

TECHNICAL

ScottishPowerExpress

Reference no.: EXP-11-360

Incident: Update to SOP 413

Date: 27/05/2025



Update to SOP 413 – Bullers 50472 Porcelain Solid Core Support Insulators at Rainhill and Frodsham

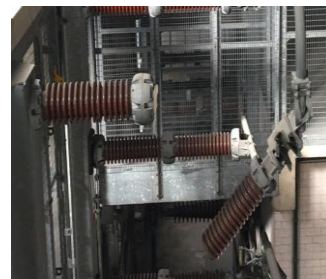
This Technical Express supersedes EXP-11-289.

Following the failure of solid core support insulators at National Grid (NGET) sites in which the insulators fractured following the operation of busbar disconnectors, SOP 413 was initiated. The failures occurred at two indoor substations erected prior to the 1970's.

This SOP was applied to SPEN assets following failure of a post insulator associated with the fixed contacts of a 132kV disconnector at Rainhill indoor substation. The insulator had completely fractured, allowing the 132kV busbar to become detached, but there was no resultant flashover or protection operation.

This SOP has been modified due to subsequent insulator failures at the NGET site at Rugeley in 2024. All insulators which failed are of the same type. The SOP will apply to all busbar and disconnector insulators at Rainhill and Frodsham 132kV substations (identified as Bullers type 50472). Due to the risk identified, the restrictions covered in this SOP will be in place until all insulators are replaced.

For protection of the switchgear operator, a specialist ballistic shelter has been designed and is in place at both substations. Any operation of disconnectors without the use of the shelter is prohibited.



Sheared Porcelain Solid Core Support Insulator at SPM site



Specialist ballistic shelter – in place at Rainhill and Frodsham

Recommendations and action points

[SOP 413](#) shall be applied to all SPEN 132kV busbar and disconnector insulators at Rainhill and Frodsham 132kV indoor substations as detailed below:

- A specially designed ballistic shelter will be present at both substations for protection of operator. Any operation of disconnectors without the use of the shelter is prohibited.
- No live operation of disconnectors where reasonably practicable.
- Two appropriately experienced authorised persons with minimum authorisation of APSP must be present in a switch hall at the time of switching; one to carry out the switching activity and the other to observe the equipment being operated with the purpose of verifying the correct alignment of the disconnector and witnessing any damage caused to associated insulators during operation with ability to warn the operator, accordingly.
- After each switching sequence has been carried out using the shelter, the switch room should be vacated for 15 minutes. This is on the basis that the second person has checked that it is safe for the switcher to leave the shelter. The shelter is to remain in place within this time period.
- Switching sequences shall be restricted to single circuit busbar transfer or single operation on a single disconnector where contact moving switching is required, before the site is cleared for the time period.
- Operations shall only be completed by staff who are familiar with this SOP, the specific switchgear and substation type. No switching is to be carried out by trainees under personal supervision.
- A detailed visual inspection of the insulators shall be completed before and after each switching operation (noting the 15 minutes delay to be observed following a switching sequence)
- When operating disconnectors owned by NGET under multi-user switching agreements, SPEN staff shall comply with NGET's safety procedures.