Use of emergency exit as a routine exit on mammography vans

New procedures are required on mammography vans to reduce the risk of spreading COVID-19 to both screening staff and ladies being screened. One option that is being considered by some screening centres is the implementation of a one-way system through their mobile mammography vans. This requires that the emergency exit is repurposed as a standard exit for clients. However, the emergency exit can then be a point of ingress for cold air, dust and moisture which may impact the reliability and performance of the X-ray imaging equipment.

This note refers solely to processes for ensuring that mammography equipment is not adversely affected by the routine use of the emergency exit. This does not cover the advisability of using a one-way system within the mammography van or any other factors that may arise with this proposal.

NCCPM contacted the suppliers of X-ray mammography equipment in use within the NHSBSP and asked for their recommendations (Table 1). Siemens, GE and Hologic advised that some form of buffer is required to maintain temperature and keep dust and moisture out. All these manufacturers agreed that an air lock would be the ideal solution. GE suggested that an air curtain would also suffice. Fujifilm suggested that turning the air conditioning up to 23°C would be sufficient to protect their equipment whilst Philips had no additional requirements for their systems. MIS recommended monitoring the internal temperature and adding a buffer or air curtain towards winter.

John Loveland, Alistair Mackenzie

National coordinating centre for the physics of mammography (NCCPM)

August 2020 (Additional responses appended September 2020)

Table 1: Suppliers' responses (August 2020 - Additional responses appended September 2020*)*

Company	**Recommendation**	**Temperature range**
Fujifilm	1. Temperature variation. Best to avoid large temp fluctuations if possible 2. The condensation point. Cool air hitting warm air could cause condensation to occur. 3.The Humidity - on wet days we can expect the humidity to rise. We would expect this to remain with specification but it's worth noting. We think as long as the radiographers leave the van air conditioning systems to auto climate control at 23C (one or two degrees above normal) We wouldn't expect a massive issue as the thermal mass of the air will act as a buffer. The risk would be if the customer changes the heating or cooling, or worse turns the air con off as this could cause issues at a faster rate than normal.	20°C to 30°C
GE	For Senographe Essential, it is liquid-cooled, and it will have no influence. For Senographe Pristina, there is also a "heat distribution plate" giving the detector some inertia. If the air temperature in the vicinity of the detector was capable to vary out of the required limits, probably the patient comfort would be impacted far before the equipment. If the van is parked on a non-clean area (with sand…), opening the door may cause some outer air enter the van and carry particles which in turn could enter the x-ray beam area, with the risk of generating dust artefacts in the images. Indeed an air lock would be perfect, but is it realistic? I would better consider having the air-conditioning generate a positive pressure, or installing an air curtain such as this one (https://www.airtecnics.com/technology/what-is-an-air-curtain), probably easier to install a posteriori.	Pristina: Operating: 15 to 30°C; Not operating: -5 to 50°C Essential: 15 to 35°C
Hologic	The best option would be an air lock system	Recommended 20 to 30°C

MIS	MIS Healthcare recommends air temperature is monitored internally when using the mobile trailers with the rear door being used as exit. As the temperature drops towards winter we recommend a buffer or air curtain to reduce fast changes in temperature within the room for the equipment and for the comfort of the patients and staff.	12 to 27°C
Philips	No adaptions should be needed our detector is liquid cooled and fairly temperature tolerant.	None
Siemens	Our concerns would be the outside temperature causing problems with the detector, difficult to control the air temp if constantly opening the emergency exit door. Okay during the summer if it stays warm but not so good during the winter, with low temperatures, rain and snow. As the emergency exit is being used as the actual exit door from the system room, you would probably require external radiation door warning lights? This would be a decision that would be made by the physics team. The mobile van suppliers could potentially provide a solution with an external cabin attached to the emergency exit door, like a porch on a house. Follow up from Siemens: Regarding the proposed One Way System solution to facilitate social distancing in the Mobile Breast Screening units, Siemens Healthineers recommends that the use of an Airlock solution at the Emergency Exit is the only viable solution to achieve this whilst maintaining the integrity of the equipment i.e temperature and humidity fluctuations which can have an adverse effect on its functionality and reliability.	ambient temperature of +12° to +35°C recommended ambient temperature of +20° to +30°C