



ofgem

energypeople

**Appointed examiner's audit of Exceptional Event Claim -
UK Power Networks (Eastern)
132kV incident – Rayleigh Main to Fleethall Grid Substation
11 October 2014**



Document Properties


Title: UK Power Networks (Eastern) – Audit of Exceptional Event Claim
– UKPN (EPN) – 132kV Rayleigh main to Fleethall Grid Substation
– 11 October 2014

Reference: ep/Ofgem/EPN/11 Oct '14

Issue: Final report v1.0

Date: 16 December 2015

Authorisation

Name	Position	Signed	Date
Geoff Stott	Ofgem's Appointed Examiner		16 December 2015

History

Issue	Date	Originator	Checker	Description
	16 December 2015	Geoff Stott	Mel Brown	Final version incorporating Ofgem and UKPN comments
0.1	03 October	Geoff Stott	Mel Brown	Draft report to Ofgem and to UKPN for comment
0.0	18 June 2015	Geoff Stott	-	Pre-draft report created from energypeople template

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of energypeople. energypeople accepts no responsibility or liability for the consequences of this document being used for a purpose other than the purposes for which it was commissioned. Any person using or relying on the document for such other purpose agrees, and will, by such use or reliance be taken to confirm his agreement, to indemnify energypeople for all loss or damage resulting therefrom. energypeople accepts no responsibility or liability for this document to any party other than the person by whom it was commissioned. Please note that the information or data prepared by parties other than energypeople which has been reviewed in the preparation of this document has not been independently checked or verified for accuracy by energypeople.



Contents

Glossary	4
Summary	5
Audit part 1	6
1.1 Summary of the main facts	6
Exceptionality requirements	8
1.2 Does the event qualify for exclusion.....	8
1.3 Exceptionality test results	8
EPN's views of its performance	9
1.4 Dealing with the incident	9
1.5 EPN's answers to questions on its performance	9
Audit part 2.....	12
1.6 EPN's performance in preventing the event	12
1.7 EPN's performance in mitigating the effects of the event	12
1.8 Recommended performance adjustments	13
1.9 Detailed justification.....	13
Appendix A - Record of Audit part 1	14
Appendix B - EPN's photographs	17

Tables

Table 1 – The number of incidents attributed to the event	8
Table 2 – Summary of exceptionality test results.....	8
Table 3 – Recommended performance adjustments	13

Figure

Figure 1 – Simplified Network Diagram of EPN's 132/33kV distribution system affected by the incident	7
--	---

EPN's Photographs

Photograph 1 – 'End-on' view of the 132kV double-circuit overhead tower line and the fire-damaged building below	17
Photograph 2 – 'Side view' of the 132kV double-circuit overhead tower line and the fire-damaged building below	18



Glossary

Abbreviation	Meaning
AE	Appointed Examiner
CB	Circuit-breaker
CI	Customer Interruptions per 100 connected customers
CML	Customer Minutes Lost per connected customer
DNO	Distribution Network Operator
EHV	Extra High Voltage – all voltages above 20kV up to but excluding 132kV
ep	energypeople
EPN	UKPN's Eastern Power Network licensed area
ESQCR	Electricity, Safety, Quality and Continuity Regulations
QoS	Quality of Service
RIGs	Regulatory Instructions & Guidance
SCADA	Supervisory Control and Data Acquisition
SLD	Single Line Diagram
SoF	Statement of Facts
ToR	Terms of Reference
UKPN	UK Power Networks

Notes:

Within this document:

1. The term "higher voltage" is used to indicate all voltages greater than 1kV.
2. The calculations of CI and CML within this document are adapted from the annual calculations contained in the RIGs to reflect the CI and CML generated by the actual incidents being audited.

They are as follows:

CI: the number of interruptions to supply – the number of customers interrupted per 100 connected customers generated by the incidents being audited.

It is calculated as:

$$CI = \frac{\text{the sum of the number of customers interrupted for incidents being audited} * 100}{\text{the total number of connected customers}}$$

CML: the duration of interruptions to supply – the number of customers interrupted per connected customer generated by the incidents being audited.

It is calculated as:

$$CML = \frac{\text{the sum of the customer minutes lost for all restoration stages for incidents being audited}}{\text{the total number of connected customers}}$$

In both the formulae above, the total number of connected customers is as declared as at 30 September during the relevant reporting year. Any claims that occur and are audited prior to 30 September in the reporting year during which they occur will be audited using the total number of customers declared at 30 September in the previous reporting year.

Summary

1. Ofgem has commissioned energypeople as its Appointed Examiner (AE) to audit the submission made by UK Power Networks (UKPN) under the "one off" exceptional event mechanism that an incident which affected its 132kV dual circuit overhead line from Rayleigh main to Fleethall Grid at 03:47 on Saturday 11 October 2014 adversely affected the reported performance for its Eastern Power Networks (EPN) licensed area for the reporting year 2014/15.
2. The AE has visited EPN to audit the claim against part 1 of the "one-off" exceptional event process and finds that it passes the exceptionality threshold in terms of CI but not CML.
3. The AE concludes that the event falls within the category of an "other event" as defined in paragraph 8.57 of Special Licence Condition CRC 8, including meeting the exceptionality requirements set out in Appendix 3 thereof.
4. The AE therefore proceeded to part 2 of the "one-off" exceptional event process, assessing EPN's performance in mitigating the impact of the event upon its customers.
5. The AE concludes that EPN's inspection and maintenance programme is consistent with good practice and was up to date at the time of the incident.
6. The AE also concludes that, prior to this incident, EPN had done all it could to safeguard its 132kV double-circuit tower line from third-party interference.
7. The AE commends EPN's control engineers for analysing the alarms generated by the incident and for restoring all supplies as quickly as possible.
8. The AE concludes that EPN had met the criteria of Appendix 4 to paragraph 8.58 of Special Licence Condition CRC 8 and that therefore the incident is deemed to be eligible for adjustment in the DNO's reported performance.
9. The AE therefore recommends that an adjustment to EPN's 2014/15 reported distribution system performance is made, in line with the part 1 audited CI and CML figures as shown in the following table:

	Audited number	Number above the threshold	Recommended adjustment
CI	1.05	0.35	0.35
CML	0.13	0	0

Note: the CI numbers differ slightly from those in the SoF due to the use in this report of the updated customer numbers as at 30 September 2014.

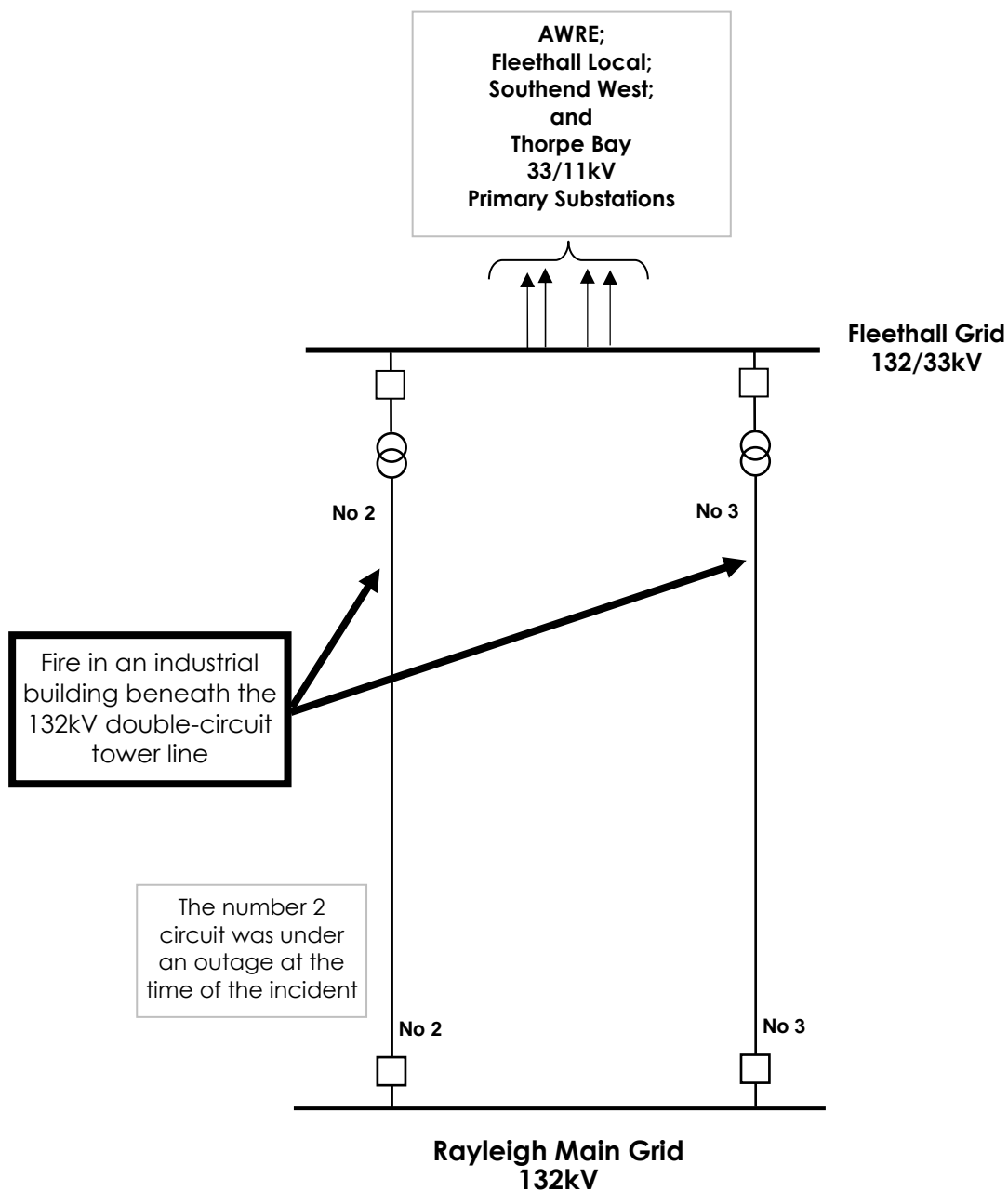


Audit part 1

1.1 Summary of the main facts

10. The AE's headline information log for this event is set out in Table A-1 at Appendix A. In addition, the following paragraphs summarise the main facts of the event.
11. The 132kV infeeds to EPN's Fleethall Grid Substation are designated as the number 2 and the number 3 circuits. They are provided by a dual-circuit tower line from Rayleigh Main Grid Substation.
12. At the time of the incident EPN's 132kV system was running abnormally with the number 2 circuit being de-energised for work on the 132/33kV transformer at Fleethall Grid Substation.
13. EPN has provided photographic evidence to support its claim that, at Rochehall Way, Rochford a fire in an industrial building beneath its 132kV dual-circuit tower line resulted in the tripping of the number 3 circuit and the 132kV infeeds to Fleethall Grid Substation.
14. As a result of the loss of 132kV infeeds to Fleethall 132/33kV Grid Substation the 33kV infeeds to four of UKPN's 33/11kV Primary Substations were interrupted and the loss of supply to 37,718 of EPN's customers for longer than three minutes.
15. EPN's protection operated correctly to clear the incident from its distribution network.
16. EPN's control engineer used tele-controlled switching to restore all supplies from alternative 33kV and 11kV sources, completing this by 04:07.
17. Subsequently a report was received from the fire service at 04:15 reporting the fire beneath EPN's 132kV tower line.
18. Following confirmation from site that no permanent damage was caused, the number 3 132kV circuit was re-energised at 09:25 on the day of the incident, thus restoring the 132kV infeed to Fleethall Grid Substation.
19. EPN measured the clearance between the fire-damaged building and the lowest part of the affected span to exceed 3.6 metres. This exceeds the minimum safety clearance of 2.9 metres.
20. EPN also confirmed the clearance to ground of the affected span exceeds the statutory minimum of 6.7 metres.
21. A simplified view of the sections of EPN's 132/33kV networks affected by this event is shown in Figure 1.

Figure 1 – Simplified Network Diagram of EPN's 132/33kV distribution system affected by the incident



Notes:

1. Only the salient items of switchgear are shown.
2. EPN's network was running abnormally at the time of the incident with the number 2 132kV circuit being on an outage for work on the 132/33kV transformer at Fleethall Grid Substation.
3. EPN's control engineer used tele-controlled switching to restore supplies via alternative 33kV and 11kV sources.
4. The outgoing 33kV feeders from Fleethall Grid Substation are shown schematically.

Exceptionality requirements

1.2 Does the event qualify for exclusion

22. The AE considers that the event falls within the category of an "other event" as defined in paragraph 8.57 of Special Licence Condition CRC 8, and meets the exceptionality requirements set out in Appendix 3 thereof.
23. The AE therefore considers that, subject to satisfying the requirements of Appendix 4 to CRC 8, the event qualifies for possible exclusion under the "one-off" exceptional events process.

1.3 Exceptionality test results

24. The number of incidents attributed to the event is shown in Table 1.

Table 1 – The number of incidents attributed to the event

Number of incidents attributed to the event	Claimed number	Audited number
132kV	1	1
EHV	0	0
HV	0	0
LV	0	0
Total	1	1

25. The results calculated by the AE to test this claim against Ofgem's exceptionality criteria are shown in Appendix A. A summary of the results is shown in Table 2.

Table 2 – Summary of exceptionality test results

Test	Threshold	Claimed number	Audited number	Pass / Fail	Amount above threshold
CI exceptionality	0.7	1.05	1.05	Pass	0.35
CML exceptionality	0.6	0.13	0.13	Fail	0

Notes:

1. Ofgem's CI and CML exceptionality criteria are set out in the AE's ToR¹.
2. The audited CI and CML used in the exceptionality test have been determined from the number of incidents attributed to the event.
3. Where the event passes either or both the exceptionality thresholds, the amount(s) above the threshold(s) is/are carried forward into the Audit part 2 assessment of DNO performance.
4. In accordance with guidance from Ofgem, the AE's calculations use the threshold values contained in the current Distribution Price Control and the number of customers connected to the DNO's network relevant to the date on which the incident occurred.

¹ Audits of Electricity Distribution Network Operators' one-off Exceptional Events Claims for 2012/13 to 2014/15



EPN's views of its performance

1.4 Dealing with the incident

26. EPN's Fleethall 132/33kV Grid Substation is normally supplied via a double-circuit 132kV tower line from Rayleigh Main Grid Substation.
27. The circuits are designated as number 2 and number 3.
28. At the time of the incident, the system was running abnormally with the number 2 circuit being on an outage for work on the 132/33kV transformer at Fleethall Grid substation.
29. At 03:47 on 11 October 2014, the 132kV circuit-breaker controlling the number 3 circuit tripped, inter-tripping the remote end.
30. EPN considers that its protection operated correctly to clear the incident from the system.
31. EPN considers that its duty control engineer reacted well in assessing the alarms generated by the event and restoring all supplies via tele-controlled switching on the 33kV and 11kV networks.
32. The cause of the incident was confirmed to be a fire in an industrial building beneath the tower line, ionising the air and causing the circuit to flash-over.
33. Following an inspection which confirmed no permanent damage, the number 3 132kV circuit was re-energised and EPN's distribution system was restored to normal running conditions that morning.

1.5 EPN's answers to questions on its performance

34. Within the last three years, the AE has reviewed EPN's design standards, construction methods and maintenance procedures during previous visits to audit exceptional event claims and found them fit for purpose.
35. The AE confirms that EPN's emergency procedures provide for the type of event being examined here.
36. To aid understanding of the background to EPN's Statement of Facts (SoF), the AE prepared a list of initial questions regarding this incident. These questions were used as the basis for the examination of UKPN's claim.
37. The initial questions were discussed during the AE's visit to UKPN's Control Centre on 19 June 2015, when the records of EPN's SCADA system, the incident report and other information were made available.
38. EPN has provided answers to the AE's initial list of questions. For ease of reference, the AE's questions are printed in bold font with EPN's answers being printed in normal font.

Q1. What, if any, changes has EPN made to its emergency plans and procedures since the Appointed Examiner (AE) last visited to audit the exceptional event claim concerning the incident that occurred 01 January 2014 which affected EPN's customers supplied from its Great Yarmouth Grid Substation?

- A1. UK Power Networks reviews its policies and procedures on a regular basis, however, no changes have been made following this incident.



- Q2. When did the planned outage on the Rayleigh Main to Fleethall Grid number 2 132kV circuit begin? When was this circuit due to be restored?**
- A2. The number 2 circuit was switched out on the 25 September 2014 for routine transformer maintenance; however, the oil sample contained high levels of acetylene and resulted in the T2 grid transformer being changed with a return to service date of 19 December 2015.
- Q3. Other than the pre-outage checks mentioned in EPN's SoF, what contingency plans, such as alterations to its network running arrangements, had EPN in place prior to the planned outage on the Rayleigh Main to Fleethall Grid number 2 132kV circuit?**
- A3. As seen from the SoF all supplies to customer were restored within 14 minutes through remote switching. The switching that took place was in line with the contingency plan put in place at the time of the original outage of the number 2 circuit.
- Q4. When was the fire-affected section of 132kV overhead tower line installed?**
- A4. The tower line was installed in 1956 and this would have been under the ownership of the CEGB.
- Q5. What is EPN's process for the routine inspection of its 132kV overhead lines, including the frequency thereof?**
- A5. UK Power Networks inspection is every 2 years for 132kV tower lines.
- Q6. When was this particular section of double-circuit 132kV tower line last inspected?**
- A6. Last inspected 10/12/2013.
- Q7. What were the observations in that report regarding buildings underneath the 132kV overhead line or buildings having been built beneath it? A copy of EPN's inspection report will be required to inform the AE's audit.**
- A7. The buildings under the overhead line are identified in the inspection reports.
- Q8. What rights regarding wayleaves, oversail, etc does EPN have on this particular section of 132kV double-circuit tower line?**
- A8. UK Power Networks has a wayleave in place for the overhead line and oversail.
- Q9. At the point where the fire occurred, what was the ground clearance to the lowest conductors? When was this measurement last taken?**
- A9. The ground clearance was confirmed to be in excess of the statutory minimum of 6.7 metres. The clearance to the fire-damaged building was measured to be in excess of 3.6 metres.
- Q.10. What protection is fitted to the Rayleigh Main to Fleethall Grid 132kV circuits?**
- A10. 132kV - Standard feeder distance protection - DAR (Delayed Auto Reclose), and bus-bar inter-tripping at Fleethall Grid.
- Q11. What protection operated to clear the incident from EPN's network?**
- A11. Distance protection (Zone 1) operated to clear the incident from the system.



Q12. What was the precise location of the fire in relation to UKPN's double-circuit 132kV overhead line? (An illustration using, say, "Google Maps" would be useful in aiding the AE's understanding of this incident).

A12. The location of the incident was demonstrated to the AE during the audit visit using "google Maps". *[AE's note: the location of the incident was seen to be in an industrial area to the east of Rochford].*

Q13. In addition to those in the SoF, what other photographs does EPN have of this incident? Electronic copies would be useful to insert into the AE's report.

A13. Additional photographs were shown to the AE during the audit visit. *[AE's note: UKPN's other photographs depict other views of its 132kV double-circuit tower line in relation to the burned-out building].*

Q14. What learning points has EPN incorporated into its procedures as a result of this incident?

A14. UK Power Networks reviews its policies and procedures on a regular basis, however, no changes have been made following this incident.

Q15. What further learning points should be considered as a result of the application of the current one-off Exceptional Event Claims process?

A15. UKPN considers it is always better to review claims as close to the event as possible as it makes it easier to retrieve any additional information requested by Ofgem's AE.

39. During the discussion of this claim it was concluded that a visit to the site of the incident would be unnecessary; the AE was satisfied with EPN's date-stamped audit trail and EPN's photographic evidence.

40. EPN also provided further information both during and subsequent to the audit visit. This includes:

- Information to show that the affected section of EPN's network is P2/6 compliant;
- Information to show that, prior to the current incident, the affected 132kV double-circuit tower line has been free from incidents due to this cause;
- EPN's photographs of the site of the incident in relation to the 132kV double-circuit tower line;
- EPN's control room log for this incident;
- EPN's incident report from which it calculated the CI and CML attributed to this incident;
- The details of EPN's SCADA alarms received during this incident;
- A representation of the incident on EPN's SCADA system; and
- Information regarding EPN's protection schemes and associated relay settings for its 132kV and 33kV feeders affected by this event.



Audit part 2

1.6 EPN's performance in preventing the event

41. In viewing EPN's performance in preventing this incident, the AE has considered what more EPN could have reasonably been expected to have done to ensure that its 132kV double-circuit tower line was safeguarded from incidents of this nature.
42. The AE has discussed EPN's inspection and maintenance regime and notes that the inspections were up to date; the most recent patrol being carried-out on 10 December 2013 when nothing untoward was reported.
43. EPN's photographs 1 and 2 show the double-circuit 132kV overhead tower line and the fire-damaged industrial building below it.
44. EPN's measurement systems clearly show the loss of 132kV infeeds to its Fleethall Grid Substation when the circuit-breaker controlling the number 3 circuit tripped at 03:47 on 11 October 2014.
45. EPN's measurement systems confirm the restoration of all supplies via tele-controlled switching from 33kV and 11kV alternative sources.
46. EPN's measurement systems also confirm the restoration of the number 3 132kV circuit at 09:25 on the day of the incident.
47. An examination of UKPN's measurement systems and a SCADA representation of its distribution network confirm that EPN did all it could to restore supplies as expeditiously as possible.
48. The AE concludes that, prior to this incident occurring, EPN had done all it could reasonably have been expected to do in considering that its 132kV double-circuit tower line from Rayleigh Main Grid Substation to Fleethall 132/33kV Grid Substation was free from third-party interference of this kind.
49. EPN's overhead line inspection policy was up to date prior to the incident occurring.

1.7 EPN's performance in mitigating the effects of the event

50. The fire service report confirmed that the incident was due to a fire at Rochehall Way, Rochford, directly below EPN's 132kV double-circuit tower line.
51. The AE has studied the running arrangements of EPN's 132kV distribution network supplying its Fleethall Grid Substation and concludes that EPN's protection systems worked correctly to clear the incident from EPN's distribution system.
52. The AE commends EPN's control engineers for analysing the situation, and for restoring supplies as rapidly as possible, thereby minimising the duration of the interruption.

1.8 Recommended performance adjustments

53. The AE's recommendations to Ofgem are shown in Table 3.

Table 3 – Recommended performance adjustments

	Amount above threshold	Audit part 2 recommendation
CI	0.35	0.35
CML	0	0

1.9 Detailed justification

54. In reaching a judgement on a recommendation, the AE has firstly considered whether or not EPN could have reasonably taken any different course of action that would have prevented the incident occurring.
55. In viewing EPN's performance in preventing this event, the AE has taken into account his personal knowledge of the United Kingdom's distribution system practice and that of his colleagues who have considerable operational experience of incidents due to many causes.
56. The AE notes that EPN has no previous records of incidents of this type affecting this 132kV double-circuit tower line.
57. The AE also notes that EPN's overhead line inspection and maintenance policy was sound and the inspections were up to date at the time of the incident.
58. The AE is mindful that the statutory minimum height for 132kV overhead line conductors at the site of the incident is 6.7 metres as defined in the Electricity, Safety, Quality and Continuity Regulations (ESQCR).
59. EPN has confirmed that it measured the minimum height of its affected overhead line span as exceeding the statutory minimum of 6.7 metres.
60. The AE therefore concludes that EPN had no cause to consider any additional measures other than those consistent with good UK practice.
61. In considering EPN's restoration strategy, the AE is conscious that UKPN's duty control engineer acted with commendable skill and speed in analysing the SCADA alarms and indications generated by this incident; and, using tele-controlled switching, restored all supplies as rapidly as possible, completing this before the call was received from the fire service.
62. The AE is satisfied that EPN's distribution network supplying its Fleethall Grid Substation complies with the requirements of Security of Supply Standard P2/6 (60 MVA firm).
63. The Appointed Examiner therefore concludes that UKPN's claim is justified and recommends to Ofgem that the amount of CI above the threshold value should be excluded from EPN's performance for reporting year 2014/15.

Appendix A - Record of Audit part 1

Table A-1: Appointed Examiner's Information Log

"One-Off" Exceptional Event	Reporting Year 2014/15
Licensed Area	UKPN(EPN)
Date of event	11 October 2014
Cause	Flashover of 132kV overhead line as a result of ionised air caused by a building fire directly beneath the line
Notification to Ofgem	13 October 2014
SoF received	27 November 2014
SoF information	<ul style="list-style-type: none"> • EPN's 132kV distribution system was running abnormally at the time of the incident with the number 2 32kV circuits being on an outage; • At 03:47 on Saturday 11 October 2014 the 132kV circuit-breaker controlling the number 3 132kV circuit tripped, thus losing 132kV infeeds to Fleethall 132/33kV Grid; and • Supplies to 4 of EPN's 33/11kV Primary Substations were interrupted (37,718 customers).
Additional pre-visit information provided	Based on the SoF the AE drew up a list of initial questions. These were discussed during the audit visit. This initial list of questions, together with EPN's responses, is contained in paragraph 38 of the report.
Location of audit visit	UKPN's Control Centre
Date of audit visit	19 June 2015
Visiting Auditor	Geoff Stott (ep)
UKPN's Representatives	Bill D'Albertanson and Stuart Plant.
Information provided during and subsequent to the audit visit	<p>Comprehensive documentation / information including:</p> <ul style="list-style-type: none"> • A discussion of EPN's overhead line ground clearance policy regarding its 132kV overhead circuits in relation to the requirements of the ESQCR; • A discussion on the clearance at the site of the incident; • A discussion regarding EPN's inspection and maintenance policy for its 132kV overhead lines and its latest reports for the section of overhead lines affected by this incident; • A discussion regarding the history of any similar previous incidents; • A view of the area via "Google Maps" which clearly shows the industrial area over which the dual-circuit tower line crosses; • A discussion of the protection arrangements on the 132/33kV networks affected by this incident; • The settings applied to the above protection schemes; • A copy of EPN's switching programme for the incident which shows the tripping of the 132kV circuit-breaker controlling the double-circuit tower line at 03:47 on 11 October 2014;



- Sight of EPN's switching programmes showing the restoration of all supplies to the affected Primary Substations via tele-controlled switching on the 33kV and 11kV networks;
- A copy of the report received from the fire service;
- Sight of the restoration of the 132kV circuit and thereby the restoration of the 132kV infeed to Fleethall Grid Substation;
- Copies of the relevant 132kV and 33kV SLDs;
- Sight of the printout from EPN's SCADA system that shows the alarms generated by the event;
- A copy of UKPN's incident report that shows:
 - the number of customers affected by the incident to be 37,718; and
 - the customer minutes lost due to the incident to be 460,891;
- The AE confirms that these figures agree with those quoted in UKPN's SoF;
- Using EPN's total connected customers at 30 September 2014 of 3,581,606 the number of customers affected equates to a CI of 1.05 $[37,718 \times 100 / 3,581,606]$
- Similarly, the customer minutes lost for this event equate to a CML of 0.13 $[460,891 / 3,581,606]$;
- UKPN's photographs of the fire-damaged industrial building in relation to the 132kV double-circuit tower line;
- No need to visit the site of the incident to clarify anything;
- Discussed post-fault learning points, including anything to affect the UKPN's future overhead line inspection and maintenance policy;
- Confirmed P2/6 compliant (60 MVA firm (winter));
- EPN provided answers to the initial questions plus additional information both during and subsequent to the audit visit; and
- Okay regarding compliance with Appendix 4 of Paragraph 8.58 of CRC 8.

Table A-2: Impact on CI and CML

	CI		CML	
Voltage (DNO's incident reference)	Claimed	Audited	Claimed	Audited
132kV (FREP-19144-D)	1.05	1.05	0.13	0.13
EHV	0	0	0	0
HV	0	0	0	0
LV	0	0	0	0
Total	1.05	1.05	0.13	0.13
UKPN (EPN) Threshold (total)	0.7		0.6	
Part 1 Exceptionality Test	Pass		Fail	
Part 1 Precondition of eligibility (meets App 3 to paragraph 8.57 of CRC 8)	Pass			

NOTE: EPN's measurement systems are subject to QoS audits for accuracy of reporting and it is not within the AE's ToR to repeat that work as part of the examination of exceptional event claims, although any consequential adjustments to reporting accuracy will be reflected in Ofgem's final adjudication of reported performance for the regulatory reporting year 2014/15.

Appendix B - EPN's photographs

Photograph 1 – 'End-on' view of the 132kV double-circuit overhead tower line and the fire-damaged building below



Photograph 2 – 'Side view' of the 132kV double-circuit overhead tower line and the fire-damaged building below

