1. SCOPE

This document details the application of SOP 2011/373/01 (Applicable to Merlin Gerin Ringmaster RN2c, RE2c and RN6c Ring Main Units operating at voltages of 6.0/6.6/11kV and in the serial number range 100204905 and 100811684) issued by the Energy Networks Association.

2. ISSUE RECORD

This is a Controlled document. The current version of Controlled document is held on the Energy Networks Intranet.

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.

3. ISSUE AUTHORITY

Author	Owner	Issue Authority
Name: Alastair Ferguson Title: Technical Risk Manager.	Name: Alastair Ferguson Title: Technical Risk Manager.	Name: Jeff Hunt Title: Head of Asset Management.  ..... Date: .....22nd Feb 2012.....

4. REVIEW

This is a Controlled document and shall be reviewed as dictated by business / legislative change but at a period of no greater than five years from the last issue date.

5. DISTRIBUTION

This document is not part of a Manual and does not have a maintained distribution list.

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7. SOP DETAILS

EQUIPMENT TYPE:	**Merlin Gerin (Schneider) Ringmaster RN2C, RE2c and RN6C Ring Main Units in the serial number range 100204905 and 100811684.**
ORIGINATING COMPANY	ScottishPower EnergyNetworks
DATE:	9th December 2011
NUMBER INSTALLED IN ENERGY NETWORKS NORTH:	1056
NUMBER INSTALLED IN ENERGY NETWORKS SOUTH:	1268
REASON:	This SOP has been raised following a failure of a Ringmaster RN2C (at Pumpherston Rd Uphall Station) to operate correctly. In this incident a circuit remained live but the associated RMU Ring Switch (RSW) had indicated "Off" and that the Earth Switch (ESW) has indicated "Earth On". Preliminary investigations have revealed a broken and dislodged bolt on the drive mechanism. This bolt secures the main drive mechanism to the switch driveshaft. Update 29/2/12: The failure has been identified with the use of zinc-plated high tensile steel bolts which have suffered hydrogen embrittlement. This leads to breakage at a high stress point – either the bolt head or at the nut on the threaded end.
STATUS IN INITIATING COMPANY:	Before and after every local operation (whether manual or via a substation controller) of a Ring Switch or a Circuit Breaker, 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.** Remote (telecontrol) operations from OCC/NMC do not require this local mechanism inspection. Any Ring Switch that was switched into the EARTH position before the issue of this SOP update is required to be inspected in accordance with the above procedure before being used as a Primary Earth. This inspection regime shall remain in place until the affected equipment has been modified in accordance with

	the Schneider approved procedure. Update 29/2/12: Following completion of the bolt replacement procedure, with either Dacromet or Geomet coated high tensile steel bolts, the SOP shall be removed from the RMU.
SPEN APPLICATION:	As above (SPEN Issued SOP)
ADDITIONAL INFORMATION:	Schneider IBMS Document PGRW-5SDGG –Revision 1 attached below.
UPDATE:	None
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.

8. SOP HEADER.

Field Name	Field Value	Field Size
Name SOP373	**SOP373 Merlin Gerin RMU Type RN2c, RN6c and RE2c**	61
The reason for the Operational Restriction	Broken switch driveshaft bolt	30
Nature of the Operational Restriction	Inspect mechanism prior to any RMU operation	50
Comments	Prior to and after any local manual RMU operation, the mechanisms of both ring switches shall be inspected to ensure that the driveshaft mechanism bolt, nut and spacer block are in place.	200
Restricted Access to Substation Flag	No	1
Search Criteria	RMU type = RN2c, RN6c and SE2c **AND** Serial number between 100204905 and 100811684	N/A

9. APPENDIX - SCHNEIDER INSPECTION PRODEDURE-IBMS DOCUMENT PGRW-5SDGG.

See Below

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.

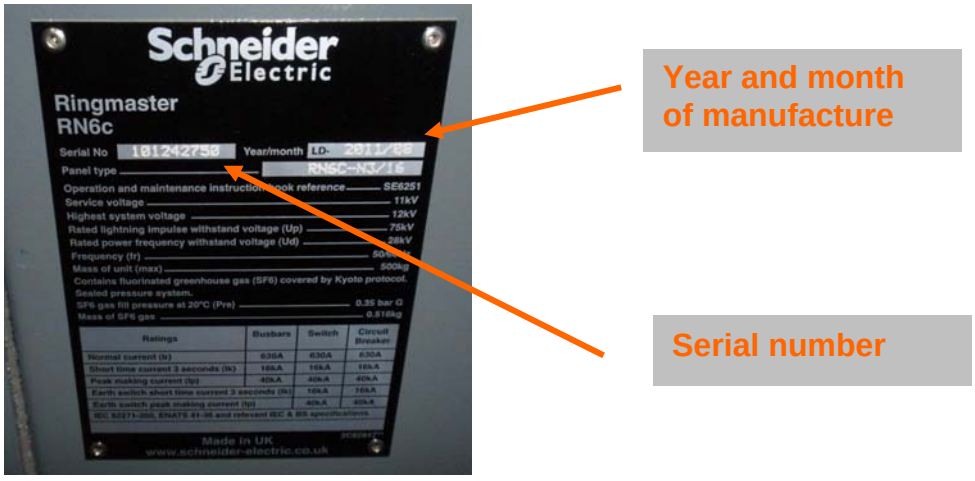
This procedure applies only to the inspection of the ring switches. We recommend this procedure is carried out BEFORE AND AFTER each operation of one or both of the ring switches.

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

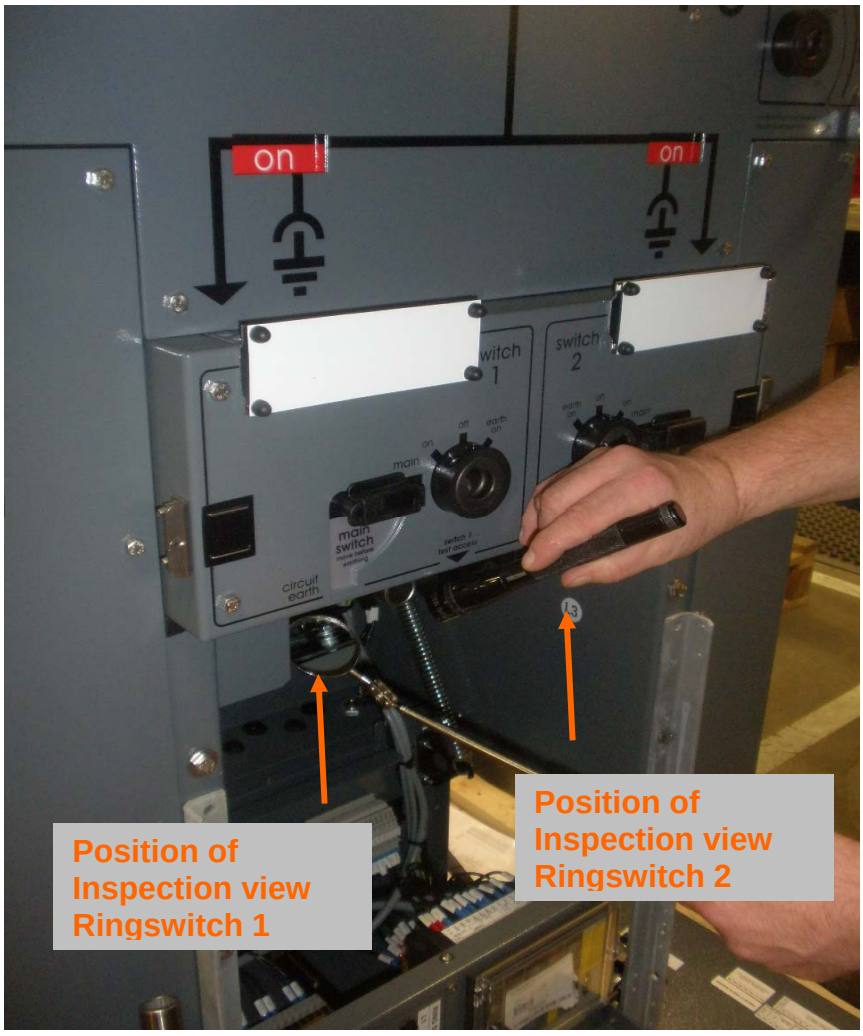
4.3 Open the LV cabinet and search for loose pieces of hardware in all accessible locations

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

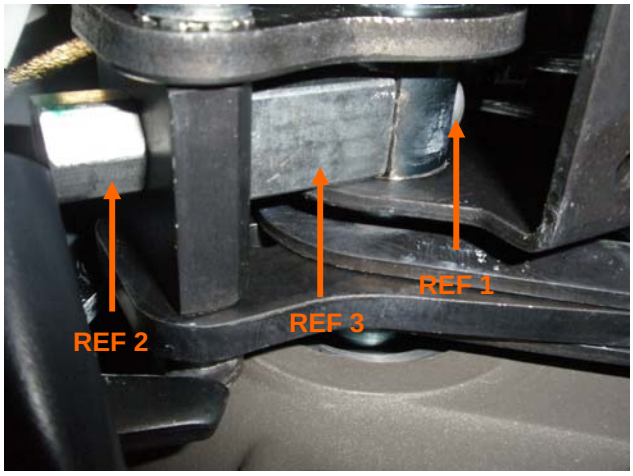
If any of the parts to be inspected described below cannot be seen or is not in the positions shown in the photos STOP and DO NOT operate the Ringmaster.



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

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

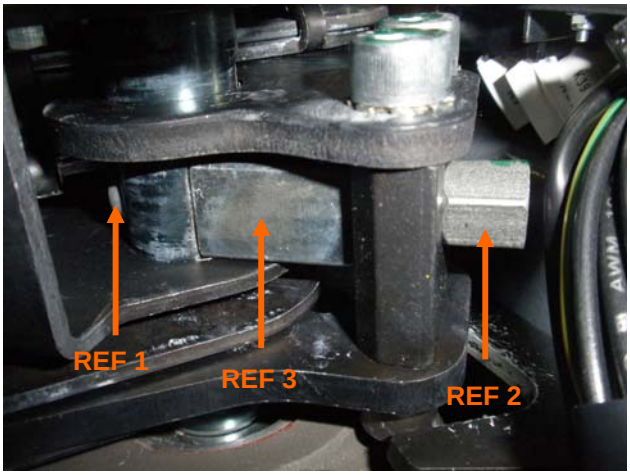
4.7 Correct view of hardware **Main selected Main ON**



Main ON

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

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

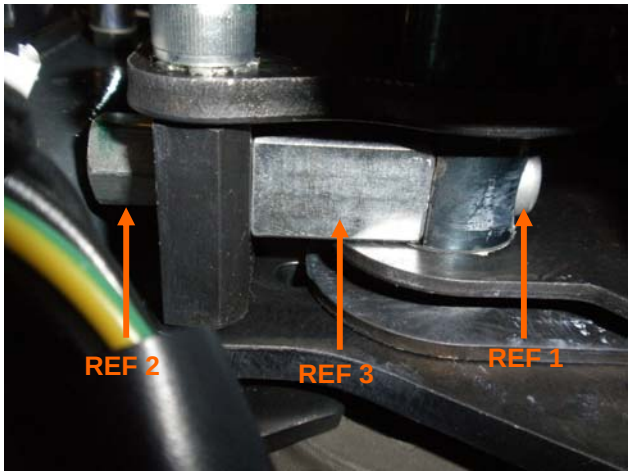


Main ON

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

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

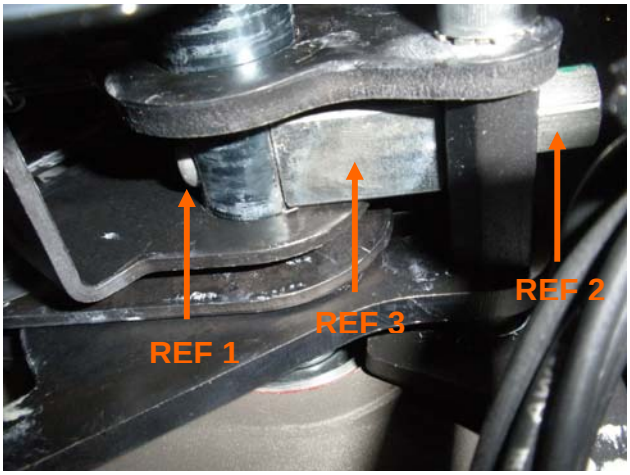
4.11 Correct view of hardware **Main selected OFF**



OFF

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

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

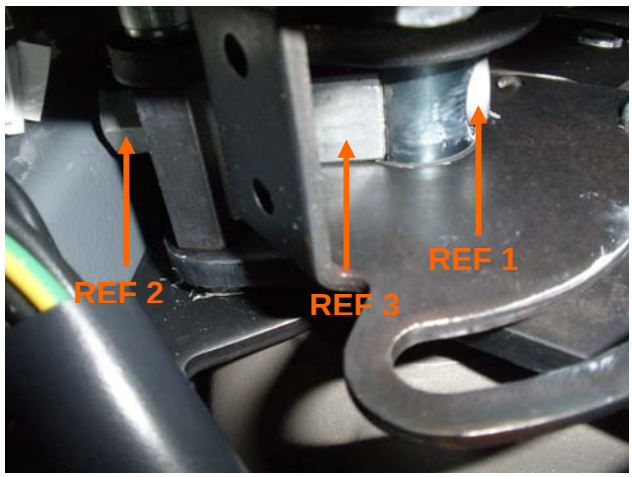


OFF

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

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

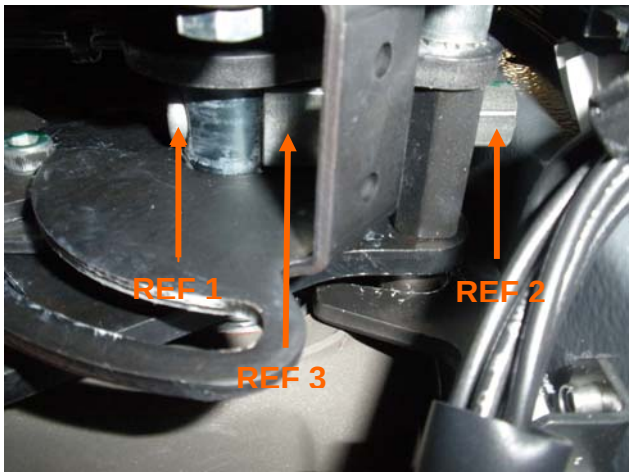
4.15 Correct view of hardware **Earth selected OFF**



OFF

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

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

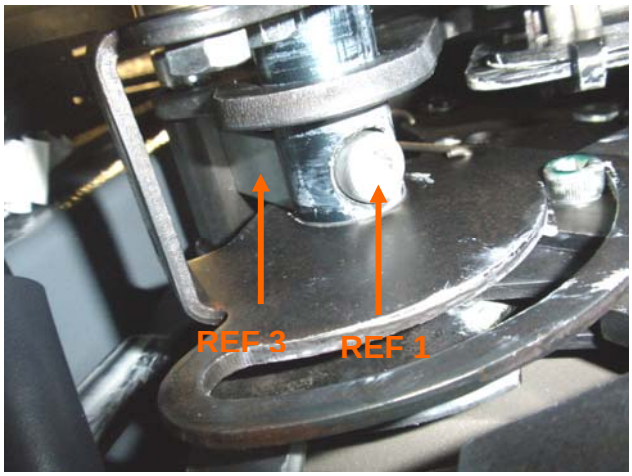


OFF

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

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

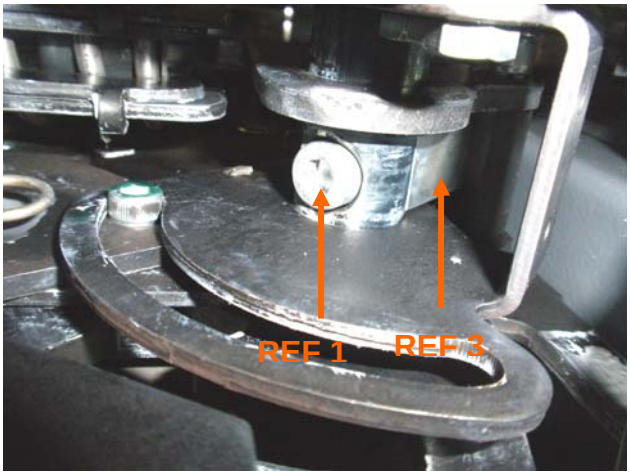
4.19 Correct view of hardware **Earth selected Earth ON**



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.