

 Eskom	Scope of Work	Hendrina Power Station
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Title: **Hendrina Power Station
Hazloc maintenance,repairs
and inspection Scope of
work**

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1. INTRODUCTION

Hendrina Power Station is in the process for initiating a long term contract for inspections , maintenance and repairs of all classified Hazardous locations areas. The main focus is to ensure that all classified hazardous location areas are compliant .The current Hazardous classification report will be used as a guide line to determine the areas needs inspections, maintenance and repairs.

2. SUPPORTING CLAUSES

2.1 SCOPE

The scope of work caters for repairs,inspection and maintenance in all hazardous locations concerning Hendrina Power Station.

2.1.1 PURPOSE

The purpose of this report is to guide the service provider as to what is expected in the inspections ,maintenance and repairs.

2.1.2 APPLICABILITY

This document shall apply to Hendrina Power Station management and contractor's management.

2.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 NORMATIVE/INFORMATIVE REFERENCES

- [1] SANS 10108:2014
- [2] SANS 60079-14
- [3] SANS 60079-17
- [3] 240-56536505 Eskom Hazloc Standard
- [4] SANS10142-1

2.2.2 INFORMATIVE

- [1] Classification of Hazardous Areas at Hendrina Power Station (MJW/HAC/001/22)
- [2] Compliance Report on Hazardous Locations at Hendrina Power Station (Hendrina/017M_039/11/05)
- [3] Hendrina Power Station Hazloc Dashboard

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2.3 ABBREVIATIONS

Abbreviation	Explanation
ATL	Approved Test Laboratory
BU	Business Unit
CoC	Certificate of Compliance
DMR	Department of Mineral Resources
DoL	Department of Labour
HAZLOC	Hazardous Locations
LEL	Lower Explosive Limit
OHS Act	Occupational Health and Safety Act 85 of 1993
PM	Planned Maintenance
UEL	Upper Explosive Limit

2.4 ROLES AND RESPOSIBILITIES

GMR2 / Compliance Management	Appointed	The GMR2 of each Eskom site is accountable for the compliance to the Electrical Machinery Regulations, Section 9 with regards to documentation, inspection, testing and maintenance of electrical equipment in hazardous locations on existing sites.
Risk and Assurance Manager	Appointed	The Risk and Assurance Manager of each Eskom site is accountable to ensure all administrative aspects required by the OHS Act is in place and available.
MIE	Appointed	The appointed MIE for the BU is accountable to issue COC's for all applicable areas at the BU. Verification of all HAZLOC areas must also be done.
Hazardous Location Committee and Chairperson	Appointed and BU based	The Hazloc committee mainly focuses on: • Verification of all Hazloc areas. • Compile files for each Hazloc area with all relevant records and information (which includes demarcation drawings) • Review Statutory PM's on SAP for Visual Inspection Close Inspection and Detailed inspections (2 yearly inspections) The Hazardous Locations Committee and Chairperson make recommendations, in the best interests of the BU, on items in accordance with the Electrical Machinery Regulations 9 of the Act for Electrical Machinery in Hazardous Locations. Ensuring that in addition to the Electrical Machinery Regulation all applicable sections of Plant Safety Regulations, Electrical Installation Regulation, applicable Eskom and applicable SANS are complied with.

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2.5 PROCESS FOR MONITORING

The Hazloc committee members are responsible for monitoring all Hazloc related activities.

3. HENDRINA POWER STATION HAZLOC SOW

3.1 HENDRINA POWER STATION HAZLOC AREAS

Hendrina Power Station currently has the following Hazloc areas:

PLANT	CLASSIFICATION OF THE PLANT (ZONING)
MAIN HYDROGEN GENERATING PLANT (H2 PLANT)	ZONE 2
UNITIZED HYDROGEN SKID BASEMENT (UNIT 1-10)	ZONE 2
H2 UNITIZED PLANTS (Under Generator-unit 1-10)	ZONE 2
OIL SYSTEM BASEMENT (Seal, lube control and jacking oil)	NON-CLASSIFIED
MAIN OIL TANK (UNIT 1-10)	ZONE 2
STEAM FEED PUMP TURBINE PIT	FIRE HAZARD
GENERATOR BRUSH GEAR CANOPY (UNIT 1-10)	ZONE 2
GENERATOR TRANSFORMER CONSERVATOR TANK (UNIT 1-10)	FIRE HAZARD
24V DC BATTERY ROOMS UNIT (1-5)	ZONE 2
24V DC BATTERY ROOMS UNIT (6 - 10)	ZONE 2
(220V DC)-STATION BATTERY ROOMS (1A & 1B, 2A & 2B, 3A & 3B, 4A & 4B)	ZONE 2
AMMONIA DOSING PLANT (UNIT 1-10)	ZONE 2
NORTH AND SOUTH BULK FUEL OIL TANKS PLANT	ZONE 2
NORTH AND SOUTH FUEL OIL PLANT TRANSFER PUMP HOUSE	ZONE 2
NORTH AND SOUTH BULK FUEL OIL SERVICE PUMPHOUSE	ZONE 2
NORTH AND SOUTH FUEL OIL SERVICE TANKS	ZONE 2
NORTH AND SOUTH FUEL OFF LOADING BAY	ZONE 2

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TURBINE CLEAN, DIRTY, AND USED OIL TANKS	NON-CLASSIFIED
WATER TREATMENT PLANT (CHLORINE PLANT	NON-CLASSIFIED
WATER PLANT WEST CHEMICAL STORE	ZONE 2
WATER TREATMENT PLANT - OXIDIZING ROOM	NON-CLASSIFIED
WATER TREATMENT PLANT EAST CHEMICAL STORE (REDUCING ROOM)	NON-CLASSIFIED
EMULSIFIER DIESEL PUMP (WATER TREATMENT PLANT)	ZONE 2
WATER TREATMENT PLANT DIESEL TANK	ZONE 2
COAL STOCKPILE DIESEL FILLING STATIONS	ZONE 2
DIESEL FILLING STATION	ZONE 2
220V DC DIESEL GENERATOR 1A 1B, 2A 2B, 3A 3B AND 4A 4B	ZONE 2
COAL STAITHES	ZONE 20
6.6KV CONVEYOR BOARD NORTH	NON-CLASSIFIED
6.6KV - CONVEYOR BOARD SOUTH	NON-CLASSIFIED
380V CONVEYOR BOARD 1	NON-CLASSIFIED
COAL LABORATORY	ZONE 21
COAL LABORATORY - CHEMICAL ANALYSES (section for burning and testing the coal)	ZONE 22
LABORATORY	ZONE 2
MILLING PLANTS (Unit 1-10)	SAFE AREA
BURNER'S LEVEL 1,2,3,4 & 5	ZONE 2
BURNERS PROBE ROOM	ZONE 2
BURNER'S WORKSHOP	NON-CLASSIFIED AREA
PETROL FILLING STATION	ZONE 2
SEWAGE DIGESTER PLANT	ZONE 2
COAL STOCKPILE YARD GAS CYLINDER STORAGE AREA	ZONE 2

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MAIN STORE GAS CYLINDER STORAGE FOR H ₂ & CO ₂	ZONE 2
LABORATORY CYLINDERS STORAGE AREA	ZONE 2
MAIN STORE MIXED GAS CYLINDER STORAGE	ZONE 2
EMPTY CYLINDER AREA MAIN STORE GAS CYLINDER STORAGE FOR H ₂ , CO ₂ & OTHER GASES	ZONE 2
C & I MAINTENANCE UNIT 1 – 5	ZONE 2
C & I MAINTENANCE UNIT 6 – 10	ZONE 2
MAIN STORE (CHEMICAL STORE)	SAFE AREA
MAIN STORE (FLAMMABLE STORE)	ZONE 2
TRANSFORMER OIL STORE	FIRE HAZARD
MMD FLAMMABLE LIQUID STORE	ZONE 2
OIL STORE – OPERATING	FIRE HAZARD
FLAMMABLE LIQUID STORE ASH DAMS	ZONE 2
BUILDING SERVICE PAINT STORE	ZONE 2
EMD FLAMMABLE STORE	ZONE 2
MMD HAZARDOUS SUBSTANCES EMPTY CYLINDER AREA	ZONE 2

3.2 HENDRINA POWER STATION INSPECTION, MAINTENANCE AND REPAIRS SCOPE OF WORK

3.2.1 INSPECTION OF CLASSIFIED HAZARDOUS LOCATIONS

The service provider shall do inspection, as per the SANS 60079-17. All classified Hazardous location areas must be inspected using a detailed Inspection schedule - SANS 60079-17 table. The additional Hazloc Inspection Check Sheet Template F/ESK/675 must be completed as well during the inspection. Inspection must be bi-annually to all coal dust areas and annually to areas with flammable substances then submit report detailing all deviations and status of plant. The deviation arose must be repaired and maintained. The Hazloc Inspection Check Sheet Template F/ESK/675 should be completed for each circuit in a classified area and filed on the related classified area file.

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3.2.1.1 Inspections must always follow the following pattern:

- 1st inspection: Visual –within two years after the issue of CoC and the equipment
- 2nd inspection: Close – within two years after the 1st inspection
- 3rd inspection: Detailed – within two years after the 2nd inspection

3.2.1.2 Inspection of earthing in the hazardous location

All Ex rated equipment that are metallic will be inspected for external earthing and tested if its sufficiently bonded to earth .Earthing connections, including any supplementary earthing bonding connections area satisfactory (for example connections are tight and conductors are of sufficient cross- section) , It shall be inspected in physicaly and visual check. Fault loop impedance (TN) System or earthing resistance(IT systems) is satisfactory. A separate report (earthing report for hazardous location) will be provided indicating all deviation with recommendations.

3.3.1.3 Guide lines of inspection on Ex rated equipments

NB :NOT LIMITED TO THESE POINTS FURTHER GUIDE LINES CAN BE CHECK IN DETAILED INSPECTION SCHEDULE - SANS 60079-17 TABLE

- Check the following on Ex rated equipment
- Equipment is appropriate to the EPL/Zone requirements of the location
- Equipment group is correct
- Equipment temperature class is correct (only for gas)
- Equipment maximum surface temperature is correct
- Degree of protection (IP grade) of equipment is appropriate for the level of protection/group/conductivity
- Equipment circuit identification is correct
- Equipment circuit identification is available
- Enclosure, glass parts and glass-to-metal sealing gaskets and/or compounds are satisfactory
- There is no damage or unauthorized modifications
- There is no evidence of unauthorized modifications

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3.2.2 MAINTENANCE AND REPAIRS OF CLASSIFIED HAZARDOUS LOCATION AREAS

The Service provider shall do repairs and maintenance as per the SANS 60079-17. All classified Hazardous location areas must be maintained and repaired, to ensure that plants are compliant then Issue CoCs. The MIE will have general control over the maintenance and repairs in the classified hazardous locations electrical installations. The deviations arose during inspection will be repaired as per the findings in the report. Repairs will be conducted under the general control of MIE, All non-Ex rated equipment in the hazardous location will be removed and replaced by Ex-rated equipment and MIE will ensure that equipment is compatible for that area. Spares will be provided by the plant owner (Eskom).

3.2.2.1 Replacing a component in an Ex rated equipment

Maintenance on Ex rated equipment , in case where a certain component or part of the EX rated equipment needs to be replaced , the following guide lines shall be followed during re-assebling

- Before replacing a component, remove any dirt and excess grease to ensure that no greater gap than permitted will remain. Grease flanges and mating gland surfaces lightly to prevent corrosion and to facilitate future separation.
- Ensure that blind holes are so cleaned out that there is a gap between the lower end of the screw when it is fully tightened and the bottom of the hole.
- Fit washers or lock washers only where required by the design.
- Use paint, wherever necessary and applicable, to prevent corrosion, but excessive use of paint should be avoided.
- Do not use paint on the mating surfaces of flanges, but the edges may be painted. Do not cover the edges of flanges with tape.
- If possible before re-assembling, check clearances relating to the flame proofing or explosion proofing qualities, such as those around shaft glands and operating rods and spindles. If excessive wear is found in a bush, replace bush. However, adequate attention of lubrication should restrict wear to negligible amount.

3.2.2.2 Maintenance and repairs on earthing

Maintenance and repairs on earthing, all metallic structure shall be earthed and bonded. All classified areas shall be installed with a earthing bar that has been proven is sufficiently connected to the mass of earth. Ex rated equipment shall be bonded to that earth bar. Test shall be conducted in the intervals of inspection to ensure that conductive materials in that area are sufficiently bonded and earthed. Where necessary an external earth will be installed to all conductive Ex rated equipment such as electric motors , extraction fans, trip switches, even though it is connected to earth via the supply cable.

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3.2.2.3 Activities will be performed by service provider

- Removing non-Ex rated equipment such as motors,lights,control station , panel etc
- Remove installation that is not in used in the area
- Install Ex rated equipment such as motors,lights,control station , panel etc
- Running of cables for installation purposes
- Cable joint when necessary during any installation or maintenance
- Amounting of panels,lights,hydrogen sensors, extraction fans, level indicators etc
- Issuing CoCs for all classified hazardous location areas

3.2.2.4 Circuits on each plant (classified hazardous location)

The following plants will be inspected, maintained and repaired as per the circuits indicated in each plant.

NB:ANY CIRCUIT THAT IS NOT MENTIONED BELOW IS NOT EXCLUDED TO THE SCOPE, SERVICE PROVIDER SHALL REPAIRED ALL ELECTRICAL INSTALLATION IN THE CLASSIFIED HAZARDOUS LOCATION

1. Main hydrogen generating plant (Outside and inside)

- Lighting circuits

2. Unitized hydrogen skid basement (unit 1-10)

- Lighting circuit X10
- 3-phase sockets circuits

2. Main oil tank (unit 1-10)

- Electric motor circuit X 20

3. Hydrogen unitized plants(unit 1-10)

- Electric motor circuits X10
- Lighting circuits X10
- Hydrogen breaker circuit X10

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4. Generator brush gear canopy (unit 1-10)

- Lighting circuit X10

6. 24V DC battery rooms(unit 1-5)

- Lighting circuit X5
- Extraction fan circuit X5
- Hydrogen sensor circuit X5
- Fire detector circuit X 5

7. 24V DC battery rooms(unit 6-10)

- Lighting circuit X5
- Hydrogen sensor circuit X5
- Fire detector circuit X 5
- Emergency lighting circuit

8. 220V DC station battery room(1A&1B,2A&2B,3A&3B,4A&4B)

- Lighting circuit X4
- Extraction fan circuit X8
- Hydrogen sensor circuit X4

9. Ammonia dosing plant (unit 1-10)

- Electric motor circuit X 20

10. North and South bulk fuel oil tanks plant

- Level sensor circuit X8

11. North and south fuel oil plant transfer pump house

- Lighting circuit X2

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- Electric motor circuit X4
- Extraction fan circuit X4

12. North and south bulk fuel oil service pump house

- Lighting circuit X2
- Electric motor circuit X8
- Extraction fan circuit X4

13. North and south fuel oil service tanks

- Lighting circuit
- Level indicator circuit

14. North and south fuel of loading bay

- Lighting circuit

15. Water plant West chemical store

- Lighting circuit
- Extraction fan circuit

16. Mulsifire Diesel pump(water treatment plant)

- Charger panel X3
- Diesel pump starting circuit X3

17. Water treatment plant diesel tank

- No electrical installations

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18. Coal plant

Under Coal stathes (Coal stathes 1,2,3&4)

- Lighting circuits X 4
- Centrifigul switch circuits X 8
- Trip switch circuits X 8
- Electric Motor circuits X 8
- Sump pump panels X 4
- Single phase socket circuits X 4
- Lighting DBs X 4
- 3 phase welding circuits X 4
- Control station X 8
- Hooter circuits X 8

Coal plant incline Conveyors (9(A,B&C and 13(A,B&C)

- Lighting circuits X 2
- Centrifigul switch circuits X 6
- Trip switch circuits X 6
- Electric Motor circuits X 6
- Single phase socket circuits X 2
- Lighting DBs X 2
- 3 phase welding circuits X 2
- Control station X 6
- Electriomagnet panels and their electric motors circuits X 6
- Hooter circuits X 8

Coal bunkers Conveyors(10,11,14&15(A&B)

- Lighting circuits X 10
- Centrifigul switch circuits X 8
- Trip switch circuits X 8
- Electric Motor circuits X 8
- Single phase socket circuits X 2

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- 3 phase welding circuits X 2
- Control station X 8
- Hooter circuits X 8

Conveyor 4(A&B)

- Lighting circuits X 2
- Centrifugal switch circuits X 2
- Trip switch circuits X 2
- Electric Motor circuits X 2
- Single phase socket circuits X 2
- 3 phase welding circuits X 2

Conveyor 5(A&B)

- Lighting circuits X 2
- Centrifugal switch circuits X 2
- Trip switch circuits X 2
- Electric Motor circuits X 2
- Single phase socket circuits X 2
- 3 phase welding circuits X 2

Conveyor 6(A&B)

- Lighting circuits X 2
- Centrifugal switch circuits X 2
- Trip switch circuits X 2
- Electric Motor circuits X 2
- Single phase socket circuits X 2
- 3 phase welding circuits X 2

Conveyor 7(A&B)

- Lighting circuits X 2

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- Centrifigul switch circuits X 2
- Trip switch circuits X 2
- Electric Motor circuits X 2
- Single phase socket circuits X 2
- 3 phase welding circuits X 2
- Tripper Cars electric motors X2
- Tripper Cars panels

Conveyor 17

- Lighting circuits X 1
- Centrifigul switch circuits X 1
- Trip switch circuits X 1
- Electric Motor circuits X 1
- Single phase socket circuits X 1
- 3 phase welding circuits X 1

Conveyor 18

- Lighting circuits X 1
- Centrifigul switch circuits X 1
- Trip switch circuits X 1
- Electric Motor circuits X 1
- Single phase socket circuits X 1
- 3 phase welding circuits X 1

Coal weigh bin plant

- Lighting circuits X 1
- Centrifigul switch circuits X 1
- Trip switch circuits X 1
- Electric Motor circuits X 1
- Single phase socket circuits X 1
- 3 phase welding circuits X 1

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- Tranfer conveyor feeder electric motor X 1
- Lubricating electric motor X 1

19. Coal stockpile diesel filling station

- Dispensor circuit X1
- Lighting circuit X1

20. Coal laboratory

- Lighting circuits

21. Coal laboratory chemical analyses

- Lighting circuit

22. Laboratory

- Lighting circuits

23. Diesel filling station

- Diesel dispenser circuit X1
- Control panel X1

24. 220V DC Diesel generator (1A,1B,2A,2B,3A,3B,4A&4B)

- Diesel engine starting circuit X8
- Control and charger circuits panels X8
- Lighting circuit X8

25. Burners (level 1,2,3,4&5)

- Lighting circuits X10
- Burner panels x36

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26. Burners probe room

- Lighting circuit X1
- Extraction fan circuit X1
- 3-phase socket circuit X1

27. Burners workshop

- Lighting circuit X1
- Extraction fan circuit X1

28. Petrol filling station

- Petrol dispenser circuit X2
- Lighting circuit X1

29. Sewege digester plant

- No electrical installations

30. Coal stockpile yard gas cylinder storage area

- No electrical installations

31. Main store gas cylinder storage for hydrogen and carbon dioxide

- No electrical installations

32. Laboratory cylinder storage area

- No electrical installations

33. Main store mixed gas cylinder storage

- Lighting circuit X1

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34. Empty cylinder area main store gas storage for hydrogen , carbon dioxide abd other gases

- No electrical installations

35. C&I maintenance unit 6-10

- No electrical installations

36. Main store(flammable store)

- Lightining circuit X1
- Extraction fan circuit X1

37. MMD flammable liquid store

- Lightining circuit X1
- Extraction fan circuit X1

38. Flammable liquid store ash dams

- No electrical installations

39. Building service paint store

- Lighting circuit X1
- Extraction fan circuit X1

40. EMD flammable store

- Lightining circuit X1
- Extraction fan circuit X1

41. MMD hazardous substances empty cylinder area

- No electrical installations

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3.2.3 DEMARCATION BOARDS

All classified hazardous location areas will have demarcation boards on each entrance, such demarcation boards will indicate the flammable/combustible substances as well as the zoning of that area. Service provider will be required to affix demarcation boards to all the classified hazardous location area on each entrance. The demarcation boards will be provided by Eskom.

3.2.4 HAZLOC RISK ASSESSMENTS

The service provider will be required to review the existing risk assessments for all the classified hazardous location and ensure that all the risk attached to the classified area are identified, controlled or mitigated.

3.2.5 DOCUMENTATION

The service provider will update file for each plant. The file will have the following index:

- Zoning classification drawings
- Electrical schematic drawings
- MSDS – Plant specific
- Hazloc risk assessment
- List of Ex equipments
- IA certificates
- Scheduled PM's
- Repair & modification records
- Quality control documents
- Plant isolation procedure
- Copies of PTW
- Valid CoC including DoL registration certificate, MIE license, Instruments calibration certificate

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3.2.6 CALIBRATION OF HYDROGEN SENSORS

The Service provider will be required to perform an additional scope to calibrate the hydrogen sensors in all the battery rooms.It can be either be calibrated via ATL or GDSA. A calibration certificate should be provide that state, its functioning with parameterers. The hydrogen sensors will be removed in the plant and sent to a ATL for calibration by the service provider.

3.2.7 HAZLOC SITE COMMITTEE MEETING

The MIE will be required to attend all hazloc site committee meetings once a month and it can be more if required. Will be appointed as a member of the committee with responsibilities on such appointment.

3.2.8 ISSUING COC S AND CLASSIFICATION DRAWING

The Service provider will be required to review and improve the existing classification drawings of the plants as per SANS 60079-10-1 and SANS 60079-10-2.

Further more the Service provider will issue CoCs on all hazardous location areas once deemed compliant by the MIE.As when required the service provider will be requested to inspect and issue CoCs to normal installation however repairs are excluded for normal installation.

3.2.9 TOOLS

Only spark free tools can be used in a classified area. The tools used will have to be registered and a copy of their certificates will be kept in a hazardous location file.

Tools which are not spark free may only be used in a classified area when the following conditions have been met:

- The area has be confirmed free of any explosive substances by gas test. The area should be monitored continuously during the work period.
- All energy sources to the classified area has been de-energised, isolated and locked out at the point of supply outside the classified area.
- A valid permit to work must be obtained.
- Intrinsically safe test equipment must be used.

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3.2.10 INSPECTION TABLE

CERTIFIED EQUIPMENT - Detailed Inspection Schedule - SANS 60079-17											
						Project No:					
Customer:						DOCUME NT REF		IRS - EX		002	
Plant / Location / Site:						Tag no.					
Zone Classification: Date:						Approval		Client's ref.			
Project Detail:						Package no.					
Installation Type			New			Existing			New part of existing		
Electrical Contractor (Name & DOL Reg No.)											
Project Co-ordinator:				Contact Details:							
Designation:				Email Address:							
A. Equipment Information											
Equipment Type	Mot or		Sto p/St art		Enclosu re / JB		Light Fitting		Other	describe	
Location					Plant reference code						
P&ID no. & rev. no					Nameplate details						
Manufacturer					Certifying authority						
Equipment type					Zone classification						
Serial no					Protection Level						

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				General Condition	New	Normal	Abused
B. Equipment Check that:							
		Yes	N/A	Initials	Date	Comments	
1	Equipment included on detail plant equipment register ?						
2	Equipment (EPL) is appropriate to the Area/Zone requirements of the location?						
3	Equipment group is correct to gas group?						
4	Equipment temperature class is correct?						
5	Equipment circuit identification is available?						
6	Enclosure, glass parts and glass-to-metal sealing gaskets and/or compounds are satisfactory?						
7	There is no damage or unauthorized modifications.						
8	Bolts, cable entry devices (direct and indirect) and blanking elements are of the correct type and are complete and tight? - physical check						
9	Flange faces are clean and undamaged and gaskets, if any, are satisfactory?						

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10	Flange gap dimensions are within maximal values permitted?					
11	Lamp rating, type and position are correct?					
12	Motor fans have sufficient clearance to enclosure and/or covers?					
13	Breathing and draining devices are satisfactory?					
14						
15						
C. Installation						
		Yes	N/A	Initials	Date	Comments
1	Relevant Drawings					
	a.) Area classification drawings available?					
	b.) Above drawings approved? Date?					
	c.) All relevant electrical drawings available?					
	d.) Other drawings available: P&ID, control?					
2	Type of cable is appropriate?					
3	Type of cable is approved / appropriate and of correct current carrying capacity?					
4	There is no obvious damage to cables?					

CONTROLLED DISCLOSURE

5	Sealing of trunking, ducts, pipes and/or conduits is satisfactory?					
6	Stopping boxes and cable boxes are correctly filled?					
7	Integrity of conduit system and interface with mixed system is maintained					
8	Earthing connections, including any supplementary earthing bonding connections are satisfactory? (For example connections are tight and conductors are of sufficient cross-section)					
9	Automatic electrical protective devices operate within permitted limits?					
10	Automatic electrical protective devices are set correctly? (Auto-reset not possible)					
11	Specific conditions of use (if applicable) are complied with "X"?					
12	Cables not in use are correctly terminated?					
13	Obstructions adjacent to flameproof flanged joints are in accordance with IEC 60079-14?					

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14	Variable speed drives (voltage/frequency) installation in accordance with documentation, and certified as one unit?					
15	There are no un-authorized modifications					
16						
D. Electrical Compliance Testing - As per SANS 10142-1						
		Yes	N/A	Initials	Date	Comments / Results
1	Permission obtained to conduct electrical tests?					
2	Earth resistance from point of supply?					
3	Earth resistance from earth bar to points of consumption?					
4	Voltage readings taken. No-load/ full load and at worst load					
5	Earthing connections, including any supplementary earthing bonding connections are satisfactory? (For example connections are tight and conductors are of sufficient cross-section)					
6	Earth Fault loop impedance (TN systems) or earthing resistance (IT systems) is satisfactory?					
7	Insulation resistance is satisfactory?					

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8	Protection devices set on correct value in relationship to equipment?					
E. Environment						
		Yes	N/A	Initials	Date	Comments
1	Equipment is adequately protected against corrosion, weather, vibration and other adverse factors.					
2	No undue accumulation of dust and dirt?					
3	Ambient temperature not outside approved temperature range? (-20°C to +40°C)					
4	Humidity and moisture content below 5%?					
5	Lux level correct according to specifications?					
Signed (for:			Printed name:			D a t e:
Signed (for Client):			Printed name:			D a t e:
	<i>Completed and signed form to be stored in project's site records, as part of turn-over package file if applicable.</i>					2/ 1 2

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4. CONCLUSION

As stated in the scope of work , the main objective is to ensure that all classified hazardous locations areas are inspected,maintained and repaired, records are kept and updated continuously

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