

Northern Ireland Safety Notice

Action

Reference: **NISN-2026-003**

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Emergency Power Off systems (EPOs) and recovery of imaging equipment following activation in interventional imaging rooms.

Summary

Following a case in England, a Regulation 28 Coroners report has highlighted potential risks in interventional imaging rooms following an Emergency Power Off (EPO) activation. Although the EPOs could be reset locally, the imaging equipment required additional re-start actions that were not understood by staff. This led to a delay in restoring imaging capability during a critical procedure, contributing to a fatality.

Action

Having reviewed the recommendations within the coroner's report, organisations are asked to take the following actions:

1. Carry out a risk assessment of all interventional imaging rooms to:
 - confirm the configuration and operation of EPO systems and associated visual indicators,
 - identify whether additional equipment re-start or reset steps are required after EPO circuit restoration.
2. Review the full recovery process following EPO activation, ensuring that:
 - all steps required to restore imaging capability are clearly defined,
 - these steps are understood by clinical teams and do not rely on external attendance which may cause a delay.
3. Ensure that all controls required to re-start the imaging equipment, for example system start buttons, are:
 - clearly identified and accessible to clinical staff,
 - incorporated into local procedures,

- replaced in line with manufacturers recommendations.
4. Review and update training for clinical, medical engineering and relevant Estates staff to ensure understanding of:
- the effect of EPO activation,
 - Ensure that local procedures explicitly describe the sequence required to restore the imaging equipment to an operational state including any manufacturer-specific re-start steps,

When completing this risk assessment, the existing requirements and the new guidance detailed below must be given appropriate consideration.

Training for personnel working within imaging rooms and for medical engineering staff should be reviewed to ensure that all relevant staff understand the operation of the EPO system, the consequences of its operation for both the patient and equipment, and the procedures required to restore equipment following an EPO activation.

Note: Resetting the EPO does not restore power. Further actions will normally be necessary to re-energise and return the equipment to service.

All staff should be instructed to report failures of indicator lamps, including supply healthy indicators, irrespective of whether equipment functionality appears to be affected.

New facilities should comply with the guidance set out below at the design stage. Existing facilities should implement any necessary measures identified through their risk assessment. In addition, whenever an interventional imaging room is refurbished or upgraded, or equipment is replaced, the EPO system and associated contactors should be reviewed for compliance with this guidance and upgraded where required.

Guidance for all imaging rooms and interventional imaging rooms

As set out in HTM 06-01, emergency stop buttons should be provided within imaging examination rooms. They should also be provided in cardiac catheterisation laboratory facilities. There are three main types of emergency button (see AXREM emergency stop button label recommendations)

Emergency Power-Off (EPO): The EPO removes mains power from the system; however, an associated UPS may remain live depending on the system configuration and operational requirements. To avoid any misunderstanding, this should be highlighted during staff training, and additional safety notices should be considered.

Additional switches may exist within an imaging installation and have a similar appearance, but have different functions, these are,

- X-ray system (or other specific imaging system) emergency power-off - this will remove power to the specific imaging equipment, in this example the X-ray system. This is the same as the EPO, but is customised to be more specific when there is more than one type of device in the same room

- Emergency Motion Stop – Not to be used to turn off the power to the equipment. This is intended to stop movement on the imaging equipment in the event of an emergency, to prevent harm to patients.

Additional switches should be clearly labelled, easily accessible by staff and mounted in a location which reduces the risk of accidental use. They should be installed in both the examination and control area, with advice sought from the Radiation Protection Advisor (RPA) or Magnetic Resonance Safety Expert (MRSE) (as appropriate) on button locations.

Emergency Power Off (EPO)

The EPO is incorporated into the no-voltage release control circuit controlling the contactor that supplies mains power to the system. The EPO will be installed within the clinical area.

For safety reasons, resetting an EPO following activation will not, by itself, restore mains power to the system. An additional deliberate action is required to re-energise the contactor and reinstate the mains supply. The contactor may be located either in the clinical area or within a dedicated equipment room for the imaging system.

The type, location and configuration of an EPO should be decided following a risk assessment and consultation between the clinical teams who will use the equipment, the Authorised Person (AP) (Low Voltage), the Authorising Engineer (AE) (Low Voltage) and the Electrical Safety Group. When selecting the type of EPO, care should be taken to prevent against accidental operation of the EPO device. This can be aided by using an EPO fitted with a shroud (often a semi-circular protrusion over the top). Further guidance can be found in “ISO 13850 Safety of machinery, emergency stop function, Principles for design”.

When assessing the location and configuration of the EPO, stakeholders should consider any additional actions that may be required in relation to the medical equipment itself, in order to reinstate the power supply. Stakeholders should consider the proximity of the EPO to the medical equipment to ensure there is no unnecessary delay in initiating the sequence of events required to restore operation of the medical equipment. The EPO configuration should enable the clinical team to reset the system locally at the point of care location.

There should be a documented process, informed by a risk assessment, outlining all steps required to reset and/or re-start the operation of the medical equipment following a loss of power initiated by operating the EPO. This may include, but is not limited to:

- Any additional steps required with respect to the medical equipment itself to resume operation
- The need to assess the status of any warning lamps
- Assessment of patient condition and/or any other clinical care considerations

All staff that will work in the room should have received training on the activation and re-setting of an EPO and what the impact will be on the equipment involved. Training should ensure that they understand the operation of the EPO, the impact its operation has on the equipment and the patient, its re-set function, the status of any indicator lamps and any additional equipment requirements for reset/restart after the EPO has been reset.

Staff should report all lamp failures (e.g. supply healthy indicators) regardless of functionality of the equipment).

There should be a visible and audible indication in the procedure room that the EPO has been activated. An EPO should feature a single action shut off.

The EPO should be labelled and clearly distinguishable from other devices.

References and other resources

Guidance on EPOs is provided in

- [HTM 06-01 Electrical services supply and distribution](#)
- [HBN 06-01 Vol 1 Facilities for diagnostic imaging and interventional radiology](#)
- [HBN 01-01 Cardiac facilities](#)

Note: HTM 06-01 is currently under review, and the updated document (expected in 2026) will include these changes.

Additional information on EPOs is provided in:

- [Medical Device Installation Safety - AXREM](#)
- [AXREM EMERGENCY Button Signs for Permanently Installed Medical Equipment - AXREM](#)

Background

A coronary intervention procedure was interrupted by the activation of an EPO. It could not be established whether this was due to a circuit fault and unintended activation of the EPO was ruled out. The loss of electrical power to the equipment removed the ability to provide x-ray images and consequently prevented commencement of the stenting procedure until power was restored. In addition to the reset of the EPO, the imaging equipment required a reset/re-start operation, and this was in an adjacent equipment room.

It was not re-set until approximately 10 minutes after activation, when a medical engineer attended the area. Although the stenting was completed after power was restored, the patient subsequently died. On balance of probabilities, the coroner felt that the patient would have survived but for the loss of electrical power to the equipment.

The content of this notice has been developed by Nation Health Service England

Suggested onward Distribution.

Directors of Estates, Heads of Estates, Electrical Authorised Persons, Health and Safety, Imaging Staff, Medical engineering

Enquires

Enquiries and adverse incident reports in Northern Ireland should be addressed to:

Medical Device and Estates Safety
Sustainability, Engineering & Estate Safety
Resources and Corporate Management
Department of Health
Room D1
Castle Buildings
Stormont Estate
Belfast
BT4 3SQ

Tel: 028 9052 3868

Email: mdes@health-ni.gov.uk

<http://www.health-ni.gov.uk/mdes>

Reporting Medical Device adverse incidents in Northern Ireland

Please report medical device incidents directly to the Medicines and Healthcare products Regulatory Agency via the [Yellow Card website](#) in line with your organisation's procedures.

Reporting Estate and Facilities Adverse incidents in Northern Ireland

[Estates Safety - Reporting Defects and Failures Ver 1.0](#)