

TECHNICAL SPECIFICATION FOR CONDITIONAL & RESIDUAL LIFE ASSESSMENT AT OBRA TPS,UPRVUNL

1.0 SCOPE OF WORK

The scope of work shall include condition and residual life assessment of following electrical equipment. The main objective of conducting this assessment exercise is to ascertain the health of equipment for proper functioning for next fifteen years.

Sr. No.	Items	Qty.
1.	30 MVA, 220/6.9KV Station Transformer YD11 Impedance 15.15% Cooling ON/OB, OLTC -10 to +10% in steps of 1.25%	1 No.
2.	1.6 MVA, 6.6/0.4KV Service Transformer Impedance 7.51% DY1 Cooling ON, Tap +7.5 to -7.5% in steps of 2.5%	1 No.
3.	220 KV LA, 10KA Station Class	6 Nos.
4.	400 KV Pentograph Isolators	4 Sets
5.	Intercom System (PA System)	5 Sets
6.	HT Motors	
	BFP Motor (6.6 KV, 3500 KW, 351 A, 3000 rpm)	1 No.
	Condensate Extraction Pump Motor (6.6 KV, 220 KW, 25 A, 1485 rpm)	1 No.
	F D Fan Motor (6.6 KV, 630 KW, 70 A, 990 rpm)	1 No.
	I D Fan Motor (6.6 KV, 1700 KW, 180A, 990rpm)	1 No.
	H P Ash Pump Motor (6.6 KV, 262 KW, 26 A, 1485 rpm)	1 No.
	H P Fire Pump Motor (6.6 KV, 168 KW, 20 A, 1485 rpm)	1 No.

2.0 DETAILS OF CONDITION & RESIDUAL LIFE ASSESSMENT

The following details/ data/ drawings/ information of the system/ equipment shall be collected and furnished with the RLA report.

- (i) Compilation of details of all equipment's/ schemes.
- (ii) Name plate details of all equipments.
- (iii) Physical inspection and general assessment to determine the equipment condition based on past performance and operating data including non availability of spares shall be brought out.

- (iv) Wherever required the contractor shall apply his expertise to obtain data/ information which is not available with the owner. It may be obtained through OEM manuals, standard curves / tables or special tests etc. as available at site.

Contractor shall review the data from the plant history, available log sheets and records, feedback from O&M personnel, and comparison of present data with the commissioning data or factory test results of equipment, wherever available, for assessing the present condition of the equipment. Contractor shall also collect/ generate data about past history of failures, modifications, replacements or augmentations and spares consumption pattern for all components/ equipment.

Following tests shall be conducted on the equipment as a minimum. Any additional tests as may be felt necessary by contractor himself to achieve the objective shall also be conducted.

(a)	Transformers
	• Magnetizing Current Measurement
	• Dielectric Loss and Capacitance Measurement (Tan Delta) – Not applicable for LT Transformers.
	• Insulation Resistance/ Polarization Index Measurement/ DC Absorption Test
	• Turns Ratio Test to detect inter-turn shorts
	• Magnetic Balance Test to ascertain the uniform distribution of the flux among the different legs
	• Winding Resistance Measurement (at all taps) including Measurement of Contact Resistance and Speed of Tap Changer Shaft for detecting broken sub-conductors and tap changer problems
	• Core Ground Test to detect if any connection is loose or whether there are other undesired and inadvertent grounds
	• Vector Group
	• Frequency Response Analysis (When un-energized) for detection of winding mechanical distortion
	• Tests on Oil: Dissolved Gas Analysis, Furan Analysis, Acidity, Water Content, BDV
	• Short Circuit Impedance Measurement
	• Operation checks of OLTC , RTCC
	• Bushing Tan Delta – Not applicable for LT Transformers
	• Physical Inspection
	• Buchholz Relay Testing
	• Checking of OTI, WTI Calibration, PRV, MOG
	• Turret CT Testing (if applicable)

	• Thermo-vision
	• Detection of Oil Leakages in the system
	• Detection of Blockages in the Cooling Circuit (By Thermo vision)
	• Condition evaluation of cooling fans, pumps and oil flow switch
	• Condition of Butterfly valves
(b)	HT Motors
	• IR/ PI/ AF Test
	• Magnetic Balance Test
	• Tan Delta Test
	• Winding Resistance Measurement
	• Shaft Voltage Measurement
	• Leakage Current Test
	• Power Quality Measurement
	• Vibration Measurement
	• Thermo vision
	• Conditional assessment by visual
	• Measurement of RTD Resistance
	• Measurement of IR test for space heater and RTD
	• Air gap measurement, Wedge tightness and core looseness tests
	• Measurement of the no load current and full load current of the motor
	• Measurement of no load starting time
(c)	Lighting Arrestors
	• IR/ PI/ AF
	• Tan Delta
	• Counter Check
	• Excitation Current Test
	• Conditional assessment by visual
(d)	Isolator
	• Thermo Vision
	• IR
	• Local, remote operation check
	• Contact resistance measurement
	• Motor (IR, PI, Winding resistance)
	• Checking of auxiliary contacts
	• Conditional assessment by visual
(e)	PA System
	• General Circuitry
	• Amplifier Conditions

3.0 FINAL RECOMMENDATION BASED ON CONDITION & RESIDUAL LIFE ASSESSMENT

The summary of RLA & CA recommendation shall be submitted along with the tests results. The summary of recommendation shall be categorized in following parts:

- a) Electrical equipment/ system requires normal repair.
- b) Equipment/ System require major refurbishment/ repair/ overhauling.
- c) Electrical equipment/ system/ subsystem require complete replacement including feasibility of replacement and details of the proposed system/ equipment.
- d) New equipment/ system requires modernization for efficient operation of the plant.

Contractor may also recommend replacement of equipment based on operational feedback, recurrent failure, maintenance problem, technological obsolescence and in view of compatibility with state of the art control system being envisaged for the station.