TECHNICAL SPECIFICATION

FIRE SUPPRESSION SYSTEM FOR PHELOPHEPA TRAINSET

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REVISION 2

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CHANGE CONTROL

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TABLE OF CONTENTS

1. GENERAL SPECIFICATION

1.1. General:

- The Fire Suppression System will be installed in the power car of the Phelophepa Train set.

1.2. Scope:

1.2.1 Power Car

This is a specification for the supply and installation of the following:

- A Fire System supplied and installed in the Power Car consisting of:
  - A fire suppression system control panel (or control panel sections linked together)
  - A back-up battery system
  - Smoke detectors, optical and temperature
  - Fire bell
  - LED Flashing Beacon
  - A powder canister or water suppression system

1.3. Warranty

- **Fire Suppression System**
  - A two year warranty on the installation, this will include conduits, brackets, and wiring
  - Standard manufacturer's warranty on all components used in the installation
  - The warranty will only commence once the system is fully operational and tested. A commissioning certificate must be issued for this purpose.

1.4. Operating Environment

- The Power car will be required to work between coastal and inland at altitudes varying between sea level and 2095 meters above sea level.
- Temperature extremes:
  - The ambient temperatures under which the equipment will have to operate in for considerable periods may be any temperature between -10°C to 45°C while extreme temperatures of -15 to 50°Cmight occur.
- Humidity and environmental conditions:
  - Equipment needs to be able to work in humidity averaging 15% to 86% with 100% being common.
  - When operating at coastal areas a very humid salty atmosphere which is very corrosive will be encountered.
  - When operating inland, extreme dry, dusty, hot, and windy conditions will be experienced.

2. TECHNICAL SPECIFICATION

2.1. Fire Suppression System

2.1.1 A Fire Suppression System supplied and installed in the Power Car

2.1.2 The system should be able to operate independently from the IP based fire alarmsystem already in the train.

2.1.3 The system must be able to interface with the IP based fire alarm system already installed inthe train. The current fire alarm system and the fire suppression system must both trigger analarm in the event of a fire incident; these systems will act as a back-up for each other.

2.1.4 The fire suppression system must not cause false alarms that will result in activating the suppression system, there should be at least two coinciding mechanisms required for this action – i.e., both the optical and temperature detectors should trigger before the fire suppression system is activated. We have experienced false activation of the fire suppressionsystem when the train travels through a veld fire – a lot of smoke is present but there is no heat source.

2.1.5 The Power car could be divided into at least four sections (refer to Annexure A). The sectionsare:

2.1.5.1 Genset 1 section

2.1.5.2 Genset 2 section

2.1.5.3 Diesel tank compartment 1

2.1.5.4 Diesel tank compartment 2

2.1.6 As seen in Annexure A, there is a fire wall between each generator and diesel tank compartment.

2.1.7 It should be noted that, in this environment, a fire could be caused through an electrical short.

2.1.8 The LED beacons should be mounted at the two entry doors to the power car to indicate totrain personnel that the fire suppression system is about to be triggered or have been triggered.

2.1.9 All electrical conduits must be of the galvanized type and will be surface mounted inside thepower car (conduits will not be hidden behind panels).

2.1.10 The standard specification for the system must be based on SANS 10136.

2.1.11 A proposed lay-out of such a fire suppression system should accompany the tender, thesketch above must be used for this proposal.

3. QUALITY ASSURANCE

- This specification must be read in conjunction with Transnet Engineering Specification number RS/W 435/1996/MARCH.
- The complete installation and operation must be tested.
- During the test measurements (as deemed necessary and in agreement with Transnet Engineering)must be recorded and documented in a report and supplied to Transnet Engineering (TE).
- An employee of TE must be present during the test.

4. TESTING

The compilation and supply of complete documentation as well as the full testing as described for the Firesuppression System is the responsibility of the contractor. The project will not be considered complete until all the tests have been completed and all documentation received.

- Testing criteria to be determined in collaboration with the supplier as each system could be different.
- The testing criteria would then form part of the contract and the required measurements must be carried out as mentioned in point 3. Quality Assurance above.
- Testing criteria must include the required standards as well as the tolerances allowed.

5. OPERATING MANUAL

- The contractor will be required to supply as part of the contract, not later than one week prior to deliveryof the system, two approved operating manuals directly and specifically applicable to the equipment being supplied.
- The operating manuals must contain broadly the following information concerning the operation of the Fire Suppression System equipment:
  - General description and data of the equipment.
  - Brief description, function of and location of all major components.
  - Description and use of all controls
  - Description of all gauges and instruments.
  - General description of all automatic protection alarms and safeguards.
  - Preparation for operation.
  - Operating procedures.
  - Shut down procedures.

- Any further information which the contractor considers essential and desirable for the safe and correct operation of the equipment.
- The successful tenderer will be required to submit as soon as possible but no later than one month after being advised that their offer has been accepted, a draft copy of the manual for reviewand approval by Transnet Engineering.

6. MAINTENANCE INSTRUCTION MANUALS

The contractor will be required to supply as part of the contract, not later than one week prior to the completion ofthe refurbishment:

- A comprehensive maintenance instruction manual, directly and specifically to the equipmentsupplied.
- It is imperative that the maintenance manuals be detailed and complete in respect of all components being supplied and fitted to the system. They must cover all information concerning inspection, adjustment and maintenance that will be needed on a day-to-day basisand for light maintenance tasks. This document must include a maintenance schedule for all components of the system.
- The successful tenderer will be required to submit as soon as possible but not later than onemonth after being advised that his offer has been accepted, draft copy/copies for review andapproval by Transnet Engineering.
- All copies of all makers manuals, catalogues drawings and servicing instructions for all individual pieces of equipment installed to be compiled and forwarded to the:
  - Product Development Coaches, Koedoespoort on completion of this installation. All the relevant testcertificates to accompany this.

7. SPARE PARTS CATALOGUE

- The contractor will be required to supply as part of the contract, not later than one week prior to the final test and commissioning of the system two copies of a spare parts catalogue, directly andspecifically applicable to the equipment being supplied.
- It is imperative that the spare parts catalogues supplied will be entirely complete and refer to each and every component or part of all the equipment supplied.
- The catalogues must include suitable illustrations of all equipment from which it will bepossible for non-technical personnel to identify all spare parts speedily and easily.
- Should the spare parts catalogues normally furnished be of a type which refers to different models of different equipment, and which consequently includes components and parts which are not used on or

applicable to the equipment supplied, it will be necessary for such catalogues to be suitably marked to clearly and easily distinguish between the parts which are applicable and those which are not applicable

- The successful tenderer will be required to submit a list of parts required for each type of service. A separate list must be submitted of spare parts that the tenderer considers essential for Transnet Engineering to keep in stock for all equipment supplied.
- The successful tenderer will be required to submit a list of third-party suppliers of equipment as well as their contact details

ANNEXURE A: POWER CAR GENERAL LAYOUT