

1. SCOPE

This document details the application of SOP 007 (Applicable to Lucy FRMU MK1 and MK2 Switchgear) issued by the Energy Networks Association.

2. ISSUE RECORD

This is a Reference document. The current version is held on the EN Document Library.

It is your responsibility to ensure you work to the current version.

Issue Date	Issue No.	Author	Amendment Details
March 2022	2	Patrick Dolan	Re-issue of SOP and confirmation that its scope reflects defect associated with SOP 085 (OPSAF-16-085)
31/03/2022	3	Ryan Miller	Correction of serial range in SOP HEADER Search Criteria
09/05/2023	4	Patrick Dolan	Update to SOP, restriction now covers all Lucy FRMU SOPs applied
06/06/2023	5	Benjamin Hughes	Modification plate stamping clarified for issues 7, 16 and 17.

3. ISSUE AUTHORITY

Author	Owner	Issue Authority
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4. REVIEW

This is a Reference document which has a 5 year retention period after which a reminder will be issued to review and extend retention or archive.

5. DISTRIBUTION

This document is not part of a Manual maintained by Document Control and does not have a maintained distribution list. It is published on the SP Energy Networks website.

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7. SOP DETAILS

EQUIPMENT TYPE	Lucy FRMU Mk1 & Mk2
ORIGINATING COMPANY	East Midlands Board
DATE	12/10/1979
NUMBER INSTALLED IN ENERGY NETWORKS NORTH	0
NUMBER INSTALLED IN ENERGY NETWORKS SOUTH	681 (scope of previous SOP version applied to 126)
REASON	Defective oil switch mechanism allowed slow closing was reason of previous SOP application, Current SOP application reasons relates to all defects applicable to the equipment type referenced in Section 10 APPENDIX 2: CONSOLIDATION OF LUCY FRMU SOPS
STATUS IN INITIATING COMPANY	Live operation banned until modified
SPEN APPLICATION	Live operation prohibited unless all required modifications and checks confirmed as completed
ADDITIONAL INFORMATION	SOP 007 has been updated to be an encompassing SOP to cover all known Lucy FRMU issues. The SOPs that are superseded and are covered by the scope of this restriction are detailed in APPENDIX 2: CONSOLIDATION OF LUCY FRMU SOPS
UPDATE	<p>Update (issue 2/3)</p> <p>Restriction reapplied, checks required to confirm defects repairs completed on all affected units. This restriction will mitigate the defects associated with SOP 85 (OPSAF-16-085) since the affected range is identical as are the control measures.</p> <p>Update (issue 4)</p> <p>SOP expanded in scope to prohibit all live operations to all Lucy FRMU assets where SOPs have been historically applied. See APPENDIX 2: CONSOLIDATION OF LUCY FRMU SOPS for further information</p>
REMEDIAL ACTION	<p>Confirm required checks and modifications have been completed to remove SOP.</p> <p>See APPENDIX 1: CHECKS REQUIRED TO CONFIRM SOP REMOVAL</p> <p>Where outstanding repairs cannot be completed, SOP shall remain in force</p>

8. SOP HEADER

Field Name	Field Value	Field Size		
Name (SOP) *	SOP007	6		
The reason for the Operational Restriction *	Various Legacy FRMU Defects	30		
Nature of the Operational Restriction *	All Live ops prohibited pending checks of FRMU	50		
Comments *	Live operation prohibited unless units confirmed to have issues resolved	200		
Restricted Access to Substation Flag *	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td align="center">Y</td> <td align="center">N</td> </tr> </table>	Y	N	1
Y	N			
SOP Impact Code * <i>(highlight or underline the appropriate code)</i>	0 Temporary/Impact under assessment <u>1 Very minor operational/network impact</u> 2 Moderate operational/network impact 3 Significant impact on system perf./measurable business costs 4 Inoperable without intervention 5 Inoperable – no cost effective solution/must be replaced	N/A		
SOP component type * <i>(highlight or underline the appropriate code)</i>	01 Bushing only 02 Circuit Breaker 03 Fixed Portion only 04 Moving Portion only 05 Switch <u>06 RMU</u> 07 Transformer only 08 Tap Changer only 09 Transformer & Bushing 10 Transformer & Tap Changer	N/A		
Search Criteria *	Manufacturer: *Lucy* Text Model: *FRMU* All variants Note: SOP shall be applied to all parts of the RMU that can be operated	N/A		

* This denotes a Mandatory Field

9. APPENDIX 1: CHECKS REQUIRED TO CONFIRM SOP REMOVAL

The following checks are required to remove the restriction on HV operations:

- Environment Check – Unit must be confirmed to have canopy if outdoor (SOP 257)
- Confirmation that all applicable checks are completed by modification plate review

9.1 Equipment Environmental Check

The first check to be done at the site is to confirm the environment that the RMU is placed.

Where the unit is not in a brick building or GRP housing, it should have a canopy placed on it to help prevent moisture ingress.

If the equipment is placed outside a building or GRP and does not have a canopy fitted, **Report to Control Room, the SOP shall remain in force.**

Where canopy is fitted, it should be lifted so that the rating plate can be viewed, and checks can progress.

9.2 Identification of remedial works applicable to the unit

It is necessary to review the serial number on the rating plate of the FRMU unit to determine the checks and remedial works that are applicable to the equipment. Once identified, it is then essential to confirm the relevant works have been completed to remove the SOP.

Step 1

All units shall be checked for presence and completeness of plant modification plate like the example shown in Figure 1.

If there is not a modification plate fitted, **Report to Control Room, the SOP shall remain in force.**

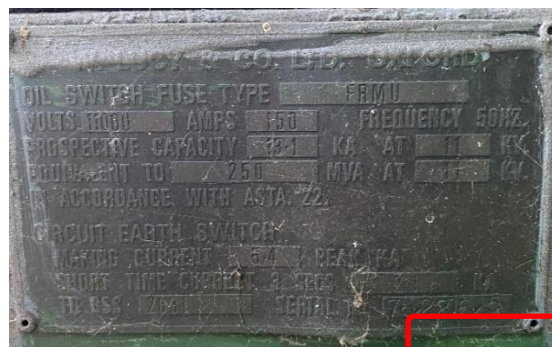
The SOP shall remain in force until all checks have been completed via invasive maintenance and a new, appropriately stamped plate is fitted.

Step 2

The rating plate of the unit should be referenced to confirm the serial number and batch number of the units as shown in example in Figure 2.



Figure 1: Modifications Plate



Serial: 76/2216/5 Batch: 76/2216

Figure 2: Rating Plate

Step 3

The batch number (the first part of the serial number on the rating plate) should be used to identify the additional checks that should be completed on that specific unit in reference to Table 1.

The letters stamped in the fields applicable to the batch number in Table 1 correspond to status of works required. A key is provided on the table as a quick reference, further information can be found in SWG-19-000.

Issues Reference	Range Applicable										
	Up to 77/2215	77/2216 To 77/2216	77/2217 to 77/2265	77/2266 to 78/2347	78/2348 to 79/2401	80/2402 to 81/2408	81/2409 to 82/2547	82/2548 to 82/2652	82/2653 to 84/3036	85/3037 to 85/3237	Above 85/3237
1	C	C	C	N	N	N	N	N	N	N	*
2	C or P	N	N	N	N	N	N	N	N	N	*
3	C	N	N	N	N	N	N	N	N	N	*
4	N	N	N	N	C or P	C or P	N	N	N	N	*
5	N	N	N	N	N	N	P	P	P	P	*
6	P	P	P	P	P	P	N	N	N	N	*
7	N	N	N	N	N	N	P or C	P or C	P or C	P or C	*
8	P	P	P	P	P	P	N	N	N	N	*
9	C or P	C or P	C or P	C or P	C or P	C or P	C or P	C or P	C or P	C or P	*
10	C or P	C or P	N	N	N	N	N	N	N	N	*
11	C	C	C	C	C	C	C	N	N	N	*
12	C	C	C	C	C	C	C	C	C	C	*
13	C	C	C	C	C	C	C	C	C	C	*
14	C	C	N	N	N	N	N	N	N	N	*
15	P	P	P	P	P	P	P	P	P	P	*
16	P or C	P or C	P or C	P or C	P or C	P or C	P or C	P or C	P or C	P or C	*
17	N	N	N	N	N	N	P or C	P or C	P or C	P or C	*
18	C	C	C	C	C	C	C	C	C	C	C
19	N SOP 102	N SOP 102	N SOP 102	N SOP 102	N SOP 102	N SOP 102	N SOP 102	N SOP 102	N SOP 102	N SOP 102	N SOP 102
Indications Window						C or P SOP181	C or P SOP181	C or P SOP181	C or P SOP181		
FSW Weld							C SOP246	C SOP246	C SOP246	C SOP246	C SOP246
Weather shields	C or P SOP257	C or P SOP257	C or P SOP257	C or P SOP257	C or P SOP257	C or P SOP257	C or P SOP257	C or P SOP257	C or P SOP257	C or P SOP257	C or P SOP257
Note: Batch information aligns to data recorded corporate data systems, please seek clarification if units outside of named ranges are found											

Table 1: Expected Plate marking based on batch number

Step 4

Review the modification plate to confirm that all applicable checks and modifications have been completed on the Lucy FRMU.

Reference bullet points below

- Number field 1-17 are expected to be stamped on all Lucy FRMU assets up to **Batch 85/3237**.
- Where expected marking has a “C”, it is acceptable if plate is marked as “P”, this would signify parts required replacement during the work.
- The stamping of modification plates on completion of works associated with other defects aside from the original 17 targeted is known to be inconsistent, follow the specific guidance on step 6 & 7 below for assessing suitability of the equipment for operation.
- Note that there may be stamps added to the modification plates related to issues addressed that are not considered to restrict operation of the equipment
- As applicable to the range, units should have, C SOP181, C SOP246 and C SOP257 stamped on the modifications plate if associated checks and actions have been completed.
- Where environment check documented in Section 9.1 has been completed successfully but unit has not been stamped with C SOP257, it must be stamped correctly on the next scheduled maintenance or sooner where possible.

Step 5

Report the issue to Control Room, if the modification plate has not been appropriately stamped (in field 1-17) for applicable units (units manufactured up to 1985 inclusive)

Under this condition, **the SOP shall remain in force.**

Step 6

Report the issue to Control Room, if the modification plate does not have a stamp “C SOP 181” or “P SOP 181” for applicable units manufactured between 1980 and 1984.

The position of this stamp on the modification plate will depend on other defects that are applicable to the unit (it is not fixed)

Under this condition, **the SOP shall remain in force.**

Where this stamp is missing on an affected unit, it is possible to inspect if the defect has been addressed by non-invasive investigation the indications window, following the guidance on SWG-13-179, *Indicator windows Issue (Original SOP 181)*

Step 7

Report the issue to Control Room, if the modification plate does not have a stamp “C SOP 246” or “P 246 181” for applicable units manufactured after 1982.

Under this condition, **the SOP shall remain in force.**

Where this stamp is missing on an affected unit, invasive maintenance on the equipment is required to determine if the work has been completed.

Step 8

If all steps are completed and it can be confirmed that no outstanding issues remain. **Confirm to Control Room that SOP can be withdrawn.** Upon receipt the control engineer should remove the SOP.

Further Considerations

Where it is not possible to remove the SOP by following steps documented, it will be possible to remove the SOP should all the required checks and modifications be addressed by invasive maintenance activity as a per SWG-13-179 instructions.

10. APPENDIX 2: CONSOLIDATION OF LUCY FRMU SOPS

In total there have been 12 separate SOPs applied to Lucy FRMUs. The reason for the SOPs, related information, current status and position in this active SOP is detailed in table below.

Original SOP	Restriction	Reason	Modifications / Information	Status	Comments
SOP 7	RSW Live Operations Prohibited	Defective switch mechanism	PSB 12	Applied	Scope of Restriction and Range expanded to cover all FRMU SOPs (Issue 4)
SOP 32	All Live Operations Prohibited	Breather allowed water ingress	PSB 12	Archived	Restriction added to scope of SOP 7 (Issue 4)
SOP 35	Ban of Test Prod use (Unit Live)	Defective interlocks	PSB 12	Archived	Restriction added to scope of SOP 7 (Issue 4)
SOP 60	All Live Operations Prohibited	Damaged Monoblock	PSB 32	Previously Withdrawn	Considered an early life failure mode
SOP 85	RSW Live Operations Prohibited	Defective switch/interlock mechanism	PSB 12 PSB 47 (withdrawn)	Archived	Restriction added to scope of SOP 7 (Issue 2)
SOP 102	Restricted FSW Operation	Defective Striker Pin Fuses	PSB 18 (withdrawn)	Previously Withdrawn	Superseded by LWM 2.2 updates
SOP 103	All Live Operations Prohibited	Water Ingress via Gaskets	PSB 12	Archived	Restriction added to scope of SOP 7 (Issue 4)
SOP 181	All Live Operations Prohibited, Unit not to be disturbed Live	Defective Indications Viewing Windows	PSB 74	Archived	Restriction added to scope of SOP 7 (Issue 4)
SOP 214	All Live Operations Prohibited	Oil Sludging	OR 49	Previously Withdrawn	Covered by OR 49
SOP 246	Restricted FSW Operation	Defective weld: Overtravel of FSW blades EARTH/ON position	PSB 80	Archived	Restriction added to scope of SOP 7 (Issue 4)
SOP 255	RSW Live Operations Prohibited	Breakage of RSW drive links	N/A	Previously Withdrawn	Defect limited to range of equipment not supplied to SPEN
SOP 257	All Live Operations Prohibited	Water Ingress	PSB 83	Archived	Restriction added to scope of SOP 7 (Issue 4)

Table 2: All Restrictions Applied to Lucy FRMU equipment