TRANSNET
freight rail

TECHNICAL

INFRASTRUCTURE

PARTICULAR SPECIFICATION

SUBSTATIONS AND SIGNAL RELAY ROOMS INDOOR SECURITY PEPPER GAS SPRAY ALARM SYSTEM

Author:	Engineering Technician Infrastructure (Electrical)	MM Lishavha	.....
Approved:	Senior Technologist Infrastructure (Electrical)	MM Mlonzi	.....
Authorised:	Principal Engineer Infrastructure (Electrical)	S Dayanand	.....

Date: 12 May 2008

Circulation Restricted To:

Transnet Freight Rail
Transnet and Relevant Third Parties
Unrestricted

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

TRANSNET
freight rail

TECHNICAL

INFRASTRUCTURE

PARTICULAR SPECIFICATION

SUBSTATIONS AND SIGNAL RELAY ROOMS INDOOR SECURITY PEPPER GAS SPRAY ALARM SYSTEM

A Division of Transnet Limited Registration Number 1990/00900/06

TABLE OF CONTENTS **PAGE NO**

1.0	**SCOPE**	**1**
2.0	**APPENDICES**	**1**
3.0	**SERVICE CONDITIONS**	**1**
4.0	**INSTALLATION AND WIRING**	**1**
5.0	**ARMING AND DISARMING**	**2**
6.0	**DESIGN**	**2**
7.0	**LEASING AGREEMENT**	**3**
8.0	**TENDERING PROCEDURE**	**3**
9.0	**ADDITIONAL INFORMATION**	**4**
10.0	**TESTING AND COMMISSIONING**	**4**
11.0	**TRAINING**	**4**

1.0 SCOPE

1.1 This specification covers the requirements for the design, supply, installation, and commissioning of an Indoor GSM Pepper Gas Spray Alarm System in Substations and Relay Rooms based on a Lease agreement.

2.0 APPENDICES

The following appendices form part of this project specification:

2.1.1 Appendix 1 - Schedule of quantities and prices.

2.1.2 Appendix 2 – Typical layout of substation buildings.

3.0 SERVICE CONDITIONS

3.1 Environmental Conditions

The equipment/material shall be designed for operation under the following conditions

3.1.1 Altitude – 0 to 1800m above sea level
3.1.2 Ambient Temperature – Minus (-) 10°C to Plus (+) 45°C
3.1.3 Relative Humidity – As high as 90%
3.1.4 Lighting – More than 10 flashes/ km² / annum

3.2 Power Supply

3.2.1 The equipment shall be capable of working off an auxiliary supply with a poor waveform caused by thyristor-controlled locomotives, line switching and lightning induced surges.

- A total harmonic voltage distortion figure of 27% must be catered for.
- Special attention must be paid to lightning protection.
- Suppliers are to provide comprehensive details of protection circuitry.
- The battery backup shall be able to provide power to the alarm system circuitry for at least 3 (three) days without being charged.

4.0 INSTALLATION AND WIRING

4.1 All wiring shall comply with SANS10142.
4.2 All materials and components used shall be of high quality and installation work shall be of a high standard of workmanship, carried out under proper supervision of experienced and competent officers.
4.3 All materials and components used for the installation shall comply with the SANS requirements.
4.4 Components or materials that do not bear the SANS mark shall be approved by the Transnet Freight Rail prior to installation.
4.5 The route of trenches shall be approved by a Transnet Freight Rail representative.

4.6 Care shall be taken not to damage the existing materials, including contaminating ballast stones, during excavation.
4.7 The minimum depth for trenches shall be 600mm.
4.8 The complete electrical installation shall be properly earthed, in accordance with the requirements of the standard regulation for the wiring of premises SANS10142.
4.9 Where the breaker room is separate to the main substation house, number of canisters shall be stated and the locations.
4.10 The contractor shall ensure that the pepper gas spray alarm system interfaces with the existing installation, where there is a newly installed alarm system.

5.0 ARMING AND DISARMING

5.1 Arming and disarming of the alarm system shall be via SMS or Transponders (Tags).
5.2 Valid tags shall be able to arm or disarm the alarm system when placed near the receiver.
5.3 It should be possible to deactivate lost tags.
5.4 The transponder shall have an indication light to show whether it is been activated or not.
5.5 The number and position of the transponder receivers required per site shall be determined at the site meeting.

6.0 DESIGN

6.1 COMPONENTS

6.1.1 Door Guards and Passive Infrared detectors supplied, shall be suitable for indoor use.
6.1.2 The positions and number of motion-detectors shall be discussed at the site meeting.
6.1.3 The system shall use cellular and telecontrol infrastructure.
6.1.4 Only authorised users using designated sim cards shall able to access the system via SMS.
6.1.5 The system shall allow programming either via SMS (remotely) or on site.
6.1.6 Each Tag shall have a unique identity which will enable the control box to identify the user.

6.2 CONTROL BOX

6.2.1 The Control Box shall able to send signals via SMS and Telecontrol (Refer to 8.4.3 & 8.4.4).
6.2.2 If an alarm is activated, the control box shall:-

- Activate the Siren, until it is reset manually or via an SMS signal.
- Activate the Strobe Light on top of the building, for the duration of the Siren.
- Send a signal (indicating the name and location of the site) to the dedicated Cell phones, Response Teams and to the Server (Computer) located at electrical control room.
- Activate the gas actuators to release the Pepper Gas.

6.2.3 Control Box shall be able to monitor and report on the following:-

- Low Battery
- Power Failure
- Low level of Pepper Gas(to be deduced from number of previous activations)
- Low Air Time

6.2.4 Should it occur that the alarm is not armed when all doors are closed and no movement of persons is detected in any of the protected zones, the control box shall be able to automatically arm the system after a period of twenty (20) minutes has lapsed.
6.2.5 The control box shall be able to log events chronologically at the server located at electrical control room.
6.2.6 The control box shall be capable of running up to four additional transponder receivers as these maybe required to arm and disarm the system from more than one point.
6.2.7 Adequate circuit protection shall be provided for the system (over-voltage, over-current, etc.)
6.2.8 Control Box shall have enough free space to expand the system for future plans.

6.3 CANISTER AND PEPPER GAS

6.3.1 The canister shall be of the refillable /replaceable gas cylinder type and shall comply with SANS10220.
6.3.2 The pepper gas formula shall be SANS approved and proof must be submitted, with the tender offer.
6.3.3 The pepper gas shall not have any effect on the substation equipment.
6.3.4 The pepper gas shall be of the non flammable type.
6.3.5 The inhalation, skin and eye contact with the pepper gas shall be highly irritating.
6.3.6 The pepper gas effects shall last up to 1 hour.

6.4 NETWORK

6.4.1 Cellular network to be used shall be approved by Transnet Freight Rail.
6.4.2 Messaging service shall not be of the general public service.
6.4.3 The telecontrol system shall be used as a backup to the cellular network.
6.4.4 In case of cellular network failure, alarm signals shall be relayed by use of the telecontrol system.

6.5 HARDWARE AND SOFTWARE REQUIREMENTS

6.5.1 Software is subject to Transnet Freight Rail's approval.
6.5.2 The software shall have full report writing capabilities.
6.5.3 Tenderers are to provide details of software and hardware requirements with their tender offers.
6.5.4 The number of transponder tags shall be 20 per Depot.
6.5.5 Provision shall be made for the supply, installation and testing of the SMS receiver at the control room.

7.0 LEASING AGREEMENT

7.1 The contractor shall enter into a leasing agreement with Transnet Freight Rail for a minimum period of 2(two) years.
7.2 The contractor shall ensure that the alarms are fully maintained and functional at all times.
7.3 Extension of the agreement shall be negotiated 60 days prior to the expiry of the existing contract.

8.0 TENDERING PROCEDURE

8.1 Tenderers shall indicate clause-by-clause compliance with this specification as well as the relevant equipment specifications.

8.2 Tenderers may submit alternative offers for equipment considered being equal to or better standard compared to that specified in this specification, however, approval of this shall be of Transnet Freight Rail discretion.

8.3 Such offers shall be accompanied by a full, detailed documentation indicating the suitability of the components supplied.

8.4 Transnet Freight Rail reserves the right to request the tenderer to run tests in order to prove the suitability of alternative equipment prior to approval.

8.5 Failure to comply with the above requirements may preclude a tender from consideration.

9.0 ADDITIONAL INFORMATION

9.1 Tenderers shall submit detailed descriptive literature, specifications, equipment schedules, layout of the equipment, etc., covering the equipment offered.

10.0 TESTS AND COMMISSIONING

10.1 All prescribed tests shall be carried out on equipment as well as the testing of installation, by the contractor, before commissioning.

10.2 Transnet Freight Rail representative shall be present to witness such tests on the equipment and installation.

10.3 The contractor shall list commissioning tests to be conducted on components offered.

10.4 The contractor shall give Transnet Freight Rail a notice of 5 working days before the day of tests.

11.0 TRAINING

11.1 The supplier will provide all the necessary training to the client's personnel with regards to the technology assistance.