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**METHOD STATEMENT FOR**

**INSTALLATION, TESTING & COMMISSIONING OF CLEAN AGENT SYSTEM**

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REVISION RECORD

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This cover page is a record of all revisions of the document identified above by number and title. All previous cover pages are hereby superseded and are to be destroyed.

Rev. No.	Date	By	Chkd.	Approvals	Description and Page Numbers of Revisions

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## 1.0 PURPOSE

The purpose of this method statement is to outline the method for handling, storage, installation, testing and commissioning for the Clean Agent System in accordance with the requirements specified in the relevant NFPA Codes, Standards and Project specifications in all applicable areas for the project.

## 2.0 SCOPE

The procedure applies for the installation, testing and commissioning of 200 Bar Clean Agent INERGEN gas fire extinguishing system in at the project.

## 3.0 REFERENCES

- Latest Approved shop drawings for the required and applicable areas for the fire fighting layouts.
- Specifications
- Project Quality Plan
- NFPA 2001: Standard for Clean Agent Fire Extinguishing System
- NFPA 72: National Fire Alarm Code
- Civil Defence Approval.

## 4.0 DEFINITIONS:

FF Sub-Contractor	: SUBCON
PQP	: Project Quality Plan
PSP	: Project Safety Plan
QCP	: Quality Control Procedure
HSE	: Health, Safety and Environment
MS	: Method Statement
ITP	: Inspection Test Plan
QA/QC	: Quality Assurance / Quality Control Engineer.
WIR	: Inspection and Test Request
AFC	: Approved for Construction.

## 5.0 RESPONSIBILITIES:

- Responsibilities for ensuring that the steps in this procedure shall be carried out are specified at relevant steps in the procedure:
  - Project Manager
  - Construction manager
  - QA/QC Engineer

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- Site Engineer
- HSE officer
- SK
- FF Sub-Contractor

### **5.1 Project Manager**

- The work progress shall be carried out as per planned program and all the equipment's required to execute the works shall be available and in good condition as per project planned.
- Specific attention is paid to all safety measures and quality control in coordination with Safety Engineer and QA/QC Engineer and in line with PSP and PQP.

### **5.2 Construction Manager**

- Construction Manager is responsible to supervise and control the work on site.

### **5.3 Site Engineer**

- The check and review the method of statement that will be submitted from FF sub-contractor to the system as per Consultant project specifications and approved shop drawings.
- Supervise and give any assignment for the FF sub-contractor.
- Provision of all necessary information and distribution of responsibilities to his Construction team.
- The constant coordination with the Safety Engineer to ensure that the works are carried out in safe working atmosphere.
- The constant coordination with the QA/QC Engineer for any works to be carried out and initiate for the Inspection for the finished works.
- He will ensure the implementation of any request that might be raised by the Consultant.
- Efficient daily progress shall be obtained for all the equipment and manpower.
- He will engage in the work and check the same against the daily report received from the Foremen.
- The passage of all the revised information to the Foremen and ensure that it's being carried out properly.

### **5.4 QA/QC Engineer (MEP):**

- The monitoring of executions of works at site and should be as per the approved shop drawings and project specifications.
- Ensure WIRs and MVRs are being raised for activities in timely manner and inspected by the Consultant.
- He will follow and carried out all the relevant tests as per project specifications.
- Obtain the required clearance prior to Consultant's inspections.
- Should acquire any necessary civil works clearances and coordination.

### **5.5 Site Foreman**

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- The carrying-out of work and the proper distribution of all the available resources in coordination with the Site Engineer on a daily basis.
- Daily reports of the works are achieved and coordinated for the future planning with the Site Engineer.
- Incorporate all the QA/QC and Safety requirements as requested by the concerned Engineer.
- Meeting with any type of unforeseen incident or requirement and reporting the same to the Site Engineer immediately.

#### **5.6 Safety Officer**

- The implementation of all safety measures in accordance with the HSE plan and that the whole work force is aware of its proper implementation.
- The implementation of safety measures is adequate to maintain a safe working environment on the work activity.
- Inspection of all the site activities and training personnel in accident prevention and its proper reporting to the Construction Manager and the Project Manager.
- The site is maintained in a clean and tidy manner.
- Ensure only trained persons shall operate the power tools.
- Ensure all concerned personals shall use PPE and all other items as required.
- Ensure adequate lighting is provided in the working area at night time.
- Ensure high risk elevated areas are provided are barricade, tape, safety nets and provided with ladders.
- Ensure service area/inspection area openings are provided with barricade, tape, and safety nets.
- Ensure safe access to site work at all times.

#### **5.7 Store Keeper (SK)**

- Responsible for overall Store operations in making sure to store the material delivery to the site and keep it in suitable area that will keep the material in safe from rusty and damage.

#### **5.8 FF Sub Contractor**

- FF sub Contractor (SUBCON) will handle the installation, testing and commissioning for the system in supervision from MEP Contractor.
- The work progress shall be implemented and monitored in accordance with the planned work program and he will provide reports to his superiors and report to MEP contractor.
- The constant coordination with the QA/QC Engineer and the site Engineer for any works to be carried out and initiate for the Inspection for the finished works.

### **6.0 EQUIPMENTS:**

#### **6.1 General Tools and Equipments:**

- Clean Agent System and Accessories.
- Pipe hangers and supports

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- Drilling Machine
- Grinding Machine
- Pipe Cutting machine
- Pipe Threading Machine
- Nylon straps/ shackles
- Grooving Machine
- Measuring Instruments (With Valid Calibration Certificates)
- Calibrated pressure gauge
- Calibrated Multi meter & Megger
- Hand Tools
- Mobile scaffold/ temporary/ high/ low scaffolding and stepladders
- Chain blocks
- Mobile scaffold/ temporary/ high/ low scaffolding and stepladders
- Air compressor
- Isolation valves
- Safety requirements tools such as safety shoes, safety helmet, safety glasses, fluorescent vest, and safety gloves to ensure maximum ability of safe work and dust mask when required.

## 6.2 MATERIAL USED:

### **INERT GAS CLEAN AGENT (INERGEN)**

#### **Inert gas clean agent (Inergen)**

##### **Cylinder**

- 200 Bar, 16.2 m3 INERGEN gas cylinders, meets DOT 3AA3000 equipped with CV-98 INERGEN valve, safety relief valve & shipping cap.

##### **Cylinder assembly**

- The bracketing components are constructed of heavy structural steel painted with a red enamel coating.

##### **Distribution piping**

- ASTM A 53 / A 106, Grade B, schedule 160, galvanized – up to pressure reducer orifice union
- ASTM A 53 / A 106, Grade B, schedule 80, galvanized – after the pressure reducer orifice union.

##### **Nozzles**

- ¼” up to 3” NPT, UL listed
- Orifice union/flange assemblies
- A 3000 psi (206.9 bar) union/flange contains a stainless steel orifice plate which is drilled to the specific size hole required based on the flow calculation.

##### **OTHER ACCESSORIES**

- INERGEN system valves, flexible connection, solenoids and pressure switches
- FP200 Cable 1.5 mm<sup>2</sup> / 2.5 mm<sup>2</sup> for wiring of solenoid valve & pressure switch
- FP cable accessories including fixing clips, glands & shrouds
- Field devices such as manual call points, sounders, sounder modules, beacons and accessories.
- SS Tube – SS , ASTM A 269 TP 316L of wall thickness 0.064

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### **6.3 PRESSURE TESTING EQUIPMENTS:**

- Pressure Test Pump (1 No.)
- Calibrated Pressure Gauges – 2 nos.
- Calibrated Pressure Relief Valve – 1 no.

### **6.4 Leakage Testing Tools:**

- Pressure Relief Valve (1 No.)
- Air Compressor (1 No.) or N2 Cylinders for test (1 Set)
- Calibrated Pressure Gauges (2 Nos.)
- Isolation valve - 2 nos.

### **6.5 INTEGRITY TEST EQUIPMENTS:**

- Canvas Sheet
- Air Current Fan unit
- Set of tools
- Sampling tubes c/w fittings (set)
- 15 meter - Extension Reel
- Digital Manometer Battery
- Digital Manometer 200/2000 Pa
- Digital Thermometer
- Measuring Tape
- Tile Lifter
- Hacksaw Blade

### **6.6 Pre- Commissioning Tools:**

- Smoke Gun
- Multi Meter
- Hand tools

## **7.0 PROCEDURE**

### **7.1 SAFETY**

- Ensure only trained persons shall operate the power tools.
- Ensure all concerned personnel shall use PPE (Personal Protective Equipment) and all other items as required.
- During the process of testing and commissioning, display warning sign boards necessarily provided and barricade the area, if required.
- Check whether required guards are provided for rotating equipment's before first start up.
- Isolate electrical power supply and lock the switchgear, whether work is to be carried out on any rotating equipment or electrical panels.
- Ensure adequate lighting is provided in the working area at night time.
- Ensure service area/work area openings are provided with barricade, tape, and safety nets.



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## 7.2 WORK SEQUENCE AND METHODOLOGY

- Check all material delivered to site is inspected properly by QA/QC Engineer and check if it is stored properly as per manufacturer's recommendations.
- MVR shall be raised for the inspection of materials received at site to the CONSULTANT Engineer.
- Work shall be carried out by the site staff under strict supervision and guidance of the concerned Supervisors / Foremen / Engineers.
- The MEP QA/QC Engineer shall check all the installations as per the Installation Check list.
- WIR shall be prepared by MEP QA/QC Engineer and will be submitted to CONSULTANT for their inspection and approval.
- MEP QA/QC Engineer shall coordinate with other Contractors and arrange inspection for installation to the CONSULTANT Engineer.
- MEP QA/QC Engineer is responsible for all installation activities for getting the work inspected / approved by CONSULTANT Engineer.

## 7.3 STORAGE

On receipt of 200 Bar INERGEN gas fire extinguishing system materials to site, precautions shall be taken for unloading, handling and storage, as follow: -

- Before shifting the cylinder storage area to be inspected by safety officer.
- All materials while unloading shall not be dropped, but lowered slowly to the ground in a smooth manner.
- Only experienced and properly trained persons should handle compressed gases.
- Do not remove or deface labels provided by the manufacturer for the identification of the INERGEN cylinder contents.
- Store the INERGEN gas cylinders with the transportation cap fitted.
- Store the INERGEN gas cylinders in a location that is free from any potential risk and away from sources of heat and ignition.
- INERGEN gas cylinders should be stored always in the vertical position and properly secured to prevent toppling.
- INERGEN gas cylinders kept in the storage area shall be periodically checked for general condition of the cylinder any possible leakage.
- INERGEN system pipes shall be stacked on a flat surface with adequate supports.
- Cable reels shall not be rolled or stored without any appropriate underlay.
- All other items such as INERGEN system valves, flexible connections, etc. shall be kept in racks within the site stores.
- Any item that is found to be damaged or not suitable shall be replaced with the new item. The removed item, if required to be stored temporarily. They shall be clearly marked and stored separately to prevent any inadvertent use.
- All cylinders while unloading and shifting in storage area, safety officer to be involved.

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#### **7.4 PREPARATION WORK**

Before commencing the installation work of the INERGEN system, the following activities shall be ensured:

- Ensure approved materials are available for the installation.
- All materials shall be inspected for damages upon receipt of materials in the store.
- Ensure the “Issued For Construction (IFC)” drawings are available for the installation.
- Ensure the necessary work permit, if any required is obtained prior to commencement of the work.
- Ensure the work area is clean and safe for work.
- Ensure the installation works are under taken only by trained and experienced personnel.

#### **7.5 INSTALLATION ACTIVITIES**

##### **7.5.1 INSTALLATION OF MANIFOLDS, PIPES WORK & CYLINDER BANK**

- Install manifolds and system components as per the layout drawings.
- Manifolds will be fabricated in off site – SUBCON workshop.
- Install INERGEN cylinder frame & supports as per the drawing and ensure that they are firmly fixed. The support system shall be recommended by the cylinder suppliers and as per drawings.
- Position and fix the INERGEN cylinders as per drawings and secure them in the brackets. Before installing cylinders, agent level to be checked.
- Install manifold pipe works and accessories as per AFC drawings. Check for correct leveling, positioning and alignment of the pipe routing.
- Connect Cylinder Hose with Inergen Cylinder
- Install electrical works- cables, junction boxes and actuators as per the P & ID.
- Termination of Cables for the Solenoid Valve & Pressure Switch to the enclosure with in the Cylinder Room.
- Pressure relief dampers shall be multi parallel blade with weighted arm closing assist. The frame shall be anodized Aluminium channel sections with formed Aluminium blades. Maximum blade length shall be 100 mm, and polyester foam seating strips shall be incorporated on blade edges. Bearings shall be in PVC with non corrodible shafts as per specs.
- 
- Install Inergen cylinders as per AFC drawings and secure them in the brackets.
- Assembly of Distribution Pipes with in the cylinder Room with Manifold
- Touch up paint on all paint damaged areas before transporting the container to site.
- Check the distribution pipes are clean inside and outside and ensure they are free from oil/grease and dust particles.

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- Determine the location of the pipe supports and pipe routes in the trench/building wall/roof.
- Determine all the pipe sleeves location & mark up in preparation for wall/slab coring.
- Perform the wall/slab coring using the appropriate drilling apparatus on the marked pipe sleeve location.
- Mark up anchor bolt positions for pipe supports on the concrete / purlins and drill to required lengths using portable electric drilling machine.
- Fix supports in position and ensure the supports are fixed securely.
- Use appropriate lifting equipment to lift the pipes when required.
- Assemble the pipe works using screwed fittings. Ensure appropriate sealing compound is used for screwed fittings.
- Clamp the pipe works to supports using U bolts and ensure they are tightly secured.
- The pipe works shall then be checked for correct leveling, position and alignment.
- Install temporary caps to any open end of pipes before leaving the work place everyday.
- Install the pre-assembled cylinder container on the foundation provided.
- Tie-In of the Cylinder Bank piping and distribution pipe work. Ensure that there is no stress on the pipes.
- Pipes and fittings to be tighten properly. Any excess cut / damage during tightening of pipes and fitting, then the same shall be replaced.

#### **7.5.2 INSTALLATION OF CABLE WORKS**

- Cables shall be pulled manually and clipped through the wall & ceiling's surface from the drum end to the termination end.
- Ensure sufficient length is maintained to connect to the devices as per the approved drawings before cutting the cable.
- The minimum bend radius will be as per manufacturer's specifications.
- Cable identification and tagging shall be in accordance with the approved drawings and project specification.
- Perform cable insulation test and ensure continuity of all cable cores. The results of all the tests to be recorded on approved forms.
- All test equipments used on site shall be accompanied by a current set of calibration certificates.
- Earthing of devices/panels shall be in accordance with the project specifications.

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- Use only approved seals on walls and flooring penetrations.
- Correct conductor polarity shall be maintained during connection to devices.
- Identification at the Fire Alarm panel and all associated connector blocks shall be in accordance with standard industrial practices.
- Prepare as-built drawings where necessary for relevant information to allow CAD department to amend existing drawings.

### **7.5.3 INSTALLATION OF FIRE ALARM FIELD DEVICES & LOCAL FIRE ALARM PANEL FOR EXTINGUISHING CONTROL**

- Install Manual Call Points, Sounders/Beacons and accessories as per the approved construction drawings and manufacturer's instructions and check the soundness of installation and alignment of the devices.
- All abort Switched, manual release devices shall be installed as per approved shop drawings.
- Terminate the cabling to the devices.
- Label the devices as per the tag numbers given in the drawing.
- Check the Local fire alarm panel for extinguishing control and its internal components including batteries before installation for any damage.
- Install the Local fire alarm panel for extinguishing control as per the approved construction drawings and manufacturer's instructions.
- Earthings of the panel shall be connected to the electrical Earth bar.
- Upon completion of cable pulling coming from the field devices, termination of cables shall be done.
- Power supply and battery connection shall be terminated after all system devices are in place.
- Clean the inside part of the panel upon completion of all cable termination and lock the door.
- Label the control panel as per the tag numbers given in the approved drawing.

### **7.6 FLUSHING & LEAK TESTING OF THE PIPING**

- By blowing air, flush the complete piping prior to leak testing. Refer to the Testing sheet.

#### **7.6.1 LEAKAGE TEST PROCEDURE:**

##### **7.6.1.A TEST REQUIREMENTS**

Before commencement of any leak testing for piping, ensure that the following are met:

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- Ensure that pipe supports and brackets are firmly secured the installed pipe work in position.
- Ensure that the piping has been flushed by clean air blowing and verified.
- Test area properly barricaded and signs posted to keep out of all non-essential personnel.
- All in-line instruments (cylinders, pressure switches & vent plugs) are isolated from the test by means of blanking off plugs or caps.

#### **7.6.1.B TEST PROCEDURE**

- The pneumatic leak test using air medium shall be conducted with all the temporary openings sealed by plugs / end caps - with no system components installed (like, gas discharge nozzles).
- An air compressor shall be connected to the pipe work at one of the manifolds ensuring that after pressurization of the pipe line being tested, the unit can be disconnected with the pipes pressurized (from the cylinders line – via check valve – to manifold / pipes end).
- 2 Nos. of calibrated pressure gauges, each having a range from 0 - 20 bar shall be used for testing. One pressure gauge shall be fitted at the start point and the second pressure gauge at the high level point at the farthest end.
- The testing shall be done at ambient temperature range.
- The system shall be gradually pressurized in steps of 5 PSI to reach 40 PSI (2.76 bar). A five minute interval shall be provided after each step to allow the air pressure to stabilize.
- After reporting required test pressure, check for leaks with a soap solution at each joint. If any leak is found, depressurize the system, repair the leak(s) and re-test.
- The test pressure of 40 PSI (2.756 bar) shall be maintained for 10 minutes minimum. The pressure drop shall not exceed 20% of the test pressure at the end of 10 minutes. If the pressure drops more than 20%, the testing shall be discontinued and leaking joint(s) shall be identified / repaired and a new test conducted.
- On satisfactory completion of the pneumatic test, the pressure shall be gradually reduced and system depressurized.
- The test certificate shall be completed with necessary signatures obtained.

#### **7.7 INSTALLATION OF THE DISCHARGE NOZZLES**

- Install the discharge nozzles in accordance with the layout drawing. Ensure correct nozzle sizes are fitted at specified locations as per the layout drawing / as - built gas flow calculations.

#### **7.8 “PUFF” TESTING OF THE PIPING**

- Blow air through the piping to make certain that all discharge nozzles are free from any blockages and to confirm that all check valves (if applicable) operate correctly.

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## **7.9 FINAL PAINTING AND IDENTIFICATION**

### **Final Painting**

- Paint touch-up of the system pipe works/supports shall be carried out at places, where paint damages have occurred using approved paint system.

### **Signage**

- Identification labels, operating instructions and warning signs in English and Arabic shall be provided as appropriate.

## **7.10 PRESSURE TESTING:**

- The manifolds shall be pressure tested one and half time of the design pressure of the 200 Bar INERGEN gas fire extinguishing system. All the manifolds shall be looped together and hydro tested at 300 Bars for a period of 2 Hours.

### **7.10.1 Test Preparation:**

Before commencement of pressure testing of the manifold, the following shall be ensured:

- All used materials have approved material certificates.
- The manifolds have been fabricated as per approved drawings.
- All manifolds to be tested shall be temporarily connected together by coupling and piping made for the testing.
- The pressure test should be conducted with no system components installed in the line.

### **7.10.2 Test Procedure:**

- Connect two calibrated pressure gauges to the system pipe work to be tested. One gauge shall install near the test pump and the other at the farthest end.
- A calibrated pressure relief valve set at a cracking pressure of 330 bars shall be installed in the line.
- A test pump shall be connected to the piping ensuring that the pump can be disconnected from the manifold when the pipes are pressurized.
- The manifold piping shall then be slowly filled with clean potable water using the pump. During water filling, the test crew must ensure that the system is completely vented.
- The piping system shall be slowly pressurized giving 5 minute interval in between every 100 bar. Pressure increase until a pressure of 300 bars is attained.
- A visual inspection shall be made on every joint for leakage. If any leaks are found, the system shall be drained and necessary repairs shall be done.
- When it is evident that there are no leaks or drop in the indicated pressure, the pressure shall be maintained for a period of 2 hours at ambient temperature.

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- Record the readings indicated in the pressure gauge after every 60 minutes.
- On satisfactory completion of the test, the water in the manifold piping shall be drained off and the pipes shall be dried up by blowing air.
- Fill in and complete the test certificate and obtain the necessary signatures.
- The test certificate shall be completed with necessary signatures obtained.

### **7.11 INTEGRITY TEST:**

#### **7.11.1 PRETEST PROCEDURE**

#### **7.11.2 PREPARATIONS**

- Ensure that the necessary work permit (if required) is obtained.
- Barricade the area.
- Inspect the room thoroughly for any openings not sealed, windows / doors opened.
- Ensure that the HVAC system is switched off and all the inlet / outlet dampers are closed.

#### **NOTE:**

The air-conditioning / ventilation system must be closed during the test. The required isolation duration will be around 2 hours for each protected area.

#### **7.11.3 TEST PROCEDURE**

- The procedure involves the fitting of a variable speed fan unit into an existing doorway by means of an adjustable door frame. The fan is used to pressurize and de-pressurize the enclosure with a known / measured quantity of air of very low pressure.
- Leakage is quantified by measuring the air flow rate and the developed pressure within the enclosure. A computer is used to calculate the “effective leakage area” (ELA) which is the sum total of all leakage sites within the perimeter of the enclosure.
- The test is essentially a two part test.
- The first part of the test uses a fan that quantifies the leakage areas within the enclosure and provides a calculation of the effective leakage area (ELA).
- The second part of the test involves the use of a computer model to predict whether the INERGEN gas would be held for a specified period.
- Personnel can be inside the enclosure during tests however, they must remain inside until tests are completed.

#### **7.11.4 Part 1: FAN TEST**

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- Ensure all pre-works were completed.
- Complete the fit-out of adjustable door frame and fan unit in door way. Connect the manometer and the pressure sampling tubes.
- After the equipment set-up, finalize preparations for the actual test.
- Fix the sign stating “DO NOT ENTER / CLOSE DOOR – FAN TEST IN PROGRESS”. The sign shall be posted in English.
- Fill the integrity test record form except the readings to be taken during the test.
- Take the readings of static pressure within the enclosure as appropriate.
- Perform Depressurization Test – the fan to be switched on and by varying the quantities of air blown into the protected enclosure, it will create negative pressures within the enclosure.
- Perform Pressurization Test – the fan to be switched on and by varying the quantities of air blown out of the protected enclosure to create Positive pressures within the enclosure.

#### **7.11.5 Part 2: COMPUTER CALCULATION**

- Following the completion of the Pressurization and Depressurization tests, the readings taken are entered into the computer along with the details of the INERGEN gas fire extinguishing system and calculation of the effective leakage area (ELA) are made as well as the prediction of the INERGEN gas retention time on the basis of design parameters.
- In case the enclosure does not hold 10 minutes retention time, then the client may need to obtain services of Specialist Consultant to seal the protected enclosure.
- After completion of the above, the room can be turned back to its normal stage.

#### **7.11.6 INTEGRITY TEST REPORT**

Upon completion of the tests, a full report shall be prepared and test results shall be compiled by the Engineer.

#### **7.12 Final Pre-Commissioning & Commissioning:**

##### **7.12.1 METHODOLOGY**

Before commissioning the 200 Bar INERGEN gas fire extinguishing system the following pre-commissioning checks shall be ensured: -

##### **7.12.1-A PRE-COMMISSIONING**

- Ensure that the installation activity of the INERGEN gas fire extinguishing system is completed.
- Ensure that the INERGEN system has been checked against the approved installation drawings.
- Ensure that the pipes are cleaned by blowing air.
- Ensure that the leak test of the piping has been carried out and witnessed.
- Ensure that the discharge nozzles and orifice units have been installed in accordance with the



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approved gas flow calculations.

- Ensure that the actuation hose and discharge hose are rigidly fitted.
- Ensure that the 200 Bar INERGEN gas cylinder pressure gauges showing the acceptable pressure range.
- Ensure that the installation of control panel and associated cabling / installation of devices are completed and tested.
- Ensure that the termination to all devices (like smoke detectors, bells, flasher beacons, solenoids & pressure switches) are completed and loops are checked.
- Ensure that all the identification and warning signs, flow directions are marked as appropriate / required.
- Ensure that the solenoid actuator is disconnected from the master cylinder.
- Ensure that the room integrity testing of the protected room is completed to ensure that the openings inside the room are within the acceptable limit and the results are acceptable.
- All results will be recorded in the attached Sheet.

#### **7.12.1-B COMMISSIONING**

- Before commencing the commissioning activities, please ensure that solenoid actuator is disconnected from the master cylinder and all loops have been checked for continuity and are witnessed by client / contractors.
- Switch ON the power for the control panel and check for the following functions of the control panel
- Using Auto / manual / disabled key switch, check the operation of system status indication

#### **Operate 1 NO. of smoke detector in the protected area using a smoke gun and confirm the FOLLOWING Sequence of operations:**

- Common fire alarm bell & common fire beacon in the building activate.
- Fire indication on the Extinguishing Control Panel operates.
- Fire signal on the F&G Panel and the shutdown of equipments.

#### **Operate one more detector in the protected area and confirm the FOLLOWING SEQUENCE OF OPERATIONS:**

- Pre-discharge sounder inside & outside the protected room is active. (intermittent Tone)
- On expiry of time delay period, confirm that the INERGEN solenoid actuator is activated.
- Discharged sounder/beacon outside protected area is activated. (Tone continuous)

#### **Operate the gas discharge pressure switch and confirm the following:**

- Gas discharge message on the Extinguishing Control Panel is activated.
- Gas discharge message on the F&G panel is activated
- Indication on Extinguishing Control Panel (INERGEN gas discharge completed) is activated

#### **PLACING THE SYSTEM IN SERVICE:**

- On completion of the tests as per above, reset the panel and install the solenoid on the master cylinder to place the system in service
- Install the manual release lever to the master cylinder.

	TITLE	Ref. No. :
	METHOD STATEMENT FOR	REV. No. 0
	<u>INSTALLATION, TESTING &amp; COMMISSIONING OF CLEAN</u>	Date :
	<u>AGENT SYSTEM</u>	Page 18 of 22

**8.0 ATTACHMENTS**

8.1 Inspection & Test Plan

8.2 Check Lists

8.3 Risk Assessment