

Quality of Service Incentive Scheme – Exceptional Events

Appointed Examiner's Report	
Reporting year	2010/11
DNO	CE Electric – NEDL Licensed Area
Cause	Vandalism to 132kV insulators on a lattice steel tower
Date of event	26 June 2010

Submitted to:

Ofgem

Submitted by:

British Power International Limited

British Power International Limited
The Octagon
Middleborough
Colchester CO1 1TG
United Kingdom

July 2011

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Name	Position	Signed	Date
Geoff Stott	Project Manager		26 July 2010

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Glossary

AE	Appointed Examiner
BPI	British Power International
CB	Circuit-breaker
CE	CE Electric UK
CI	Customer Interruptions per 100 connected customers
CML	Customer Minutes Lost per connected customer
DAR	Delayed Auto-reclose
DNO	Distribution Network Operator
EHV	Extra High Voltage – all voltages above 20kV up to but excluding 132kV
HV	High Voltage – all voltages above 1kV up to and including 20kV
NEDL	Northern Electricity Distribution Limited
NG	National Grid
QoS	Quality of Service
RIGs	Regulatory Instructions and Guidance
SCADA	System Control and Data Acquisition
SoF	Statement of Facts
ToR	Terms of Reference

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

Ofgem has appointed British Power International Limited (the Appointed Examiner) to audit the submission made by CE Electric UK (CE) under the “one-off” exceptional event mechanism that vandal damage caused to insulators on tower number 10 of its Stella South to Annfield n°1 132kV feeder on Saturday, 26 June 2010 materially and adversely affected reported performance for its Northern Electricity Distribution (NEDL) licensed area for the reporting year 2010/11.

The Appointed Examiner (AE) has visited CE 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.

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.

The AE therefore proceeded to part 2 of the “one-off” exceptional event process, assessing NEDL’s performance in mitigating the impact of the event upon its customers.

The AE concludes that NEDL restored its customers’ supplies without delay.

The AE also concludes that NEDL replaced the damaged insulators and re-commissioned the feeder without delay, thus minimising the risk to the security of supplies to its customers.

The AE concludes that NEDL had met the criteria of Appendix 4 to paragraph 8.58 of Special Licence Condition CRC 8 and that the incident is therefore deemed to be eligible for adjustment in the DNO’s reported performance.

The AE therefore recommends that an adjustment to NEDL’s 2010/11 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	2.73	1.13	1.13
CML	0.46	0	0

1. Audit part 1

Summary of main facts

- 1.1 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.
- 1.2 NEDL has furnished evidence to support its claim that vandalism severely damaged 18 of the reinforced glass insulators on tower 10 of its Stella South to Annfield n°1 132kV feeder.
- 1.3 NEDL's Stella South to Annfield teed Coalburns n°2 132kV feeder had been switched out on 21 June 2010 and was undergoing essential maintenance work.
- 1.4 The weather over the two weeks prior to the incident was dry. However, it was raining on the day of the incident and the lack of insulation due to the vandal damage resulted in a flashover from the live conductors to the earthed tower, resulting in loss of the 132kV infeed to Annfield 132/66kV substation.
- 1.5 Supplies to the customers fed from NEDL's Annfield, Consett and Tanfield Primary Substations were interrupted.
- 1.6 Prior to commencing supply restoration by tele-controlled switching, NEDL's control engineer contacted the engineer responsible for the maintenance work on the n°2 feeder to ensure that there were no safety issues to be considered.
- 1.7 42,967 of NEDL's customers' supplies were interrupted for periods of between twelve and twenty four minutes.
- 1.8 A simplified view of the section of NEDL's 132/66kV network affected by this event is shown in Figure 1.

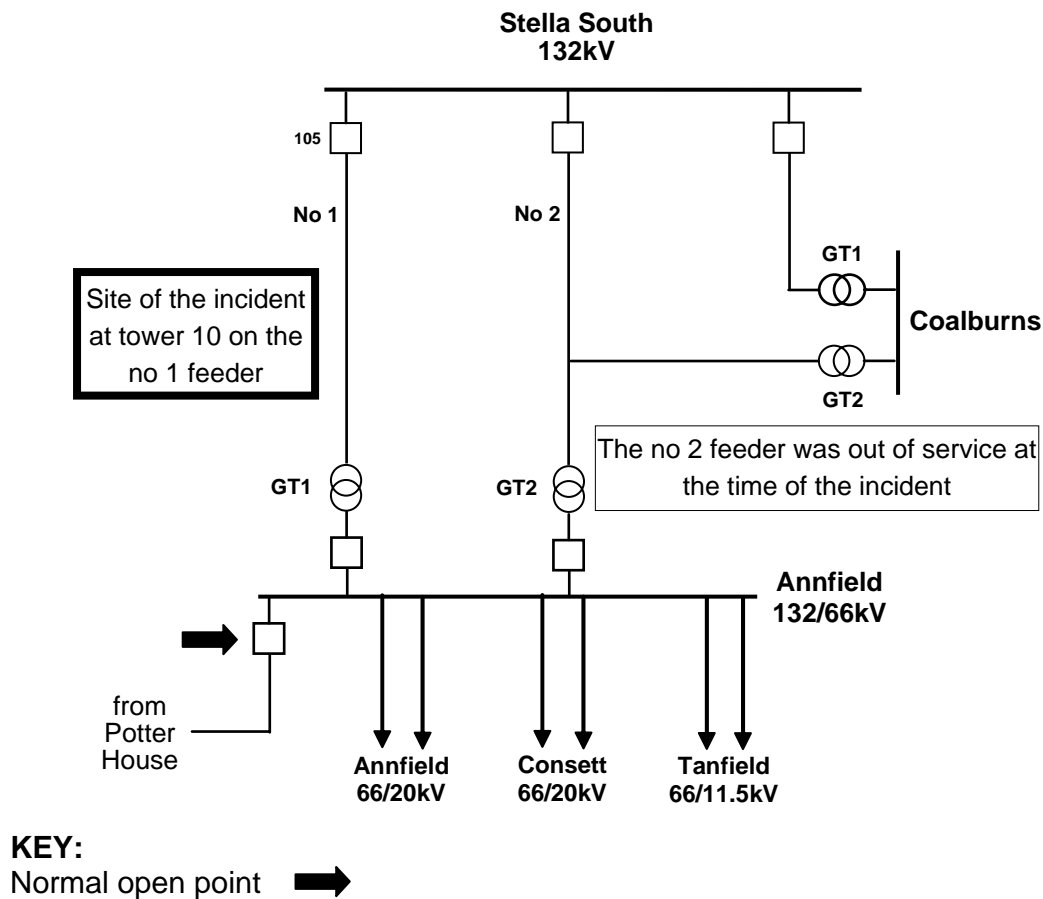


Figure 1 – Simplified Network Diagram of NEDL's 132/66kV distribution network affected by the incident

Notes:

1. Apart from the outage of the Stella South to Annfield teed Coalburns n°2 circuit, NEDL's distribution system affected by this incident was running normally at the time of the incident.
2. All supplies were restored via tele-controlled switching from NEDL's 66kV network using the interconnector from Potter House.
3. For clarity, only the salient items of switchgear are shown.

Exceptionality requirements

Does the event qualify for exclusion?

- 1.9 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.
- 1.10 The AE therefore considers that, subject to meeting the requirements of Appendix 4 to CRC 8, the event qualifies for possible exclusion under the "one-off" exceptional events process.

Exceptionality test results

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

Table 1-1: 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

1.12 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 1-2.

Table 1-2: Summary of exceptionality test results

Test	Threshold	Claimed number	Audited number	Pass / Fail	Amount above threshold
CI exceptionality	1.6	2.73	2.73	Pass	1.13
CML exceptionality	1.3	0.46	0.46	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 threshold 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 2010/11

NEDL's views of its performance

- 1.13 NEDL has a robust, commercially confidential, risk assessment policy that details the various checks that must be carried out during the process of requesting a system outage at or above Extra High Voltage (EHV). *[AE's note: The AE has seen CE's risk assessment policy. CE Electric does not wish the inherent security arrangements of its policy to become public knowledge – hence the commercially confidential classification].*
- 1.14 Prior to the outage of the Stella South to Annfield teed Coalburns n°2 132kV feeder, NEDL is satisfied that its policy was fully applied and that its personnel had no reason to suspect the reliability of the Stella South to Annfield n°1 feeder.
- 1.15 The outage on the n°2 feeder commenced as scheduled on Monday 21 June 2010, the feeder being scheduled for restoration on Monday 03 July 2010.
- 1.16 In accordance with good engineering practice, several items of equipment were scheduled for essential maintenance during the outage on the n°2 circuit.
- 1.17 During a period of heavy rain, at 18:23 on Saturday 26 June 2010, the Stella South to Annfield n°1 feeder tripped, resulting in the loss of supplies to three of NEDL's Primary Substations.
- 1.18 In accordance with NEDL's policy, before attempting to re-energise the feeder, NEDL's control engineer contacted the engineer in charge of the maintenance work on the n°2 feeder. Having determined that there were no safety issues associated with the outage on the n°2 feeder, NEDL's control engineer tried to reenergise the n°1 circuit via tele-control but the circuit-breaker tripped immediately.
- 1.19 NEDL's control engineer then used tele-controlled switching to restore supplies to the three affected Primary Substations.
- 1.20 NEDL considers that the protection applied to 132kV circuit-breaker (CB) 105 at Stella South Substation and the 66kV Grid T2 CB at Annfield Substation operated correctly to clear the fault from its system.
- 1.21 NEDL considers that its duty control engineer reacted well in assessing the alarms generated by the event, contacting the engineer in charge of the work on the n°2 feeder, trying the n°1 feeder back and beginning to restore supplies in twelve minutes, completing the task in twenty four.
- 1.22 The protection equipment at Stella South is owned and operated by National Grid (NG) and NEDL requested NG to attend site.
- 1.23 Following information from NG that the fault on the n°1 feeder was 3.15 km away from Stella South, NEDL's personnel discovered 18 shattered glass insulators, damage to the original danger plate and tin cans with shotgun holes on the ground at tower 10 of the Stella South to Annfield n°1 132kV feeder.
- 1.24 NEDL considers that its engineering team did well in replacing the damaged 132kV insulators at tower 10 of the n°1 feeder on the following day.
- 1.25 NEDL also considers that it acted appropriately in returning the n°2 feeder to service on the following day to safeguard its customers' supplies against any other possible vandalism damage on the n°1 feeder.

NEDL's answers to questions on its performance

- 1.26 Within the last four years, the AE has reviewed NEDL's design standards, construction methods and maintenance procedures during previous visits to audit exceptional event claims and found them fit for purpose.
- 1.27 NEDL's SoF indicates that it has examined the engineering implications of this incident with a view to introducing enhanced security measures at tower 10 as far as is practicable. As part of the audit of this claim, the AE therefore included a discussion on how far NEDL had progressed in its deliberations.
- 1.28 The AE confirms that NEDL's emergency procedures provide for the type of event being examined here.
- 1.29 To aid understanding of the background to NEDL's SoF, the AE prepared a list of initial questions regarding this incident. These questions were used as the basis for the examination of NEDL's claim.
- 1.30 The initial questions were discussed during the AE's visit to NEDL's Peshaw Control Centre on 20 June 2011 when the records of NEDL's SCADA system, the incident report and other information were made available.
- 1.31 Given the information and photographic evidence provided by NEDL and the AE's personal knowledge of installations of this type, it was considered to be unnecessary to visit tower number 10.
- 1.32 NEDL 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 NEDL's answers being printed in normal font.
- Q1. What changes, if any, has NEDL made to its emergency plans and procedures since BPI last visited to audit an Exceptional Event claim on 29 March 2007?**
- A1. A large number of changes as the plans are under constant review. Please note that some information is commercially confidential but the AE will be given sight of the documentation during the audit visit.
- Q2 The claim is that the incident exceeded NEDL's CI threshold. What is the value of CML that NEDL attributes to the incident? How has NEDL calculated the above values?**
- A2. CI was 42,967 (2.73), CML 726,612 (0.46) – using Sept 2010 customers 1,575,686. An IRIS record will be available for the audit visit.
- Q3. How does NEDL's risk assessment policy incorporate the requirements of Appendix 4 to paragraph 8.58 of its Special Licence Condition CRC 8; in particular, the requirements on NEDL to take 'all appropriate steps within its power ... to limit the number of Customers interrupted by the event...and restore customers' supplies quickly and efficiently'**
- A3. The key to this is "appropriate" – in other words we only do what is appropriate in the circumstances and not absolutely everything that we could possibly do regardless of time and cost. We have a specific "outage planning" group of

experienced control engineers working on the approval of all outages. Their purpose is to fulfil the requirements of section 3.8 of CE's policy CRL/001/014:

3.8 EHV Outage Risk Assessment

All EHV outages shall be subjected to a network risk assessment by Control Operations and documented.

The network risk assessment considers a combination of the system risk category as defined in P2/6, the number of customers at risk, resultant system demands, the earliest restoration time to service and any shortfall in demand pick-up capability following the loss of an adjacent circuit.

The result of the network risk assessment may give rise to outage rejection or a request for additional contingency arrangements.

Q4. What evidence can NEDL provide to demonstrate that its risk assessment policy has been fully applied ahead of the outage on the Stella South to Annfield teed Coalburns n°2 132 kV circuit?

A4. Memo from engineer in charge (Keith Daly) of systems checked. Outage request form and control risk assessment will be available at the audit visit.

Q5. What protection schemes are installed on the single circuit 132 kV feeder between Stella South and Annfield?

A5. Main feeder protection is distance with single shot DAR – protection sheets will be available at the audit visit.

Q6. What settings are applied to the above protection schemes?

A6. Copies of NEDL's protection scheme settings will be handed to the AE during the audit visit.

Q7. Following the attempted reclosure of the faulted feeder what protection operated?

A7. As will be provided at the audit visit, NEDL's control log shows the details from NG (main: distance zone 1 and back-up: B-ph O/C & E/F).

Q8. What type(s) of tripping relays are installed on the protection schemes of the Stella South to Annfield 132kV feeder? (i.e. self reset, SCADA reset, etc)?

A8. They are timed auto-reset. Please see NEDL's protection sheets.

Q9. What, if any, auto-reclose schemes are installed on the above 132 kV feeder?

A9. See protection sheet (single shot DAR).

Q10. Given that NEDL considers the most likely cause of the incident to be the shotgun damage at tower 10, what photographic or other evidence has NEDL retained to support this view?

A10. NEDL has no contemporaneous photographic evidence but please see the notes in NEDL's switching log at item numbers 27 and 42 where NEDL's site personnel reported what they discovered at tower 10 on the day of the incident.

Following the receipt of the AE's initial questions, NEDL's personnel have obtained photographs of tower 10, one of which shows the shotgun damage to the original danger plate. (Please note the original danger plates are still in place but have been superseded by the current style of mandatory ones at each tower corner).

Q11. Where is tower 10 located? (e.g. rural setting or edge of conurbation).

A11. Tower 10 is located in a wooded area on the western edge of the Blaydon conurbation. The section of the tower from the conductors to its peak is visible from the nearest road but the tower is located in a defile and its base is hidden from the public gaze.

Q12. What is the design of tower 10 – i.e. a single circuit section angle or a double circuit section – angle with only 1 side strung?

A12. Double circuit strung for 1 circuit only (stub x-arms only on 2nd circuit side).

Q13. BPI is aware that NEDL has several lower-profile tower lines as well as those with the more traditional taller towers. What are the approximate heights from ground of the insulator strings of the yellow and blue phases?

A13. Standard full height 132 kV D60 tower – Blue 17.2m, Yellow – 20.3m, Red - 23.4m.

Q14. What material(s) were the damaged insulators made from?

A14. Reinforced glass.

Q15. Photographs of tower 10 in relation to the surrounding terrain would assist BPI and the lay reader to more readily understand the answers to the above questions.

A15. Photos will be available at the audit visit.

Q16. At what frequencies are NEDL's 132 kV tower lines inspected, by helicopter and by ground patrol?

A16. Normal for tower lines is high speed helicopter patrol every 2 years, high resolution helicopter patrol every 10 years, foot patrol every 10 years (interleaved with high resolution helicopter patrol). Where helicopter patrol has failed – follow up foot patrol.
Identified higher risk sites – 2 years foot inspection.

Q17. What evidence can NEDL provide to demonstrate its line patrol procedures have been correctly applied in the case of the Stella South to Annfield 132 kV circuit?

A17. The foot patrol report from November 2009. The high resolution helicopter patrol report (first) from August 2010. Both documents will be available at the audit visit.

Q18. Where remedial or tree trimming work was required, what evidence can NEDL provide to demonstrate that there were no outstanding defects at the time of the incident?

A18. Please see the Tilhill report made available at the audit visit from Graeme Denison - survey dated 10 February 2011 – nothing outstanding.

Q19. Why does NEDL's risk-assessment policy (CRL/001/0144) only refer to the resolution of defects 'identified helicopter patrol' and thus exclude ground patrol reports?

A19. Where appropriate we actually check both but helicopter patrols are much more frequent – but will be correcting when updating to cover recommendations of ENA group (please see A20).

Q20. What learning points has NEDL incorporated into its procedures as a result of this incident?

A20. Rechecked correctness of contingency level – conclusion was that further contingency for outages of this type not economic. However, CE is leading a national group examining this whole issue of outage planning contingencies via ENA and will obviously be applying any recommendations from this group when they report.

Q21. What further learning points should be considered as a result of the application of the revised Exceptional Event Claims process?

A21. None.

1.33 NEDL also provided further information during the audit visit. This includes:

- sight of the commercially confidential review that NEDL has undertaken regarding its policies and procedures;
- a discussion regarding the relative reliabilities of NEDL's feeders at the EHV / 132kV voltage levels;
- copies of the protection schemes and their settings for the n°1 feeder;
- the details of NEDL's SCADA alarms received during this incident as included in its SCADA log;
- a record of the information received from NG as contained in NEDL's control log;
- a copy of NEDL's incident report;
- a copy of the pre-outage request and risk assessment for the n°2 feeder;
- a representation of the incident on NEDL's SCADA system;
- DINIS (50,000) and 10,000 scale geographic plots of the route of the Stella South to Annfield n°1 132kV feeder showing tower 10 and its distance from Stella South; and
- a simplified SLD of the affected sections of NEDL's 132kV and 66kV networks, annotated with circuit-breaker numbers, showing bus-section / bus-coupling circuit-breakers and the three Primary Substations affected by the loss of the 132kV infeeds to Annfield 132 / 66kV substation.

2. Audit part 2

NEDL's performance in preventing the event

- 2.1 In viewing NEDL's performance in preventing this event, the AE has considered what more NEDL could have reasonably done to ensure that its Stella South to Annfield n°1 132kV feeder was free from any defect prior to the outage on the Stella South to Annfield teed Coalburns n°2 feeder 132kV.
- 2.2 The AE has discussed the fault history of the n°1 feeder with NEDL and is satisfied that NEDL's SCADA database shows no previous incidents of any kind.
- 2.3 NEDL's control room log clearly states the situation regarding the evidence of vandalism (shotgun damage) at tower 10. Photograph 1 of tower 10, recently taken by NEDL's personnel, shows the shotgun damage to the original danger notice. *[AE's note: the original danger plates have been superseded by the mandatory yellow-coloured "Danger to Life" signs that are affixed to the corners of tower 10. The "PS10 plate below the damaged danger plate indicates it is tower number 10 on the line that has the "PS" identity; i.e. the section of the Stella South to Annfield n°1 132kV tower line that is strung as a single circuit].*
- 2.4 NEDL's photograph n°2 shows the construction of tower 10.
- 2.5 Whilst NEDL has no contemporaneous photographic evidence of the damaged insulators, a close inspection of the high-resolution photograph (photograph n°3) taken during the helicopter patrol in August 2010 shows the then recently replaced insulators. *[AE's note: from a high magnification examination of this photograph and NEDL's photograph n°2 it is possible to see the different colouration of the replaced insulators].*
- 2.6 NEDL's measurement systems confirm the tripping of CBs to clear the incident from NEDL's system at 18:23 on 26 June 2010 as reported in NEDL's SoF.
- 2.7 NEDL's measurement systems also confirm the restoration of supplies to its customers fed from Annfield, Consett and Tanfield Primary Substations via tele-controlled switching.
- 2.8 An examination of NEDL's photographs of tower n°10 of its Stella South to Annfield n°1 132kV feeder shows it to be situated in a wooded defile to the west of the Blaydon conurbation.
- 2.9 The photographs also show that tower 10 carries the statutory warning notices.
- 2.10 An examination of NEDL's confidential documentation shows that its outage planning / risk assessment policy is robust and that it was rigorously applied during the planning of the outage of the Stella South to Annfield teed Coalburns n°2 132kV feeder.

- 2.11 NEDL's documentation also shows that there were no known outstanding defects concerning the faulted feeder and that NEDL's personnel had no reason to believe that the feeder was unreliable.
- 2.12 The AE concludes that NEDL had done all it could reasonably have been expected to do in considering that the Stella South to Annfield n°1 132kV feeder could not be relied upon during the necessary outage of the n°2 feeder.

NEDL's performance in mitigating the effects of the event

- 2.13 NEDL's incident report shows the cause of the incident to be "Wilful or accidental contact, damage, interference or theft" and is annotated with the site report of a 'full set of 12 disc insulators blown off blue phase towards tower 9 plus various other insulators'.
- 2.14 The hole in the tower's original danger plate and the site report of shotgun damaged tin cans and blown off insulators are all consistent with third party damage by shotgun blasts. The damage to a complete set of insulators on the blue phase combined with the heavy rain of the evening of 26 June 2010 are also consistent with a flashover of blue phase to the structure of the earthed tower as 'seen' by the distance protection.
- 2.15 The AE has discussed the running arrangements and protection schemes associated with the affected section of NEDL's 132kV distribution network with NEDL's engineering personnel.
- 2.16 The examination of the protection arrangements at Stella South and Annfield Substations shows that NEDL's protection schemes operated correctly to clear the fault from its network.
- 2.17 The AE concludes that NEDL did all it could to restore supplies as expeditiously as possible, thereby minimising the duration of the interruption.
- 2.18 The AE commends NEDL's control engineers in analysing the situation, contacting the engineer responsible for the work on the n°2 feeder and restoring all supplies within twenty four minutes.
- 2.19 The AE is pleased to note that NEDL has learned from this incident and has already put in place commercially confidential measures to enhance the security of tower 10.

Recommended performance adjustment(s)

2.20 The AE's recommendations to Ofgem are shown in Table 2-1.

Table 2-1: Audit part 2 recommended adjustment(s)

	Amount above threshold	Audit part 2 recommendation
CI	1.13	1.13
CML	0	0

Detailed justification

- 2.21 In reaching a judgement on a recommendation, the AE has firstly considered whether or not NEDL could have reasonably taken any different course of action that would have prevented the incident on its Stella South to Annfield n°1 132kV feeder.
- 2.22 In viewing NEDL's performance in preventing this event, the AE has taken into account the lack of any previous incidents on the affected feeder and the rigorous application of NEDL's comprehensive and robust risk assessment / pre-outage planning policy associated with the work on the n°2 feeder.
- 2.23 The AE has also taken into account NEDL's reliability statistics for its 132kV and its 66kV feeders that show the former to be more reliable per kilometre than the latter. The AE is therefore satisfied that the circuit configuration adopted during the outage of the n°2 circuit was the most reliable option and therefore afforded the most system security to NEDL's customers.
- 2.24 The AE has also discussed this incident with his colleagues who have considerable operational experience of incidents with many differing causes; they agree with the visiting auditor's conclusions and recommendations.
- 2.25 The AE considers that the preventative measures employed by NEDL at its tower number 10 of its Stella South to Annfield n°1 132kV circuit are in accordance with current industry practice.
- 2.26 In considering NEDL's restoration strategy, the AE is conscious that NEDL's duty control engineer acted with commendable skill and speed in analysing the SCADA alarms and indications for this incident, contacting the engineer responsible for the work on the n°2 feeder, trying the faulted feeder back and restoring all supplies via tele-controlled switching as rapidly as possible.
- 2.27 Similarly, NEDL's operational personnel are to be commended for replacing the damaged insulators at tower 10 and restoring to service the number 2 circuit on the day following the incident, thus restoring the security to NEDL's customers.

- 2.28 The AE is satisfied that the affected sections of NEDL's distribution network comply with the requirements of Security of Supply Standard P2/6.
- 2.29 The AE has discussed NEDL's learning from this incident, its incorporation of tower number 10 into its high risk register and the commercially confidential enhanced security measures it has put in place and is pleased to note NEDL's pro-active approach.
- 2.30 During the discussions, the AE mentioned that, should any subsequent incident of this type arise, NEDL's progress in ensuring its enhanced measures were appropriately used would be taken into account during the audit of any associated exceptional event claim.
- 2.31 The AE is satisfied that NEDL has met the criteria for preventative and mitigating actions set out in Appendix 4 to paragraph 8.58 of Special Licence Condition CRC 8.
- 2.32 The AE therefore concludes that NEDL's claim is justified and recommends to Ofgem that the amount of CI above the threshold value should be excluded from NEDL's performance for regulatory reporting year 2010/11.

Appendix A Record of Audit part 1

Table A-1: Appointed Examiner's Information Log

“One-Off” Exceptional Event	Reporting Year 2010/11
Licensed Area	NEDL
Date of event	26 June 2010
Cause	Vandalism to 132kV insulators
Notification to Ofgem	08 July 2010
SoF received	06 August 2010
SoF information	<ul style="list-style-type: none"> • supplies from Annfield 132/66kV Substation were interrupted at 18:23 on Saturday 26 June 2010 when 132kV CB 105 at Stella South tripped. • NEDL's duty control engineer: <ul style="list-style-type: none"> ○ Contacted the engineer in charge of the maintenance work on the n°2 feeder; ○ Tried n°1 feeder back at 18:28 – it tripped immediately; ○ Restored first supplies via tele-control at 18:35; ○ Restored second supplies via tele-control at 18:41; ○ Restored final supplies via tele-control at 18:47; and ○ Received a message from NG reporting that distance protection had operated (3.135 km from Stella South) plus blue phase o/c and earth fault. • NEDL's personnel attending site reported 18 damaged tension insulators at tower number 10, shotgun damage to the tower's original “danger plate” and tin cans with shotgun holes lying on the ground beneath the tower. 13 of the damaged insulators, including a full set of 9, were on the lower (blue phase conductor) and 5 on the centre (yellow phase).
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 NEDL's response, is contained in paragraph 1.32 of the report.
Location of audit visit	NEDL's Penshaw Control Centre
Date of audit visit	20 June 2011
Visiting Auditor	Geoff Stott (BPI)
NEDL's Representatives	Tony Ingham, Jeremy Meara, Jim Morrell, Danielle Oates and Ian Punshon

<p style="text-align: center;">Information provided during and subsequent to the audit visit</p>	<p>Comprehensive documentation / information including:</p> <ul style="list-style-type: none"> • the protection arrangements for the Stella South to Anfield 132kV number 2 feeder; • copies of the relevant 132kV and 66kV SLDs; • a copy of the most recent foot patrol report for tower 10 (Nov '09 - no signs of third party activity); • a copy of the most recent high-resolution helicopter patrol (Aug '10 – no further damage at tower 10); • a copy of NEDL's tree trimming report database (no work needed at tower 10 until 2012 at the earliest); • the SCADA switching log showing the loss of supplies from Annfield 132/66kV Substation at 18:23 on 26 June 2010; • the normal network running arrangements were demonstrated; • a copy of NEDL's 'IRIS' incident report that shows: <ul style="list-style-type: none"> ○ the number of customers affected by the incident to be 42,967; and ○ the customer minutes lost to be 726,612. • the AE confirms that these figures agree with those quoted in NEDL's SoF; • using NEDL's total connected customers at 30 September 2010 of 1,575,686 the number of customers affected equates to a CI of 2.73. [42967*100/1575686]; • similarly, the customer minutes lost for this event equate to a CML of 0.46. [726612/1575686]; • a summary of the on-going review of CE's various policy documents; • a copy of the outage request for the number 2 feeder, including the responsible engineer's check list; • a copy of NEDL's post-incident internal report; • a geographic diagram showing the location of tower 10 along the circuit route; • the relevant section of the overhead profile showing the ground clearances at tower 10 and its being sited in a defile; and • a copy of the weather warning sent from the Meteorological Office issued at 18:29 on 26 June 2010 alerting NEDL of the heavy rain expected in the Durham and Tyne & Wear areas. <p>NEDL's photographs show that Tower 10 is in a wooded area across open farmland to the west of the Blaydon conurbation.</p> <p>Whilst NEDL does not have photographs of the damaged insulators, the shotgun damage to the original danger plate is obvious. The high-resolution photograph of tower 10 taken during the helicopter patrol of August 2010 shows the construction of the tower, its setting and the replaced insulators.</p> <p>Discussed the protection that operated (distance to fault – geographic and tower 10).</p> <p>Confirmed protection consistent with rain and shattered dishes.</p> <p>Discussed post-fault learning points, including tower 10 now on NEDL's high risk register and subject to commercially confidential enhanced inspection regime.</p>
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	<p>Disappointing that no photographs taken of the shot-gunned cans or the damaged insulators – a learning point for NEDL.</p> <p>Discussed NEDL’s risk assessment / outage planning / request policy – documents show the outage request on the n°1 circuit was fully compliant.</p> <p>Statistical reliability 132kV vis-a-vis 66kV and full switched alternative.</p> <p>Very reliable - no previous fault history for the n°1 feeder.</p> <p>Confirmed P2/6 compliant.</p> <p>The list of initial questions was discussed.</p> <p>NEDL provided answers to the initial questions plus additional information both during and subsequent to the audit visit.</p> <p>Ok re compliance with Appendix 4 of Paragraph 8.58 of CRC 8.</p>
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Table A-2: Impact on CI and CML

	CI		CML	
	Claimed	Audited	Claimed	Audited
132kV	2.73	2.73	0.46	0.46
EHV	0	0	0	0
HV	0	0	0	0
LV	0	0	0	0
Total	2.73	2.73	0.46	0.46
NEDL Threshold (total)	1.6		1.3	
Part 1 Exceptionality Test	Pass		Fail	
Part 1 Precondition of eligibility (meets App 3 to paragraph 8.57 of CRC 8)	Pass			

NEDL’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 regulatory reporting year 2010/11.

Appendix B Photographs



Photograph 1 – The shotgun damage to the original danger plate at tower 10



Photograph 2 – Showing the construction of tower 10



Photograph 3 - High resolution photograph of tower 10 taken during the helicopter patrol of August 2010