



GOVERNMENT OF ODISHA
THE CHIEF ENGINEER-CUM-CHIEF ELECTRICAL INSPECTOR
NORTH EASTERN ZONE, ODISHA, BALASORE
NEAR I.T.I. SQUARE, AT-I.G. MARG, PIN -756001
Email Id: ceinzblsr-od@gov.in

OBSERVATIONS AND RECOMMENADATIONS

	Report No.	77/2021-22
1	Dates of inspection	05.03.2022
2	Inspection Fees	Due Rs.185625/- Paid: Rs.185625/- vide e-TC Ref No: CKT1270842/16.03.2022 . Details of inspection fees and balance dues if any shall be communicated separately.
3	Type of inspection	ANNUAL
4	Voltage and system of supply	33KV, 11 KV, 415V, 3 Phase AC
5	Name of the consumer & address	M/s. Ardent Steel Ltd., At/PO- Phuljhar Dist. – Keonjhar
6	Location of the premises:	Inside factory premises
7	Particulars of the installations:	As per ANNEXURE-II . Additions and alterations carried out if any during FY 2021-22 may be communicated to this office for further necessary action.
8	Inspection conducted by:	Sri P.M. Mishra, CE-cum-CEI NEZ, Balasore
	Assisted by :	Sri Narendra Kumar Rout, Electrician , Gr-I
9	Representatives present	Sri Santosh Ku. Lenka (Plant Head), 9826009279 Sri S. Ramesh(DGM E&I), 9491801321 Sri R. Kumar Nayak (AGM HR & Admin), Mob No-9937043855 Sri Susant Kumar Swain, Mgr (Electrical Safety Officer), Mob-7735891998
10	Single line diagram	Updated SLD and plant layout diagram indicating the electrical installations as per actual installations need to be maintained. SLD to be displayed in all control rooms.
11	INSPECTION OBSERVATIONS	<ul style="list-style-type: none">• All opening for cable entries/exits can be provided with fire barriers to prevent spread of fire. Fire barriers are to be provided at the entry point of the cable trays into the cable vault. Use of Linear heat sensing devices can be used for the cable runs. Recommendation of IS 12459 (1988): Code of Practice for Fire Safety in Cable Runs need to adopted for cable systems.• Transformers (ground cover) made with concrete is impervious and will support spill fire. Impervious surfaces can allow the burning oil to form a large pool fire, which will increase the heat flux to adjacent equipment and structures. The use of 30 cm (12 in) thick crushed stone ground covers below the transformer will suppress the flames from a burning oil spill fire. Refer to IEEE Std 979™.2012: IEEE Guide for Substation Fire Protection.• The 33kV S/stns and Transformers are to be maintained safely. The earth electrodes are to be maintained, measured and recorded. Oil leakage from transformers are to be addressed.(hackbridge)• Many of the pumps and motors were found inaccessible under the slurry tank due to water logging and need to be addressed. Cable terminations to motors and pumps are to be provided with support and sealed at terminal entries, earthing is to be ensured, all panels are to be identified. Unsafe panel covers are to be replaced.• Safe electrical clearances in the 33kV Switchyard is to be ensured near the jumpers from the isolators to the breakers and may be straightened for better clearance.• Periodical Interlock and protection tests of all transformers and electrical installations are to be taken up and records of all such tests are to be maintained.• All auxiliary transformers and associated S/tns shall be identified with voltage level and capacity. Transformers oil leakage to be addressed.



	<ul style="list-style-type: none"> • All control rooms and work areas to be provided with adequate illumination and ventilation, fire exits and appropriate signage for emergency exits with backup power supply. Fire alarms and protection systems are to be installed in the control rooms. • For Air-conditioning systems circulating air to more than one floor area, it should be provided with dampers designed to close automatically in case of fire and thereby prevent spread of fire or smoke. Such a system should also be provided with automatic controls to stop fans in case of fire, unless arranged to remove smoke from a fire, in which case these should be designed to remain in operation. Please refer to IS Clause 8 of 1642.1989. • Temporary connections and power supply to portable equipments are to be safely extended using armored cables with RCCB and using industrial sockets, ensuring proper earthing and use of adequate PPEs. Many cables/wires are being used in unsafe manner and the cables are to be properly supported and protected. <p>The name of the designated persons as per regulation CEA (Measures Relating to Safety and Electric Supply) Regulations 2010 is to be communicated to this office. Please refer to Regulation 3 to 6 of the Regulations in this regard and ensure compliance.</p> <p>Many of the electrical installations need to be maintained as per the prescribed Safety Standards and Safety Regulations besides applicable Indian Standards and also the manufacturers' guidelines, especially the transformers, 33kV switchyards etc. Compliance to many of the last observations are to be undertaken and have been re-iterated for immediate reference. The observations and deficiencies mentioned have already been explained to your representatives present during the inspection visit for compliance. Specific attention is invited regarding fire safety of transformers with oil capacity more than 2000 ltrs as per regulation 44, CEA (Measures Relating to Safety and Electric Supply) Regulations 2010. Attention is also invited to Regulation 46(7) regarding the responsibility of owners.</p> <p>Since large volume of process oil is stored, adequate fire safety measures need to be taken as per prescribed statutory guidelines.</p> <p>Testing of the metering system of DG i.e the energy meter, associated CTs and PTs are to be taken up annually by STL. The last sealing and testing details are to be submitted for verification and records.</p>
(A)	<p>33kV Structure and Lines</p>
	<ul style="list-style-type: none"> • The SLD need to be provided in the control room clearly highlighting the installations. 33kV Feeder names with length (Incomers) can be indicated in the SLD. The make of the transformers can be mentioned in the SLD. • HT cables shall be identified with cable tag at both the ends as well as throughout the cable routes. Cable route to be identified with route markers along with danger notices indicating the presence of HT cables. • Cables shall be laid, maintained and protected as per IEC 62067 and other applicable IEC standards. The cable trays supporting the HT cables in the switchyard is to be provided with continuous earthing. Control and other power cables are to be laid and maintained as per IS 1255. • The panels/marshalling box connectivity to earth to be maintained. The panel doors are to be connected to earth using flexible copper bond. Interlock and protection arrangements to be ensured as per Regulation 45 of CEA (Measures Relating to Safety and Electric Supply) Regulations 2010. • The entire area of the sub-station/ switchyard shall be maintained with 150/100mm thick gravels to restrict the growth of grass in outdoor sub-station/ switchyard. The gravels shall consist of 75/50mm thick of 40mm stone size on the top and 75/150mm thick of 20mm stone size below. The resistivity of gravel shall be 3000Ω-mtr. • All open cable trenches and other openings to be covered and protected. • The fencing around the switchyard to be properly connected to the earth. The gate to remain locked. Adequate Voltage level and Danger notices are to be provided. • The Lightning Arresters need to be verified for proper operation. The leakage currents to be checked to be within the prescribed range. Refer to the Regulation 43(2)(g) of Central Electricity Authority (Technical Standards for construction, operation and maintenance of electrical plants and electric lines) Regulations 2010, regarding provision of surge counters and arresters. • All earth electrodes are to be tested and verified. Test results are to be submitted. Damaged dysfunctional earth electrodes are to be replaced. • The earth pits are to be numbered and indicated with individual and combined resistance values and date of last testing. Records of the details need to be maintained. An updated drawing showing the



	<p>main earth connection and electrodes to be maintained as per clause 4.7 of IS 3043:2018.</p> <ul style="list-style-type: none"> • Auxiliary earth mats can be maintained to cover the area below the AB Switch handle for better safety. The operating handles are to be connected to earth using flexible copper bond. • Cables used for extending temporary power supply to be laid and supported as per IS 1255. Cables to be tagged and identified. • <i>Phase marking and identification of bays to be done for all the bays with proper nomenclature of voltage level etc. The markings have faded over time.</i> • The interlock arrangements to be periodically verified. Specific attention is invited to the provisions in regulation 45 of CEA (Measures Relating to Safety and Electric Supply) Regulations 2010 regarding isolators, breakers and earth switches. Both electrical and mechanical interlock needs to be ensured. LOTO systems to be adopted for safety. • <i>The Switchyard lighting power supply cabling arrangements to be safely done. Joints and loose connections to be attended. Cables to be properly routed and supported.</i> • The damaged insulating mats provided in the control rooms are to be checked and replaced if necessary. • The 33kV and LT Line is to be maintained as per prescribed statutory provisions. Please refer to CEA (Measures Relating to Safety and Electric Supply) Regulations 2010 and also the Technical Standards. Earthing of each pole, anti climbing, pole numbering, guardings are to be mandatorily provided besides danger notices. Safe clearances are to be ensured for the entire stretch of the line. Joist Poles are to be painted. • Guarding to the L.T line crossing road near the switchyard to be provided & earthed at both ends.
	<p>33/11kV 7500 KVA, 2 x 33/0.433 kV 5800 KVA and 11/0.433kV, 11/0.433kV 2850 KVA Transformers</p>
	<ul style="list-style-type: none"> • <i>Entry gate of the 7.5MVA,33/11KV transformer area to be connected to earth.</i> • The transformers are to be provided with enclosure/fencing with gates and to be connected to earth. • Nitrogen injection to be provided (if available) near the transformers. • The name plate details of the transformer are to be shifted to accessible location. • Marshalling box view glass to be replace and cleaned regularly. • Adequate capacity and size of oil soak pit needs to be constructed • It is observed that the area below many transformers (ground cover) has been made with concrete which is impervious and will support spill fire. Impervious surfaces can allow the burning oil to form a large pool fire, which will increase the heat flux to adjacent equipment and structures. • The use of 30 cm (12 in) thick crushed stone ground covers below the transformer will suppress the flames from a burning oil spill fire. Refer to IEEE Std 979™-2012: <i>IEEE Guide for Substation Fire Protection.</i> • <i>The prescription as made in Regulation 44(ix) of CEA (Measures Relating to Safety and Electric Supply) Regulations 2010, Regulation 43(2)(a)(iii), 43(3)(b) of Central Electricity Authority (Technical Standards for construction of electrical plants and electric lines) Regulations 2010, regarding provision of fire detection, alarm and protection system, fighting system as per IS-3034:1993 or with Nitrogen Injection Fire Protection System <u>has not been implemented for transformers with oil capacity of more tha 2000 ltrs.</u> It is highly recommended install fire fighting systems as prescribed in the Safety Regulation and applicable Indian Standard.</i> • The physical distance of the transformers from other transformer installed needs to be clearly indicated and accordingly <i>provisions of fire wall</i> and fire safety is to be made if physical distance is more than 15m. Please refer Regulation 43(2)(a)(iv) of Central Electricity Authority (Technical Standards for construction of electrical plants and electric lines) Regulations 2010. • <i>Since there is significant volume of oil in the transformers, oil drainage arrangement needs to be verified. The capacity of oil soak pit should be more than the total oil volume of the transformers. Adequate capacity and size of transformer oil soak pit needs to be ensured as per CEA Safety Regulation 45(vii) and proper size of drainage arrangement is to be made as per IS 3034.</i> • The control cables of the transformers are to be supported, dressed and supported. • Oil leakages from the 7500 KVA transformers are to be rectified. The transformers are to be kept clean to facilitate identification of oil leakage. • The protection and interlock arrangement of the transformers also to be periodically verified for



	<p>correct operation.</p> <ul style="list-style-type: none"> • It needs to be ensured that the earthing of marshalling box, control panels and equipment are always made with two separate earth connections from distinct sources. Please refer to clause 4.2 of IS 3043 regarding the statutory provisions for earthing. • The transformers are to provided with enclosure/fencing with gates and to be connected to earth.
	<p>E.S.P. Installations</p> <ul style="list-style-type: none"> • The ESP transformer units are to be maintained as per prescribed guidelines. The ESP being a critical installation for environmental and pollution compliance, needs to be maintained regularly for required operation. • The ESP floor cables to be routed or supported. The silica gel of the transformers to be changed and oil level to be maintained. • Earth flats is to be laid properly, joints if any to be welded. • The MV control/main switches on the ESP floor are to be properly maintained and earthed. The connections are to be properly done using appropriate connectors rather than being loosely twisted. Entry/exit of cables from the panels/switches to be done using cable glands, gland covers and properly sealed. MCCBs to be properly mounted. • Danger Boards are to be provided at the E.S.P. Transformer. Control and power cables to be laid separately for the ESP transformer. Cable tag markers at regular intervals are to be provided both for control & power cables. • Lightning spikes at suitable intervals on the metal structure over the E.S.P. transformers can be provided as necessary. • I.D. fan motors are to be double earthed and their earth connections to be verified and properly routed. • Operation of Mechanical and Electrical inter locking and control system is to be ensured. • Cable trays to be provided for carrying power and control cables to the transformers and are to be earthed by using adequate size of earth flat.
	<p>Control Rooms and Control Panels</p> <ul style="list-style-type: none"> • Fire barrier are to be provided at all entries of the cable trays into the control rooms. • Fire retardant painting to be done near the exit of the cable from the control room. • 33kv spare feeder to be marked with bold lettering • <i>The door of capacitor bank room is to kept locked and door switches/sensors are to be installed to disconnect the power in case of opening of the door.</i> • <i>Temporary unsafe cables running on the floor of the control rooms are to be removed.</i> • <i>Unsafe openings near panels are to be closed.</i> • Adequate safety clearance is to be maintained for the capacitor banks and reactors mounted inside the capacitor bank rooms. Appropriate danger notice needs to be provided clearly indicating the voltage level. The live terminals at to be properly covered with insulation and made in accessible. • Working space around the control panels and control areas needs to be ensured as prescribed under CEA safety regulation 37. Storage of materials needs to be avoided for the purpose. • All the panels are identified with proper voltage. SLD and Shock treatment chart is to be fixed at the conspicuous places. Panels shall be provided with the description of its identification at front and at the rear along with voltage level. • Unused openings in control panels/ distribution boards shall be sealed. All panel/board covers shall be connected to earth using flexible copper bond. • RCCBs is to be provided for the industrial socket in place of MCCBs available in the control room/panels meant for extending temporary power supply. • Emergency switches to be provided with fluorescent markers for visibility during power failures. • Regular checking for sparks, damaged insulations and loose connections etc. are to be taken up for all terminations/joints and attended immediately. Thermo vision scanning can be useful for detecting hot spots.
	<p>Ball Mill, Kiln Installations</p> <ul style="list-style-type: none"> • Ball mill control room to be provided SLD clearly highlighting the installations, & improved illumination , sealed from dust and openings to be closed. • Ball mill control room to be identified with painting & exit of the room to be marked.



	<ul style="list-style-type: none"> • Compressor power distribution board damaged cover to be replaced. • All masonry earth chambers of the plant are to be maintained periodically by measuring earth resistance value, cleaning of electrode and flats, greasing of welding area. • Transformer body is to be cleaned for identifying oil leakage. Oil leakage from transformer to be identified and arrested. • <i>Unsafe cable terminations and panels near the pellet cooling pumping areas, multi stage pumps etc. are to be safely maintained.</i> • The electrical systems of the hoists and cranes are to be maintained as per IS 3177, IS 4137 and other prescribed standards. Statutory safety inspection needs to be undertaken for the hoists and cranes as applicable. • Nomenclature of each earth pits along with earth resistance value with date of measurement is to be displayed. • Control Rooms are to be maintained to avoid dust deposit on panels. • Annunciation system (audio and visual) need to be provided in the control room panel for operation during faults. • Open terminal of various motors should be avoided and motor body cover must be provided. • Fire hydrant system in the control rooms. • Exhaust fan arrangement in the control system and MCC rooms. • Poor illuminations in the control rooms must be rectified. • Nomenclature of all panels to be done in bold letter. • Cables inside the sub-station area should run through cable trenches or using cable trays. • OTI & WTI viewing glass to be kept cleaned.
HT/MV Motors, Drives and HT/MV Loads	
	<ul style="list-style-type: none"> • All the motors, compressors, machines, metallic parts etc. not intended as conductors, iron support structures etc. shall be earthed by two separate and distinct connections with earth. Frame of every metallic part not intended as conductors, iron support structures shall be earthed by two separate and distinct connections with earth. All the motor couplings exposed rotating parts are to be provided with guard covers for safety of workforce. • Cable entry or exit into the control rooms, panels, motor terminals, marshalling/console box to be properly done using cable glands and the unused openings to be properly sealed. IS 1255 needs to be adopted for installation and maintenance of cables. • All cables to be properly tagged with cable tag at both the ends as well as at intermittent points. HT cables and their routes to be specifically marked at specific intervals. • Since conveyers and other metal fines are being moved in the system, adequate protection needs to be taken against static electricity building up in the conveyers, pipes, structures etc. by providing proper earthing arrangements as per IS 7689. A prescribed maximum resistance of 10 ohm is acceptable to avoid static electricity hazards as per section 15.3 of the IS. Transportable metal items should have a resistance to earth of 10 ohm or less, provided by a special earth connection. • Proper functioning of interlocking and protection arrangements of transformers and other equipment need to be ensured. Appropriate danger notice needs to be provided clearly indicating the voltage level. • All the auxiliary Transformers are to be maintained as per standard and checked for oil leakage. The metal barricades at to be connected to earthing. The metal barricades/enclosures at to be connected to equipotential bonding/earthing. The winding and oil temperature indicators are to be preferably relocated to the front side for safe access, visibility and reading. • <i>All HV/MV cable inlets/outlets of ball mill motors, rotor terminals etc. to be properly sealed. All cables to be tagged and to be properly labeled on the HV and MV side with voltage level.</i> • <i>Emergency stop switches to be prominently identified.</i> • The electrical systems of the hoists and cranes are to be maintained as per IS 3177, IS 4137 and other prescribed standards. Statutory safety inspection needs to be undertaken for the hoists and cranes as applicable. • All the motors, compressors, machines, metallic parts etc. not intended as conductors, iron support structures etc. shall be earthed by two separate and distinct connections with earth. Frame of every metallic part not intended as conductors, iron support structures shall be earthed by two separate and



	<p>distinct connections with earth.</p> <ul style="list-style-type: none"> • Unused openings in control panels/ distribution boards shall be sealed. All panel/board covers shall be connected to earth using flexible copper bond. • Cable entry or exit into the control rooms, panels, motor terminals, marshalling/console box to be properly done using cable glands and the unused openings to be properly sealed. IS 1255 needs to be adopted for installation and maintenance of cables. • The earthing connection of individual Panels, DBs to be verified for appropriate connectivity with earth. The continuity with earth pits to be verified. • Cables running on the back side/top of the DBs/panels to be properly arranged. All cables to be properly tagged with cable tag at both the ends as well as at intermittent points. HT cables and their routes to be specifically marked at specific intervals. • The cable support structures should be provided with continuous running earth. Power and control cable should be segregated and clearances of power cable from control and communication cables to be maintained as per IS 1255. • Working space around the control panels and control areas needs to be ensured as prescribed under CEA safety regulation 37. Storage of materials needs to be avoided for the purpose. • Since storage of oil and inflammable items are undertaken as part of the manufacturing process, adequate fire safety measures needs to be as per statutory provisions. Use of fire detection and alarms, fire extinguisher systems as applicable needs to be ensured as per prescribed fire hazard classification. Please refer to IS 3594 section 11 regarding electrical installations at storage areas, IS 1641 regarding classification etc.
	<p>DG Sets</p>
	<ul style="list-style-type: none"> • <i>The unused cables and equipments of the old removed DG set are to be dismantled and removed safely from the DG Room.</i> • <i>As the existing DG Energy meters & Current Transformers installed are Class- 1.0, same are to be replaced with Class-0.5s for all DG sets.</i> • <i>New Energy Meter Along With new CT/PT with 0.5 accuracy Class needs to be installed after being tested by STL. Sealing arrangement of the metering system is to be ensured. The energy metering system need to be tested annually by STL and the reports are to be submitted to this office for records.</i> • <i>The changes over panels, DBs and panels of the DG sets are to be safely maintained. Unsafe cable terminations and wirings are to be addressed.</i> • <i>Voltage level and change over positions are to be clearly indicated. The unsafe cable entries are to be addressed.</i> • <i>The cables densities are found to be high at the DG terminal box and panels. Please refer to IS 12459 (1988): Code of Practice for Fire Safety in Cable Runs and take applicable measures. Cable densities can be reduced by using separate panels.</i> • The DG sets earthing are to be at ensured at minimum two points using an exclusive independent earth electrode i.e for the prime mover body and for the generator body and the neutral. Please refer to IS:3043 for further details. The present earthing to be properly verified and measured. • Fire extinguishers and adequate ventilation arrangement is to be made for the DG control room/area. The firefighting system functioning is to be ensured. • Oil and lubricant leakage if any from the DG sets are to be checked. • The DG room is to be kept clean and dry of spilled oil and lubricants. Oil storage from the DG rooms can be relocated. • It should be ensured that the exhaust system operated with minimum back pressure. • The asbestos ropes used for the exhaust piping inside the acoustic enclosure/Genset to be periodically checked and replaced to avoid heat input inside the enclosure. • In case the exhaust gas enters the nearby working areas, the direction can be altered or the height can be changed. • The exhaust stack height needs to be verified as per prescribed standard to ensure disposal of exhaust above building height. • All moving parts of the DG set needs to be mechanically guarded in such a manner that a human finger cannot reach any moving part.



	<ul style="list-style-type: none"> • The space heaters of the DG sets with capacity of more than 500KVA needs to be verified for their operation so that the winding temperature is maintained to avoid moisture during long idle periods. • The interlocking and protection arrangements are to be verified for all the DG sets operating in islanding mode for necessary compliance to regulation 45(iii). • Attention is also invited to the provisions contained in IS 732:2019, specifically the sections 5.5.2.6 and 5.5.2.7, i.e. additional requirements for installations with generating sets providing backup supply or which may operate in parallel with other sources.
	<p>Office/Building installations</p>
	<ul style="list-style-type: none"> • Compliance to the provisions of National Electrical Code, specifically the provisions for lightning protection, earthing, protection against voltage surges, energy efficiency, electrical installation of office buildings, outdoor lighting installations, electrical installation in hazardous areas etc. needs to be considered. • For false ceilings, provision of inspection windows/opening needs to be considered to facilitate inspection of electrical connections running within the false ceilings. • Periodical checking of the air conditioning system needs to be ensured, mostly for the stand alone type air-conditioners so that overloaded operation can be verified to avoid insulation damage due to overheating leading to short circuits. • For proper operation of the circuit breakers/MCCBs, the fault loop impedance of the circuits needs to be verified to ensure proper tripping of the RCDs/MCCBs. • Attention is also invited to the provisions of the National Building code, regarding the electrical and allied installations under section 2 Part-8, Volume -I of the Code besides other provisions regarding escalators, lifts, fire and life safety etc. • It is strongly recommended to undertake the energy efficiency study to determine the SEC and take necessary steps to reduce its carbon footprint.
12	<p>NB:</p>
	<ul style="list-style-type: none"> • <i>The installation, operation and maintenance manual of the equipment manufactures is to be strictly adhered for safe operation.</i> • Appropriate training shall be provided to personnel working in the plant regarding safety, first aid and shock treatment. • Considering that this is a Manufacturing plant with furnaces, power plants, SMS etc. adequate safety measures needs to be taken for ensuring safety of the work force. Fire alarms and detection systems needs to be provided. Adequate number of fire extinguishers, gas masks and other safety devices at accessible locations needs to be provided. Exit routes to be identified and prominently displayed for use during emergency. • All the motors, compressors, machines, metallic parts etc. not intended as conductors, iron support structures etc. shall be earthed by two separate and distinct connections with earth. Frame of every metallic part not intended as conductors, iron support structures shall be earthed by two separate and distinct connections with earth. All the motor couplings exposed rotating parts are to be provided with guard covers for safety of workforce. • The Regulations 27 and 28 of the CEA (Measures Relating to Safety and Electric Supply) Regulations 2010 regarding the provision of protective equipment and display of instructions for resuscitation of persons suffering from electric shock is to be strictly followed besides other applicable provisions. Danger notices are to be provided as per regulation 18. • The Regulation regarding safety procedures, inspection and patrolling, maintenance schedules, use of diagnostic techniques for condition monitoring of equipment, thermo vision scanning, failure analysis, training etc. needs to be adopted. • The regulation 46(7) regarding responsibility of the owner needs to be adequately addressed. Also compliance to the CEA (Technical Standards for connectivity to the Grid) Regulations 2007, CEA (Grid Standard) Regulation 2010 needs to be ensured as a bulk consumer. • Insulating mats are to be installed and maintained as prescribed in the “Indian Standard 15652 (2006): Insulating mats for electrical purposes”, needs to be referred for the purpose. • Fire extinguishers and detection systems are to be maintained in the control room and other locations as per prescribed Indian Standards i.e. IS 3034, IS 1646, IS 1647, IS 2189, Tariff Advisory Committee manual as applicable.



- All equipment, panels shall be marked with the description of its identification at front and at the rear.
- An updated drawing showing the main earth connections and earth electrodes for the electrical installations incorporating the earthing arrangement is to be prepared and maintained.
- IS 2026, IS 10028, CBIP manual publication no 295 for transformers and other applicable standards needs to be adopted during installation, operation and maintenance of the transformers.
- IS 10118-4 (1982): Code of practice for selection, installation and maintenance of switchgear and control gear, Part 3: Installation, may please be referred for maintenance of switchgears besides other applicable standards such as IS/IEC 62271-203 (2003): High-Voltage Switchgear and Control gear, Part 203: Gas-Insulated Metal-Enclosed Switchgear for Rated Voltages Above 52 kv [ETD 8: High Voltage Switchgear and Control gear] etc.
- Regular testing of earth value, insulation resistance/IR values, operation of protecting and isolating devices, interlocks etc. to be taken up as per applicable standards to ensure safety and a record of such periodic testing and maintenance is to be recorded in a register and is to be produced during inspection as necessary.
- Safety arrangements to be ensured as per Central Electricity Authority (Safety requirements for construction, operation and maintenance of electrical plants and electric lines) Regulations 2011, CEA (Measures relating to Safety and Electric Supply) Regulations 2010 etc. Specific attention is invited to the regulations 3 to 6 regarding designating and engagement of trained and qualified persons, role of electrical safety officer etc. You may refer to appropriate Regulations of Central Electricity Authority by visiting the CEA website and ensure compliance.
- Reference is also invited to the Central Electricity Authority (Safety requirements for construction, operation and maintenance of electric plants and electric lines) regulations 2011, indicating safety provisions relating to owner, safety manual, safety officer and safety committee, safety provision relating to contractors, reporting of accidents, emergency management plan, medical facilities, safety training and awareness etc. for necessary implementation.
- Required statutory clearances as necessary for operation of the plant needs to be obtained as applicable.
- Deficiencies if any in the report may please be brought to the notice of the undersigned for further necessary action.
- *The report in no way relieves the installation owners from any of their statutory obligations and responsibility for ensuring operation and maintenance of the installations in a condition free from danger and as recommended by the manufacturer or by relevant codes of practice of the BIS and CEA.*
- The annual inspection of the electrical installations is due from 1st April onward of every year. Electricity duty return is to be submitted each month and payment is to be made regularly as per provisions of the Odisha Electricity Duty Act 1961 and applicable rules.

The metering system of the DG sets need to be annually tested by STL including the energy meters, associated CTs and PTs. The last test and sealing details are to be submitted to this office for verification and records. Sealing system are to be maintained properly to avoid any damage to the seals.

Many of the transformers with oil capacity of more than 2000 ltrs are found without installation of appropriate fire safety measures and are not safe to be operated without additional care to avoid fire hazard as mentioned before. The prescribed fire safety measures are to be installed on priority and till such time proactive monitoring of the transformer temperatures and loads are to be ensured and in case of any abnormal temperature rise, the transformers are to be shut down immediately. The support of manufacturer in this regard may be obtained. Also oil leakages in many transformers have been observed which increases the fire hazard and need to be addressed on priority.

The installations covered in this report are allowed to remain energized subject to rectification of defects and deficiencies mentioned in the report, and detailed compliance needs to be submitted to this office within 90 days of issue of the report.

Sd/-
P. M. Mishra
C.E-Cum-C.E.I., NE Zone
Odisha, Balasore



Copy forwarded to:

1. The Plant Head, M/s. Ardent Steel Ltd., At/PO- Phuljhar, Dist. – Keonjhar, for information and necessary compliance.
2. The EICI-cum-PCEI, Odisha, Bhubaneswar for favour of kind information.

ANNEXURE-I

DG Set Details and Meter Reading as on 05.03.2022

DG	DG1	DG2	DG4
Make.:-	Leroy Somer	Leroy Somer	Leroy Somer
Alternator sl. No.	L86-074	L86-072	L86-073
VOLTAGE	415V 3 Ph AC	415V 3 Ph AC	415V 3 Ph AC
Capacity	2250 KVA	2250 KVA	2250 KVA
Running Hours	14488.97	-	12836 Hrs
Energy Meter make and sl no	HPL 1K082818	HPL 1K082786	HPL 1M001414
Energy meter reading	17623.6 KWh	18568.8 KWh	02079.7 KWH
TP Box	0001177&0001178	0001176 &0001300	0013963 &0013964
CT Box Seal	-		0013961 &0013962
<i>The meter, CT the testing and sealing details all the TGs are to be submitted for necessary verification and updating of records. Discrepancy if any may please be brought to the notice for necessary action.</i>			
Energy meter along with CT needs to be tested annually by STL and test reports needs to be submitted to this office for records.			
<i>A 320KVA DG is available within the plant premises with disconnected cables from the DG set terminal box. Running hour recorded was 1991. The organization is advised to use the DG only after necessary inspection and approval from this office and after installation of energy meters.</i>			



ANNEXURE-II

List of Electrical Equipments of M/s. Ardent Steel Ltd. For Annual Inspection For the Year 2021-22				
ESP Installations				
Sl. No.	Equipments	Qnty.	Rate	Amount
1	ESP Transformer	3	9000	27000
2	ESP MCC Panel			
3	Panel	3	500	1500
4	I/C and O/G Switchgear feeder	12	250	3000
5	900 KW Motor	1	850	850
6	HT/ MV Installations			
7	33 KV LA	3	500	1500
8	33 KV Isolator	1	500	500
9	33 KV ,3x400 sqmm Cable	2	250	500
10	NESCO Metering Cubicle	1	500	500
11	33/0.433 KV, 5.8 MVA Transformer	2	2250	4500
12	33/11 KV, 7.5 MVA Transformer	1	2250	2250
13	11/.415 KV, 2.85 MVA Transformer	1	1700	1700
14	33 KV HT Panel	6	500	3000
15	Breaker	6	250	1500
16	CT	18	250	4500
17	PT	6	250	1500
18	33 KV HT Cable(3Cx185 mmsq) < 1 Km	9	250	2250
19	11 KV HT Cable < 1km	2	250	500
20	LT Cable < 1 km	31	125	3875
21	11 KV Switch Board			
22	Panel	5	500	2500
23	Breaker	5	250	1250
24	CT	15	250	3750
25	PT	3	250	750
26	200 KVAR,11 KV Capacitor Bank	3		
27	Upto 10 KW LT Motor	162	50	8100
28	10 to 100 KW LT Motor	75	200	15000
29	100 to 500 KW Motor	11	400	4400
30	500 to 1000 KW Motor	1	900	900
31	1000 to 5000 KW HT Motor(1400 KW,11 KV Motor)	2	2400	4800
32	FCMA Motor Control Panel	2	500	1000
33	11 KV HT Cable < 1km	5	250	1250
34	PCC-1 Panel			
35	Panel	8	500	4000
36	Breaker	8	250	2000
37	O/G Switchgear feeder	8	250	2000
38	LT Capacitor Bank 750 KVA	2	850	1700



41	PCC-2			
42	Panel	8	500	4000
43	Breaker	8	250	2000
44	O/G Switchgear feeder	8	250	2000
45	LT Capacitor Bank 750 KVA	2	850	1700
46	FCMA Motor Control Panel	2	500	1000
47	Kiln & Cooler MCC			
48	Panel	7	500	3500
49	I/C and O/G Switchgear feeder	19	250	4750
50	TG and balling mill system MCC			
51	Panel	4	500	2000
52	I/C and O/G Switchgear feeder	17	250	4250
53	Pump House and Oil system MCC			
54	Panel	4	500	2000
55	I/C and O/G Switchgear feeder	17	250	4250
56	TG DDV MCC			
57	Panel	4	500	2000
58	I/C and O/G Switchgear feeder	20	250	5000
59	Proportioning MCC			
60	Panel	5	500	2500
61	I/C and O/G Switchgear feeder	26	250	6500
62	Servo Voltage Stabilizer	3	500	1500
63	Air Condition Control Panel	1	500	500
64	Load cell Panel	1	500	500
65	UPS 10 KVA	2	500	1000
66	UPS Junction Box	1	500	500
67	Battery Set	2	500	1000
68	DG-1,2 & 3 Sets (2250 KVA)			
69	DG,2250KVA,415 V	3	2750	8250
70	Metering Panel	3	400	1200
71	C/R Panels	9	400	3600
72	Battery	4	250	1000
73	CT	9	250	2250
74	Breaker	4	250	1000
75	Fuel Oil pump 30KW	2	200	400
76	Compressor 45 KW	1	200	200
77	water suck pump 1.1kw	1	50	50
78	Light load 400W	3	50	150
79	LT Cable	4	125	500
80	HT Cable	1	250	250
Total Inspection Fees for the FY 2021-22				185625