

# Summary of Meeting and Actions

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Meeting Name	E3C OC6.6 (Automatic LFDD) Working Group
Meeting No.	2
Date of Meeting	Thursday, 5th March 2009
Time	10:00am – 2:30pm
Venue	Conference Room 8, National Grid House, Warwick

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This note outlines the key action points from the second meeting of the E3C OC6.6 (Automatic LFDD) Working Group.

## 1) Apologies for Absence

Apologies were received from Guy Nicholson (Senergy Econnect), Russell Swift (Scottish & Southern Energy) and Babara Vest (AEP)

## 2) Minutes from Previous Meeting

The draft minutes of the Grid Code Working Group meeting held on 22<sup>nd</sup> January 2009 were approved and will be accessible from the Grid Code Website.

**Action: National Grid**

## 3) GB Transmission System Incident (27<sup>th</sup> May 2008)

The Working Group noted that the final report into the System Events which took place on 27<sup>th</sup> May 2009 had been made public and was available on National Grid's Grid Code website:

<https://www.nationalgrid.com/uk/Electricity/Codes/gridcode/associateddocs/>

As previously noted by the Working Group the system incident resulted in approximately 2GW of generation (direct connected and embedded) being disconnected from the grid within a matter of minutes. This unsecured non-credible loss resulted in the frequency dropping to 48.8Hz before the system started to recover. The frequency drop instigated operation of stage one of the Low Frequency Demand Disconnection (LFDD) relays in NGET's Transmission Area.

National Grid provided the Working Group with detailed information of the total demand which was shed through the relays. The Working Group was informed that the relays accounted for the disconnection of about 1.5% of the demand at the time of trip. It was noted that a significant number of relays did not operate because the frequency drop was within the relay tolerance settings and that if all relays had operated the demand shed would have been about 6% of the total demand. It was agreed that overall the Low Frequency Demand Disconnection Scheme worked well and that if the frequency had fallen further the relays would have operated as expected.

IB stated that EDF's demand figures at the time of trip suggest a significant difference to that compiled by National Grid. DC would provide the figures he had obtained to IB to see where the discrepancy lies.

**Action: National Grid**

## 3) Working Group Discussions

The Working Group noted that the current Grid Code obligations stated that the LFDD relays should enable load shedding of 60% of total peak demand (based on Annual ACS Conditions) in NGET's Transmission Area and 40% of total peak demand in SHETL's and SPT's Transmission Area. The group agreed that it will be useful to understand the extent to which the percentage demand shed may vary across the year.

National Grid had identified a limited number of periods considered adequate to represent the variation across the year from which the DNOs would provide an analysis of the amount of load that would be shed at those times:

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- 03/01/2008: 17:30 (National Grid peak)
- 13/03/2008: 14:30
- 08/05/2008: 06:30
- 05/08/2008: 05:30
- 23/10/2008: 20:30

Given the limited time between National Grid specifying the time periods and the Working Group meeting, only a limited amount of information was returned. The initial results suggested that there was not much variation (in percentage terms) between the various times selected and the time of peak demand (based on Annual ACS Conditions)

It was noted that this trend was based on the submissions from two DNO companies and it was subject to change once all the data had been submitted. It was noted and accepted that there may be wider variations regarding the results depending on the geographical region and the way in which the system had been designed or was operated.

It was agreed that any recommendations/informed views would be formulated when all the information had been received. The Working Group agreed to provide National Grid with the information as soon as possible given the work involved in completing the analysis and the timeline of the Working Group discussions/recommendations.

### **Action: National Grid and DNO Representatives**

It was noted that embedded generation located within DNOs LFDD demand groups could affect the demand disconnected at any particular time. If generation was operating when the LFDD percentages were established, but not at the time of LFDD operation; the actual demand disconnected would be greater than anticipated. If the generation was not operating when the LFDD percentages were established, but was at the time of the LFDD operation; the actual demand disconnected would be greater than anticipated.

There was no guidance/advice on how to incorporate embedded generation within the block settings for the relays. The Working Group noted that the findings/recommendations from the E3C Small Embedded Generation Frequency Obligations Working Group may impact the E3C OC6.6 Working Group in terms of the resilience of small embedded generation and how to incorporate such generations with the block sizes (if appropriate).

It was noted that the E3C Small Embedded Generation Frequency Obligations Working Group was not due to finalise its conclusions until November 2009. Given that the E3C OC6.6 Working Group was due to report back in May 2009, the Working Group report would note that there may be an interaction between the two groups depending on the conclusions from the E3C Small Embedded Generation Frequency Obligations Working Group.

The Working Group has been asked to investigate whether any possible improvements could be made to the LFDD scheme, with particular attention to:

- where a demand group included as part of a LFDD scheme is supplied by a number of circuits, are there relays on each circuit and are all the relays at the same setting?
- is the LFDD scheme interactive with other automatic demand restoration scheme e.g. Delayed Auto Reclose, Auto-close? If yes, what is the extent of the interaction and how many MWs are involved?

The results from the investigation, thus far, had not identified any issues which would materially impact the operation of LFDD scheme (in line with Grid Code obligations). It was noted that the investigation had highlighted areas which could be slightly adapted to ensure consistency in the relay settings/scheme. It was reported that some DNOs find it perhaps inappropriate to issue 'Standing Instructions or Guidance Notes' for designers and operators in respect of making sure that LFDD scheme operation was not compromised when DNO networks were designed or operated as such considerations should be an integral part of the normal design and operational practices.

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The Working Group agreed that all members would report back their findings before any formal conclusions were reached.

**Action: DNO Representatives**

In the event of no material improvements being identified this would be noted in the Working Group report.

The Working Group discussed the timing of the relays together with the timing of the overall scheme and noted that the Grid Code only currently specified the 'operational time' of the relay which excludes the operating time of the circuit breakers. DC stated that the overall time shall not be greater than 200 ms; a longer time would increase the risk of fast dropping frequency transgressing to the next stage and jeopardising the performance of the scheme. It was noted that DNOs' older circuit breakers may have an operating time of the order of 100-120 ms and even with new Grid Code compliant relays the overall operating time could be in excess of 200ms. If old breakers have to be replaced ahead of their asset life, Ofgem would have to approve such expenditure. National Grid will consider further the timings of the overall scheme and DNOs to consider what their overall operating times are at sites with compliant relays. It was recognised that a cost benefits analysis would need to be undertaken as to justify any additional expenditure.

**Action: All**

It was acknowledged that National Grid had similar responsibilities regarding the Automatic LFDD Scheme (to that of the DNOs) for Non Embedded Customers. It was agreed that National Grid will review its LFDD relays obligations in accordance with the Working Group discussions e.g. reliability, timings, arrangements and report back to the group (in order to ensure consistency between the different User groups).

**Action: National Grid**

The Working Group was informed that National Grid has a programme to replace the non-compliant relays which it owned at joint National Grid/DNO sites.

The Working Group discussed the best way of capturing the learning points identified. The Working Group discussed whether it would be beneficial to have a guidance note outlining good practice regarding the application of the LFDD Scheme within the DNO's network. DC's view was that it would be inappropriate to incorporate a guidance note in the GC.

The Working Group noted that a guidance notes might become a useful reference document for the industry when compared to the Working Group Report. However the Working Group queried the status of the guidance documents (and noted that there had been previous examples of when the guidance notes did not align with the requirements in the Code).

#### **4) Working Group Report & Proposed Grid Code Changes**

A draft Working Group report would be circulated to members prior to the next group meeting. The Working Group would include a description of the scheme, its purpose and utilisation in the 27<sup>th</sup> May 2008 System Incident. It would also include a summary of the Working Group discussions, recommendations and proposed minor Grid Code changes i.e. CC.A.5.3.1 and CC.A.5.5.1 (insert the words as far as reasonably practicable).

**Action: National Grid**

#### **5) Working Group Terms of Reference and Governance Arrangements**

Members noted that the Working Group's terms of reference were approved by the Grid Code Review Panel at its February 2009 meetings subject to the inclusion of the following points:

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- provide an update on the programme of replacing obsolete relays (which will be utilised in the scheme);
- provide an update on the testing regime for the relays;

The Terms of Reference will be made publicly available on National Grid's Grid Code website.

**Action: National Grid**

The Working Group agreed to provide an update on the testing regime for the relays and the obsolete relays replacement programme which will be included in the Working Group Report. The update information should be provided to Darren Chan ([Darren.Chan@uk.ngrid.com](mailto:Darren.Chan@uk.ngrid.com)).

**Action: All**

Members noted that the Working Group's findings and recommendations are to be presented to the E3C by June 2009. It was agreed that the Working Group should present their findings and recommendations to May's 2009 GCRP meetings.

### 6) Next Steps

- DNOs will complete the analysis of the five different times chosen across the year for potential load shedding.
- DNOs will complete the investigation regarding interaction between LFDD relays and other automatic demand disconnection/restoration schemes.
- DNO's will complete the investigation regarding the LV running arrangements with the LFDD scheme i.e. is there any interaction?
- National Grid will investigate the Grid Code obligations regarding relays' operating times.
- National Grid will provide an update regarding the LFDD arrangements for Non-Embedded Customers.
- Updates to be provided on the testing regime for the relays and the obsolete relays replacement programme.
- National Grid to provide a draft Working Group report which will be circulated to group members prior to the next meeting.

### 7) Next Meeting

- It was agreed that the next meeting of the Working Group would be scheduled for Thursday, 2<sup>nd</sup> April 2009 commencing at 10am at National Grid House, Warwick.
- A subsequent meeting has been scheduled for 23<sup>rd</sup> April 2009 however it was noted that it may not be necessary for the fourth (face to face) meeting depending on the completion and findings of the actions highlights thus far. A final decision regarding the meeting scheduled for 23<sup>rd</sup> April 2009 will be taken in early April 2009.

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## Appendix 1 – Working Group Attendance

### Members Present:

Mark Perry	MP	Working Group Chairperson
Lilian Macleod	LM	Working Group Secretary
Darren Chan	DC	National Grid
Raj Nagarajan	RN	National Grid
Bridget Morgan	BM	Ofgem
Graham Brewster	GB	EON UK
Nigel Buckland	NB	Western Power Distribution
Ian Burgess	IB	EDF Energy
Alan Creighton	AC	CE Electric UK
Diyar Kadar	DK	Scottish Power
Bob Wells	BW	Electricity North West
<b>Apologies:</b>		
Guy Nicholson	GN	Senenergy Econnect
Russell Swift	RS	Scottish and Southern Electricity
Barbara Vest	BV	AEP