1. SCOPE

This document details the application of SOP 2011/373/02 (Applicable to Merlin Gerin Ringmaster RN2c and RN6c Ring Main Units operating at voltages of 6.6/11kV and in the serial number range 100204905 and 100811684) 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
November 2011	1	Alastair Ferguson	Initial issue
December 2011	2	Alastair Ferguson	Update with agreed Schneider inspection arrangements.
February 2012	3	Alan MacGregor	Update to SOP Header, serial number range affected and clarification of SOP removal.
September 2023	4	Benjamin Hughes	Update to include detail of handle shaft bolt failure.

3. ISSUE AUTHORITY

Author	Owner	Issue Authority
Benjamin Hughes Lead Engineer Engineering Design and Standards	Jon Ruiz De Aguirre Substations Manager Engineering Design and Standards	Fraser Ainslie Head of Engineering Design and Standards F. Ainslie Digitally signed by Fraser Ainslie DN: cn=Fraser Ainslie, o=SPEnergyNetworks, ou=Processes and Technology, email=fraser.ainslie@spenergynetworks.co.uk, c=GB Date: 2023.11.16 19:57:02 Z

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.

6. CONTENTS

7. SOP DETAILS

EQUIPMENT TYPE	Merlin Gerin (Schneider) Ringmaster RN2c and RN6c Ring Main Units in the serial number range 100204905 and 100811684.
ORIGINATING COMPANY	ScottishPower Energy Networks
DATE	9th December 2011
NUMBER INSTALLED IN ENERGY NETWORKS NORTH	936
NUMBER INSTALLED IN ENERGY NETWORKS SOUTH	1140
REASON	Potential failure of Merlin Gerin Ringmaster RN2C Ring Main Unit to isolate and earth as shown on the position indicator window. This SOP also affects RN6c and RE2c units.
STATUS IN INITIATING COMPANY	Before and after every operation an inspection shall be made to establish the correct location of the mechanism drive bolt and nut and the drive spacer block on both Ring Switches. The inspection shall be in accordance with Schneider IBMS Document PGRW-5SDGG3 Revision 1. If these components are found to be displaced or missing, no operation of either Ring Switch or the Circuit breaker shall be undertaken until the Schneider approved repair has been completed. This inspection regime shall remain in place until equipment in the identified serial number range has been modified in accordance with the Schneider approved procedure. UPDATE Dec 2012 – Additional requirements. The inspections detailed above relate to the disconnector drive shaft bolt failures and shall be continued. However, several handle shaft bolt failures have subsequently been identified by Schneider and network operators. Since these failures are difficult to detect through inspection, the following additional precautions shall be introduced to minimise the consequences of a bolt failure. If, during and after a RSW operation (on a unit within the identified Serial No. range) any unusual sound, feel or indication is noticed, no further live operation shall be undertaken until the unit is inspected and repaired by Schneider or is otherwise confirmed to be operating satisfactorily. In all cases, before work is carried out on any cable connected to a Ring Switch of an affected Ringmaster RN2C/RE2c or RN6C, it shall be spiked in accordance with the Company Safety Rules. **Note: see below SPEN Application for most current guidance.**

SPEN APPLICATION	Before and after every local switching operation on an affected unit, the mechanism drive bolt, nut, and spacer shall be inspected on both ring-switches in accordance with Schneider IBMS Document PGRW-5SDGG3 Revision 1 (appended). If the mechanism drive bolt arrangement is found to be broken or displaced during inspection, inform Control, and do not proceed with the operation. Note: Particular attention shall be given to the LV drop down compartment, where broken hardware may collect. The operator shall be mindful of any unusual sound, indication or feel during operation. If the operation seems abnormal, vacate the substation, inform Control, and arrange for the unit to be remotely de-energised as soon as possible. All live switching operations shall be prohibited on units when issues are detected or suspected until an approved Schneider inspection and if necessary, repair is completed.
ADDITIONAL INFORMATION	Schneider IBMS Document PGRW-5SDGG3 – Revision 1 attached below. Schneider have a process of stamping the rating plate with the letter R following approved repairs.
UPDATE	14/09/23 – In addition to drive-shaft bolt failures, Schneider have disclosed reports of handle-shaft bolt failures on supplied equipment within the same serial range. This failure can potentially prevent the mechanism from latching thus affecting the equipment's electrical performance. In this update, further guidance has been added to heighten awareness of this failure mode.
REMEDIAL ACTION	Update 29/2/12: Schneider has developed an approved repair procedure for equipment affected by this SOP. Following completion of the replacement task, with either Dacromet or Geomet coated high tensile steel bolts, the SOP shall be removed from the RMU. Update 14/09/23: Schneider have bolt repair kits available to facilitate a site service repair or SPEN internal staff repair following adequate training. Repair of defective units intended to be incorporated into routine maintenance.

8. SOP HEADER

Field Name	Field Value		Field Size
Name (SOPXXX**)** *	**SOP373**		6
The reason for the Operational Restriction *	Brittle bolts in RSW mechanism		30
Nature of the Operational Restriction *	Inspect drive shaft mechanism prior to operation		50
Comments *	Prior to/after local op, inspect mech on both RSWs. Vacate substation, inform Control if any loose/displaced hardware is found or unusual switching action exhibited.		200
Restricted Access to Substation Flag *	Y	N	1
SOP Impact Code * *(highlight or underline the appropriate code)*	0 Temporary/Impact under assessment 1 Very minor operational/network impact 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 * *(highlight or underline the appropriate code)*	01 Bushing only 02 Circuit Breaker 03 Fixed Portion only 04 Moving Portion only 05 Switch **06 RMU** 07 Transformer only 08 Tap Changer only 09 Transformer & Bushing 10 Transformer & Tap Changer		N/A
Search Criteria *	RMU type = RN2c and RN6c **AND** Serial number between 100204905 and 100811684 Apply to both RMU RSWs In addition, SOP to be applied on any units where serial number information is missing or not in recognisable format.		N/A

* This denotes a Mandatory Field

9. APPENDIX: SCHNEIDER INSPECTION PROCEDURE – IBMS DOCUMENT PGRW-5SDGG3 – REVISION 1

Title
Ringmaster Compact Ringswitch Mechanism Drive Bolt Inspection Medium Voltage Division Leeds

Introduction

The inspection procedure applies only to **Ringmaster type RN2c, RN6c and RE2c** that were manufactured from 17 November 2006 to 31 October 2009 with serial numbers between 100204905 and 100811684.

This procedure does not apply to Ringmaster type RN2c, RN6c and RE2c outside these dates of manufacture or serial number range.

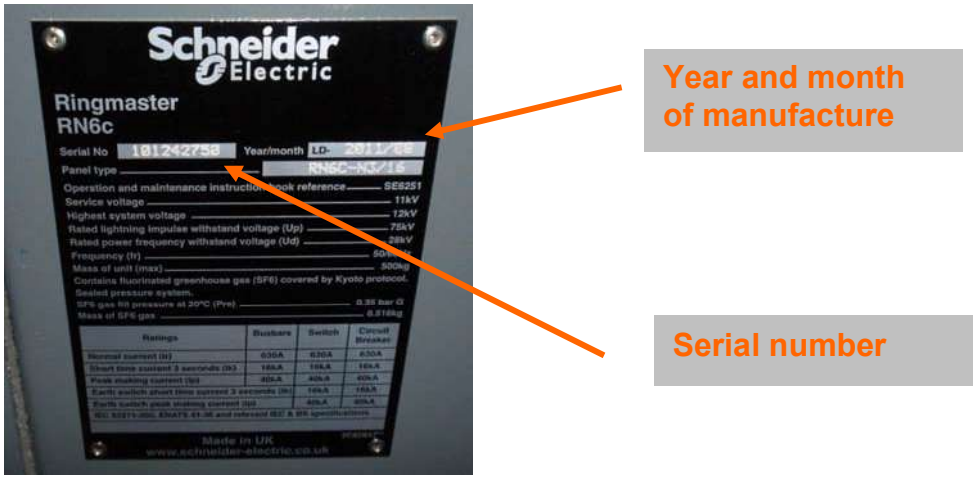
This procedure applies only to the inspection of the ring switches. We recommend this procedure is carried out BEFORE AND AFTER each operation of one or both of the ring switches.

The date of manufacture and serial number can be found on the product data plate on the front of all the Ringmaster ring main units. Refer the photo below.

IMPORTANT: If a Motorpack has been fitted it must be switched OFF in the RTU before this inspection is carried out.

We recommend that the Motorpack is left switched OFF to prevent the Motorpack from being remotely operated until the Ringmaster has been repaired.

It is recommended to check both RSW1 (left hand) and RSW2 (right hand) ring switch at the same time even if it is only required to operate one of the ring switches after the inspection.



Data plate on the LV cabinet of the Ringmaster

Title
Ringmaster Compact Ringswitch Mechanism Drive Bolt Inspection Medium Voltage Division Leeds

1. Health, Safety & Environment

This inspection can be carried out whilst the equipment is still energized. None of the external covers are being removed and NO MANUAL OPERATION shall be carried out during the inspection.

We recommend that only one person carries out the inspection at any one time and wears the appropriate Personal Protective Equipment required to enter an electrical substation.

2. Tools

	
Telescopic Mirror	Torch

3. Parts to be Inspected

Ref	Part Number	Description	Qty
1	4807713**	M8X60 CAP HD Bolt	2
2	2C83144**	SPECIAL NUT M8X12 Long	2
3	2C83128**	Drive Spacer (26.5mm Long)	2

		
M8 x 60mm cap head bolt	Drive spacer	Special nut

Title
Ringmaster Compact Ringswitch Mechanism Drive Bolt Inspection Medium Voltage Division Leeds

4. Inspection of Ringmaster as described below

4.1 Ringmaster ring main Unit

4.2 Ringswitch I and 2

Do not operate the either of Ringswitch mechanisms from their current service position

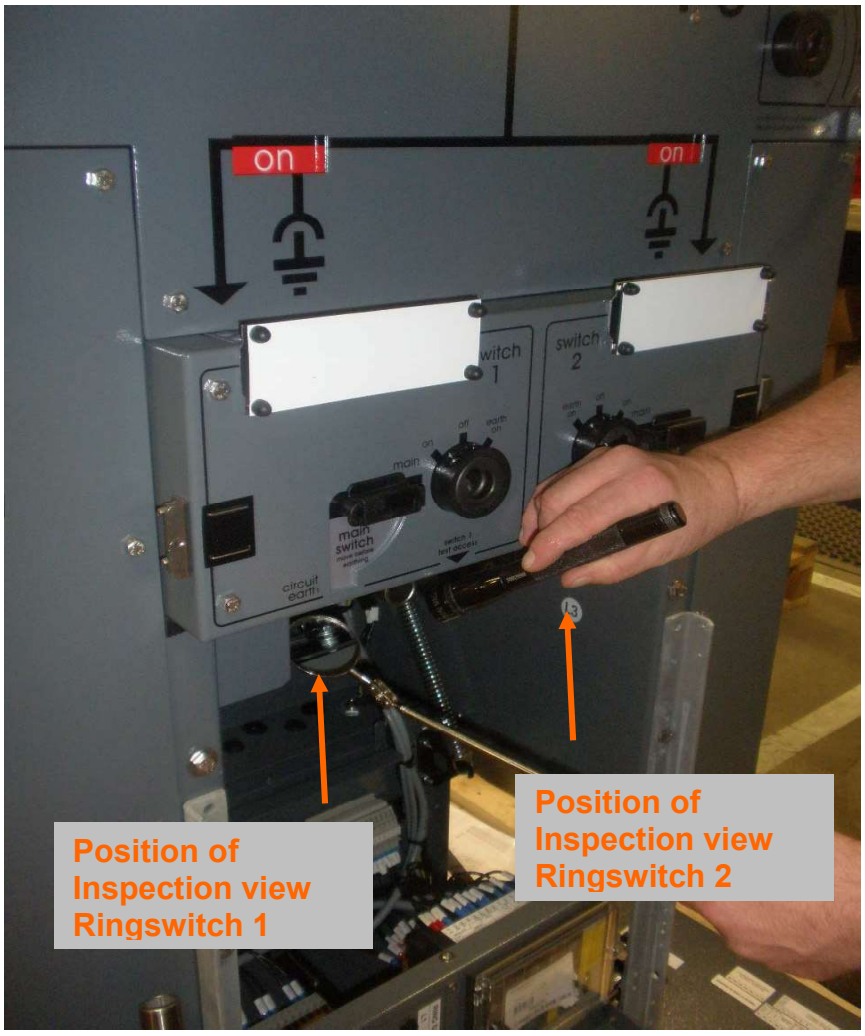
4.3 Open the LV cabinet and search for loose pieces of hardware in all accessible locations

Title
Ringmaster Compact Ringswitch Mechanism Drive Bolt Inspection Medium Voltage Division Leeds

4.4 Check the parts to be inspected are still correctly located in Ring switch 1 drive shaft using a mirror and torch

4.5 Repeat the check for the correct location of hardware on Ring switch 2

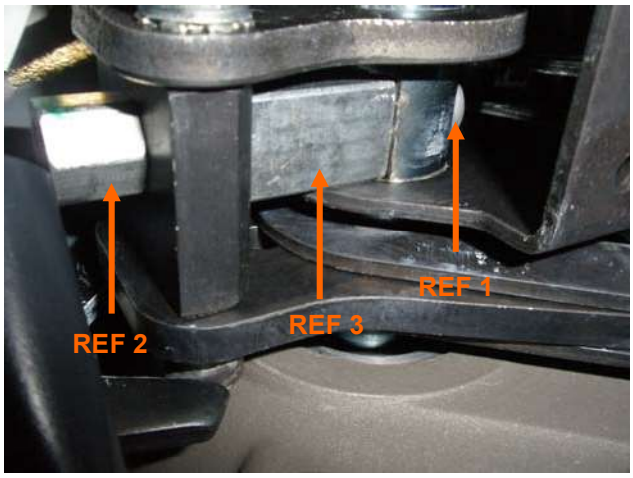
If any of the parts to be inspected described below cannot be seen or is not in the positions shown in the photos STOP and DO NOT operate the Ringmaster.



Title
Ringmaster Compact Ringswitch Mechanism Drive Bolt Inspection Medium Voltage Division Leeds

4.6 **RSW1** Service position **Main selected Main ON**

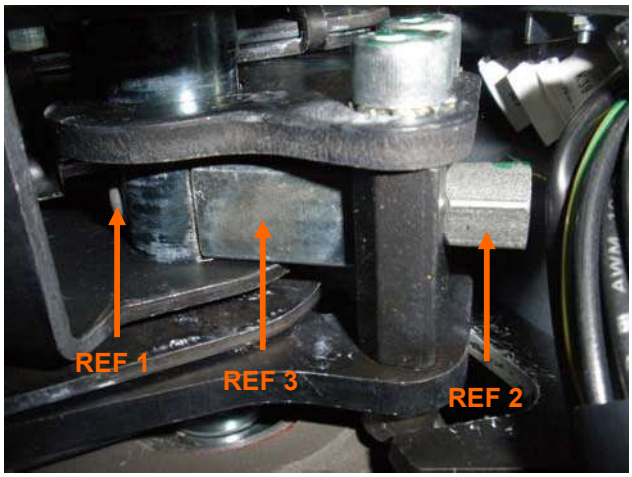
4.7 Correct view of hardware **Main selected Main ON**



Main ON

4.8 **RSW2** Service position **Main selected Main ON**

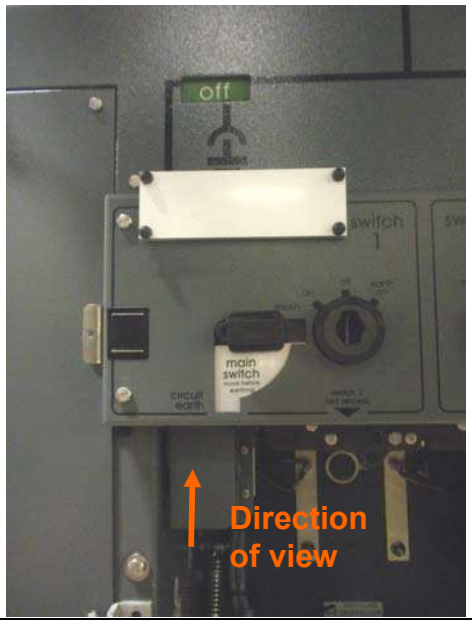
4.9 Correct view of hardware **Main selected Main ON**



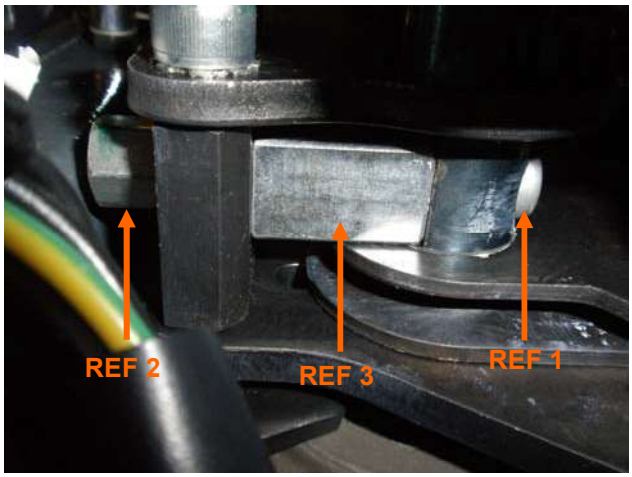
Main ON

Title
Ringmaster Compact Ringswitch Mechanism Drive Bolt Inspection Medium Voltage Division Leeds

4.10 **RSW1** Service position **Main selected OFF**



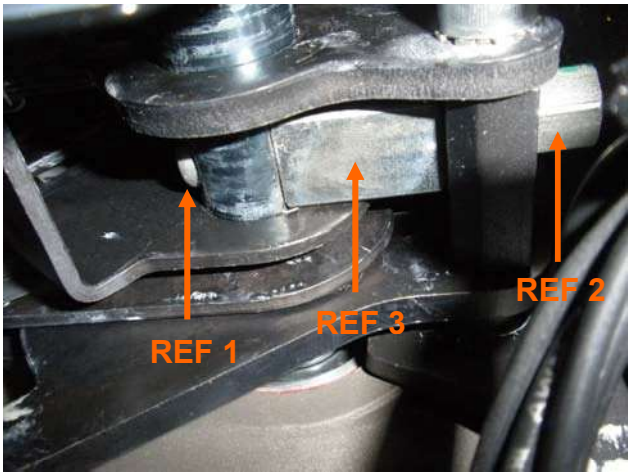
4.11 Correct view of hardware **Main selected OFF**



OFF

4.12 **RSW2** Service position **Main selected OFF**

4.13 Correct view of hardware **Main selected OFF**

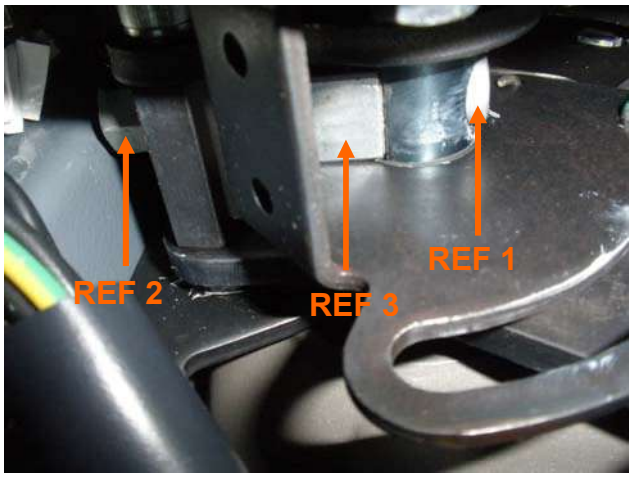


OFF

Title
Ringmaster Compact Ringswitch Mechanism Drive Bolt Inspection Medium Voltage Division Leeds

4.14 **RSW1** Service position **Earth selected OFF**

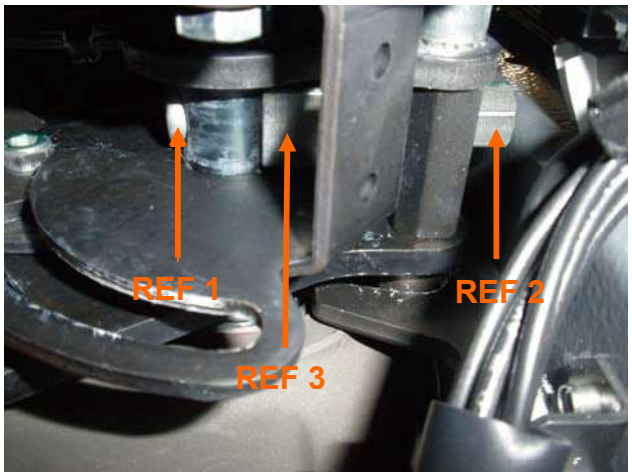
4.15 Correct view of hardware **Earth selected OFF**



OFF

4.16 **RSW2** Service position **Earth selected OFF**

4.17 Correct view of hardware **Earth selected OFF**

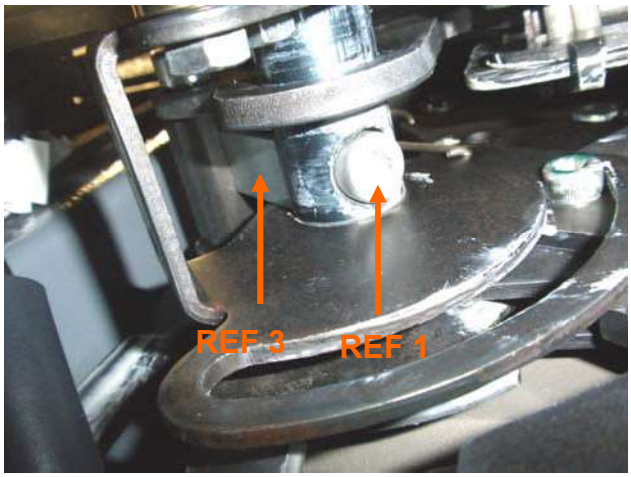


OFF

Title
Ringmaster Compact Ringswitch Mechanism Drive Bolt Inspection Medium Voltage Division Leeds

4.18 **RSW1** Service position **Earth selected Earth ON**

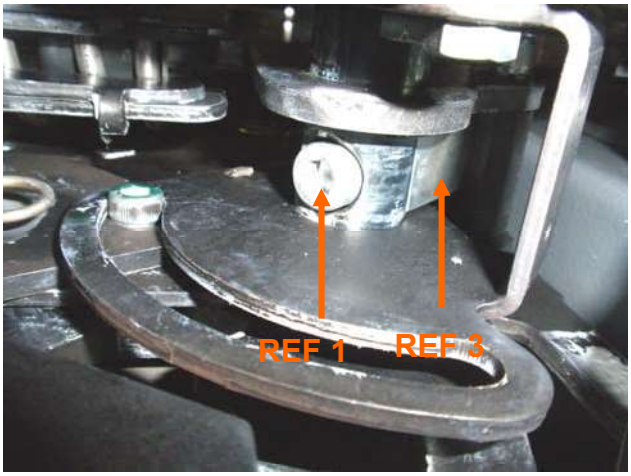
4.19 Correct view of hardware **Earth selected Earth ON**



Earth ON

4.20 **RSW1** Service position **Earth selected Earth ON**

4.21 Correct view of hardware **Earth selected Earth ON**



Earth ON

Title
Ringmaster Compact Ringswitch Mechanism Drive Bolt Inspection Medium Voltage Division Leeds

5.0 After the inspection has been carried out the LV cabinet door should be closed.

WARNING - IF THE PARTS TO BE INSPECTED ARE NOT FOUND IN THE CORRECT LOCATION THE RINGMASTER MUST NOT BE OPERATED.

Please follow the instructions in the Ringmaster Product Safety Notice for further action to be taken.