WES1A - Fire Suppression

System Manual by Skanstec Engineering B.V
Submittal Number: SM-0009-FP-MDCx

Revision	Date of Issuance	Scope of Revision
A	2025-04-17	First Approved Version

Table of Contents

SM-0009-FP-MDCx - Fire Suppression System (Siemens)

This System Manual has been produced by Skanstec Engineering B.V as per current industry best practices and applicable occupational safety and health regulations.

This System Manual will allow the operator to operate and maintain the installed systems/equipment safely.

It is strongly recommended that the System Manual is first read and understood before commencing any operations on the installed systems/equipment.

The System Manual will provide information to the operator of the facility on:

- What systems/equipment/components were supplied and installed and by whom
- General description of the equipment/system and its relation to other related systems
- Detailed information on safe operation and maintenance
- References to relevant drawings, commissioning documentation, manufacturer literature (product data, calculation) and warranties

CONTACT INFORMATION

Design Team Details

The design for the installed systems/equipment was completed by:

Name of Fire Detection and Suppression Designer: Siemens

Address of Designer: Postbus 16068, Den Haag, 2500 BB

Telephone Number: [redacted]

Contact Name: [redacted]

Main Contractor Details

The construction for the systems/equipment was undertaken by:

Name of Contractor: Dornan Engineering

Address of Contractor: 10 Eastgate Ave, Castleview, Little Island, Co. Cork

Telephone Number: [redacted]

Contact Name: [redacted]

Subcontractor Team Details

The installation for the systems/equipment was undertaken by:

Name of Fire Detection and Suppression Designer: Siemens

Address of Designer: Postbus 16068, Den Haag, 2500 BB

Telephone Number: [redacted]

Contact Name: [redacted]

Owner Project Team Details

Project Manager: [redacted]

Manufacturers and Component Suppliers

Name	Equipment/System Supplied	Contact (Phone, Email, Address)
Georg Fischer	Extinguishing Gas Materials	Phone: [redacted] Email: [redacted] Address: Mariazeller SlraSe 75 A-3160 Traisen Austria
MUPRO	Extinguishing Gas Materials	Phone: [redacted] Email: online-shop_SI@muepro.de Address: Borsigstraße 14 65205 Wiesbaden Germany
PUMA	Inert Gas Pressure Relief Dampers	Phone: [redacted] Email: sales@pumaproducts.co.uk Address: Unit C Alexander Bell Centre Hopkinson Way West Portway Business Park Andover Hampshire SP10 3UR
SIEMENS	Extinguishing Agent Cylinder, Silent Nozzle, Solenoid and Pneumatic Actuator, Valves, Hoses, Manifold, Cables, Pressure gauge, Pressure Switches, Pressure Regulator, Free-standing rack module, Manual Release Button, Emergency Stop Button, Power Supply Kits, Sounder Beacon, Base Deep (Wall Mounting)	Phone: [redacted] Email: Contact via Web Address https://new.siemens.com/global/en/general/contact.html Address: Smart Infrastructure Global Headquarters Theilerstrasse 1a CH-6300 Zug

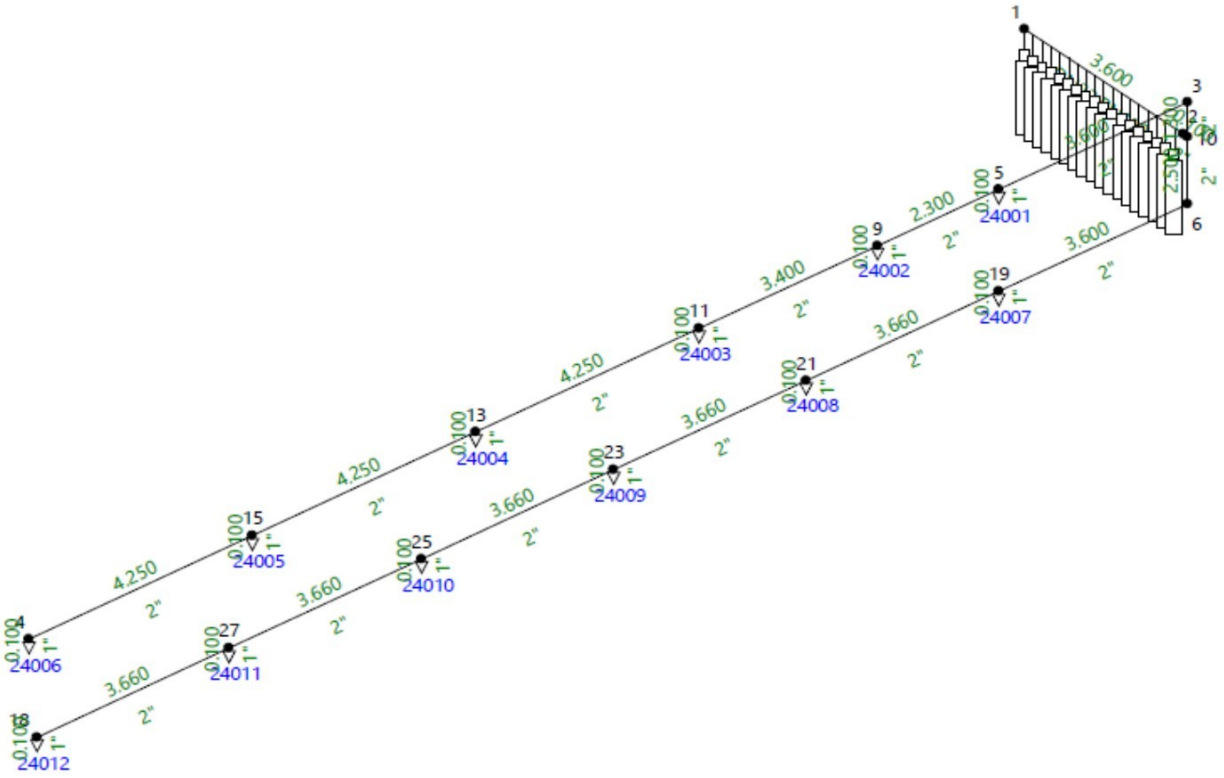
1. System Overview

SM-0009-FP-MDCx - Fire Suppression

1.1 System Description

The System consists of the following:

- Extinguishing Agent Cylinder and Fittings.
- Silent Nozzles.
- Valves and Pipework



- Manual Release Button and Emergency Stop Button.
- Power Supply Kits.
- Sounder Beacon.
- Extinguishing Gas Materials.
- Inert Gas Pressure Relief Dampers.

WES1A - MDCx Fire Alarm and Suppression Design

The fire suppression system extinguishes electrical fires by releasing a concentrated gas into the full building except the Fire Suppression Room, thereby removing oxygen and extinguishing the fire.

The extinguishing control panel, located within the fire control panel on the First Floor, is designed to monitor the gaseous extinguishing systems installed in the Control Room, Switchgear Room on the Ground Floor, and the First Floor Level.

For further information regarding the extinguishing control panel and detection system,

please consult the document titled "WES1A_ Fire Alarm_System Manual"

1.1.1 Extinguishing Agent Cylinder and Fittings

The 300 bar gas cylinders, equipped with F230 valves and protective caps, are installed in the Cylinder Room on the Ground Floor. These cylinders hold the IG-100 (Nitrogen) under pressure until it is discharged.

An actuator serves as a valve opening device utilized to release the gas stored in the cylinder. The solenoid actuator is attached to the F230 cylinder valve EL actuation port and is electrically activated by the extinguishing control panel (ECP). Meanwhile, the pneumatic actuator is attached to the cylinder valve PM actuation port and is activated by pressure from the pilot line.

The bleed valve is installed on a pneumatic actuator. It serves to regulate pressure in the pilot circuit by creating microleaks, thereby preventing pressure buildup. When the pilot circuit is not pressurized, the bleed valve remains open (piston retracted). However, when the extinguishing system is activated, the bleed valve closes (piston extended).

The manifold links the cylinders within the battery together. It gathers the extinguishant from each cylinder and channels it into the discharge network. Each cylinder connects to the manifold through a discharge hose, a check valve, and a pressure regulator. A 2-row manifold is installed for 140-liter extinguishant cylinders, allowing the connection of 4 to 10 extinguishant cylinders.

Fittings are supplied for use in the pilot circuit and discharge piping of an automatic gas extinguishing system. Discharge hoses with a nominal diameter of 16 mm are equipped with end fittings featuring swivel nuts. Additionally, a safety component is mounted on the discharge hose outlet.

The manocab-start connection cable is used to electrically connect the first contact pressure gauge. The manocab-ext cable serves as an extension cable and is offered in lengths of 1.5 m and 5 m. The manocab-ext extension cable can be connected to any point in the monitoring line, such as between the manocab-start connection cable and the first contact pressure gauge on the line, or between two contact pressure gauges that are distant from each other.

The MANO-AH testing tool is utilized to simulate a "Loss of agent" signal, providing safety for technicians during commissioning and maintenance tasks.

The check valve is employed to guarantee that gas flows in only one direction: towards the extinguishing agent cylinder/discharge network. It prevents gas from flowing in the opposite direction.

The pressure gauge with electrical contacts for F230 cylinder valves serves for visual checking of the cylinder pressure and for transmitting "Extinguishant loss" information to the extinguishing control panel (ECP). The pressure gauge contact remains open when the pressure equals the nominal pressure of the cylinder. However, it closes when the pressure drops below the switchover point.

The pressure switch detects pressure increases in the discharge network and sends gas flow

data to the ECP. It activates when the pressure rises by 5 bar.

Rack accessories are utilized to affix components of the automatic gas extinguishing system onto the rack.

1.1.2 Silent Nozzle

The silent nozzle is designed specifically for use in inert gas extinguishing systems. Its unique linear design facilitates the inflow of inert gas into the protected area, consequently reducing noise levels.

1.1.3 Valves and Pipework

Pressure regulators are supplied to decrease and maintain pressure at a consistent level. They are mounted in the following locations:

- At the inlet, on the check valve CAR12-360.
- At the outlet:
  - On the discharge piping in extinguishing systems with a single cylinder.
  - On the manifold in extinguishing systems with multiple cylinders.

Distribution pipework is installed to each protected area with discharge nozzles. All pipework is securely fastened to the structure, leading directly back to the adjacent bottle storage area.

1.1.4 Manual Release Button and Emergency Stop Button

The manual release button is integrated into the gas extinguishing system to enable indirect extinguishing release. This is achieved by pushing in the glass plate and pressing the push button. To replace the glass plate, open the housing door with the key. Ensure the push button is reset before closing the door again.

Similarly, the emergency stop button is installed within the building to provide an indirect stop function. This is done by pushing in the glass plate and pressing the push button. Once the button is no longer pressed (self-reset), the extinguishing release will resume. To replace the glass plate, open the housing door with the key.

For added safety, a protective cover accessory shields both the manual release and emergency stop buttons from unintentional glass breakage. Additionally, a seal accessory protects these buttons in wet applications.

1.1.5 Power Supply Kits

The standalone power supply is intended for decentralized supply to external devices. This power supply kit features an integrated operating and fault indicator, enabling the forwarding of faults via potential-free contacts.

Included in the power supply kit (70 W) is a mounted housing, a left-hand installation frame containing an integrated power supply (70 W) FP2015 and FP120-Z1 mainboard, a right-hand installation frame for optional components, and a pre-wired connection for the battery.

1.1.6 Sounder Beacons

Sounders / beacons are strategically installed throughout the protected area to provide both audible and visual indications of fire alarm activation. Beacons serve as a supplement to sounders, catering to occupants who may be deaf or hard of hearing.

The sounder beacon (voice) is wall-mounted and utilizes an addressable FDnet/C-NET network for communication. It provides voice output in multiple languages, including:

- Fifteen languages integrated into the device, with the option to order additional languages.
- Each voice message can be emitted in two languages.
- Up to seven available events.
- Customer-specific voice messages and/or tones can be ordered to suit specific requirements.

1.1.7 Inert Gas Pressure Relief Dampers

Inert Gas Pressure Relief Dampers (PRDs) are installed to alleviate overpressure spikes during the release of high-pressure inert gas systems. These dampers typically remain closed under normal conditions. However, in the event of a gas discharge, they open to relieve both negative and excessive positive pressure, safeguarding the integrity of the room.

1.2 Asset Identifications

Asset Tag/ID	Manufacturer	Model	Description
NA	SIEMENS	CYF-140 300 55 - S54476 - C646-A1	Extinguishing Agent Cylinder (Cylinders Equipped with Valve and Protective Cap) Capacity: 20 l +5/-0 % Cylinder Test Pressure: 450 bar Cylinder Valve: F230-IG300 / F2303000
NA	SIEMENS	Sinorix SDN-x	Silent Nozzle Max. Operating Pressure: 100bar Material: Brass (CuZn39Pb3)
NA	SIEMENS	ACTF230-EL	Solenoid Actuators Nominal Actuation Voltage: 24 VDC, polarity-independent Minimum / Maximum Actuation Voltage: 18.0 VDC / 27.6 VDC
NA	SIEMENS	ACTF230-PNEUMS	Pneumatic Actuators Actuation Pressure

Asset Tag/ID	Manufacturer	Model	Description
			Nominal: PN8 (bar) Minimum: 8 bar Maximum: 360 bar
NA	SIEMENS	BLEED-360	Bleed Valves Maximum Operating Pressure: 360 bar Closing Condition: Flow over 40l/min. (approx. 0.4 bar)
NA	SIEMENS	CAR12-360	Check Valves Nominal Diameter: 12 mm Flow Area: 113.3 mm² Maximum Operating Pressure: 360 bar
NA	SIEMENS	FLEX16-500 - S54476-B565-A1	Discharge Hoses Nominal Diameter: 16 mm Maximum Operating Pressure: 360 bar
NA	SIEMENS	FLEX5-400 - S54476-B560-A2	Pilot Hose Nominal Diameter: 5 mm Maximum Operating Pressure: 360 bar
NA	SIEMENS	FLEX5-450 - S54476-B560-A3	Pilot Hose Nominal Diameter: 5 mm Maximum Operating Pressure: 360 bar
NA	SIEMENS	FLEX5-800 - S54476-B560-A9	Pilot Hose Nominal Diameter: 5 mm Maximum Operating Pressure: 360 bar
NA	SIEMENS	MANI80-2-140-10 - S54476-B762-A10	DN80 2-row Manifold for 140 l Extinguishant Cylinders Internal Diameter: 78.9 mm External Diameter: 88.9 mm Maximum Operating Pressure: 120 bar
NA	SIEMENS	MANI80-2-	DN80 2-row Manifold for 140 l

Asset Tag/ID	Manufacturer	Model	Description
		140-8 - S54476-B762-A8	extinguishant cylinders Internal Diameter: 78.9 mm External Diameter: 88.9 mm Maximum Operating Pressure: 120 bar
NA	SIEMENS	MANI80-DS - S54476-B718-A1	Fittings for DN80 high pressure manifolds and extension pipes Nominal Size: DN80 Thread: Female ISO 228-1 G 3" thread (Quantum)
NA	SIEMENS	MANI80-END - S54476-B712-A1	Fittings for DN80 high pressure manifolds and extension pipes Nominal Size: DN80 Thread: Female ISO 228-1 G 3" thread (Quantum)
NA	SIEMENS	MANOCAB-START – A5Q00073018	Connecting cable, end-of-line device, and testing tool for pressure gauges with electrical contacts Voltage: 24 VDC, max 48 V Current: max. 1 A
NA	SIEMENS	MANOEOL-XC10 – S54476-X11-A2	Connecting cable, end-of-line device, and testing tool for pressure gauges with electrical contacts Voltage: 24 VDC, max 48 V Current: max. 1 A
NA	SIEMENS	MANOF230-180	Pressure gauge with electrical contacts for F230 cylinder valves Nominal Dimension: 50 mm Nominal pressure: 200 bar Measurement Range: 0 to 315 bar
NA	SIEMENS	PSWITCH-300 5	Pressure Switches Maximum Operating Pressure: 300 bar Maximum Voltage: 250 V~ Switching Current (max.): 4 A

Asset Tag/ID	Manufacturer	Model	Description
NA	SIEMENS	S54476-B505-A1	Pressure Regulator Flow Diameter: 14.5 mm Flow Cross-Section: 165.1 mm2 Operating Pressure at 15°C: 300 bar
NA	SIEMENS	RACF-140L X	Free-standing rack module for extinguishant cylinders
NA	SIEMENS	Refer to Literature	Rack Accessories
NA	SIEMENS	Refer to Manufacturer Literature	Fittings for pilot circuit and discharge piping Maximum Operating Pressure: 360 bar
NA	SIEMENS	DM1103-L	Manual Release Button Operating Voltage: 16... 26 VDC Max. Current, Permanent: 60 mA
NA	SIEMENS	DM1103-S	Emergency Stop Button Operating Voltage: 16... 26 VDC Max. Current, Permanent: 60 mA
NA	SIEMENS	FP120-Z1	Power Supply Kits Power Supply: 70 W (ASD) Batteries: max. 17 Ah
NA	SIEMENS	FDS226-RR	Sounder Beacon Voltage: 16...33 V DC Operating Current: 400 µA
NA	SIEMENS	FDB227-R	Base Deep (Wall Mounting)
NA	MUPRO, GF	Refer to Manufacturer Literature	Extinguishing Gas Materials
NA	PUMA	PRD 675	Inert Gas Pressure Relief Dampers Free Vent Area: 0.417 m² Width x Height: 730 x 730

2. Sequence of Operation

SM-0009-FP-MDCx - Fire Suppression

2.1 Schedule of SOOs Sequence of Operations

	SOO Title	Submittal/Document Reference Number
1.	Fire Suppression & Fire Alarm System	WES1A-MDCx-SOO-FP-003

3. Drawings

SM-0009-FP-MDCx - Fire Suppression

3.1 Schedule of AE Drawings

	Drawing Title	Drawing Number
1.	Extinguishing System	xx
2.	MDC-X Fire Alarm Plan – Ground Floor	xx
3.	MDC-X Fire Alarm Plan – First Floor	xx
4.	MDC-X HVAC and Pipework Plan – Ground Floor	WES1A.M-2002-MDC-0

3.2 Schedule of other Drawings

IMPORTANT! DCOps technicians, ensure to consult the latest electrical single-line diagrams in the Operations document management system.

	Drawing Title	Submittal/Document Reference Number
1.	N/A	

4. Maintenance

SM-0009-FP-MDCx - Fire Suppression

4.1 Health & Safety Requirements

Prior to commencing any maintenance work, you must carry out a risk assessment and sign off the applicable form. You must take all necessary control measures dictated by the result of the risk assessment.

Prior to commencing the maintenance, you must evaluate and, if necessary, ensure the equipment/systems are isolated and locked out and that all control and ancillary circuits have been de-energized. See section 4.2 for further instructions.

System / Equipment	Potential Hazard	Advice on Minimizing Hazard
WES1A Fire Suppression System (Siemens)	Trip or fall hazards	• Walking/working surfaces training for working around uneven, wet and slippery surfaces (includes warning to others of slippery surfaces) use cord cover and out of traffic areas
WES1A Fire Suppression System (Siemens)	Working at Heights	Registers are to be completed as per client procedures laid down within this section to include: • working platform inspection • provision and use of work equipment, report of inspection • lifting operations and lifting equipment, report of inspection Plant and machinery will only be operated by authorised persons, where applicable, and this will be restricted to holders of a CITB recognised Construction Plant Competency Scheme Card (CPCS) or equivalent approved scheme. Mandatory training requirements are to be imposed.
WES1A Fire Suppression System	Periodic lifting/ climbing/ bending/	• Use proper lifting techniques. Ergonomic training

System / Equipment	Potential Hazard	Advice on Minimizing Hazard
(Siemens)	stooping	
WES1A Fire Suppression System (Siemens)	Potential electrical shock	• Implement LOTO in accordance with employer policy and as noted in Safe Isolation advice. • Avoid working around electrical equipment or outlets. • Ensure insulation on electrical cord is unbroken. • Shut-off electricity if possible. • Call in electrician for electrical repair/connection.
WES1A Fire Suppression System (Siemens)	Fire and Emergency response	• Proper training to be given of fire extinguisher, first aid and phone communication
WES1A Fire Suppression System (Siemens)	Cuts, crush, pinch, etc. during operation and/or maintenance of powered equipment (electrical, pneumatic, hydraulic, etc)	• Keep protective guards in place disconnect from power source before servicing. Use lockout-tag out. use PPE • Keep away from power lines

4.2 Lockout Procedure

IMPORTANT:

- Only trained and authorized operators are allowed to perform energy isolations and lockout as per applicable legislation.
- Operators must take into account all other systems that might relate to each energy isolation.

Equipment	Lockout Procedure(s)
Power Distribution Systems	This instruction illustrates a safe isolation procedure for persons concerned with work on low and medium voltage electrical systems. Provide for a safe system of work upon electrical circuits and equipment and applies directly to building operations. Apply the local regulations as a standard to any place where a person is at work. The regulations also provide that wherever repair, alteration,

Equipment	Lockout Procedure(s)
	extension or cleaning is carried out upon electrical systems or where technical knowledge is required in order to avoid the danger of an electrical shock a competent person only may do such work and he must be accompanied.
General Electrical Safe Isolation (LOTO)	Implement Lock Out Tag Out Process as applicable to the equipment. This ensures the requirements According to the European standard EN 50110-1, the safety procedure before working on electric equipment comprises the following five steps: **1.** Disconnect completely; this means identify the source of supply, followed by the operation of switches, the removal of fuses or links, or physical disconnection of conductors in order to make any system, or part of a system DEAD and secured so that it cannot be inadvertently made live. This will involve cutting off an electrical installation, a circuit or an item of equipment from every source of electrical energy. **2.** Secure against re-connection; A keyed lock and tag should be applied to the point of electrical isolation **3.** Verify that the installation is dead; by testing the equipment/system is dead. **4.** Carry out earthing and short-circuiting; and **5.** Provide protection against adjacent live parts. LOTO is the practice of Lock Out Tag Out. This involves removing a fuse or isolating a breaker & locking it off with a padlock to which only the person who isolated & is working on the isolated system has the key. This is the only acceptable method of 'Safe Isolation'.
General	• Avoid risk wherever possible. • Carry out risk assessment to evaluate risks that cannot be avoided. • Provide means of isolating pipework to allow maintenance and repairs to be carried out.

4.3 Recommended Maintenance and Schedule

Note: This section is supplemented by manufacturer's literature documents.

System/Equipment	Maintenance Tasks	Frequency
Gaseous Fire	Gaseous Fire Fighting Visual Inspection	WEEKLY

System/Equipment	Maintenance Tasks	Frequency
Fighting	Weekly the client/user of the system should Visually check the hazard and the integrity of the enclosure for changes which might reduce the efficiency of the system. Carry out a visual check that there is no obvious damage to pipework and that all operating controls and components are properly set and undamaged. Check pressure gauges and weighing devices, if fitted, for correct reading and take the appropriate action specified in the users` manual. The client/user of the system should check that all personnel who may have to operate the equipment or system are properly trained and authorised to do so and, in particular, that new employees have been instructed in its use. Such systems must only be maintained and tested by qualified engineers and in accordance with standard codes. This task is applicable to the extinguishants listed below; FK-5-1-12, HCFC Blend A, HCFC-123, HCFC-22, HCFC-124, HFC 125, HFC 227ea, HFC 23, IG-01, IG-100, IG-55, IG-541. Where, due to unforeseen difficulties, it is necessary to leave an installation not available for use, the fire and rescue service should be informed immediately in order that alternative arrangements can be made to cover this deficiency should the need arise. In addition, a suitable notice to indicate that the installation is not available for use should be placed in a prominent position.	
Gaseous Fire Fighting	<u>Residential High Rise Fire Equipment Mandatory Check</u> Any equipment for use by the Fire Services must be checked and its condition reported to the Local Fire and Rescue Service electronically. Monthly checks are also be required on all evacuation lifts and key fire-fighting equipment (which is defined in The Fire	1 MONTHLY

System/Equipment	Maintenance Tasks	Frequency
	Safety (England) Regulations 2022). Responsible persons will be required to record the outcome of these monthly checks in an open and transparent way that is accessible to residents (for example by posting them on a notice board or making them available to a resident's association).	
Gaseous Fire Fighting	<u>Gaseous Fire Fighting Enclosure Integrity Test</u> • Check the enclosure for any boundary penetrations or other changes to it that could affect leakage of gas on operation. If this cannot be visually determined an integrity test should be carried out. • Note: Where the integrity test reveals increased leakage that would result in an inability to retain the extinguishant for the required period, remedial action shall be carried out.	6 MONTHLY
Extinguishant Control Panel	<u>Extinguishant Control Panel</u> • Check to correct functioning of power supplies, battery backup. • Check correct receipt signals and alarms. • Check correct action in event of simulated Fire Condition. If faults are found the end user shall be advised and should take corrective action. <u>Gaseous Fire Fighting Auxiliary Electric Device/ Alarm, Door Closures, Etc.</u> • Test Operation. • Note: Operational test to be carried out in accordance with manufacturers recommended procedure.	6 MONTHLY
Gaseous Fire Fighting Cylinders	<u>Gaseous Fire Fighting Cylinders</u> • Check labels are securely fixed and legible, check security of brackets	6 MONTHLY

System/Equipment	Maintenance Tasks	Frequency
	and fixings, check liquid level, check pressure in cylinder. • Externally examine containers for signs of damage or unauthorized modification, and for damage to system hoses. If the visual examination shows any defect, the hose(s) shall be replaced. <u>Gaseous Fire Fighting Cylinder Gauges</u> • Where container pressure gauges or weight-monitoring devices are used for this purpose, they shall be compared to a separate calibrated device. • Note: Operational test to be carried out in accordance with manufacturer`s recommended procedure. <u>Gaseous Fire Fighting Valve Actuators</u> • Where possible, remove cylinder valve and replace action caps. • Check supply voltage and polarities are correct. • Check control signal for presence and that polarity is correct. • Check operation of auxiliary control functions i.e. on/off switches, frost protection and position indicators. • Check manual operation to prove actuator will mechanically open/close valve to its working limits. • Check for correct position for application when power fails.	
Gaseous Fire Fighting Pipework	<u>Gaseous Fire Extinguishing Pipework Mechanical</u> • Check generally for mechanical damage. <u>Gaseous Fire Fighting Master/Slave System</u> • Check slave actuation system including pistons in pneumatic valve actuators.	6 MONTHLY

System/Equipment	Maintenance Tasks	Frequency
	<u>Gaseous Fire Extinguishing Pipework & Nozzles</u> • Externally examine pipework to determine its condition. • Examine nozzles for blockages and clean as necessary. • Note: Replace or pressure test and repair as necessary pipework showing corrosion or mechanical damage. <u>Gaseous Fire Fighting Control Valves</u> • Check all control valves for correct manual function and automatic valves additionally for correct automatic function.	
Controls and Visual Indicators	• Check all controls and visual indicators at control and indicating equipment for correct operation.	6 MONTHLY
Alarm Signals	• Check the operation of any facility for automatic transmission of alarm signals to an alarm receiving centre. • Note: Where more than one form of alarm signal can be transmitted (e.g. fire and fault signals), the correct transmission of each signal should be confirmed.	6 MONTHLY
Ancillary Functions	• Test all ancillary functions of the control and indicating equipment.	6 MONTHLY
Fault Indicators	• Check all fault indicators and their circuits, where practicable, by simulation of fault conditions.	6 MONTHLY
False Alarms	• Check the records of false alarms. • Record the rate of false alarms during the previous 12 months. • Record action taken in respect of false alarms.	6 MONTHLY
Analogue Values	• In fire detection systems that enable analogue values to be determined at the control and indicating equipment, it should be confirmed that each	ANNUALLY

System/Equipment	Maintenance Tasks	Frequency
	analogue value is within the range specified by the manufacturer.	

4.4 Specific Tools

Equipment / System & Maintenance Task	Specific Tool Required
Standalone Extinguishing Control Panel detection loop - Fault detection	Line tester - FDUL221

4.5 Equipment Troubleshooting

Equipment	Problem	Possible Solutions
Fire Suppression System	NA	Due to the life safety function of the Fire Suppression System, fault finding and rectification should only be attempted by competent Specialist Contractor employing trained personnel. Untrained personnel should not attempt anything other than what is detailed in the User Manual. Even persons attempting these functions should have had prior familiarisation and training. In the event that a fault message is displayed on the Standalone Extinguishing Control Panel, then this should be reported to the Contractor with whom a maintenance Contract has been entered into.

4.6 System Troubleshooting

Problem	Possible Solutions
	Refer to 4.5

5. Spare Parts

SM-0009-FP-MDCx - Fire Suppression

5.1 Spare Parts Schedule for Preventive Maintenance

Equipment	Manufacturer of Equipment	Manufacturer Part No	Quantity/ Timeline	Spare Part Description	Data Sheet Submittal Document No.
N/A					

5.2 Spare Parts Schedule for Corrective Maintenance

Equipment	Manufacturer of Equipment	Manufacturer Part No	Quantity/ Timeline	Spare Part Description	Data Sheet Submittal Document No.
N/A					

6. Manufacturer's Product Literature

SM-0009-FP-MDCx - Fire Suppression

6.1 Schedule of Manufacturer's Product Literature

	Manufacturer/Supplier	Submittal / Document title	Submittal/ Document Reference Number
1.	SIEMENS	MDCx Fire Suppression	WES1A-019200-2000-0050-PD
2.	MUPRO	MDCx Fire Suppression	WES1A-019200-2000-0050-PD
3.	PUMA FIRE	MDCx Fire Suppression	WES1A-019200-2000-0050-PD
4.	GF	MDCx Fire Suppression	WES1A-019200-2000-0050-PD

7. Testing Documentation

SM-0009-FP-MDCx - Fire Suppression

7.1 Schedule of Commissioning Documents

	CX Report Type (level)	Item	Submittal/Document Reference Number
1.	Commissioning	L2_Yellow_Life Safety_Fire Alarm Panel_FAP MDC-X	L2_Yellow_Life Safety_Fire Alarm Panel_FAP MDC-X
2.	Commissioning	L3_Blue_Life Safety_MDC Fire Cause & Effect_FAP_FAP MDC-X	L3_Blue_Life Safety_MDC Fire Cause & Effect_FAP_FAP MDC-X

7.2 Schedule of Other Test Reports

	Item	Submittal/Document Reference Number
1.	N/A	

7.3 Schedule of Certificates

	Item	Submittal/Document Reference Number
1.	N/A	

8. Training Materials

SM-0009-FP-MDCx - Fire Suppression

8.1 Schedule of Training Materials

	Training Description	Media	Submittal/Document Reference Number
1.	To be completed at final issue.		

9. Warranties

SM-0009-FP-MDCx - Fire Suppression

9.1 Schedule of Warranties

	Manufacturer	System/Equipment	Submittal/Document Reference Number
1.		Warranty	

10. Environmental, Health and Safety References

SM-0009-FP-MDCx - Fire Suppression

10.1 Schedule of EHS Regulations and Requirements

	Regulation Description	Reference
1.	EN 1990	Design Working Life

10.2 Schedule of EHS Documentation

IMPORTANT!

- DCOps technicians, ensure to consult the latest electrical single-line diagrams in the Operations document management system.
- Refer to the approved SCCAF for calculated values, engineers findings and labels.
- Refer to section 4.1 Health and Safety Requirements for additional safety / hazard concerns.

	Submittal Title	Submittal/Document Reference Number
1.	Not applicable to these works	

11. Design Specifications

SM-0009-FP-MDCx - Fire Suppression

11.1 Schedule of Design Specifications

	Specification Section Number	Specification Name
1.	WES1A_21 23 00	Specification - 21 23 00, Gas suppression specification (EMEA)
2.	WES1A_21 05 00	Specification - 21 05 00, Common Work Results For Fire Suppression (EMEA)
3.	WES1A_21 05 48	Specification - 21 05 48, Vibration And Seismic Controls For Fire Suppression Piping and Equipment (EMEA)
4.	WES1A_21 05 53	Specification - 21 05 53, Identification For Fire Suppression Piping And Equipment (EMEA)
5.	WES1A_21 08 00	Specification - 21 08 00, Commissioning of Fire Suppression Systems (EMEA)

Glossary of Terms

	Term	Description
1.	A	Amperage (Amps)
2.	A&E	Architectural & Engineering Firm
3.	A/C	Air Conditioning
4.	AC	Alternating Current
5.	AI	Analogue Input
6.	AO	Analogue Output
7.	ATP	Automatic transfer Pair deriving primary supply from PMDC and alternate supply from IR SWDB and feeding downstream busbar system for data hall IT critical and mechanical load.
8.	BAS	Building Automation System
9.	BDC	Panel board for miscellaneous supplies – Typically supporting mechanical services in plant rooms and general lighting & small power distribution boards
10.	BMS	Building Management System
11.	BST	British Summer Time
12.	cGMP	Current Good Manufacturing Practices in accordance with Title 21 Code of Federal Regulations.
13.	DB	Dry Bulb
14.	DC	Direct Current
15.	DC	Data Centre
16.	DDC	Direct Digital Control
17.	DDE	Dynamic Data Exchange
18.	DDS	Detailed Design Specification

	Term	Description
19.	DI	Digital Input
20.	DO	Digital Output
21.	DPT	Differential Pressure Transmitter
22.	DPU	Distributed Processing Unit (Standalone BMS Control Panel)
23.	EMS	Environmental Monitoring System (Qualified)
24.	EU	European Union
25.	FAS	Fire Alarm System
26.	FAT	Factory Acceptance Test
27.	FMC	Facility Management Control
28.	FS	Functional Specification
29.	FTS	Functional Test Specification
30.	GAMP	Good Automated Manufacturing Practice
31.	GDP	Good Documentation Practice
32.	GEP	Good Engineering Practice
33.	GLS	Graphic Locator System
34.	GMP	Good Manufacturing Practices
35.	GMT	Greenwich Mean Time
36.	GUI	Graphical User Interface
37.	HDS	Hardware Design Specification
38.	HFAT	Hardware Factory Acceptance Test
39.	HMI	Human Machine Interface
40.	HOA	Hand-Off-Auto Switch

	Term	Description
41.	HV	High Voltage
42.	HVAC	Heating, Ventilation and Air Conditioning
43.	Hz	Hertz
44.	I/O	Input / Output Signals
45.	ICEA	Insulated Cable Engineers Association
46.	ICU	Integral Control Unit
47.	IED	Intelligent Electronic Devices – Protection relays/devices
48.	IP	Ingress Protection
49.	IQ	Installation Qualification
50.	ISA	Instrumentation Systems and Automation Society
51.	kW	Kilowatt
52.	l/s	Litres per Second
53.	LB	Load Bank
54.	LBS	Load Bank Switchgear
55.	LPHW	Low Pressure Hot Water
56.	LV	Low Voltage
57.	MB	Main Building
58.	MCB	Miniature Circuit Breaker
59.	MDC	Main Distribution Centre
60.	MES	Manufacturing Execution System
61.	MMI	Man Machine Interface
62.	MRP	Media Redundancy Protocol
63.	MS	Motor Starter (Fuel Oil)

	Term	Description
64.	MT	Moisture Transmitter
65.	NC	Non-Critical Alarms
66.	ºC	Degree Centigrade
67.	OFE	Owner Furnished Equipment
68.	OIP	Operator Interface Panel
69.	OPC	OLE for Process Control, (Object Linking and Embedding for Process Control)
70.	OQ	Operation Qualification
71.	OWS	Operator Work Station
72.	P&ID	Piping and Instrument Diagram
73.	PC	Personal Computer
74.	PCS	Process Control System
75.	PD	Partial Discharge
76.	PID	Proportional-Integral-Derivative
77.	PLC	Programmable Logic Controllers
78.	PMDC	Power Module Distribution Centre Packaged substation providing primary supply to critical IT and ancillary building loads via Automatic Transfer Pair switchgear
79.	PMS	Power Monitoring System – Dedicated network to collect and store all power management data from the metering devices, as well as information from the protective devices.
80.	PQ	Performance Qualification
81.	PSU	Power Supply Unit
82.	PT	Pressure Transmitter
83.	QA	Quality Assurance

	Term	Description
84.	QBMS	Qualified Building Management System
85.	R&D	Research & Development
86.	RIO	Remote I/O
87.	RTN	Real Time Network
88.	SAN	Storage Area Network
89.	SAT	Site Acceptance Test
90.	SCADA	Supervisory Control and Data Acquisition System – The SCADA system carries out and monitors all automatic electrical switching procedures.
91.	SDC	Site Distribution Centre –switchboard deriving supply from upstream MDC and feeding downstream PMDCs
92.	SDP	Smoke Damper Panel
93.	SDS	Software Design Specification (Detailed SOO)
94.	SHE	Safety, Health and Environment
95.	SOO	Sequence of Operation
96.	SOP	Standard Operating Procedure
97.	SSFR	Shared Services Facility Racks
98.	SSNR	Support Services Network Room
99.	TBC	To Be Confirmed
100.	TCP/IP	Transmission Control Protocol over Internet Protocol
101.	TDR	Time Domain Reflectometry
102.	TT	Temperature Transmitter
103.	U0	Nominal system phase-to-earth voltage
104.	UAT	User Acceptance Test

	Term	Description
105.	UPS	Uninterrupted Power Supply
106.	URS	User Requirements Specification
107.	USS	Unit Substation Switchgear – 12kV Switchgear comprising of two circuit breakers on a common Busbar, supplying 1no. MV/LV transformer. This MV Switchgear arrangement shall be free-issued to the LV Switchgear specialist for incorporation into the 'USS Skid'.
108.	UTC	Coordinated Universal Time
109.	V	Volts
110.	VAV	Variable Air Volume
111.	VDC	Voltage in a direct current (DC) circuit
112.	VDU	Visual Display Unit
113.	VFC	Volt Free Contact
114.	VFD	Variable Frequency Drive
115.	WB	Wet Bulb