

BID SPECIFICATIONS OF THE BUILDING MONITORING SYSTEM FOR TAD

1. BACKGROUND

The objective of this tender is to invite suitably qualified and regulatory compliant services provider to bid for services relating to the diagnosis and subsequently, replace/installation and maintenance of the Air Handling Unit, HEPA Filter System, Ducting's and Building Management System (BMS) in the existing High Containment Facility (BSL-3) at the Transboundary Animal Disease campus of the ARC– Onderstepoort Veterinary Institute.

This document serves to describe the scope of work required including the technical and regulatory requirements for the diagnosis, supply, installation, commissioning, validation and maintenance of a HEPA filter system, Ducting's and Building Management System (BMS) for a High Containment (Biosafety Level 3) Facility. All systems must comply with the relevant local and international biosafety standards.

2. OBJECTIVES

The ARC wants to achieve the following objectives:

- 2.1. Qualified experience supplier for BMS Systems in BSL 3 Laboratories that can provide assistance with critical timeframes in terms of breakdown.
- 2.2. System that has the ability to monitor and restrict access when and where required.
- 2.3. System that complies with environmental conditions and accessibility
- 2.4. That addressed the bio-safety regulations requirements effectively and efficiently and provide flexibility to communicate / interact with existing system.

3. SITE INFORMATION

The Building Manage System must consist of a visual front-end station (Control Room) from where the building must be monitored. HVAC controlling for BSL3 lab with graphics and set points on operations that can be altered. Data and Trends online and offline to be gathered. Historic database to be kept and from where the standby personnel will be called whenever priority alarms occur and a WEATHER STATION to monitor rainfall ; outside temperature ; wind direction and speed and Humidity.

4. SCOPE OF WORK

The Laboratorial areas is divided in two areas, which consists of a clean area Tissue culture Lab (positive pressure) and contaminated area which is Diagnostic Lab; Vaccine Clean and Vaccine contaminated; Utensil; Buffer zone; Stables; Basement; Incinerators and effluent Plant (negative pressure)

5. LEGISLATIVE REQUIREMENTS, STANDARDS AND PROCEDURES

Bidders shall comply, amongst others, to the following legislative requirements which does not exclude non mentioned legislation:

- 5.1. Bio-Safety procedures for TAD
- 5.2. South African National Standards
- 5.3. Occupational Health and Safety Act, 1983 as amended
- 5.4. Certificate of compliance to be issued where required

6. OTHER AREAS

- 6.1 Standby generators to be controlled seasonally between the two generators
- 6.2 Chiller plant water temperature to be monitored
- 6.3 All DB boxes to be monitored for trip actions
- 6.4 Autoclaves to be monitored on starting and stopping
- 6.5 Pass-through cabinets on starting and stopping
- 6.6 Water tank low level and high-level alarms
- 6.7 Distil plant tank full alarm
- 6.8 WFI –Plant alarm
- 6.9 Fuel tank levels
- 6.10 Hospital Dampers must close on power failure and monitored
- 6.11 Power failure alarm

- 6.12 All controllers must have spare points available for expansion
- 6.13 All fixed walk-in cold rooms and freezers

7. SOFTWARE REQUIREMENTS

- 7.1 The software offered must be compatible with the latest Windows system
- 7.2 Software offered must be preferably open source. Bidder is required to indicate whether the software offered is propriety licensed and provide the costing separately.
- 7.3 The system offered must be able to provide administrative controls to determine the level of access granted to users.
- 7.4 All software upgrade must be included and specified. Should any costing be applicable, the bidder is required to specify the costing separately.
- 7.5 Software to be supported and supplied for a period of at least 36 months.

8. SYSTEM REQUIREMENTS

- 8.1 Bidders shall take into consideration the thickness of the walls for the transmission of controllers as signals might be weak or dead in certain areas. Alternatives must be included to avoid signals not received.
- 8.2 Temperature and pressure set points must be adjustable
- 8.3 Bidders are required to indicate the possibility for remote access to the system that must be password protected. Costing to be indicated separately.
- 8.4 The system must provide the flexibility to download data to an external hard drive.
- 8.5 The system must provide backup of at least 1TB
- 8.6 Alarm settings and notifications to be send to the cell phone numbers of the standby personnel
- 8.7 The system must allow for access to be restricted into laboratories as per Bio-safety regulations as an alternative add-on.

- 8.8 The system must monitor and make data logs for every time movement is detected. The data log must contain the date, time, area / location and provide readings. Must be able to monitor frequency of events.
- 8.9 System must provide reports as per the needs of the ARC, i.e. monthly or daily reports. The system must be flexible to create user reports in terms of temperature readings, pressure readings, etc.
- 8.10 System must be protected against any power fluctuations
- 8.11 Bidders shall provide the upgrade path of the system and whether the system will be supported / parts available, for at least 5 years.
- 8.12 The system must allow for future expansions should it be required. Costing to be included separately.
- 8.13 Warranty to be included for at least 5 years.
- 8.14 Bidders shall ensure that all controllers, sensors or any other equipment are properly fixed. Drills and nails are not allowed.
- 8.15 System must be integrated with the fire control panel and building alarm and access control.
- 8.16 All control boxes must be easily accessible
- 8.17 Bidder shall be required to supply drawings, wiring diagrams and software indication points.
- 8.18 Certificate of compliance to be issued where required by law
- 8.19 Should it be required, the bidder may apply for approval for work to be done after hours.
- 8.20 Bidders shall ensure that disruptions are minimised to ensure normal ARC functions to be performed.
- 8.21 The bidder shall be liable for any damages or losses during the implementation of the project.
- 8.22 Bidders shall take into consideration the quarantine movements with the time span delays in the preparation and implementation of this project.
- 8.23 Manuals of the system and software must be supplied in English

TECHNICAL REQUIREMENTS FOR THIS BID

Air Conditioning Control Area, Central Lobby Loft

9. EQUIPMENT OPERATION OF 100% FRESH AIR AIR-CONDITIONING SYSTEMS

9.1 GENERAL

The following words and expressions have the following meanings and values assigned to them:

- a) "Alarm" "Alarm for" and "Give Alarm": Sound audible alarm and display message
- b) 'On high space pressure": Operating pressure plus 10 Pa. (e.g. operating pressure is -55 Pa: the high space pressure = $-55 + 10 = -45$ Pa)
- c) "On low space pressure": Operating pressure minus 10 Pa. (e.g. operating pressure is -55 Pa: then, low space pressure = $-55 - 10 = -65$ Pa)
- d) "Set time": 10 sec to 10 min

Historical trending of pressure are logged on the Vision PC hard disk every 60 minutes.

On power failure and re-start, all duty fans will start via the main starter panel step controller and all damper actuators will remain in closed positions.

During the start-up sequence the PLC control of the damper actuators shall be delayed to prevent "out of limit" high negative pressures.

All control system alarms will be by-passed for a suitable period. The exhaust air fans will start first followed by the supply air fans.

9.2 STABLES MAIN SUPPLY- AND EXHAUST AIR

- a) The stables main supply and exhaust air pressures are automatically controlled at +250Pa and +250Pa respectively through a PLC controlling the SA and EA damper actuators.

Control of the SA and EA damper actuators are continuous. IF the space pressure increases by 15 Pa, the supply air damper actuator (SA) is closed by the PLC and only returns to the normal position upon attainment of the pressure set point.

- b) On low supply air velocity, after a set time, the PLC switches the duty supply air fan OFF and the standby supply air fan ON, while simultaneously driving the standby supply air damper actuator (SA2) to the pre-set position.

Alarm for:

“Stables Air-conditioning duty main supply air fan low velocity – Switching to standby supply air fan”

- c) On low exhaust air velocity, after a set time, the PLC switches the duty exhaust air fan OFF and the standby air fan ON, while simultaneously driving the standby exhaust air damper actuator (EA2) to the pre-set position.

Alarm for:

“Stables air-conditioning duty main exhaust air fan low velocity – switching to standby exhaust air fan”

9.3 STABLES F5 TO F16

- a) The space pressure levels of the stables are automatically controlled at -55 Pa through a PLC controlling the SA and EA damper actuators for each stable.

Control of the SA and EA damper actuators is continuous – If the space pressure in any stable increases or decreases by 10 Pa then the appropriate Alarm for:

“Stable F** low space pressure”

OR “Stable F** high space pressure”

9.4 STABLE CORRIDORS AND POST MORTEM

- a) The space pressure levels of the central corridor and Post Mortem, and of the outer corridors are automatically controlled at -85 Pa and -35 Pa respectively through a PLC controlling the SA and EA damper actuators.

Control and the SA and EA damper actuators is continuous. – If the space pressure increases by 15 Pa, the supply air damper actuator (SA) is closed by the PLC and only returns to the normal position upon attainment of the pressure set point.

- b) On low supply air velocity for each plant, after a set time, the PLC shall switch the duty supply air fan of that plant OFF and the standby supply air fan ON, while simultaneously driving the standby air damper actuator (SA2) to the pre-set position.

- The appropriate alarm for:

“Stables outer corridors air-conditioning Duty exhaust air fan low velocity – switching to standby exhaust air fan”

OR

“Post Mortem Air-conditioning duty supply air fan low velocity – switching to standby supply air fan”

- c) On low exhaust air velocity for each plant, after set time, the PLC switches the duty exhaust air fan of that plant PFF and the standby exhaust air fan ON, while simultaneously driving the standby exhaust air damper actuator (EA2) to the pre-set position.

- The appropriate alarm for:

“Stables outer corridor air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”

OR

“Stables central corridor air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”

OR

“Post Mortem air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan” – If the Post Mortem standby exhaust air fan still does not satisfy the exhaust air velocity requirements within a further set time the supply air fan will switch OFF.

Alarm for:

“Post Mortem air-conditioning both exhaust air fans low velocity – supply air fan Shutdown” – If any of the corridors standby exhaust air fans still does not satisfy the exhaust air velocity requirements within a further set time, the supply air fan will switch OFF.

The appropriate alarm for:

“Stables outer corridor air-conditioning both exhaust air fan low velocity – All supply – and exhaust air fans Shutdown”

OR

“Stables central corridor air-conditioning both exhaust air fan low velocity – All supply – and exhaust air fans Shutdown”

- d) On high space pressure in the central corridor and post mortem, after a set time, the exhaust air fan of the stables and outer corridors will switch off leaving the exhaust air fans of the central corridors and post mortem operating.

- Alarm for:

“stables central corridor and post mortem high space pressure – stables and outer corridors air-conditioning exhaust air fans Shutdown”

- e) In high space pressure in the outer corridors, after set time, the exhaust air fans of the outer corridors and the central corridor will switch OFF leaving the supply and exhaust air fans of the stables and post mortem operating.
- Alarm for:
“Stables outer corridors high space pressure – Outer-and central corridors air-conditioning supply air fans Shutdown”
- f) On low space pressure in the central corridors and post mortem, after a set time, give alarm:
- “Stables central corridor and post mortem low space pressure”
- g) On low space pressure in the outer corridors, after a set time, the exhaust air fans of the outer corridors, central corridor and stables will switch OFF.
- Alarm for:
“Stables outer corridors low space pressure – outer- and central corridors air-conditioning exhaust air fans Shutdown”

9.5 BASEMENT

- a) The space pressure level is automatically controlled at -55 Pa through a PLC controlling the SA and EA damper actuators. Control of the SA and EA damper actuations is continuous. If the space pressure increases by 15 Pa, the supply air damper actuator (SA) shall be closed by the PLC and only returns to the normal position upon attainment of the pressure set point.
- b) On low supply air velocity, after a set time, the PLC will switch the duty supply air fan OFF and the standby supply air fan ON, while simultaneously driving the standby air damper actuator (SA2) to the pre-set position.
- Alarm for:
“Basement air-conditioning fulty supply air fan low velocity – switching to standby supply air fan”
- c) On low exhaust air velocity for each plant, after a set time, the PLC will switch the duty exhaust air fan OFF and the standby exhaust air fan ON, while simultaneously driving he standby exhaust air damper actuator (EA2) to the pre-set position.
- The appropriate alarm for:
“Stables basement air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”;

OR

“Diagnostic basement air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”;

OR

“Vaccine basement air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”

- If the standby exhaust air fan still does not satisfy the exhaust air velocity requirements within a further set time, the supply air fan only will switch OFF.

- The appropriate alarm for:

“Stables basement air-conditioning both exhaust air fan low velocity – switching air fan Shutdown”

OR

“Diagnostic basement air-conditioning both exhaust air fan low velocity – switching air fan Shutdown”

OR

“Vaccine basement air-conditioning both exhaust air fan low velocity – switching air fan Shutdown”

- d) In high space pressure, after a set time, the supply air fan only will switch OFF.

- Alarm for:

“Basement high space pressure – air-conditioning supply air fan Shutdown”

- e) On low space pressure, after a set time, give Alarm:

“Basement low space pressure”

9.6 DIAGNOSTIC LABORATORIES AND DIAGNOSTIC SHOWERS

- a) The space pressure level will be automatically controlled at -55 Pa through a PLC controlling the SA and EA damper actuators. Control of the SA and EA damper actuators will be continuous.

- If the space pressure increases by 15 Pa, the supply air damper actuator (SA) shall be closed by the PLC and only returns to the normal position upon attainment of the pressure set point.

- b) On low supply air velocity, after a set time, the PLC will switch the duty supply air fan OFF and the standby air fan ON, while simultaneously driving the standby supply air damper actuator (SA2) to the pre-set position.

- Alarm for:

“Diagnostic laboratories air-conditioning duty supply air fan low velocity – switching to standby supply air fan”

- c) On low exhaust air velocity, after a set time, the PLC will switch the duty exhaust air fan OFF and the standby exhaust air fan ON, while simultaneously driving the standby exhaust air damper actuator (EA2) to the pre-set position.
- Alarm for:
“Diagnostic laboratories air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”
 - If the standby exhaust air fan still does not satisfy the exhaust air velocity requirements within a further set time the supply air fan only will switch OFF.
 - Alarm for:
“Diagnostic laboratories air-conditioning both exhaust air fan low velocity – switching air fan Shutdown”
- d) On high space pressure, after a set time, the supply air fan only will switch OFF.
- Alarm for:
“Diagnostic laboratories high space pressure air-conditioning air fan Shutdown”
- e) On low space pressure, after a set time, give alarm:
“Diagnostic Laboratories low space pressure”

9.7 VACCINE PRODUCTION LABORATORIES

- a) The vaccine contaminated and clean laboratories space pressure levels will be automatically controlled at -85 Pa and -55 Pa respectively through a PLC controlling the SA and EA damper actuators. Control of the SA and EA damper actuators shall be continuous.
- If the space pressure increases by 15 Pa, the supply air damper actuator (SA) will be closed by the PLC and only returns to the normal position upon attainment of the pressure set point.
- b) On low supply air velocity, after a set time, the PLC will switch the duty supply air fan OFF and the standby supply air fan ON, while simultaneously driving the standby air damper actuator (SA2) to the pre-set position.
- Alarm for:

“Vaccine Laboratories air-conditioning duty supply air fan low velocity – switching to standby supply air fan”

- c) On low exhaust air velocity for each plant, after a set time, the PLC will switch the duty exhaust air fan of that plant OFF and the standby exhaust air damper actuator (EA2) to the pre-set position.

- The appropriate alarm for:
“Vaccine clean laboratory air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”

OR

“Vaccine contaminated laboratory air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”

- If the standby exhaust air fan still does not satisfy the exhaust air velocity requirements within a further set time, the supply air fan only will switch OFF.
- Give the appropriate alarm for:
Vaccine clean laboratory air-conditioning both exhaust air fans low velocity – supply air fan Shutdown”

OR

“Vaccine contaminated laboratory air-conditioning both exhaust air fans low velocity – supply air fan Shutdown”

- d) On high space pressure in either of the two laboratories, after a set time, the supply air fan only will switch OFF.

- Alarm for:
“Vaccine laboratories high space pressure – Ventilation supply air fan Shutdown”

- e) On low space pressure, after a set time, give alarm:
“Vaccine laboratories low space pressure”

9.8 RESEARCH LABORATORY

- a) The space pressure level is automatically controlled at -55 Pa through a PLC controlling the SA and EA damper actuators. Control of the SA and EA damper actuators is continuous.

- If the space pressure increases by 15 Pa, the supply air damper actuator (SA) will be closed by the PLC and only returns to the normal position upon attainment of the pressure set point.

- b) On low supply air velocity, after a set time, the PLC will switch the duty supply air fan OFF and the standby supply air fan ON, while simultaneously driving the standby supply air damper actuator (SA2) to the pre-set position.
- Alarm for:
"Utensil apparatus air-conditioning duty exhaust air fan low velocity – switching to standby supply air fan"
- c) On low exhaust air velocity, after a set time, the PLC will switch the duty exhaust air fan OFF and the standby exhaust air fan ON, while simultaneously driving the standby exhaust air damper actuator (EA2) to the pre-set position.
- Alarm for:
"Utensil apparatus air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan"
 - If the standby exhaust air fan still does not satisfy the exhaust air velocity requirements within a further set time, the supply air fan only will switch OFF.
 - Alarm for:
'Utensil apparatus air-conditioning both exhaust air fans low velocity – supply air fan shit down"
- d) On high space pressure, after a set time, the supply air fan only will switch OFF.
- Alarm for:
"Utensil apparatus high space pressure – air-conditioning supply ait fan Shutdown"
- e) On low space pressure, after a set time, alarm:
"Utensil apparatus low space pressure"

9.9 EFFLUENT STERILISATION PLANT

- a) The space pressure level is automatically controlled at -85 Pa through a PLC controlling the SA and EA damper actuators. Control of the SA and EA damper actuators is continuous.
- If the space pressure increases by 15 Pa, the supply air damper actuator (SA) is be closed by the PLC and only returns to the normal position upon attainment of the pressure set point.

- b) On low supply air velocity, after a set time, the PLC will switch the duty supply air fan OFF and the standby supply air fan ON, while simultaneously driving the standby supply air damper actuator (SA2) to the pre-set position.
- Alarm for:
“Effluent plant air-conditioning duty supply air fan low velocity – switching to standby supply air fan”
- c) On low exhaust air velocity, after a set time, the PLC will switch the duty exhaust air fan OFF and the standby exhaust air fan ON, while simultaneously driving the standby exhaust air damper actuator (EA2) to the pre-set position.
- Alarm for:
“Effluent plant air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”
 - If the standby exhaust air fan still does not satisfy the exhaust air velocity requirements within a further set time, the supply air fan only will switch OFF.
 - Alarm for:
“Effluent plant air-conditioning both exhaust air fans low velocity – supply air fan shut down”
- d) On high space pressure, after a set time, the supply air fan only will switch OFF.
- Alarm for:
“Effluent plant high space pressure – air-conditioning supply air fan Shutdown”
- e) On low space pressure, after a set time, alarm:
“Effluent plant low space pressure”

9.10 INCINERATORS

- a) The space pressure level is automatically controlled at -85 Pa, and when the incinerators are in operation at -15 Pa through a PLC controlling the SA and EA damper actuators. Control of the SA and EA damper actuators is continuous.
- If the space pressure increases by 15 Pa, the supply air damper actuator (SA) will be closed by the PLC and only returns to the normal position upon attainment of the pressure set point.

- b) On low supply air velocity, after a set time, the PLC will switch the duty supply air fan OFF and the standby supply air fan ON, while simultaneously driving the standby supply air damper actuator (SA2) to the pre-set position.
- Alarm for:
“Incinerator room air-conditioning duty supply air fan low velocity – switching to standby supply air fan”
- c) On low exhaust air velocity, after a set time, the PLC will switch the duty exhaust air fan OFF and the standby exhaust air fan ON, while simultaneously driving the standby exhaust air damper actuator (EA2) to the pre-set position.
- Alarm for:
“Incinerator room air-conditioning duty exhaust air fan low velocity – switching to standby exhaust air fan”
 - If the standby exhaust air fan still does not satisfy the exhaust air velocity requirements within a further set time, the supply air fan only will switch OFF.
 - Alarm for:
“Incinerator room air-conditioning both exhaust air fans low velocity – supply air fan shut down”
- d) On high space pressure, after a set time, the supply air fan only will switch OFF.
- Alarm for:
“Incinerator room high space pressure – air-conditioning supply air fan Shutdown”
- e) On low space pressure, after a set time, alarm:
“Incinerator room low space pressure”
- f) When the incinerators are ready for operation the operator turns the local key switch (in incinerator room) to the “OFF” position. The space pressure level will now be automatically controlled at -15 Pa by the PLC.
- Alarm for:
“incinerators in operation”
 - To re-instate the plant to normal condition the operator turns the local key switch back to the “ON” position.

10. EQUIPMENT OPERATION OF RECIRCULATING AIR AIR-CONDITIONING AND VENTILATION SYSTEMS

Tissue Culture Building Loft

10.1 GENERAL

The following words and expressions have the meanings and values assigned to them;

- a) "Alarm", Alarm for" and "Give Alarm": Sound audible alarm and display message
- b) "Set time": 10 seconds to 10 minutes

Historical trending of pressure, humidity and temperatures are logged on the PC's hard disk every 60 minutes.

Log all events on the PC hard disk and printer.

On power failure and re-start, all fans will start via the main starter panel times and all damper actuators will remain in closed position.

During the start-up sequence the PLC control of the damper actuators will be delayed to prevent "out of limit" high negative pressures.

All control system alarms will be passed for a suitable period. In the automatic mode, the fresh air fans will start first followed by the duty supply air fans.

10.2 BOTTLING PLANT – ZONE 1

10.2.1 SPACE PRESSURE CONTROL

- a) The space pressure level is automatically controlled at +80 Pa through a PLC controlling the SA and EA damper actuators. Control of the SA and EA damper actuators is continuous.
 - If the space pressure increases by 15 Pa, the supply air damper actuator (SA) is be closed by the PLC and only returns to the normal position upon attainment of the pressure set point.
- b) On low supply air velocity, after a set time, the PLC will switch the duty supply air fan OFF and the standby supply air fan ON, while simultaneously driving the standby supply air damper actuator (SA2) to the pre-set position.

- Alarm for:
“Tissue culture bottling plant air-conditioning duty supply air fan low velocity – switching to standby supply air fan”
- c) If the space pressure deviates by more than 10 Pa and persists, after a set time, the PLC will switch the supply air fan OFF and CLOSE the supply – and exhaust air Shutdown dampers (SSD & ESD).
- Alarm for:
“Tissue culture bottling plant air-conditioning high/low space pressure – supply air fan Shutdown”

10.2.2 TEMPERATURE AND HUMIDITY CONTROL

The temperature and humidity levels are automatically controlled between 18 to 30°C and 40 to 60% RH through a PLC controlling the heating and cooling valves (HV & CV for temperature control) and the humidifier and cooling valves (& CV for humidity control) in sequence.

A pressure switch (DPS) in the supply air duct de-energises the temperature / humidity control system when the plant is not in operation.

10.3 LABORATORIES – ZONE 2

10.3.1 SPACE PRESSURE CONTROL

- a) The space pressure level is automatically controlled at +50 Pa through a PLC controlling the SA and EA damper actuators. Control of the SA and EA damper actuators is continuous.
 - If the space pressure increases by 15 Pa, the supply air damper actuator (SA) is be closed by the PLC and only returns to the normal position upon attainment of the pressure set point.
- b) On low supply air velocity, after a set time, the PLC will switch the duty supply air fan OFF and the standby supply air fan ON, while simultaneously driving the standby supply air damper actuator (SA2) to the pre-set position.
 - Alarm for:
“Tissue culture laboratories air-conditioning duty supply air fan low velocity – switching to standby supply air fan”
- c) If the space pressure deviates by more than 10 Pa and persists, after a set time, the PLC will switch the supply air fan OFF and CLOSE the supply – and exhaust air Shutdown dampers (SSD & ESD).

- Alarm for:
“Tissue culture laboratories air-conditioning high/low space pressure – supply air fan Shutdown”

10.3.2 TEMPERATURE AND HUMIDITY CONTROL

The temperature and humidity levels are automatically controlled between 18 to +28°C and 10 to 90% RH through a PLC controlling the heating and cooling valves (HV & CV for temperature control) and the humidifier and cooling valves (& CV for humidity control) in sequence.

A pressure switch (DPS) in the supply air duct de-energises the temperature / humidity control system when the plant is not in operation.

10.4 CORRIDOR – ZONE 3

10.4.1 SPACE PRESSURE CONTROL

- a) The space pressure level is automatically controlled at + 30 Pa through a PLC controlling the SA and EA damper actuators. Control of the SA and EA damper actuators is continuous.
 - If the space pressure increases by 15 Pa, the supply air damper actuator (SA) is be closed by the PLC and only returns to the normal position upon attainment of the pressure set point.
- b) On low supply air velocity, after a set time, the PLC will switch the duty supply air fan OFF and the standby supply air fan ON, while simultaneously driving the standby supply air damper actuator (SA2) to the pre-set position.
 - Alarm for:
“Tissue culture corridor air-conditioning duty supply air fan low velocity – switching to standby supply air fan”
- c) If the space pressure deviates by more than 10 Pa and persists, after a set time, the PLC will switch the supply air fan OFF and CLOSE the supply – and exhaust air Shutdown dampers (SSD & ESD).
 - Alarm for:
“Tissue culture corridor air-conditioning high/low space pressure – supply air fan Shutdown”

10.4.2 TEMPERATURE CONTROL

The temperature level is automatically controlled between -10 to +30°C through a PLC controlling the heating and cooling valves (HV & CV) in sequence.

A pressure switch (DPS) in the supply air duct de-energises the control system when the plant is not in operation.

10.4.3 SHOWERS EAST TEMPERATURE CONTROL

The temperature level is automatically controlled between 18 to +28°C through a PLC controlling the heating valve (HV)

10.4.4 SHOWERS WEST TEMPERATURE CONTROL

The temperature level is automatically controlled between 18 to +28°C through a PLC controlling the heating valve (HV)

11. EQUIPMENT PER AREA

11.1. SHOWER E9, E10, E14, E15, E19, E21, E11, E12, E16, E17, E20, E22, AUTOCLAVE G4, G5, B7, PASS THROUGH G6

11.1.1. CENTRAL LOBBY GROUND FLOOR

No	Equipment	Points
i.	Shower E9 Clean Door Open	
ii.	Shower E9 Dirty Door Open	
iii.	Shower E9 Dirty Door Seal Deflated	
iv.	Shower E9 Emergency Switch – ES9	
v.	Shower E10 Clean Door Open	
vi.	Shower E10 Dirty Door Open	
vii.	Shower E10 Dirty Door Seal Deflated	
viii.	Shower E14 Clean Door Open	
ix.	Shower E14 Dirty Door Open	
x.	Shower E14 Dirty Door Seal Deflated	
xi.	Shower E15 Clean Door Open	
xii.	Shower E15 Dirty Door Open	
xiii.	Shower E15 Dirty Door Seal Deflated	
xiv.	Shower E9 Both Doors Open	
xv.	Shower E10 Both Doors Open	
xvi.	Shower E14 Both Doors Open	
xvii.	Shower E15 Both Doors Open	
	Total number of Points	

11.1.2. CENTRAL LOBBY BASEMENT

No	Equipment	Points
i.	Shower E19 Clean Door Open	
ii.	Shower E19 Dirty Door Open	
iii.	Shower E19 Dirty Door Seal Deflated	
iv.	Shower E19 Emergency Switch – ES19	
v.	Shower E21 Clean Door Open	
vi.	Shower E21 Dirty Door Open	
vii.	Shower E21 Dirty Door Seal Deflated	
viii.	Shower E21 Emergency Switch – ES21	
ix.	Shower E19 Both Doors Open	
x.	Shower E21 Both Doors Open	
xi.	MRS Bus Switch	
xii.	Force Comms	
xiii.	Force Fail	
xiv.	Force Rotate Bus	
xv.	Autoclave G4 Sterilisation Cycle Started	
xvi.	Autoclave G4 Sterilisation Cycle Completed	
xvii.	Autoclave G5 Sterilisation Cycle Started	
xviii.	Autoclave G5 Sterilisation Cycle Completed	
xix.	Autoclave B7 Sterilisation Cycle Started	
xx.	Autoclave B7 Sterilisation Cycle Completed	
xxi.	Fumigation G6 Cycle Started	
xxii.	Fumigation G6 Cycle Completed	
xxiii.	Autoclave G4 Ready	
xxiv.	Autoclave G5 Ready	
xxv.	Autoclave B7 Ready	
xxvi.	Fumigation G6 Ready	
	Total number of Points	

11.1.3. CENTRAL LOBBY GROUND FLOOR

No	Equipment	Points
i.	Shower E11 Clean Door Open	
ii.	Shower E11 Dirty Door Open	
iii.	Shower E11 Dirty Door Seal Deflated	
iv.	Shower E12 Clean Door Open	
v.	Shower E12 Dirty Door Open	
vi.	Shower E12 Dirty Door Seal Deflated	
vii.	Shower E16 Clean Door Open	
viii.	Shower E16 Dirty Door Open	
ix.	Shower E16 Dirty Door Seal Deflated	
x.	Shower E16 Emergency Switch – ES16	
xi.	Shower E17 Clean Door Open	
xii.	Shower E17 Dirty Door Open	
xiii.	Shower E17 Dirty Door Seal Deflated	
xiv.	Shower E11 Both Doors Open	
xv.	Shower E12 Both Doors Open	

No	Equipment	Points
xvi.	Shower E16 Both Doors Open	
xvii.	Shower E17 Both Doors Open	
	Total number of Points	

11.1.4. CENTRAL LOBBY BASEMENT

No	Equipment	Points
i.	Shower E20 Clean Door Open	
ii.	Shower E20 Dirty Door Open	
iii.	Shower E20 Dirty Door Seal Deflated	
iv.	Shower E22 Clean Door Open	
v.	Shower E22 Dirty Door Open	
vi.	Shower E22 Dirty Door Seal Deflated	
vii.	Shower E20 Both Doors Open	
viii.	Shower E22 Both Doors Open	
	Total number of Points	

11.2. AIRLOCK B3 BUFFER ZONE ALARMS

11.2.1 BUFFER ZONE

No	Equipment	Points
i.	Airlock B3 Clean Door Open	
ii.	Airlock B3 Dirty Door Open	
iii.	Airlock Clean Door Seal Deflated	
iv.	Airlock Dirty Door Seal Deflated	
v.	Cold Room Temp High	
vi.	Chiller Temp	
vii.	Distribution Board 1A MCB Tripped	
viii.	Buffer Zone Oxygen Low	
ix.	Airlock B3 Both Doors Open	
x.	MRS Bus Switch	
xi.	Force Comms	
xii.	Force Fail	
xiii.	Force Rotate Bus	
xiv.	Buffer Zone Cold Room Low	
	Total number of Points	

11.3. OXYGEN DOOR, FUMIGATION CABINET H9, AUTOCLAVE H10, H11, H12, DOOR B4 AND DOOR B6

No	Equipment	Points
i.	Fumigation Cabinet H9 Cycle Started	
ii.	Fumigation Cabinet H9 Cycle Completed	
iii.	Autoclave H10 Sterilisation Cycle Started	
iv.	Autoclave H10 Sterilisation Cycle Completed	
v.	Autoclave H11 Sterilisation Cycle Started	

No	Equipment	Points
vi.	Autoclave H11 Sterilisation Cycle Completed	
vii.	Autoclave H12 Sterilisation Cycle Started	
viii.	Autoclave H12 Sterilisation Cycle Completed	
ix.	Door B6 Open	
x.	Door B4 Open	
xi.	Bottle Wash Area Oxygen Level Low	
xii.	Door B4 Seal Deflated	
xiii.	Autoclave H10 Ready	
xiv.	Autoclave H11 Ready	
xv.	Autoclave H12 Ready	
xvi.	Fumigation Cabinet H9 Ready	
xvii.	MRS Bus Switch	
xviii.	Force Comms	
xix.	Force Fail	
xx.	Force Rotate Bus	
	Total number of Points	

11.4. DOOR B5, FERMENTER

No	Equipment	Points
i.	Door B5 Open	
ii.	Door B5 Seal Deflated	
iii.	Fermenter 1 Trip (Malfunction)	
iv.	Future Fermenter	
v.	Future Fermenter	
vi.	MRS Bus Switch	
vii.	Force Comms	
viii.	Force Fail	
ix.	Force Rotate Bus	
	Total number of Points	

11.5. COMPRESSED AREA: DISTRIBUTION BOARD (DB 7), DB 9, COMPRESSED AIR

No	Equipment	Points
i.	DB 7 MCB Tripped	
ii.	DB9 MCB Tripped	
iii.	Compressed Air Pressure	
iv.	MRS Bus Switch	
v.	Force Comms	
vi.	Force Fail	
vii.	Force Rotate Bus	
	Total number of Points	

11.6. INCINERATORS

No	Equipment	Points
i.	Incinerator 1 Flame Fail	
ii.	Incinerator 2 Flame Fail	
iii.	Incinerator 1 Stack Temperature Low	
iv.	Incinerator 2 Stack Temperature Low	
v.	Fuel Tank Level Low	
vi.	Fuel Tank Level High	
vii.	DB11 MCB Tripped	
viii.	BD 12 Diesel Pump Tripped	
ix.	MRS Bus Switch	
x.	Force Comms	
xi.	Force Fail	
xii.	Force Rotate Bus	
	Total number of Points	

11.7. EFFLUENT STERILISATION PLANT: AIRLOCK B1, B2, FUMIGATION CABINET B8, EFFLUENT PLANT

11.7.1 BASEMENT SOUTH END

No	Equipment	Points
i.	Airlock B1 Clean Door Open	
ii.	Airlock B1 Dirty Door Open	
iii.	Airlock B1 Clean Door Deflated	
iv.	Airlock B1 Dirty Door Deflated	
v.	Airlock B1 Emergency Switch Activated ES3	
vi.	Airlock Fumigation Cycle Started	
vii.	Airlock B2 Clean Door Open	
viii.	Airlock B2 Dirty Door Open	
ix.	Airlock B1 Both Doors Open	
x.	Airlock B2 Both Doors Open	
xi.	Airlock B1 Fumigation Timer	
	Total number of Points	

11.7.2 EFFLUENT PLANT

No	Equipment	Points
i.	Fumigation Cabinet B8 Cycle Started	
ii.	Fumigation Cabinet B8 Cycle Completed	
iii.	Effluent Sterilisation Temperature	
iv.	Effluent Steam Pressure Low	
v.	Collect Vessel Level High	
vi.	Effluent Sump Overflow	
vii.	DB10 MCB Tripped	
viii.	Fumigation Cabinet B8 Ready	
ix.	Pump 1 Run	

No	Equipment	Points
x.	Pump 2 Run	
xi.	Effluent Flow	
xii.	Valve Open	
xiii.	Valve Closed	
xiv.	Effluent Temperature Out	
xv.	MRS Bus Switch	
xvi.	Force Comms	
xvii.	Force Fail	
xviii.	Force Rotate Bus	
	Total number of Points	

11.8. SMALL ANIMAL LABORATORIES IN LOFT AREA: SHOWER G1, AIRLOCK G2, AUTOCLAVE G4, COLD ROOM, INCUBATOR FREEZERS 1 – 3, PNEUMA VALVES

11.8.1 BLOCK G GROUND FLOOR

No	Equipment	Points
i.	Shower G1 Clean Door Open	
ii.	Shower G1 Dirty Door Open	
iii.	Shower G1 Dirty Door Deflated	
iv.	Shower G1 Emergency Switch ES1	
v.	Airlock G2 Clean Door Open	
vi.	Airlock G2 Dirty Door Open	
vii.	Airlock G2 Clean Door Deflated	
viii.	Airlock G2 Dirty Door Deflated	
ix.	Airlock G2 Emergency Switch ES4	
x.	Airlock G2 Fumigation Cycle Started	
xi.	Airlock G2 Fumigation Timer	
xii.	Shower G1 Both Doors Open	
xiii.	Airlock G2 both Doors Open	
xiv.	Autoclave G3 Sterilisation Cycle Started	
xv.	Autoclave G3 Sterilisation Cycle Completed	
xvi.	Autoclave G3 Ready	
	Total number of Points	

11.8.2 BLOCK G

- SAL 1 – Diagnostic Laboratory North 2
- SAL 2 – Diagnostic Laboratory North 1
- SAL 3 – Diagnostic Laboratory South 2
- SAL 4 – Diagnostic Laboratory South 1

No	Equipment	Points
i.	Ultra Freeze 1 High Temperature	
ii.	Ultra Freeze 2 High Temperature	
iii.	Ultra Freeze 3 High Temperature	

No	Equipment	Points
iv.	Incubator Temperature G4 Low	
v.	Incubator Temperature G4 High	
vi.	Cold Room CR1 Temperature	
vii.	Freezer Room FR1 Temperature	
viii.	MRS Bus Switch	
ix.	Force Comms	
x.	Force Fail	
xi.	Force Rotate Bus	
xii.	SAL 1 Front Door Open	
xiii.	SAL 1 Shower Door Open	
xiv.	SAL 1 Pneuma Valves Closed S/A	
xv.	SAL 2 Front Door Open	
xvi.	SAL 2 Shower Door Open	
xvii.	SAL 2 Pneuma Valves Closed S/A	
xviii.	SAL 3 Front Door Open	
xix.	SAL 3 Shower Door Open	
xx.	SAL 3 Pneuma Valves Closed S/A	
xxi.	SAL 4 Front Door Open	
xxii.	SAL 4 Shower Door Open	
xxiii.	SAL 4 Pneuma Valves Closed S/A	
xxiv.	SAL 1 Pneuma Valces Closed E/A	
xxv.	SAL 2 Pneuma Valces Closed E/A	
xxvi.	SAL 3 Pneuma Valces Closed E/A	
xxvii.	SAL 4 Pneuma Valces Closed E/A	
xxviii.	SAL 1 Pressure	
xxix.	SAL 2 Pressure	
xxx.	SAL 3 Pressure	
xxxi.	SAL 4 Pressure	
xxxii.	SAL 1 Both Pneumatic Valves Open	
xxxiii.	SAL 2 Both Pneumatic Valves Open	
xxxiv.	SAL 3 Both Pneuma Valves Open	
xxxv.	SAL 4 Both Pneuma Valves Open	
	Total number of Points	

11.9. BLOCK H: SHOWER H15, AIRLOCK H13, H14, COLD ROOM 1, 2, INCUBATOR 1, 2, FREEZERS 1 – 4, DOOR H18

11.9.1 BLOCK H GROUND FLOOR

No	Equipment	Points
i.	Shower H15 Clean Door Open	
ii.	Shower H15 Dirty Door Open	
iii.	Shower H15 Dirty Door Deflated	
iv.	Shower H15 Emergency Switch – ES15	
v.	Airlock H13 Clean Door Open	
vi.	Airlock H13 Dirty Door Open	
vii.	Airlock H14 Clean Door Open	

No	Equipment	Points
viii.	Airlock H14 Dirty Door Open	
ix.	Airlock H14 Clean Door Deflated	
x.	Airlock H14 Dirty Door Deflated	
xi.	Airlock Emergency Switch – ES14	
xii.	Airlock H14 Fumigation Cycle On	
xiii.	Airlock H14 Fumigation Timer	
xiv.	Shower H15 Both Doors Open	
xv.	Airlock H13 Both Doors Open	
xvi.	Airlock H14 Both Doors Open	
xvii.	Door H18 Door Open	
	Total number of Points	

11.9.2 BLOCK H

No	Equipment	Points
i.	Ultra Freezer 1 Temperature High	
ii.	Ultra Freezer 2 Temperature High	
iii.	Ultra Freezer 3 Temperature High	
iv.	Ultra Freezer 4 Temperature High	
v.	Incubator 1 Temperature Low	
vi.	Incubator 1 Temperature High	
vii.	Incubator 2 Temperature Low	
viii.	Incubator 2 Temperature High	
ix.	Cold Room CR1 Temperature	
x.	Freezer Room FR1 Temperature	
xi.	Cold Room CR2 Temperature	
xii.	MRS Bus Switch	
xiii.	Force Comms	
xiv.	Force Fail	
xv.	Force Bus	
	Total number of Points	

11.10. BLOCK H: SHOWER H16, H17 AND DB16

11.10.1 BLOCK H GROUND FLOOR

No	Equipment	Points
i.	Shower H16 Door Open	
ii.	Shower H17 Door Open	
iii.	DB 16 MCB Tripped	
iv.	MRS Bus Switch	
v.	Force Comms	
vi.	Force Fail	
vii.	Force Bus	
	Total number of Points	

11.10.2 DISTIL PLANT

No	Equipment	Points
i.	Pump Tripped	
ii.	Booster Pump Tripped	
iii.	Booster Pump Fail	
iv.	Booster Tank Level Low	
v.	Booster Tank Level High	
	Total number of Points	

11.11. LOFT STABLES AREA: SHOWER E13, F34, F35, PASS THROUGH F4, DOOR F36, F37, STABLES F5 TO F16

11.11.1 STABLES GROUND FLOOR NORTH END

No	Equipment	Points
i.	Shower E13 Clean Door Open	
ii.	Shower E13 Dirty Door Open	
iii.	Shower E13 Dirty Door Seal Deflated	
iv.	Shower E13 Emergency Switch – ES13	
v.	Shower E13 Both Doors Open	
	Total number of Points	

11.11.2 STABLES LOFT NEED SHUTES NORTH END

No	Equipment	Points
i.	Shower F34 Clean Door Open	
ii.	Shower F34 Dirty Door Open	
iii.	Shower F34 Dirty Door Seal Deflated	
iv.	Shower F34 Emergency Switch – ES34	
v.	Shower F35 Clean Door Open	
vi.	Shower F35 Dirty Door Open	
vii.	Shower F35 Dirty Door Seal Deflated	
viii.	Shower F35 Emergency Switch – ES35	
ix.	Shower F34 Both Doors Open	
x.	Shower F35 Both Doors Open	
xi.	Pass through Cabinet F4 Inside Door Open	
xii.	Pass through Cabinet F4 Outside Door Open	
xiii.	Door F36 Door Seal Deflated	
xiv.	Door F36 Door Open Stal/H	
xv.	Door F37 Door Seal Deflated	
xvi.	Door F37 Door Open	
xvii.	Pass through F4 Both Doors Open	
xviii.	MRS Bus Switch	
xix.	Force Comms	
xx.	Force Fail	
xxi.	Force Bus	
xxii.	Stable F5 North Shower Door Open	

No	Equipment	Points
xxiii.	Stable F5 South Shower Door Open	
xxiv.	Stable F5 Outer Corridor Door Open	
xxv.	Stable F5 Outer Corridor Door Seal Deflated	
xxvi.	Stable F5 Central Corridor Door Open	
xxvii.	Stable F5 Central Corridor Door Seal Deflated	
xxviii.	Stable F5 Supply Air Pneuma Valve Closed	
xxix.	Stable F5 Exhaust Air Pneuma Valve Closed	
xxx.	Stable F6 North Shower Door Open	
xxxi.	Stable F6 South Shower Door Open	
xxxii.	Stable F6 Outer Corridor Door Open	
xxxiii.	Stable F6 Outer Corridor Door Seal Deflated	
xxxiv.	Stable F6 Central Corridor Door Open	
xxxv.	Stable F6 Central Corridor Door Seal Deflated	
xxxvi.	Stable F6 Supply Air Pneuma Valve Closed	
xxxvii.	Stable F6 Exhaust Air Pneuma Valve Closed	
xxxviii.	F5 Both Corridor Doors Open	
xxxix.	F5 Both Shower Doors Open	
xl.	F5 Both Pneuma Valves Open	
xli.	F6 Both Corridor Doors Open	
xlii.	F6 Both Shower Doors Open	
xliii.	F6 Both Pneuma Valves Open	
xliv.	Stable F7 North Shower Door Open	
xlv.	Stable F7 South Shower Door Open	
xlvi.	Stable F7 Outer Corridor Door Open	
xlvii.	Stable F7 Outer Corridor Door Seal Deflated	
xlviii.	Stable F7 Central Corridor Door Open	
xlix.	Stable F7 Central Corridor Door Seal Deflated	
l.	Stable F7 Supply Air Pneuma Valve Closed	
li.	Stable F7 Exhaust Air Pneuma Valve Closed	
lii.	Stable F8 North Shower Door Open	
liii.	Stable F8 South Shower Door Open	
liv.	Stable F8 Outer Corridor Door Open	
lv.	Stable F8 Outer Corridor Door Seal Deflated	
lvi.	Stable F8 Central Corridor Door Open	
lvii.	Stable F8 Central Corridor Door Seal Deflated	
lviii.	Stable F8 Supply Air Pneuma Valve Closed	
lix.	Stable F8 Exhaust Air Pneuma Valve Closed	
lx.	F7 Both Corridor Doors Open	
lxi.	F7 Both Shower Doors Open	
lxii.	F7 Both Pneuma Valves Open	
lxiii.	F8 Both Corridor Doors Open	
lxiv.	F8 Both Shower Doors Open	
lxv.	F8 Both Pneuma Valves Open	
lxvi.	Stable F9 North Shower Door Open	
lxvii.	Stable F9 South Shower Door Open	
lxviii.	Stable F9 Outer Corridor Door Open	
lxix.	Stable F9 Outer Corridor Door Seal Deflated	

No	Equipment	Points
lxx.	Stable F9 Central Corridor Door Open	
lxxi.	Stable F9 Central Corridor Door Seal Deflated	
lxxii.	Stable F9 Supply Air Pneuma Valve Closed	
lxxiii.	Stable F9 Exhaust Air Pneuma Valve Closed	
lxxiv.	Stable F10 North Shower Door Open	
lxxv.	Stable F10 South Shower Door Open	
lxxvi.	Stable F10 Outer Corridor Door Open	
lxxvii.	Stable F10 Outer Corridor Door Seal Deflated	
lxxviii.	Stable F10 Central Corridor Door Open	
lxxix.	Stable F10 Central Corridor Door Seal Deflated	
lxxx.	Stable F10 Supply Air Pneuma Valve Closed	
lxxxii.	Stable F10 Exhaust Air Pneuma Valve Closed	
lxxxii.	F9 Both Corridor Doors Open	
lxxxiii.	F9 Both Shower Doors Open	
lxxxiv.	F9 Both Pneuma Valves Open	
lxxxv.	F10 Both Corridor Doors Open	
lxxxvi.	F10 Both Shower Doors Open	
lxxxvii.	F10 Both Pneuma Valves Open	
lxxxviii.	Stable F11 North Shower Door Open	
lxxxix.	Stable F11 South Shower Door Open	
xc.	Stable F11 Outer Corridor Door Open	
xc.	Stable F11 Outer Corridor Door Seal Deflated	
xcii.	Stable F11 Central Corridor Door Open	
xciii.	Stable F11 Central Corridor Door Seal Deflated	
xciv.	Stable F11 Supply Air Pneuma Valve Closed	
xcv.	Stable F11 Exhaust Air Pneuma Valve Closed	
xcvi.	Stable F12 North Shower Door Open	
xcvii.	Stable F12 South Shower Door Open	
xcviii.	Stable F12 Outer Corridor Door Open	
xcix.	Stable F12 Outer Corridor Door Seal Deflated	
c.	Stable F12 Central Corridor Door Open	
ci.	Stable F12 Central Corridor Door Seal Deflated	
cii.	Stable F12 Supply Air Pneuma Valve Closed	
ciii.	Stable F12 Exhaust Air Pneuma Valve Closed	
civ.	F11 Both Corridor Doors Open	
cv.	F11 Both Shower Doors Open	
cvi.	F11 Both Pneuma Valves Open	
cvii.	F12 Both Corridor Doors Open	
cviii.	F12 Both Shower Doors Open	
cix.	F12 Both Pneuma Valves Open	
cx.	Stable F13 North Shower Door Open	
cx.	Stable F13 South Shower Door Open	
cxii.	Stable F13 Outer Corridor Door Open	
cxiii.	Stable F13 Outer Corridor Door Seal Deflated	
cxiv.	Stable F13 Central Corridor Door Open	
cxv.	Stable F13 Central Corridor Door Seal Deflated	
cxvi.	Stable F13 Supply Air Pneuma Valve Closed	

No	Equipment	Points
cxvii.	Stable F13 Exhaust Air Pneuma Valve Closed	
cxviii.	Stable F14 North Shower Door Open	
cxix.	Stable F14 South Shower Door Open	
cxx.	Stable F14 Outer Corridor Door Open	
cxxi.	Stable F14 Outer Corridor Door Seal Deflated	
cxxii.	Stable F14 Central Corridor Door Open	
cxxiii.	Stable F14 Central Corridor Door Seal Deflated	
cxxiv.	Stable F14 Supply Air Pneuma Valve Closed	
cxxv.	Stable F14 Exhaust Air Pneuma Valve Closed	
cxxvi.	F13 Both Corridor Doors Open	
cxxvii.	F13 Both Shower Doors Open	
cxxviii.	F13 Both Pneuma Valves Open	
cxxix.	F14 Both Corridor Doors Open	
cxxx.	F14 Both Shower Doors Open	
cxxx.	F14 Both Pneuma Valves Open	
cxxxii.	Stable F15 North Shower Door Open	
cxxxiii.	Stable F15 South Shower Door Open	
cxxxiv.	Stable F15 Outer Corridor Door Open	
cxxxv.	Stable F15 Outer Corridor Door Seal Deflated	
cxxxvi.	Stable F15 Central Corridor Door Open	
cxxxvii.	Stable F15 Central Corridor Door Seal Deflated	
cxxxviii.	Stable F15 Supply Air Pneuma Valve Closed	
cxxxix.	Stable F15 Exhaust Air Pneuma Valve Closed	
cxl.	Stable F16 North Shower Door Open	
cxli.	Stable F16 South Shower Door Open	
cxlii.	Stable F16 Outer Corridor Door Open	
cxliii.	Stable F16 Outer Corridor Door Seal Deflated	
cxliv.	Stable F16 Central Corridor Door Open	
cxlv.	Stable F16 Central Corridor Door Seal Deflated	
cxlvi.	Stable F16 Supply Air Pneuma Valve Closed	
cxlvii.	Stable F16 Exhaust Air Pneuma Valve Closed	
cxlviii.	Outer Corridor S/A Pneuma Valves Closed	
cxlix.	Central Corridor S/A Pneuma Valves Closed	
cl.	Stable Corridor Pneuma Valves Open	
cli.	F15 Both Shower Doors Open	
clii.	F15 Both Pneuma Valves Open	
cliii.	F16 Both Corridor Doors Open	
cliv.	F16 Both Shower Doors Open	
clv.	F16 Both Pneuma Valves Open	
	Total number of Points	

11.12. INCINERATORS

No	Equipment	Points
i.	Duty Supply Air Damper	
ii.	Standby Supply Air Damper	
iii.	Duty Exhaust Air Damper	
iv.	Standby Exhaust Air Damper	
v.	Duty Supply Air Fan Command	
vi.	Standby Supply Air Fan Command	
vii.	Duty Exhaust Air Fan Command	
viii.	MRS Bus Switch	
ix.	Supply Air Flow Switch	
x.	Exhaust Air Flow Switch	
xi.	Hospital Damper 1 Open	
xii.	Hospital Damper 1 Closed	
xiii.	Local Key Switch	
xiv.	Space Pressure Sensor	
xv.	Temperature Sensor	
xvi.	Humidity Sensor	
xvii.	Standby Exhaust Air Fan Command	
xviii.	Switch to Duty S/A	
xix.	Switch to Duty E/A	
xx.	Both S/A Fans Shutdown	
xxi.	Force Comms	
xxii.	Force Fail	
xxiii.	Force Rotate Bus	
xxiv.	Pressure during Incinerator Operation	
xxv.	History Incinerators 806	
	Total number of Points	

11.13. EFFLUENT PLANT

No	Equipment	Points
i.	Duty Supply Air Damper	
ii.	Standby Supply Air Damper	
iii.	Duty Exhaust Air Damper	
iv.	Standby Exhaust Air Damper	
v.	Duty Supply Air Fan Command	
vi.	Standby Supply Air Fan Command	
vii.	Duty Exhaust Air Fan Command	
viii.	MRS Bus Switch	
ix.	Supply Air Flow Switch	
x.	Exhaust Air Flow Switch	
xi.	Hospital Damper 1 Open	
xii.	Hospital Damper 1 Closed	
xiii.	Local Key Switch	
xiv.	Space Pressure Sensor	
xv.	Temperature Sensor	

No	Equipment	Points
xvi.	Humidity Sensor	
xvii.	Standby Exhaust Air Fan Command	
xviii.	Switch to Duty S/A	
xix.	Switch to Duty E/A	
xx.	Both S/A Fans Shutdown	
xxi.	Force Comms	
xxii.	Force Fail	
xxiii.	Force Rotate Bus	
xxiv.	History Effluent Plant 835	
	Total number of Points	

11.14. SHOWER F18, SHOWER F19, SHOWER F30, AIRLOCK F25, AIRLOCK F31

11.14.1 STABLES GROUND FLOOR SOUTH END

No	Equipment	Points
i.	Shower F18 Clean Door Open	
ii.	Shower F18 Dirty Door Open	
iii.	Shower F18 Dirty Door Seal Deflated	
iv.	Shower F18 Emergency Switch – ES18	
v.	Shower F19 Clean Door Open	
vi.	Shower F19 Dirty Door Open	
vii.	Shower F19 Dirty Door Seal Deflated	
viii.	Airlock F25 Clean Door Open	
ix.	Airlock F25 Dirty Door Open	
x.	Airlock F25 Clean Door Seal Deflated	
xi.	Airlock F25 Dirty Door Seal Deflated	
xii.	Airlock F25 Emergency Switch – ES25	
xiii.	Airlock F25 Fumigation Cycle Started	
xiv.	Airlock F25 Both Doors Open	
xv.	Airlock F25 Fumigation Timer	
xvi.	Shower F18 Both Doors Open	
xvii.	Shower F19 Both Doors Open	
	Total number of Points	

11.14.2 STABLES LOFT NEED SHUTES SOUTH END

No	Equipment	Points
i.	Shower F30 Clean Door Open	
ii.	Shower F30 Dirty Door Open	
iii.	Shower F30 Clean Door Seal Deflated	
iv.	Shower F30 Emergency Switch – ES30	
v.	Airlock F31 Clean Door open	
vi.	Airlock F31 Dirty Door Open	
vii.	Airlock F31 Clean Door Seal Deflated	
viii.	Airlock F31 Dirty Door Seal Deflated	
ix.	Airlock F31 Fumigation Cycle Started	

No	Equipment	Points
x.	Airlock F31 Fumigation Timer	
xi.	Airlock F31 Both Doors Open	
xii.	Shower F30 Both Doors Open	
xiii.	MRS Bus Switch	
xiv.	Force Comms	
xv.	Force Fail	
xvi.	Force Bus	
xvii.	Force Rotate Bus	
	Total number of Points	

11.15. SHOWER F1, F2, F32, AIRLOCK F22, F24, F33, AUTOCLAVE F23, COLD ROOM, DB18

11.15.1 STABLES GROUND FLOOR SOUTH END

No	Equipment	Points
i.	Shower F1 Clean Door Open	
ii.	Shower F1 Dirty Door Open	
iii.	Shower F1 Dirty Door Seal Deflated	
iv.	Shower F2 Clean Door Open	
v.	Shower F2 Dirty Door Open	
vi.	Shower F2 Dirty Door Seal Deflated	
vii.	Shower F2 Emergency Switch – ES2	
viii.	Airlock F22 Clean Door Open	
ix.	Airlock F22 Dirty Door Open	
x.	Airlock F24 Clean Door Open	
xi.	Airlock F24 Dirty Door Open	
xii.	Airlock F24 Clean Door Seal Deflated	
xiii.	Airlock F24 Dirty Door Seal Deflated	
xiv.	Airlock F24 Emergency Switch – ES24	
xv.	Airlock F24 Fumigation Cycle Started	
xvi.	Airlock F22 Both Doors Open	
xvii.	Airlock F24 Both Doors Open	
xviii.	Airlock F24 Fumigation Timer	
xix.	Shower F1 Both Doors Open	
xx.	Shower F2 Both Doors Open	
	Total number of Points	

11.15.2 STABLES LOFT NEED SHUTES SOUTH END

No	Equipment	Points
i.	Shower F32 Clean Door Open	
ii.	Shower F32 Dirty Door Open	
iii.	Shower F32 Dirty Door Seal Deflated	
iv.	Shower F32 Emergency Switch – ES32	
v.	Airlock F33 Clean Door Open	
vi.	Airlock F33 Dirty Door Open	

No	Equipment	Points
vii.	Airlock F33 Clean Door Seal Deflated	
viii.	Airlock F33 Dirty Door Seal Deflated	
ix.	Airlock F33 Fumigation Cycle On	
x.	Airlock F33 Fumigation Timer	
xi.	Airlock F33 Both Doors Open	
xii.	Shower F32 Both Doors Open	
xiii.	Autoclave F23 Sterilisation Cycle Started	
xiv.	Autoclave F23 Sterilisation Cycle Completed	
xv.	Autoclave F23 Ready	
	Total number of Points	

11.15.3 POST MORTEM COLD ROOM

No	Equipment	Points
i.	DB18 MCB Tripped	
ii.	Cold Room Motor Tripped	
iii.	Cold Room Temperature	
iv.	MRS Bus Switch	
v.	Force Comms	
vi.	Force Fail	
vii.	Force Bus	
viii.	Force Rotate Bus	
	Total number of Points	

11.16. STANDBY PLANT, WATER STORAGE, UNINTERRUPTED POWER SUPPLY (UPS) AND MAINS POWER

11.16.1 CONTROL ROOM

No	Equipment	Points
i.	Standby Plant Faulty	
ii.	Water Storage Tank Low	
iii.	Gas Store	
iv.	Building Monitoring System Power Failure	
v.	MRS Bus Switch	
vi.	Force Comms	
vii.	Force Fail	
viii.	Force Bus	
ix.	Force Rotate Bus	
	Total number of Points	

11.17. AIRLOCK T1, DOOR T4, DOOR T5

11.17.1 BLOCK TISSUE CULTURE GROUND FLOOR

No	Equipment	Points
i.	Airlock T1 Clean Door Open	

No	Equipment	Points
ii.	Airlock T1 Dirty Door Open	
iii.	Airlock T1 Clean Door Seal Deflated	
iv.	Airlock T1 Dirty Door Seal Deflated	
v.	Door T4 Seal	
vi.	Door T5 Seal	
vii.	Airlock T1 Both Doors Open	
viii.	MRS Bus Switch	
ix.	Force Comms	
x.	Force Fail	
xi.	Force Bus	
xii.	Force Rotate Bus	
xiii.	Door T4 Open	
xiv.	Door T5 Open	
	Total number of Points	

11.18. DOOR T3, T8, T10 AIR-CONDITIONING CHILLER, AUTOCLAVE T11, T12, FERMENTERS

11.18.1 TISSUE CULTURE BLOCK

No	Equipment	Points
i.	Door T3 Door Open	
ii.	Door T8 Door Seal	
iii.	Door T9 Door Seal	
iv.	Door T10 Door Seal	
v.	Autoclave T11 Sterilisation Cycle Started	
vi.	Autoclave T11 Sterilisation Cycle Completed	
vii.	Autoclave T12 Sterilisation Cycle Started	
viii.	Autoclave T12 Sterilisation Cycle Completed	
ix.	Fermenter 1 Malfunction	
x.	Fermenter 2 Malfunction	
xi.	Fermenter 3 Malfunction	
xii.	Fermented 4 Malfunction	
xiii.	A/C Chiller 1 Tripped	
xiv.	A/C CNDW Pump 1 Run	
xv.	A/C CNDW Pump 1 Trip	
xvi.	A/C CNDW Pump 2 Run	
xvii.	A/C CNDW Pump 2 Trip	
xviii.	A/C CHW Pump 1 Run	
xix.	A/C CHW Pump 1 Trip	
xx.	A/C CHW Pump 2 Run	
xxi.	A/C CHW Pump 2 Trip	
xxii.	Oxygen Low	
xxiii.	A/C Chiller 1 Supply Temp	
xxiv.	Autoclave T11 Ready	
xxv.	Autoclave T12 Ready	
xxvi.	MRS Bus Switch	

No	Equipment	Points
xxvii.	Force Comms	
xxviii.	Force Fail	
xxix.	Force Rotate Bus	
xxx.	Door T8 Door Open	
xxxi.	Door T9 Door Open	
xxxii.	Door T10 Door Open	
xxxiii.	Chiller2 Tripped	
xxxiv.	Chiller 2 Supply Temp	
xxxv.	Condenser 1 Inlet Temp	
xxxvi.	Condenser 2 Inlet Temp	
	Total number of Points	

11.19. AIRLOCK T2, DOOR T6, DOOR T7

11.19.1 BLOCK TISSUE CULTURE GROUND FLOOR

No	Equipment	Points
i.	Door T7 Seal	
ii.	Airlock T2 Clean Door Open	
iii.	Airlock T2 Dirty Door Open	
iv.	Airlock T2 Clean Door Seal Deflated	
v.	Airlock T2 Dirty Door Seal Deflated	
vi.	Door T6 Seal	
vii.	Airlock T2 Both Doors Open	
viii.	MRS Bus Switch	
ix.	Force Comms	
x.	Force Fail	
xi.	Force Rotate Bus	
xii.	Door T6 Open	
xiii.	Door T7 Open	
	Total number of Points	

11.20. COLD ROOM 1 TO 3, INCUBATOR, VENTILATION EAST, VENTILATION WEST

11.20.1 DIAGNOSTIC LABORATORIES BLOCK G

No	Equipment	Points
i.	Heat Valve Vent East	
ii.	Heat Valve Vent West	
	Total number of Points	

11.20.2 TISSUE CULTURE LABORATORIES

No	Equipment	Points
i.	Incubator Temperature	
ii.	Cold Room CR1 Temp	

No	Equipment	Points
iii.	Freezer Room FR1 Temp	
iv.	Cold Room CR2 Temp	
v.	Cold Room CR3 Temp	
vi.	Vent East Temp	
vii.	Vent West Temp	
viii.	MRS Bus Switch	
ix.	Force Comms	
x.	Force Fail	
xi.	Force Rotate Bus	
	Total number of Points	

11.21. AIR-CONDITIONING ZONE 1 (+80 Pa), TISSUE CULTURE BOTTLING PLANT

No	Equipment	Points
i.	Duty S/A Damper	
ii.	Standby S/A Damper	
iii.	Exhaust Air Damper R/A	
iv.	Heat Valve	
v.	Cool Valve	
vi.	Humid Valve	
vii.	Shut-Off Damper S/A Fresh	
viii.	Shut-Off Damper E/A	
ix.	S/A Air Flow	
x.	Space Pressure Sensor	
xi.	Duct Pressure Switch	
xii.	Temperature Sensor	
xiii.	Humidity Sensor	
xiv.	Duty S/A Fan	
xv.	Standby S/A Fan	
xvi.	Switch to Duty S/A	
xvii.	R/A Temp Set Point	
xviii.	R/A Humidity Set Point	
xix.	History Zone 1	
	Total number of Points	

11.22. AIR-CONDITIONING ZONE 2 (+50 Pa), TISSUE CULTURE LABORATORIES

No	Equipment	Points
i.	Duty S/A Damper	
ii.	Standby S/A Damper	
iii.	Exhaust Air Damper	
iv.	Heat Valve	
v.	Cool Valve	
vi.	Humid Valve	
vii.	Shut-Off Damper S/A	
viii.	Shut-Off Damper E/A	

No	Equipment	Points
ix.	S/A Air Flow	
x.	Space Pressure Sensor	
xi.	Duct Pressure Switch	
xii.	Temperature Sensor	
xiii.	Humidity Sensor	
xiv.	Duty S/A Fan	
xv.	Standby S/A Fan	
xvi.	Switch to Duty S/A	
xvii.	R/A Temp Set Point	
xviii.	R/A Humidity Set Point	
xix.	History Zone 2	
xx.	Total number of Points	

11.23. AIR-CONDITIONING ZONE 3 (+30Pa), TISSUE CULTURE CORRIDOR

No	Equipment	Points
i.	Duty S/A Damper	
ii.	Standby S/A Damper	
iii.	Exhaust Air Damper	
iv.	Heat Valve	
v.	Cool Valve	
vi.	Humid Valve	
vii.	Shut-Off Damper S/A	
viii.	Shut-Off Damper E/A	
ix.	S/A Air Flow	
x.	Space Pressure Sensor	
xi.	Duct Pressure Switch	
xii.	Temperature Sensor	
xiii.	Humidity Sensor	
xiv.	Duty S/A Fan	
xv.	Standby S/A Fan	
xvi.	Switch to Duty S/A	
xvii.	Mains Power Fail	
xviii.	Uninterrupted Power Supply (UPS) Main Power	
xix.	R/A Temp Set Point	
xx.	R/A Humidity Set Point	
xxi.	History Zone 3	
xxii.	Total number of Points	

11.24. STABLES MAIN, SUPPLY AND EXHAUST

No	Equipment	Points
i.	S/A Damper Duty	
ii.	S/A Damper Standby	
iii.	E/A Damper Duty	
iv.	E/A Damper Standby	
v.	Duty S/A Fan Command	

No	Equipment	Points
vi.	Standby S/A Fan Command	
vii.	Exhaust Duty Fan Command	
viii.	Standby Exhaust Fan Command	
ix.	S/A Air Flow Switch	
x.	E/A Air Flow Switch	
xi.	Space Pressure Sensor S/A	
xii.	Temperature Sensor	
xiii.	Humidity Sensor	
xiv.	Pressure E/A	
xv.	Switch to Duty S/A	
xvi.	Switch to Duty E/A	
xvii.	Stable E/A Fans (Central Corridor and Post Mortem High pressure)	
xviii.	History Stables Main Supply and Exhaust	
xix.	Supply Pressure Set Point	
xx.	Exhaust Pressure Set Point	
	Total number of Points	

11.25. OUTER CORRIDORS, POST MORTEM AND CENTRAL CORRIDORS

No	Equipment	Points
i.	S/A Damper Duty	
ii.	S/A Damper Standby	
iii.	E/A Damper Duty	
iv.	E/A Damper Standby	
v.	Duty S/A Fan Command	
vi.	Standby S/A Fan Command	
vii.	Exhaust Duty Fan Command	
viii.	Standby Exhaust Fan Command	
ix.	S/A Air Flow Switch	
x.	E/A Air Flow Switch	
xi.	Space Pressure Sensor	
xii.	Temperature Sensor	
xiii.	Humidity Sensor	
xiv.	Post Mortem S/A Duty Damper	
xv.	Post Mortem S/A Standby Damper	
xvi.	Post Mortem E/A Duty Damper	
xvii.	Post mortem E/A Standby Damper	
xviii.	Central Corridor E/A Duty Damper	
xix.	Central Corridor E/A Standby Damper	
xx.	MRS Bus Switch	
xxi.	Post Mortem Temperature	
xxii.	Post Mortem Humidity	
xxiii.	Post Mortem H/D Open	
xxiv.	Post Mortem H/D Closed	
xxv.	Post Mortem Space Pressure Sensor	
xxvi.	Central Corridor Temperature	

No	Equipment	Points
xxvii.	Central Corridor Humidity	
xxviii.	Post Mortem Duty SAF Command	
xxix.	Post Mortem Standby SAF Command	
xxx.	Post Mortem Duty EAF Command	
xxxi.	Post Mortem Standby EAF Command	
xxxii.	Central Corridor Duty EAF Command	
xxxiii.	Central Corridor Standby EAF Command	
xxxiv.	Post Mortem Air Flow S/A	
xxxv.	Post Mortem Air Flow E/A	
xxxvi.	Central Corridor Air Flow E/A	
xxvii.	Post Mortem History	
xxviii.	Switch to Duty Post Mortem S/A	
xxxix.	Switch to Duty Post Mortem E/A	
xl.	Switch to Duty Outer Corridor S/A	
xli.	Switch to Duty Outer Corridor E/A	
xl.ii.	Switch to Duty Central E/A	
xl.iii.	Force Comms	
xl.iv.	Force Fail	
xl.v.	Force Rotate Bus	
xl.vi.	Outer Corridor S/A Fans Shutdown (Outer Corridor Standby EAF Flow Fail)	
xl.vii.	Outer Corridor E/A Fans (Central Corridor and Outer Corridor High Pressure or Outer Corridor Low Pressure)	
xl.viii.	Post Mortem S/A Fans Off (Post Mortem and Outer Corridor Standby EAF Flow Fail)	
xl.ix.	Central Corridor E/A Fans (Outer Corridor High/Low Pressure)	
	Total number of Points	

11.26. STABLE BASEMENT, DIAGNOSTIC BASEMENT AND VACCINE BASEMENT

No	Equipment	Points
i.	Stable Basement S/A Duty Damper	
ii.	Stable Basement S/A Standby Damper	
iii.	Stable Basement E/A Duty Damper	
iv.	Stable Basement E/A Standby Damper	
v.	Diagnostic Basement E/A Duty Damper	
vi.	Diagnostic Basement E/A Standby Damper	
vii.	Vaccine Basement E/A Duty Damper	
viii.	Vaccine Basement E/A Standby Damper	
ix.	Stable Basement Pressure Sensor	
x.	Stable Basement Temperature	
xi.	Stable Basement Humidity	
xii.	Diagnostic Basement Temperature	
xiii.	Diagnostic Basement Humidity	

No	Equipment	Points
xiv.	Vaccine Basement Temperature	
xv.	Vaccine Basement Humidity	
xvi.	Stable Basement Duty SAF Command	
xvii.	Stable Basement Standby SAF Command	
xviii.	Stable Basement Duty EAF Command	
xix.	Stable Basement Standby EAF Command	
xx.	Diagnostic Basement Duty EAF Command	
xxi.	Diagnostic Basement Standby EAF Command	
xxii.	Vaccine Basement Duty EAF Command	
xxiii.	Vaccine Basement Standby EAF Command	
xxiv.	Stable Basement Air Flow S/A	
xxv.	Stable Basement Air Flow E/A	
xxvi.	Diagnostic Basement Air Flow E/A	
xxvii.	Stable Basement H/D Open	
xxviii.	Stable Basement H/D Closed	
xxix.	Vaccine Basement Exhaust Air Flow	
xxx.	Switch to Duty Stable Basement S/A	
xxxi.	Switch to Duty Stable Basement E/A	
xxxii.	Switch to Duty Diagnostic Basement S/A	
xxxiii.	Switch to Duty Diagnostic Basement E/A	
xxxiv.	Switch to Duty Vaccine Basement S/A	
xxxv.	Switch to Duty Vaccine Basement E/A	
xxxvi.	Diagnostic Basement Air Flow S/A	
xxvii.	Vaccine Basement Air Flow S/A	
xxviii.	Stable Basement Both S/A Fans Off	
xxxix.	Diagnostic Basement Both S/A Fans Off	
xl.	Vaccine Basement Both S/A Fans Off	
xli.	Basement History	
	Total number of Points	

11.27. STABLES F5 TO F8

No	Equipment	Points
i.	Stable F5 S/A Damper	
ii.	Stable F5 E/A Damper	
iii.	Stable F6 S/A Damper	
iv.	Stable F6 E/A Damper	
v.	Stable F7 S/A Damper	
vi.	Stable F7 E/A Damper	
vii.	Stable F8 S/A Damper	
viii.	Stable F8 E/A Damper	
ix.	Stable F5 Space Pressure Switch	
x.	Stable F6 Space Pressure Switch	
xi.	Stable F7 Space Pressure Switch	
xii.	Stable F8 Space Pressure Switch	
xiii.	Diagnostic Basement H/D Open	
xiv.	Diagnostic Basement H/D Closed	

No	Equipment	Points
xv.	Vaccine Basement H/D Open	
xvi.	Vaccine Basement H/D Closed	
xvii.	Stable F5 History	
xviii.	Stable F6 History	
xix.	Stable F7 History	
xx.	Stable F8 history	
	Total number of Points	

11.28. STABLES F9 TO F12

No	Equipment	Points
i.	Stable F9 S/A Damper	
ii.	Stable F9 E/A Damper	
iii.	Stable F10 S/A Damper	
iv.	Stable F10 E/A Damper	
v.	Stable F11 S/A Damper	
vi.	Stable F11 E/A Damper	
vii.	Stable F12 S/A Damper	
viii.	Stable F12 E/A Damper	
ix.	Stable F9 Space Pressure Switch	
x.	Stable F10 Space Pressure Switch	
xi.	Stable F11 Space Pressure Switch	
xii.	Stable F12 Space Pressure Switch	
xiii.	Stable F9 History	
xiv.	Stable F10 History	
xv.	Stable F11 History	
xvi.	Stable F12 history	
xvii.	Total number of Points	

11.29. STABLES F13 TO F16

No	Equipment	Points
i.	Stable F13 S/A Damper	
ii.	Stable F13 E/A Damper	
iii.	Stable F14 S/A Damper	
iv.	Stable F14 E/A Damper	
v.	Stable F15 S/A Damper	
vi.	Stable F15 E/A Damper	
vii.	Stable F16 S/A Damper	
viii.	Stable F16 E/A Damper	
ix.	Stable F13 Space Pressure Switch	
x.	Stable F14 Space Pressure Switch	
xi.	Stable F15 Space Pressure Switch	
xii.	Stable F16 Space Pressure Switch	
xiii.	Stable F13 History	
xiv.	Stable F14 History	
xv.	Stable F15 History	

No	Equipment	Points
xvi.	Stable F16 history	
xvii.	Total number of Points	

11.30. DIAGNOSTIC LABORATORIES AND DIAGNOSTIC SHOWERS

No	Equipment	Points
i.	Diagnostic Laboratory S/A Damper Duty	
ii.	Diagnostic Laboratory S/A Damper Standby	
iii.	Diagnostic Laboratory E/A Damper Duty	
iv.	Diagnostic Laboratory E/A Damper Standby	
v.	Diagnostic Shower E/A Damper Duty	
vi.	Diagnostic Shower E/A Damper Standby	
vii.	Diagnostic Laboratory Temperature	
viii.	Diagnostic Laboratory Humidity	
ix.	Diagnostic Laboratory Pressure Sensor	
x.	Diagnostic Shower Pressure Sensor	
xi.	Diagnostic Showers Temperature	
xii.	Diagnostic Shower Humidity	
xiii.	Diagnostic SAL-4 Damper Open	
xiv.	Diagnostic SAL-4 Damper Closed	
xv.	Diagnostic Laboratory Duty SAF Command	
xvi.	Diagnostic Laboratory Standby SAF Command	
xvii.	Diagnostic Laboratory Duty EAF Command	
xviii.	Diagnostic Laboratory Standby EAF Command	
xix.	Diagnostic Shower Duty EAF Command	
xx.	Diagnostic Shower Stanby EAF Command	
xxi.	Diagnostic Laboratory Air Flow S/A	
xxii.	Diagnostic Laboratory Air Flow E/A	
xxiii.	Diagnostic Laboratory SAL-1 Damper Open	
xxiv.	Diagnostic Laboratory SAL-1 Damper Closed	
xxv.	Diagnostic Laboratory SAL-2 Damper Open	
xxvi.	Diagnostic Laboratory SAL-2 Damper Closed	
xxvii.	Diagnostic Laboratory SAL-3 Damper Open	
xxviii.	Diagnostic Laboratory SAL-3 Damper Closed	
xxix.	Diagnostic Showers Exhaust Air Flow	
xxx.	Switch to Duty Diagnostic Laboratory S/A	
xxxi.	Switch to Duty Diagnostic Laboratory E/A	
xxxii.	Switch to Duty Diagnostic Shower E/A	
xxxiii.	Diagnostic Basement Duty S/A Fan	
xxxiv.	Diagnostic Basement Standby S/A Fan	
xxxv.	Vaccine Basement Duty S/A Fan	
xxxvi.	Vaccine Basement Standby S/A Fan	
xxvii.	Diagnostic Laboratory Both S/A Fans Off (Diagnostic Laboratory High Pressure or EAF Fail)	
xxviii.	History Diagnostic Laboratory	
xxxix.	History Diagnostic Shower	

No	Equipment	Points
	Total number of Points	

11.31. VACCINE PRODUCTION CONTAMINATED LABORATORIES

No	Equipment	Points
i.	S/A Damper Duty	
ii.	S/A Damper Standby	
iii.	E/A Damper Duty	
iv.	E/A Damper Standby	
v.	Duty SAF Command	
vi.	Standby SAF Command	
vii.	Duty EAF Command	
viii.	Standby EAF Command	
ix.	Space Pressure Sensor	
x.	Temperature Sensor	
xi.	Humidity Sensor	
xii.	Supply Air Flow	
xiii.	Exhaust Air Flow	
xiv.	Hospital Damper 1 Open	
xv.	Hospital Damper 1 Closed	
xvi.	Hospital Damper 2 Open	
xvii.	Hospital Damper 2 Closed	
xviii.	Switch to Duty S/A	
xix.	Switch to Duty E/A	
xx.	Both S/A Fans Shutdown (High Pressure or EAF Flow Fail)	
xxi.	Vaccine Production Contaminated Laboratory History	
	Total number of Points	

11.32. VACCINE PRODUCTION CLEAN LABORATORIES

No	Equipment	Points
i.	E/A Duty Damper Command	
ii.	E/A Standby Damper Command	
iii.	Duty EAF Command	
iv.	Standby EAF Command	
v.	Space Pressure Sensor	
vi.	Temperature Sensor	
vii.	Humidity Sensor	
viii.	Exhaust Air Flow	
ix.	Hospital Damper 1 Open	
x.	Hospital Damper 1 Closed	
xi.	Hospital Damper 2 Open	
xii.	Hospital Damper 2 Closed	

No	Equipment	Points
xiii.	Switch to Duty E/A	
xiv.	Diagnostic Basement S/A Damper Duty	
xv.	Diagnostic Basement S/A Damper Standby	
xvi.	Vaccine Basement S/A Damper Duty	
xvii.	Vaccine Basement S/A Damper Standby	
xviii.	Vaccine Production Clean Laboratories	
	Total number of Points	

11.33. BUFFER ZONE AND VACCINE LABORATORY SHOWERS

No	Equipment	Points
i.	S/A Damper Duty	
ii.	S/A Damper Standby	
iii.	E/A Damper Duty	
iv.	E/A Damper Standby	
v.	Duty SAF Command	
vi.	Standby SAF Command	
vii.	Duty EAF Command	
viii.	Standby EAF Command	
ix.	Space Pressure Sensor	
x.	Temperature Sensor	
xi.	Humidity Sensor	
xii.	Supply Air Flow	
xiii.	Exhaust Air Flow	
xiv.	Hospital Damper 1 Open	
xv.	Hospital Damper 1 Closed	
xvi.	Switch to Duty S/A	
xvii.	Switch to Duty E/A	
xviii.	Both S/A Fans Shutdown (High Pressure or Standby EAF Flow Fail)	
xix.	Buffer Zone and Vaccine Laboratory Showers history	
	Total number of Points	

11.34. UTENSIL APPARATUS

No	Equipment	Points
i.	S/A Damper Duty	
ii.	S/A Damper Standby	
iii.	E/A Damper Duty	
iv.	E/A Damper Standby	
v.	Duty SAF Command	
vi.	Standby SAF Command	
vii.	Duty EAF Command	
viii.	Standby EAF Command	
ix.	Space Pressure Sensor	
x.	Temperature Sensor	
xi.	Humidity Sensor	

No	Equipment	Points
xii.	Supply Air Flow	
xiii.	Exhaust Air Flow	
xiv.	Hospital Damper 1 Open	
xv.	Hospital Damper 1 Closed	
xvi.	Switch to Duty S/A	
xvii.	Switch to Duty E/A	
xviii.	Both S/A Fans Shutdown (High Pressure or EAF Flow Fail)	
xix.	Utensil Apparatus History	
	Total number of Points	