



### LEGEND

	DISCONNECTOR		STEAM TURBINE GENERATOR
	EMERGENCY D.C. SET		TWO WINDING TRANSFORMER WITH OLTC (ON LOAD TAP CHANGER)
	MOTOR OPERATED ISOLATOR WITH EARTH SWITCH INTERLOCKED		THREE PHASE INDUCTION MOTOR
	TWO WINDING TRANSFORMER WITH OLTC (ON LOAD TAP CHANGER)		THREE WINDING PT
	THERMISTOR		EARTHING
	VACUUM CONTACTOR (LV)		CABLE GLAND
	VACUUM CONTACTOR (HV)		HRC FUSE
	DRAWOUT TERMINALS		BUSDUCT
	SPACE HEATER		CURRENT TRANSFORMER
	LOCAL CONTROL STATION WITH START/STOP PUSH BUTTONS		SURGE ARRESTER
	LOCAL CONTROL STATION WITH START/STOP PUSH BUTTONS AND AMMETER		DRAW OUT TYPE MOTOR OPERATED CIRCUIT BREAKER
	LOCAL CONTROL STATION WITH ITC SWITCH, START & STOP INDICATING LAMP AND AMMETER		NEUTRAL GROUNDING RESISTOR (NGR)
	CONTACTOR		EARTH LEAKAGE CIRCUIT BREAKER
	THREE PHASE TRANSFORMER WITH OFF CIRCUIT TAP CHANGER WITH 1% STEPS		SWITCH FUSE UNIT (SFU)
	ELECTRICAL INTERLOCK		TIMER
	MECHANICAL INTERLOCK		ELECTRONIC OVERLOAD RELAY/DIGITAL MOTOR PROTECTION RELAY
	MOLDED CASE CIRCUIT BREAKER (MCCB)		MINIATURE CIRCUIT BREAKER (MCB)
	BATTERY BANK		MOTOR PROTECTION RELAY
	SERVO CONTROLLED VOLTAGE STABILIZER		FEEDER PROTECTION RELAY
	MOTOR PROTECTION RELAY		AMMETER
	FEEDER PROTECTION RELAY		AMMETER SELECTOR SWITCH
	COMPOSITE MULTI FUNCTION METER		AUTO TRANSFER SCHEME
	INVERTER		AUTO MANUAL
	RECTIFIER		LOAD BREAK SWITCH
	STATIC SWITCH		

- ### NOTES:
- EXISTING 220KV SWITCHYARD WILL BE EXTENDED TO PROVIDE TWO ADDITIONAL POWER TRANSFORMER BAYS WHICH WILL FEED STREAM 5 OF ALUMINA REFINERY.
  - TWO FEEDERS AT 11KV WILL BE PROVIDED IN HT-212 IN NEW 11KV SWITCHGEAR BUILDING FOR EACH OF THE EIGHT SUBSTATIONS PLANNED FOR POWER DISTRIBUTION TO STREAM 5 OF REFINERY (SEE TABLES ALONG SIDE).
  - THE SCHEME SHOWN FOR SUBSTATION US-503 IS TYPICAL. SIMILAR SCHEME IS ENVISAGED FOR OTHER SUBSTATIONS.
  - 415V DCS SETS ARE ENVISAGED AT TWO LOCATIONS NEAR SUBSTATIONS NO. US-503 & US-505 WHICH ARE IN EPCM SCOPE.
  - THE RATING OF 11KV/0.433KV TRANSFORMER SHALL BE RESTRICTED TO 2.5MVA. ACCORDINGLY NO. OF TRANSFORMERS, PCC PANELS SHALL BE PROVIDED.
  - THE PCC & MCC PANELS SHOWN ARE TYPICAL.
  - UNITS FED FROM EACH SUBSTATION AND THE SCOPE OF SUBSTATION ARE INDICATED IN THE TABLES AS SHOWN.
  - 11/34.5 KV TRANSFORMERS FOR POTTANGI MINES & 33KV ICGC PANEL SHALL BE LOCATED IN NEW 11KV SWITCHGEAR BUILDING.
  - FOR SUBSTATIONS US-503 & US-505, 11KV/0.72KV 2-WINDING TRANSFORMERS SHALL BE PROVIDED ALONG WITH SINGLE BUS 690V SWITCHGEAR TO FEED ACTIVE FRONT END VFDs.
  - INTERCONNECTION BETWEEN EXISTING 11KV SWITCHGEAR AND NEW 11KV SWITCHGEAR IS ENVISAGED ONLY FOR MAINTENANCE PURPOSE. PARALLELING WITH EXISTING INCOMERS IS NOT ENVISAGED. INTERLOCKS SHALL BE IMPLEMENTED ACCORDINGLY.
  - FOR PROTECTION, METERING, INDICATIONS AND OTHER REQUIREMENTS REFER DES/DETAIL SLD.
  - RATINGS INDICATED ARE PRELIMINARY AND SHALL BE FINALIZED DURING DETAIL ENGINEERING.

### REFERENCE DRAWINGS

6695-ELT-000-EC-0002	GENERAL ENGINEERING SPECIFICATION - ELECTRICAL
6695-ELT-000-EC-0003	GUIDELINES FOR ELECTRICAL EQUIPMENT NUMBERING SYSTEM

\*\* - VALUES SHALL BE DECIDED DURING DETAIL ENGINEERING

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<b>tkIS India / Owner/Client</b> <input type="checkbox"/> 1 For Approval <input type="checkbox"/> 2 For Review / Comments <input type="checkbox"/> 3 For Information <input checked="" type="checkbox"/> 4 For Engineering <input type="checkbox"/> 5 For Enquiry <input type="checkbox"/> 6 For Order Placement <input type="checkbox"/> 7 Final & Approved <input type="checkbox"/> 8 Released for Construction		<b>tkIS India / Owner/Client</b> <input type="checkbox"/> 1 Approved <input type="checkbox"/> 2 Approved for Manufacturing/ Fabrication With Comments as Marked <input type="checkbox"/> 3 Not Approved/Resubmit <input type="checkbox"/> 4 Retained for Information/Records <input type="checkbox"/> 5 Reviewed <input type="checkbox"/> 6 Reviewed as Noted/Resubmit	
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<b>1.0 MTPA ALUMINA REFINERY STREAMS DAMANJODI, ODISHA</b> Date: _____ Drawn: _____ Prepared: _____ Checked: _____ Approved: _____ Scale: N.T.S.		<b>thysenskrupp</b> thysenskrupp Industrial Solutions (India) Private Limited 2017 Description: _____ <b>KEY SINGLE LINE DIAGRAM</b>	
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Rev	Date	Name	Date	Name	Date	Name	Description	Acc. Code
05	20.12.18	BTk	20.12.18	MSD	20.12.18	RPM/SJP	REVISED AS PER ADDENDUM, REVISED AS MARKED & ISSUED FOR ENGINEERING	
04	15.05.18	BTk	15.05.18	MSD	15.05.18	RPM/SJP	REVISED AS MARKED & ISSUED FOR ENGINEERING	
03	22.03.18	RDk	22.03.18	MSD	22.03.18	RPM/SJP	REVISED AS PER NALCO'S COMMENT ON BRIDGE ARRANGEMENT FOR VFD & ISSUED FOR ENGINEERING	
02	19.01.18	RDk	19.01.18	MSD	19.01.18	RPM/SJP	FINALIZED AFTER NALCO'S REVIEW & ISSUED FOR ENGINEERING	
01	31.10.17	RDk	31.10.17	MSD	31.10.17	RPM/SJP	REVISED BASED ON CLIENT COMMENTS	
00	22.09.17	RDk	22.09.17	MSD	22.09.17	RPM/SJP	FOR APPROVAL	