE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

118. RANGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

119. ACCURACY \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

120. BURDAN

I) VOLTAGE COIL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

II) CURRENT COIL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

121. DIMENSIONS (ATTACHED DRAWING) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EARTHING**

127. DIMENSION OF COMMON EARTHING STRIP \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

128. DIMENSION OF FLEXIBLE EARTHING  
 PARTS OF HINGED PARTS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

129. SIZE OF EARTHING TERMINAL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

130. SHORT TIME WITHSTAND CURRENT FOR   
 FOR EARTHING CIRCUITS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

131. DURATION OR SHORT TIME CURRENT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

132. PEAK WITHSTAND CURRENT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**WEIGHTS AND DIMENSION**

133. WEIGHT OF TROLLEY WITH CIRCUIT BREAKER FOR  
 I) INCOMING PANEL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 II) OUTGOING PANEL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 III) BUS COUPLER PANEL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

134. WEIGHT OF COMPLETE PANEL  
 I) INCOMING PANEL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 II) OUTGOING PANEL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 III) BUS COUPLER PANEL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_