Document Number:	**SASoM/EQUIP/077.v2**
Title:	**Use of the Asper AS300RX Freezer Alarm System**
Version:	**v2**
Author:	**Peter Mullen**

Effective from:	18/12/2018
Valid to:	17/12/2023

SOP History		
Number	Date	Reason for Change
v1	18/12/2013	Original
V2	18/12/2018	Update

1.0 Purpose –
The purpose of this SOP is to outline the principles and operation of the Asper AS300RX Coldroom and Freezer Alarm System for use in Labs 248 and 249 at the St Andrews School of Medicine (SASoM).

2.0 Scope –
This SOP applies to all staff in the SASoM using the Asper AS300RX Alarm System in Labs 248 and 249.

3.0 Responsibilities –
It is the responsibility of all users of the Asper AS300RX Alarm System within the SASoM to comply with this SOP.

4.0 Procedure –
The Asper AS300RX Alarm System is an automatic real-time monitoring and alarm system which can accommodate multiple individual transmitters (up to 100). The central receiving unit can be interrogated at any time by means of text messages sent to the SIM card contained within the receiver(s).

The telephone number for the SIM card (Tx1-10) is as follows: **07568 103707**.
The telephone number for the SIM card (Tx11-20) is as follows: **07834 145756**.

Each transmitter is assigned to a specific fridge, freezer or cold room and each transmitter is independent of any other transmitter. These transmitters are coded as Tx1 - Tx100 and are currently* assigned to the following appliances:

Tx1 = Labtech Haier -70 Upright Freezer (JC-S)
Tx2 = New Brunswick -80 Upright Freezer (DJH)
Tx3 = New Brunswick -80 Upright Freezer (SG)
Tx4 = New Brunswick -80 Upright Freezer (CG)
Tx5 = Electrolux -20 Upright Freezer (SG)
Tx6 = Sanyo -80 Upright Freezer (FGM)
Tx7 = New Brunswick -80 Upright Freezer (SP)
Tx8 = Sanyo -40 Chest Freezer (FGM)
Tx9 = Lab 249 Cold Room
Tx10 = Lab 248 Cold Room

Tx11 = Lab 249D (Freezer Room) – ambient temperature
Tx12 = Taylor Wharton Liquid Nitrogen Tank (DJH)
Tx13 = Underbench -20 Freezer (Ollie's bench)
Tx14 = Underbench -20 Freezer (Sam Pitt)
Tx15 = Underbench -20 Freezer (Hannah, Jen, Peter)
Tx16 = Liquid Nitrogen Dewar (GC)
Tx17 = Underbench -20 Freezer (Cell Culture)
Tx18 = Underbench -20 Freezer (DJH - Antibodies)
Tx19 = Underbench -20 Freezer (FGM)
Tx20 = Underbench -20 Freezer (FGM)

(* this can be amended with no need to amend the SOP)

Principle of Operation:
Each transmitter (appliance) is allocated up to three mobile telephone numbers which are assigned in a pecking order. Each transmitter therefore has its own unique list of phone numbers! These phone numbers can be amended as necessary by those with administration rights.

If an alarm is activated, the dedicated transmitter will send a text to the first person on its (specific) list who must then acknowledge the text.

The text should be acknowledged by replying with '**tx1ack**' if pertaining to transmitter Tx1; '**tx6ack**' if pertaining to transmitter Tx6, and so forth.

If no acknowledgement is made, the transmitter will dial the second contact number, and then the third. The cycle will continue until such time as the freezer receives an acknowledgement after which it will dismiss its responsibility. It is then the responsibility of the person who acknowledged the text to ensure that the matter is dealt with in the appropriate way.

You can text any freezer at any time to see its current status using the commands listed below:

NB. When an alarm is activated it has to be 'acknowledged' before it will stop sending out the alarm Outgoing Message (OGM) text. Once acknowledged, all recipients who have received the alarm OGM text will be sent an additional text giving telephone details of the acknowledger. Once the alarm has been acknowledged, the Alarm Activated LED will be extinguished and the sounder will be silenced. No further action will be taken by the Alarm system and responsibility passes to the individual who acknowledged the alarm.

Current Status:
The status of each Transmitter (attached to the side of the freezer) can be ascertained at any given time by looking at the display panel as below:

Unit Enabled: Green LED when the unit is enabled. Red LED when the unit is disabled
Status: LED indicating the status of the unit.
System OK: 'ON' for 4 seconds and 'OFF' for 1 second.
Mains Power Fail: Status Light 'OFF' for 4 seconds and 'ON' for 1 second.
In Alarm Condition: Status Light 'ON' for 1 second and 'OFF' for 1 second.
GSM Signal: Indicates signal strength. LED will be solid and flash every 1 minute. Four flashes indicate an excellent signal strength. This LED will be extinguished if a weak signal is detected.
Alarm Activated: 'ON' when alarm is activated.
Power Failed: 'ON' when power fail has been activated (after delay time).
Alerts in Progress: 'ON' when alarm alerts and acknowledgements are being sent.
Display: The display scrolls through current information on the system.
Scroll and Main Switches: Allows access to Alarm, System, Probe and Tx Info menus.

Operation:
The Alarm system works by continually monitoring each transmitter, be that on a fridge, freezer or cold room. You can text any freezer at any time to see its current status by sending a text to 07568 103707 (the Receiver) using the commands listed below:

To acknowledge a Transmitter alarm:

tx3ack (to acknowledge Transmitter 3 alarm)
tx5ack (to acknowledge Transmitter 5 alarm)
tx9ack (to acknowledge Transmitter 9 alarm)

To acknowledge a Power Failure or Test Function alarm:

rxack

To query all registered Transmitters in the Receiver:

regtx?

To query all active Transmitters in the Receiver:

actx?

To query current Transmitter values (eg temperature status):

tx1? (to query Transmitter 1 status)
tx5? (to query Transmitter 5 status)
tx10? (to query Transmitter 10 status)

To query Receiver telephone numbers:

rx6tel

To query transmitter telephone numbers:

tx6tel? (to query Transmitter 6 telephone numbers)
tx8tel? (to query Transmitter 8 telephone numbers)

In addition to the basic commands above, there are additional functions which can only be accessed by an individual with administrative rights. All administrative functions require a 4-digit numerical code in order to become effective. This access code can be obtained from either Peter Mullen (pm72) or Mike Fearon (mf42).

For the purpose of this SOP, the administrative ID code will be represented by the digits '1234'.

To Register Transmitters with the Receiver:

To register the Transmitters a text message has to be sent to the central Receiver. The receiver will then look for transmitters which are 'in range' for a period of 90 minutes. Once the 90 minutes has elapsed no more transmitters will be allowed onto the system. This Registration process will need to be performed each time a Transmitter is 'added to' or 'removed from' the system.

1234space**regstr** (register all available transmitters)
1234space**regend** (ends registration period before 90 minutes has elapsed)

Setup Safety Telephone Number RX1Tel1:

RxTel1 is a Safety Telephone Number and serves the following purpose:

1. If no telephone numbers are programmed into individual transmitters, RxTel1 will be called in the event of an alarm.
2. This number will be called in the event of a Power Fail.
3. This number will be sent a monthly test message.
4. Up to three Safety Telephone Numbers can be entered as follows

1234space**rxtel1**space**07850686xxx** (setup Safety Telephone number 1)
1234space**rxtel2**space**07850686yyy** (setup Safety Telephone number 2)
1234space**rxtel3**space**07850686zzz** (setup Safety Telephone number 3)

Setup Transmitter Telephone Numbers:
Each Transmitter (freezer) can be programmed with up to three separate contact telephone numbers. These numbers must be MOBILE numbers and NOT landline numbers. All communication is done by TEXT via the SIM card associated with the Receiver (see above). This process is repeated for each Transmitter logged with the Receiver. If no telephone numbers are entered for any given transmitter, the safety telephone number will be contacted in the event of an alarm. Instructions are based on the following format:

1234space**tx1tel1**space**07850686xxx** (setup Transmitter 1; Telephone number 1)
1234space**tx1tel2**space**07850686xxx** (setup Transmitter 1; Telephone number 2)
1234space**tx1tel3**space**07850686xxx** (setup Transmitter 1; Telephone number 3)
1234space**tx1tel1**space**07850686xxx** (setup Transmitter 7; Telephone number 3)

5.0 Training –
Training in understanding and using the system is required.

6.0 Related documents –

6.1 Risk Assessment RA/GEN/012 (Freezer Storage and Dry Ice)

Risk Assessment RA/GEN/013 (Cold room)

7.0 Approval and sign off –

Author:

Name: Peter Mullen

Position: Research Fellow

Signature: Date:

Management Approval:

Name: Mary Wilson

Position: Laboratory Manager

Signature: Date:

QA release by:

Name: Alex MacLellan

Position: QA Manager

Signature: Date:

STANDARD OPERATING PROCEDURE

Please sign below to indicate you have read this S.O.P and understand the procedures involved.

NAME	POSITION HELD	SIGNATURE	DATE