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Exercise Quartz

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Executive Summary

Exercise Quartz (Quartz) was a Network Emergency Co-ordinator (NEC) Exercise, required under GS(M)R to test the emergency arrangements in place to manage a Network Gas Supply Emergency (NGSE).

Quartz was an effective test of the emergency arrangements testing both the Downstream and Upstream responses to a progressive Gas Deficit Emergency (GDE). Downstream processes were tested between the NEC the Network Emergency Management Team (NEMT), the four Distribution Networks Control Centres (DNCC), Distribution Network operational teams and the Shipper community.

Upstream tests focused on the authorisation of Gas Availability Status (GAS) reports by the Department of Energy and Climate Change (DECC) and their completion by terminals. Further communications were maintained through DECC led teleconferences with Terminal Group leaders.

The exercise was the first full scale test to include interactions with all independent Distribution Network Control Centres and provided the opportunity to ensure continued alignment of each organisations respective E3 procedures. Quartz also included the testing of new procedures with the Electricity National Control Centre (ENCC) and also with LNG Importation Terminals.

Quartz demonstrated improvements in emergency procedures from previous exercises. It also identified areas where existing procedures needed some modification and where communications could be improved.

- Exercise Quartz contained elements of strategy development and parallel running which worked well enabling a greater number of processes to be tested;
- Communication and processes between the NEMT and the new structure of multiple Distribution Network Control Centres have remained aligned;
- Shippers understood and engaged with the new control rooms;
- Upstream processes were proven to be successful with participation through DECC Upstream teleconferences;
- Changes to the E3 procedures were aligned and changes related to Supplementary Transporters and communications with the ENCC were effective;
- During the exercise the NEMT developed and enacted emergency strategies including restoration;
- During the exercise the BGE process that had been tested in exercise Prelude was not initialised as planned;
- In common with previous large NEC Exercises the quality of the contact details available from Shippers remained an issue;
- Information systems performance in general was better than previous exercises;

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Quartz was an effective test of emergency arrangements and the authors would like to thank all participants. Numbered footnotes in this document refer to the recommendations table in section 7.2.

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1.0 Introduction

Quartz tested the emergency arrangements in place to manage a Network Gas Supply Emergency (NGSE) and fulfilled the NEC's obligations under GS(M)R to periodically carry out a full industry exercise.

1.1 Exercise Scope

1.1.1 Quartz was held on the 14th and 15th of October 2009. It focused on testing the emergency processes in place to effectively manage a NGSE. The exercise examined upstream and downstream industry process. Communications and procedures were tested over the two days with the four Distribution Network Control Centres, Shippers and end users responding to downstream actions. Using the DECC Upstream Crisis Management process provided an effective framework for communication with, Terminals and Terminal Group Leaders (TGL). Storage sites and interconnectors also participated in Quartz to complete the supply side picture. Interaction between the NEMT and National Grids Electricity Control Centre (ENCC) was also tested on day one of Quartz. The modelling of the SRT, Public appeals and the full DECC NEP remained out of the scope of the exercise.

1.1.2 The exercise modelled a scenario of a progressive GDE and focused on the demand reduction measures enacted by the industry to achieve a supply demand balance at each stage of the emergency.

1.1.3 During the exercise the majority of strategic decision making by the Network Emergency Coordinator (NEC) and development of the strategy by the Network Emergency Management Team (NEMT) were progressed within free play with exercise injects only being used to expedite timely progress of the exercise. This simulation approach added realism and depth to the exercise. Participants felt they were in a real event with the subsequent pressures. This approach also afforded the NEMT the opportunity to develop their options and responses at the various stages of the emergency, and see the actions implemented.

1.1.4 End users were contacted as part of the Emergency Interruption and Firm Load Shedding process.

1.2 Exercise Structure and Context

1.2.1 Quartz departed from Prelude and previous large scale NEC exercises that have mainly tested the processes and communications used in an emergency. Quartz enabled the NEMT greater scope to develop and implement strategic decisions in response to changes to the exercise

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scenario. This was an important and effective test as strategic decision making had previously been covered only in desktop exercises. It also included a higher level of interaction with DECC and the Terminal Group leaders on day one of the exercise. New processes were tested such as the interaction between the NEMT and the ENCC. Also Quartz was the first full scale exercise in which the four Distribution Network Control Centres fully participated. In addition NTS consumers were contacted on day two of the exercise and completed a questionnaire related to their sites ability to reduce load.

- 1.2.2 The wider scope of Quartz compared to previous exercises presented some unique challenges in terms of exercise planning. To enable meaningful strategy development, and the participation of a wider number of exercise participants, it was necessary to run parts of the exercise in parallel and to different scenarios and timescales. This ensured that each aspect of the exercise fulfilled the potential of giving players the experience of an NGSE. The participants and the broad objectives of the exercise for each are detailed in the following paragraphs.
- 1.2.3 For both days the NEMT and specifically the NEC, Incident Controller Network Manager Liaison and ESP operator roles, developed strategies to manage the Gas Deficit Emergency. The focus of the NEMT actions was on ensuring a smooth and coordinated downstream response through demand management and delivering a robust longer term strategy to restore the network to normal operation.
- 1.2.4 For the wider NEMT team and downstream participants, testing was focused on ensuring that the E3 processes and communications were implemented successfully. In order to fully test the processes it was necessary to supplement the strategy developed by the NEMT with some actions via exercise injects. This ensured that process testing was executed in a timely manner.
- 1.2.5 The addition of significant upstream participation in the exercise necessitated the running of a parallel scenario during parts of day one of the exercise. This was managed in conjunction with DECC who required an accelerated scenario to assess their response at each stage. NEMT participation was enacted by the officer in charge of supply who participated in the DECC teleconferences with Terminal Group Leaders and monitored the return of Gas Availability Status Reports and Terminal Situation Reports.
- 1.2.6 The exercise plan enabled successful testing of these areas and added a greater sense of realism and immediacy to the exercise actions. Twice within Quartz predefined actions conflicted with the NEC Strategy. The relevant officer in charge enacted the agreed NEC strategy. It is recommended that where exercise injects take precedence that this is highlighted explicitly in the team briefing and this is discussed further in 2.2.2

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1.2.7 Quartz tested the consistency of procedures through each stage of a NGSE by simulating progressive supply losses over the two days of the exercise. The processes tested over the two days are detailed below.

Day One

On day one effort was concentrated on the following stages and subsequent actions:

Stage One Potential NGSE

- Emergency Interruption

Stage Two

- Maximisation of Beach and storage supplies
- Suspension of National Grids' participation on the OCM as residual balancer

Stage Three

- Firm Load Shedding of NTS and DN VLDMC's

Day Two

On day two the exercise progressed with further supply losses leading to the following actions:

Stage Three (continued)

- DN Firm Load Shedding

Stage Five

- Restoration strategy development

1.2.8 In addition to the above, specific tasks were completed by the NEMT relating to communications briefings and the commercial effects of the emergency.

1.2.9 Individuals were tasked to observe key industry participants actions during the exercise and report their recommendations. Feedback has also been received from industry participants and informs the production of this report.

2.0 Results and Observations

2.0.1 Emergency exercises are run to comply with the Gas Safety Management Regulations 1996 and Safety Case requirements. Exercises test the effectiveness of existing processes and procedures and identify where improvements are required. This section of the report assesses the success of existing procedures, discusses any communication issues encountered and identifies any problems experienced with the support tools and systems critical to managing a gas supply emergency.

2.1 Procedures

2.1.1 The formation of the NEMT worked well with roles being clearly defined. A number of newly trained individuals successfully took part in the exercise both as Officers In Charge (OIC) and within the defined teams. Changes to NEMT roles and duties following recommendations from exercise Prelude also proved to be constructive.

2.1.2 There were a number of changes to distribution network contacts by some of the DN's that resulted in Transporter contacts having to be reissued 8 times at the start of the exercise. This appears to be a problem of definition within the Distribution Networks of which numbers should be public in an NGSE. Going forward, the DN's will need to come to a collective decision as to which numbers to utilise. It is recommended that these should be specific numbers at all times and not be changed during an exercise or actual emergency in all but exceptional circumstances.¹

2.1.3 Recent changes to the E3 procedures such as the issuing of NEC notices directly to supplementary transporters have been effective with clearer communication lines for notification and operational contact. Key to this achievement has been the scheduling of regular E3 alignment meetings between Transporters which has ensured that E3 documents remain aligned and improvements shared.

2.1.4 Communications and procedures in general between the DN Liaison Officer and the four Distribution Network Control Centres (DNCC's) were well executed. Delays did exist in issuing the DNCC forms due to network connectivity issues that temporarily affected e-mail. Concentrating on recovering these small delays led to the compromising of the Bord Gáis Eireann (BGE) process testing. It also highlighted that parts of the BGE process are split between the Distribution Network Liaison and the Shipper Liaison functions within the NEMT. It is recommended that the full end to end BGE process be owned by the DN Liaison team in future.²

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- 2.1.5 Changes introduced since Prelude to maintain the assessment and modelling of storage monitors were much improved. The methodology used to calculate storage monitors is available from <http://www.nationalgrid.com/uk/Gas/Data/storage/>. In addition procedures to liaise with LNG importation terminals also worked well with the OIC Supply team managing contact and information flows with the terminals.
- 2.1.6 Quartz also tested new emergency communication procedures between the NEMT and the Electricity National Control Centre. The protocol used outlined greater detail of the emergency stage options and provided useful assessment of the consequential impacts on the Gas Network.
- 2.1.7 On day one of the exercise escalated progression through the emergency stages was tested in conjunction with DECC Upstream. The Gas Availability Status Reports (GAS) and engagement of the Terminal Group Leaders (TGL) were tested. The process worked well with detailed responses to the initial GAS report and the subsequent situation reports being populated. Teleconferences with TGL were led by DECC and focused on the progression through the emergency stages with participation from the OIC Supply providing NEMT input.
- 2.1.8 There were fewer queries during Quartz relating to the increase in the number of Distribution Network Control Centres. This provides some evidence of the work completed by Distribution Networks and Shippers to adapt procedures to reflect industry changes since Prelude.

2.2 Communication

- 2.2.1 Communication between the teams and parties in Quartz was effective. There were no significant delays in communications from the NEMT to other parties with all teams working well in the exercise. Telephone communications with sites were supplemented with the relevant faxed notification to Shippers and sites. The target for contacting NTS VLDMC customers by telephone of 30 minutes was met in the exercise an improvement since Prelude.
- 2.2.2 On isolated occasions the elements of free play and strategy development during the exercise did cause slight confusion. On day one of the exercise, the inject to contact a proportion, and then all Firm NTS customers, was altered by the Incident Controller following development and approval of the NEC strategy. As a result the Shipper Liaison Officer only contacted the sites identified in the approved strategy. Clearer identification and briefing of “free play” elements and exercise instructions and goals, will eliminate any confusion in future exercises.³

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- 2.2.3 New players to the officer roles were unfamiliar of the feedback required from NEMT Officers to the Incident Controller and NEC. It is recommended that future officer in charge training includes a specific focus on feedback to NEMT meetings for each role.⁴
- 2.2.4 Faxed communication of notices caused few practical issues for Shippers when compared with Prelude. There were no issues in the exercise related to the widespread resending of SC2004 notices as in Prelude. Three shippers did report isolated duplication however these instances were exceptional and were resolved swiftly by the SC2004 team.
- 2.2.5 The NEC declaration and update notices worked well, with detail being provided to the community on the progress of the exercise. The simultaneous escalation of Stage 2 and Stage 3 was unclear to some industry participants as a single notification was issued for declaration of both stages. It is recommended that the E3 procedures and declaration forms are amended to improve the clarity of simultaneous declaration of stages.⁵
- 2.2.6 The provision by Shippers of effective contact details is a key performance indicator in any downstream demand reduction exercise. The results from Quartz show marginal improvement since Prelude. This is analysed in detail in section 3.4 and Table 5. Distribution Networks have proposed that Shippers could use data from exercises of successful and unsuccessful contacts to update their emergency contact records. It is recommended that Shippers and Transporters identify and remedy any obstacles that may prevent implementation of this proposal.⁶
- 2.2.7 The NEC Safety Case specifies ANS as a primary method of notification. There was a notable improvement in performance compared to Prelude, with a considerably lower number of ANS recipients having to be contacted to ensure notices had been read.
- 2.2.8 On Day two of the exercise the Shipper Liaison Team contacted NTS consumers to canvas opinion and information on the emergency procedures, their profiles for demand reduction and restoration, and their preferences for communication from the NEC. For NTS consumers it has been noted that the vast majority would respond to both telephone and fax notification, and would verify instructions by phone in an actual emergency. It is recommended that the E3 procedures for the GNCC be modified to reflect this.⁷

2.3 Supporting systems

- 2.3.1 Generally system performance was greatly improved in Quartz in comparison to Prelude. In particular the Emergency Strategy Program

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(ESP) decision support tool was used throughout the exercise with prepared data sets to generate the next stage of the NGSE. This performed well in the elements of strategy development during the exercise enabling the NEMT to revise strategy and view the effect of different options on the end of day balance.

- 2.3.2 NEC Declaration forms and OIC Supply forms were sent to fax machines using the online Webfax application. There were some issues with the webfax system being incorrectly timestamped by the sending fax servers. It is also noted that the quality of notices sent by the system was inconsistent in that the same notice would vary in readability between similar receiving machines. It is recommended that webfax is not used in the future unless this issue can be rectified.⁸
- 2.3.3 As highlighted in 2.1.4 Lotus Notes access to contact details were affected for a short time during day one due to an internal local area network issue. However this issue was rectified within an hour, which highlights the need to have swift escalation and prioritisation of IS issues in the event of an actual emergency. It is noted that team members were able to access other sources of contact data during the outage.
- 2.3.4 On day two of the exercise the NEMT devised a medium term plan to restore supplies over the next four days highlighting the strategy actions and milestones they would be progressing. It was noted that tools could be developed to supplement existing within day tools to assist the forming of the strategy.⁹ Similarly DN's reported that developing accurate restoration profile for each network would require modelling. It is recommended that transporters focus on the restoration issues, with the objective of establishing protocols within the emergency documentation to develop and exchange relevant data.¹⁰

3.0 Load Shedding Analysis

3.0.1 Successful demand reduction is a vital element in successfully managing a NGSE. Exercise Quartz was an effective test of demand reduction on both the primary and secondary systems. In this section of the report particular attention has been paid to analysing performance with appropriate comparisons being made with both exercise Prelude and exercise Opus to identify any trends.

3.1 VLDMC Interruption and Firm Load Shedding

3.1.1 Emergency interruption and Firm Load Shedding of VLDMC's is actioned by the GNCC and Distribution Network control centres, for NTS and Distribution Network loads respectively. Each control room contacts the site to instruct load shedding via telephone followed by a fax notification.

3.1.2 The strategy that was developed during Quartz identified 15 NTS firm VLDMC contacts to curtail. The remaining firm sites were contacted on day two of the exercise as part of the consumer questionnaire. It was confirmed that all sites could be contacted within the 30 minute target. As highlighted in 2.2.2 it is important that the boundaries between free play and inject actions are explained to participants.

NTS Emergency Interruption

NTS VLDMCs	
Time to contact All Sites 21 Mins	
Number of VLDMCs	22
Isolate within 1hr	22
Isolate within 1 - 2 hrs	
Isolate within 2 - 3 hrs	
Isolate within 3 - 4 hrs	

Table 1

Distribution Network Emergency Interruption

LDZ VLDMC	
Time to contact All sites 14 mins	
Number of VLDMC's	9
Isolate within 1hr	9
Isolate within 1-2hr	
Isolate within 2-3hr	
Isolate within 3-4hr	

Table 2

NTS Firm Load Shed of VLDMC's

NTS VLDMCs	
Time to contact 15 Sites 23 mins	
Number of VLDMCs	15
Isolate within 1 hr	15
Isolate within 1 - 2 hrs	

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Isolate within 2 - 3 hrs	
Isolate within 3 - 4 hrs	

Table 3

Distribution Network Firm Load Shed of VLDMC's

LDZ VLDMC	
Time to contact All sites	13 mins
Number of VLDMC's	8
Isolate within 1hr	8
Isolate within 1-2hr	
Isolate within 2-3hr	
Isolate within 3-4hr	

Table 4

3.1.3 Performance by the Distribution Network control rooms was timely and efficient with all VLDMC customers contacted within the target of 30 minutes. For NTS VLDMC's this target was also achieved. To heighten realism the NEMT developed a strategy selecting a number of the Firm NTS sites that were contacted. This involved sorting and identifying the sites individually, and so increased the time taken to contact the sites relative to the interruptible VLDMC's that were curtailed. Accuracy of contact details, particularly individuals with the appropriate authority, was much improved in Quartz relative to Prelude.

3.1.4 On day two of Quartz the NTS Shipper Liaison team conducted a telephone questionnaire with NTS consumers to specifically identify their plans for both isolation and restoration, and to understand any concerns or effects demand reduction would have. All the sites contacted were able to discuss their plans and a number have completed the template issued with the briefing pack. It is recommended that non specific information be shared at appropriate industry forum.¹¹

3.2 Emergency Interruption of Non-VLDMC Distribution Network Loads

3.2.1 Non-VLDMC interruptible sites are emergency interrupted by their Shippers. Distribution Network Control rooms contact Shippers and instruct them to emergency interrupt their interruptible portfolio. Shippers provide feedback to the respective Distribution Network control room on the progress of emergency interruption every ½ hour in line with the DN's E3 procedures, until all their sites have been interrupted. The Distribution Network control room collates this data and provides updates to the NEMT on an hourly basis in accordance with the E1 procedure. Further details of the emergency interruption updates provided to the NEMT are supplied in Appendix 1.

3.2.2 Despite the increase in the number of Distribution Network Control Centres in Quartz, Shippers commented that they were clearer about which control rooms to communicate with than in Prelude. It is noted

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however that some shippers were not able to contact all of the interruptible consumers. This would necessitate physical isolation of those sites in an emergency.

3.2.3 Updates on the progress of interruption were regularly communicated to the NEMT by all distribution network control rooms. Each control room provided updates, but performance was mixed against the 60 minute target in E1. Performance and clarity may be improved if target information exchange times are given as part of the process. This would enable the NEMT to establish a clear position at set times. It is advised that the Transporters E3 alignment group examine synchronised information exchange as an option to provide this clarity.¹²

3.3 Firm Load Shedding > 25,000 tpa Consumers

3.3.1 In exercise Quartz Distribution Networks were asked to contact a minimum of 200 sites in each of their networks LDZ's to enable comparison with previous exercises. A number of the networks also took the opportunity to contact a greater number of sites and to undertake a sample of site visits.

3.3.2 For the purposes of the report the results of Firm Load Shedding are examined under the following headings.

- Overall performance
- Large DN Site Performance.

3.4 Overall performance

3.4.1 The Firm Load Shedding results for Quartz, compared to all recent exercises, are shown in the table below. Where sites could be contacted and could stop using gas, calls were classed as "successful". Where sites were contacted but could not turn off gas, they were classed as "could not turn off gas". Where it was not possible to contact sites from the contact details, calls were classed as "contact details incorrect". Full details of the data used in Quartz are attached in Appendix 2. All percentages are expressed in relation to the number of attempted calls.

Firm Load Shedding of Above 25,000 tpa by Exercise.

Contact Type	Moscow 2005		Neptune 2006		Opus 2007		Prelude 2008		Quartz 2009	
	No.	%	No.	%	No.	%	No.	%	No.	%
Successful (could turn off)	582	36.17%	1112	42.74%	1651	47.00%	1558	52.23%	1809	51.29%
Could not turn off	515	32.01%	612	23.52%	657	19.00%	444	14.88%	589	16.70%
Total sites where contact was made	1097	68.18%	1724	66.26%	2308	65.36%	2002	67.11%	2398	67.99%
Contact details incorrect	512	31.82%	878	33.74%	1223	34.64%	981	32.89%	1129	32.01%
Total attempted contacts	1609		2602		3531		2983		3527	

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Table 5

3.4.2 The results in Table 5 demonstrate that more attempts were made to contact consumers, and more consumers confirmed that they could turn off than in previous exercises. The improvement in absolute numbers is welcome.

3.4.3 In terms of percentage performance the improvement is muted. The percentage of incorrect contacts only marginally improving from 32.89% in exercise Prelude to 32.01%. From fig 1 below it can be seen that performance deteriorated for sites who could not turn off when contact was made. The increase from 14.88% to 16.70% in Quartz may relate to the increased number of contacts made in the exercise. This should be assessed closely by DN's as to achieve incremental demand reduction DN's will need to contact more customers with smaller loads in their demand profile.¹³

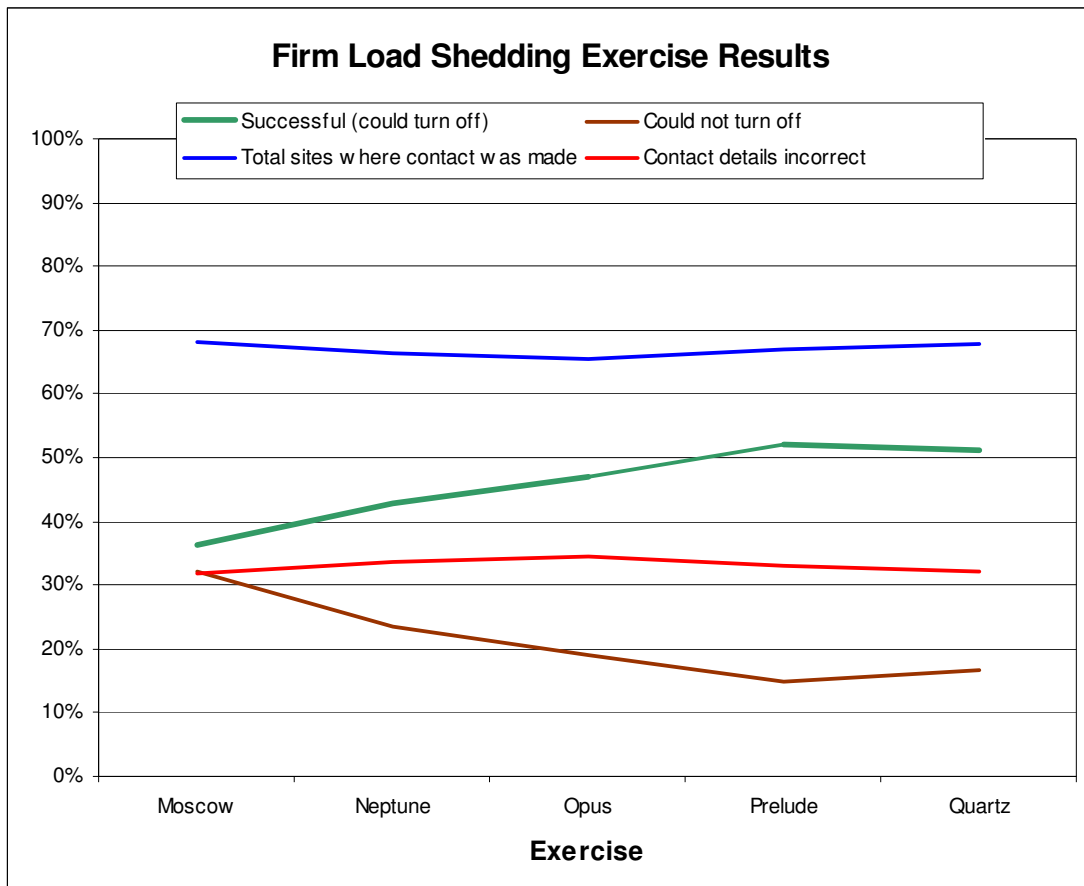


Fig 1

3.4.4 Table 6 below shows the Firm Load Shedding results for each of the LDZ's for exercise Quartz. For comparison Table 7 reproduces the results for exercise Opus, Prelude and Quartz. The quantity of SOQ shed, and successful contacts made improved in absolute terms, with greater quantities for both in Quartz compared with previous exercises.

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Exercise Quartz Firm Load Shedding Results by Local Distribution Zone (LDZ)

LDZ	Calls	Unsuccessful Contacts	Can Turn off	Cannot Turn Off	% Unsuccessful Contacts	% Can Turn Off	% Cannot Turn Off	% of Site SOQ Isolated
East Anglia	250	107	92	51	43%	37%	20%	46%
East Midlands	250	87	122	41	35%	49%	16%	61%
North London	250	94	115	41	38%	46%	16%	58%
North West	250	45	114	91	18%	46%	36%	61%
West Midlands	250	109	131	10	44%	52%	4%	64%
North	200	76	109	15	38%	55%	8%	79%
Yorkshire	200	57	83	60	29%	42%	30%	51%
Scotland	250	74	157	19	30%	63%	8%	70%
South East	226	86	138	2	38%	61%	1%	70%
South	250	98	106	46	39%	42%	18%	55%
South West	397	105	247	45	26%	62%	11%	71%
Wales North	361	105	175	81	29%	48%	22%	70%
Wales South	393	86	220	87	22%	56%	22%	70%
Total	3527	1129	1809	589	32%	51%	17%	63%

Table 6

Comparison of Firm Load Shedding Results by Exercise

LDZ	% Unsuccessful Contacts			% Can Turn Off			% of Site SOQ Isolated		
	Opus	Prelude	Quartz	Opus	Prelude	Quartz	Opus	Prelude	Quartz
East Anglia	22.40%	35.60%	42.80%	45.20%	46.40%	36.80%	37.64%	56.48%	46.18%
East Midlands	30.80%	35.20%	34.80%	56.80%	64.00%	48.80%	70.29%	73.44%	61.20%
North London	45.20%	45.20%	37.60%	44.40%	54.40%	46.00%	54.12%	56.72%	58.38%
North West	22.00%	20.80%	18.00%	52.40%	57.20%	45.60%	50.65%	65.32%	60.97%
West Midlands	24.00%	27.20%	43.60%	52.00%	55.60%	52.40%	57.17%	63.22%	63.97%
North	29.50%	19.00%	38.00%	52.00%	70.50%	54.50%	58.93%	86.01%	78.76%
Yorkshire	38.00%	31.00%	28.50%	46.50%	51.50%	41.50%	52.72%	63.32%	50.58%
Scotland	29.81%	24.78%	29.60%	47.20%	50.87%	62.80%	64.53%	58.73%	70.26%
South East	20.50%	45.60%	38.05%	55.00%	41.20%	61.06%	54.27%	52.76%	69.90%
South	22.00%	43.87%	39.20%	42.50%	38.73%	42.40%	46.38%	59.53%	55.39%
South West	40.60%	25.00%	26.45%	39.85%	52.50%	62.22%	60.78%	61.07%	70.84%
Wales North	57.73%	39.00%	29.09%	42.27%	45.50%	48.48%	48.06%	70.41%	70.26%
Wales South	43.97%	30.50%	21.88%	42.21%	53.00%	55.98%	67.40%	71.66%	69.91%
TOTAL	34.64%	32.89%	32.01%	46.75%	52.23%	51.29%	56.07%	65.10%	63.45%

Table 7

3.4.5 The graph (fig 2) compares the SOQ successfully firm load shed between exercise Opus, Prelude and Quartz. Performance overall in percentage terms has reduced slightly from 65.10 % in Prelude to 63.45% in Quartz. There is some evidence of recessionary effects having an influence on the overall quantity of SOQ, and the SOQ that can turn off. Comparing absolute numbers between Quartz and Prelude there was an 18% increase in the number of attempted contacts, and successful contacts increased by 16 %. This translated into only a 1.5 % increase in the Total SOQ being targeted, and a reduction of SOQ that could turn off of -1 %.

3.4.6 From fig 2 it can be seen that significant improvements were made in Scotland the South East and South West LDZ's response. There were reductions in East Anglia, East Midlands, Yorkshire and North LDZ's. It is worth noting that North LDZ even with the reduction, still maintained

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the best performance of any LDZ. The factors influencing the drops in performance are explained further in the report.

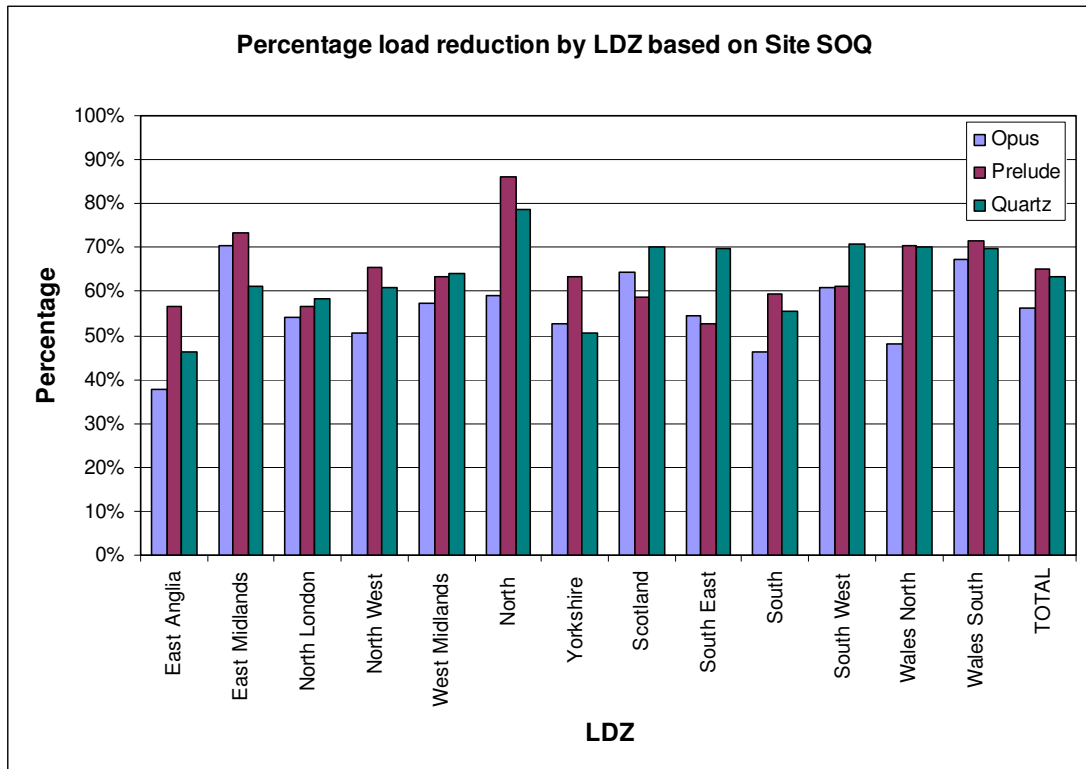


Fig 2

3.4.7 Improvements observed in the “Turn Off” percentage in exercise Prelude have slipped in Exercise Quartz from 52.23% to 51.29% respectively. Fig 3 charts the ‘turn off’ percentage for each LDZ. It is worth noting the work progressed by all Transporters to improve processes by sharing best practice and these efforts will continue. Responses from the Distribution Networks indicate that where performance reduced this was a consequence of using only the official emergency contacts as updated by Shippers. (Appendix 3) Distribution Networks that had better performance utilised operational contacts and “recycling” when the emergency contacts as updated by Shippers through the UNC processes failed. As noted in 2.2.6 contact information would be improved if specific consumer contact details were passed back for update to Shippers. A factor for Northern Gas Networks reduced performance was the prioritisation of arranging site visits over the continued recycling of contacts during exercise Quartz. Their analysis of this approach is detailed in their supporting information. (Appendix 3).

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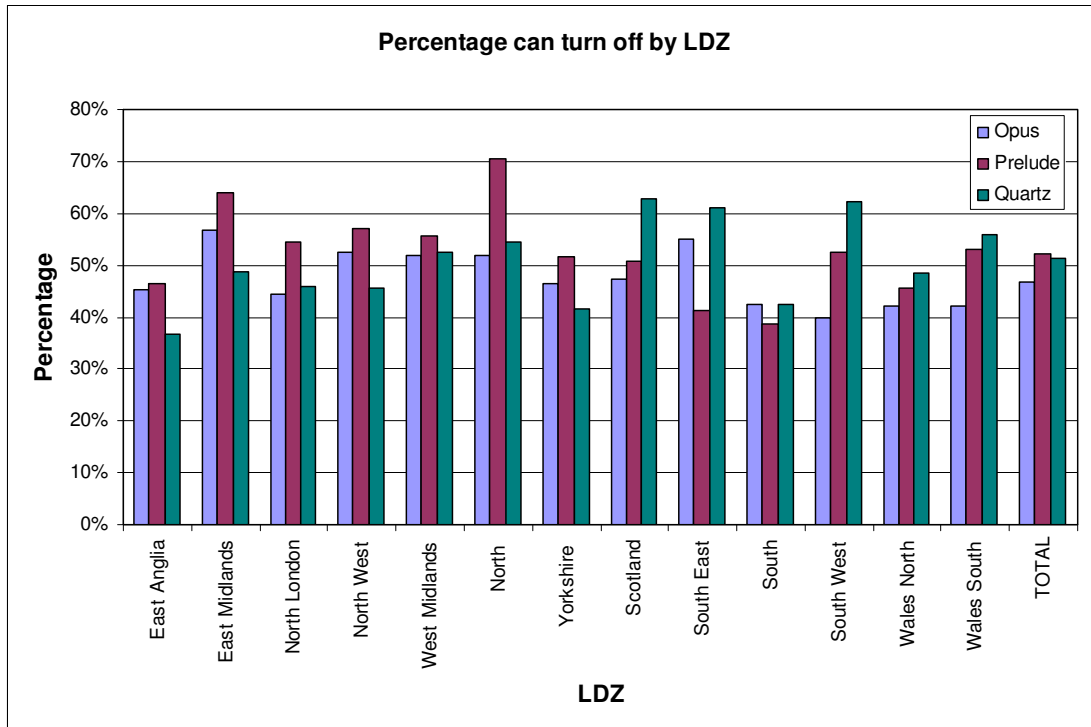


Fig 3

3.4.8 Shippers are responsible for providing emergency contacts via Xoserve to Transporters. Previously, analysis has concentrated on Shippers with 60 or more attempted contacts. For Quartz the analysis has included those shippers that have greater than 10 attempted contacts during the exercise and compared the returns from previous exercises. Going forward this increased transparency will highlight the performance of Shippers who may have a few large significant sites. The analysis for unsuccessful contacts by Shipper is detailed below in fig 4.

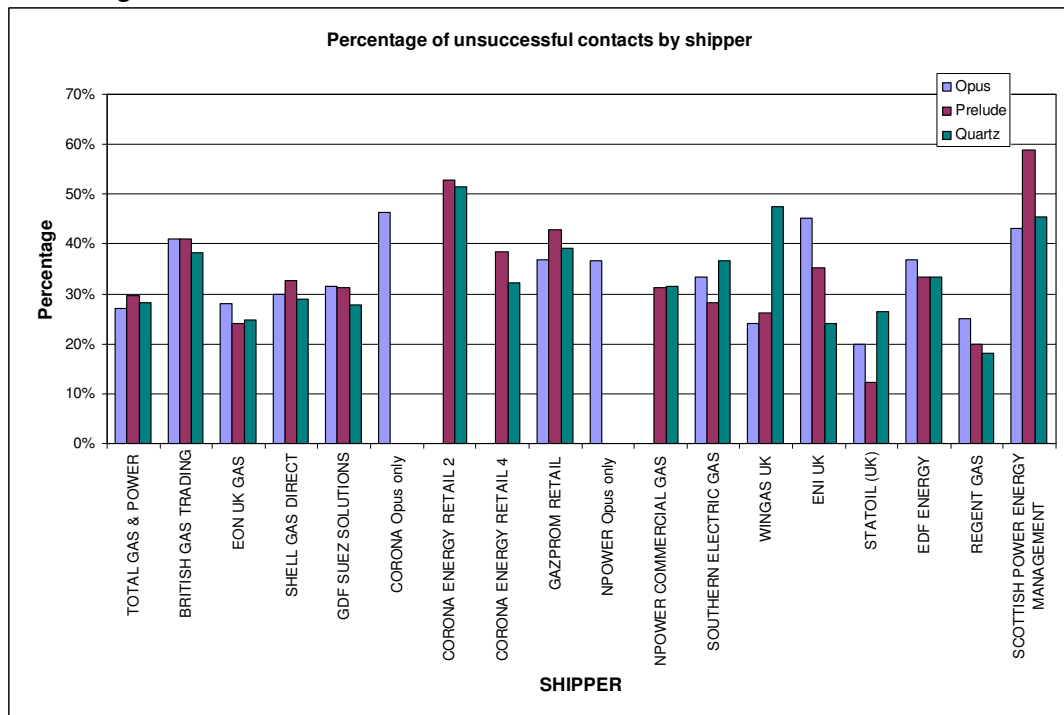


Fig 4

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3.4.9 From fig 4 and the detail of performance in Appendix 4 it is important to note the steady improvement in performance of a number of Shippers with respect to both reduced unsuccessful contacts and increases in successful contacts that are able to turn off gas. It has been commented upon that current measures do not account for size in terms of portfolio or SOQ. Views from Shippers on the appropriate measures to use going forward would be welcomed.

3.4.10 The following chart (fig 5) measures the percentage of sites contacted that could not turn off. As such it is a useful indication of whether the person contacted has the knowledge and authority to comply with the transporters request. Full details of Firm Load Shedding by Shipper are in Appendix 4.

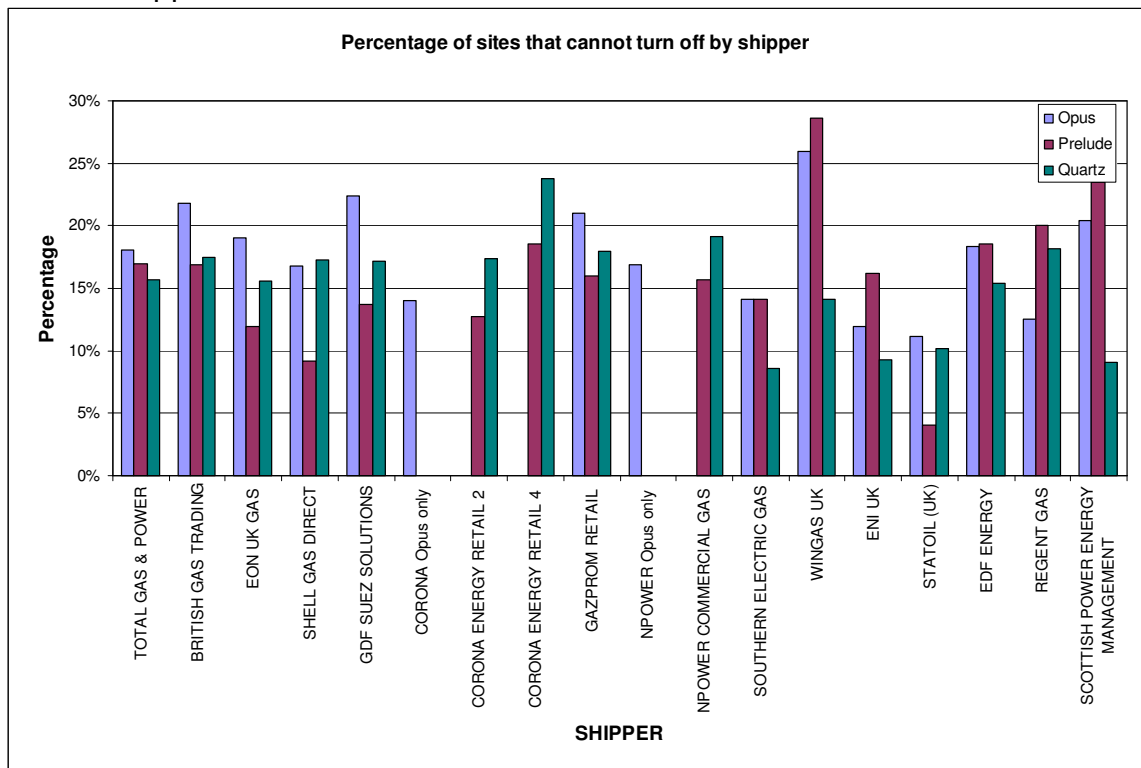


Fig 5

3.5 Large DN Loads.

3.5.1 Large DN Loads are defined by each Distribution Network as the sites that it has a high confidence can be load shed quickly and represent a significant element of the network's demand. In common with previous exercises where these sites were called Special Status Sites, Quartz tested the capability to load shed these sites.

3.5.2 The tables below Table 8 and Table 9 enable comparison of performance between Quartz and Prelude for the Large DN Loads.

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Exercise Quartz Large Distribution Network Loads

LDZ	No of Large DN Loads	No of Large DN Loads shed by phone	% SOQ of Large DN Loads Shed by Phone	No of Large DN Loads visited in exercise	% SOQ of Large DN Loads shed by visit in exercise	Predicted No of Large DN Loads shed in 4 hours	% SOQ of DN Large Loads reduced in 4 Hours	Minutes to deliver maximum load shed of Large DN Loads
East Anglia	7	3	34.67%	4	65.33%	7	65.33%	240
East Midlands	20	16	88.25%	4	11.75%	20	100.00%	300
North London	10	9	91.53%	1	8.47%	10	100.00%	240
North West	17	8	54.20%	5	26.75%	13	80.95%	360
West Midlands	30	22	80.55%	4	12.54%	26	93.08%	360
North	20	20	100.00%	0	0.00%	20	100.00%	55
Yorkshire	9	5	54.60%	4	45.40%	9	100.00%	75
Scotland	12	12	100.00%	0	0.00%	12	100.00%	120
South East	5	5	100.00%	0	0.00%	5	100.00%	120
South	5	5	100.00%	0	0.00%	5	100.00%	120
South West	9	9	100.00%	0	0.00%	9	100.00%	240
Wales North	6	6	100.00%	0	0.00%	6	100.00%	240
Wales South	13	13	100.00%	0	0.00%	13	100.00%	240
TOTAL	163	133	85.67%	22	11.69%	155	95.62%	

Table 8

3.5.3 The most notable features of Quartz relative to Prelude are the shortened timescale for load shedding particularly North and Yorkshire LDZ's. As noted in 3.4.7 these LDZ's focused on prioritising site visits during Quartz. Also worth noting is the increase in the number of sites from 157 in Prelude to 163 in Quartz

Exercise Prelude Large Distribution Network Loads

LDZ	No of Large DN Loads	No of Large DN Loads shed by phone	% SOQ of Large DN Loads Shed by Phone	No of Large DN Loads visited in exercise	% SOQ of Large DN Loads shed by visit in exercise	Predicted No of Large DN Loads shed in 4 hours	% SOQ of DN Large Loads reduced in 4 Hours	Minutes to deliver maximum load shed of Large DN Loads
East Anglia	6	6	100.00%	0	0.00%	6	100.00%	240
East Midlands	19	18	91.00%	1	9.00%	19	100.00%	240
North London	9	4	55.12%	3	44.88%	7	85.45%	360
North West	17	15	91.20%	2	8.80%	17	100.00%	480
West Midlands	30	17	67.17%	3	32.83%	20	79.18%	480
North	19	19	100.00%	0	0.00%	19	100.00%	180
Yorkshire	8	5	73.35%	3	26.65%	8	100.00%	180
Scotland	12	9	67.18%	3	32.82%	12	100.00%	180
South	7	5	74.63%	2	25.37%	7	100.00%	180
South East	5	4	87.57%	1	12.43%	5	100.00%	180
South West	8	7	92.32%	1	7.68%	8	100.00%	180
Wales North	4	4	100.00%	0	0.00%	4	100.00%	90
Wales South	13	12	90.39%	1	9.61%	13	100.00%	150
TOTAL	157	125	83.32%	20	16.68%	145	96.07%	

Table 9

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3.5.4 In common with reduced SOQ highlighted in 3.4.5 there has been a slight decrease for large DN loads SOQ of -1.07 % between Prelude and Quartz. Going forward the proportion of demand reduction achieved through large DN loads is going to increase as DN interruptible sites transfer to firm status. It is important that this transition is managed and tested through the 2010 exercise programme and beyond to ensure the good response rate of Large DN loads is maintained.

4.0 Other Exercise Injects

- 4.0.1 The structure of exercise Quartz enabled elements of free play for the NEC and NEMT in developing, approving and implementing strategy. Exercise injects were used to facilitate a wider variety of options and actions available to the NEMT and also to observe handover between Officers in charge and members of their respective teams.
- 4.0.2 Strategy injects were used throughout the exercise in order to capture the decision making process of the NEMT these proved valuable in identifying alternative options and will be used to inform future exercises.
- 4.0.3 Handovers were observed on day two of quartz between OIC's and their team members. These were efficiently done by each of the OIC's and worked well. It is advised that handover advice be included in NEMT training in order to capture best practice.

5.0 Restoration strategy

- 5.0.1 During day two the Incident Controller was tasked through exercise injects to propose a restoration strategy from stage three back to normal operation. Further realism was introduced during the strategy development process by issuing injects that could influence the strategy. With key inputs from the Network Manager Liaison and OIC Supply a compelling and orderly strategy was developed by the Incident Controller to stabilise the network and manage the transition back to normal operation.
- 5.0.2 In constructing the strategy the Incident Controller considered the expected demand, supply and storage positions for each day and identified key milestones that would have to be achieved. The strategy and options available were reassessed when injects were introduced. It was identified that this reassessment was a key part of the process of implementing an effective restoration strategy. It is recommended that changes to the GNCC E3 be made to ensure that implementation of the restoration strategy is appropriately documented, and monitored.¹⁴
- 5.0.3 Distribution Networks identified modelling requirements when requested to provide restoration profiles. This information would be available in an emergency, but would have to be based on very detailed network analysis of the prevailing and predicted conditions leading to restoration. It is recommended transporters identify the specific flows of information and monitoring that may be needed in addition to normal operations to enable successful implementation of restoration.¹⁵

6.0 Supplementary transporters

6.0.1 As highlighted in 2.1.3 new procedures have been introduced in the E3 procedures to ensure that the NEC declarations of the stage of the NGSE are initially made directly to supplementary transporters. Distribution networks provide the supplementary transporters contact details and cascade subsequent actions to supplementary transporters from the Distribution Networks Control Centres to ensure a co-ordinated approach to the emergency. These procedures were tested in Quartz and worked well.

7.0 Bord Gais Eireann

7.0.1 The BGE process was last successfully tested in 2008 as part of exercise Prelude. As discussed in 2.1.4 the planned BGE process was not executed on Day One of exercise Quartz in line with the exercise injects. BGE did run a parallel exercise to test their procedures to effect load shedding downstream of Moffat interconnector on Day Two of the exercise. The omission of the BGE process on the day is a finding that highlights the importance of adapting to new circumstances in an emergency. Together with the recommendation in 2.1.4 to ensure end to end process ownership in the E3 documentation. Although the BGE processes were successfully tested in 2008 in exercise Prelude, it is recommended testing of the process is scheduled in the 2010 exercise programme.¹⁶

8 Findings and Recommendations

8.0.1 Exercise Quartz tested the emergency arrangements against a scenario of a progressive Gas Deficit Emergency with interactions from both Upstream and Downstream participants. It was a wide ranging and challenging exercise that sought to simulate a real emergency for the NEMT. It has highlighted areas for improvement and these are detailed in the table under section 8.2 . The findings below detail and summarise some of the key issues.

8.1 Findings

8.1.1 Exercise Quartz proved to be an effective test of the emergency procedures and the actions of the NEMT. The responses from all parties, including the active participation of DECC and the Terminal Group Leaders, reflected a high level of engagement with the process.

8.1.2 Quartz was a challenging exercise that tested participants within a realistic simulation. This enabled a greater variety of options and strategies to be developed, made the exercise itself feel 'real' for participants, and examined both Upstream and Downstream

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processes. In doing so there were some points where individuals may of benefited from direct intervention by observers. This will be considered when adopting a simulated approach in future exercises.¹⁷

- 8.1.3 In common with previous exercises provision of contact details remained a significant issue in Quartz. In absolute terms, performance did improve, in that more sites were able to demonstrate they would be able to turn off. However when expressed as a percentage of the overall number of calls made, performance remains at a plateau. It is important that Transporters and Shippers work together to overcome any perceived obstacles that may exist in improving collective performance.
- 8.1.4 Quartz was utilised by some Distribution Networks to examine some processes in greater detail. This is to be encouraged even if performance dips on the established measures for the network concerned. It is important that the NEC exercise programme adapts to reflect the needs of participants whilst maintaining the focus on process, communications, systems and demand reduction performance.
- 8.1.5 Progress was made in Quartz in identifying the information flows and actions required to develop a successful restoration strategy. As highlighted in 5.0.3 it is recommended that as part of the 2010 exercise programme Transporters explore this further and identify the specific actions required and model these specifically in an exercise.

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7.2 Recommendations.

No.	Issue	Action	Owner	Target
1	Clarification of DN contact details to be issued in an emergency	DN networks to clarify the roles that will be outward facing and will be able to receive calls in an emergency.	E3 alignment group	April 2010
2	The BGE process is split between two NEMT officers. Ownership needs to be established with the DN liaison officer	Clarify the GNCC E3 to align full end to end ownership of the BGE process with the DN liaison officer.	EPT	May 2010
3	Precedence of exercise injects or free play during exercises	This should be made explicitly clear in a structured pre-brief where the exercise contains elements of simulation or parallel running of scenarios.	EPT	Future exercise planning
4	Improving effective feedback to the NEMT	Include practical tests of feedback within OIC training.	EPT	July 2010
5	Clarify which stages are being declared when stages are declared simultaneously	Redesign the NEC declaration form to improve the clarity of when stages are declared simultaneously. This is particularly important if an emergency required an immediate declaration of stage 3.	EPT	April 2010
6	No effective feedback loop of information from transporters to Shippers of emergency contact details that have been tested	It is Shippers responsibility to provide emergency contact details. It is important that industry parties work together to identify and overcome any perceived barriers to implementing an effective feedback loop for site contact details.	Shippers / DN's	Ongoing
7	NTS Sites would seek to confirm back to NTS contacts any instruction received to curtail sites	Ensure the impact of this action is understood and adapt the GNCC E3 to ensure that site confirmation calls are managed appropriately with minimum impact on Control Room processes	EPT	August 2010
8	Quality of the output from the webfax system is variable and does not provide a clear audit trail	Investigate what alternative mass faxing systems can be used	EPT	July 2010
9	No formal NEC tools to assist in planning the restoration strategy	Development of simple tools and guidance that will assist the NEMT in developing restoration strategy options and milestones. Output will be a specification of tools	EPT	Aug 2010
10	Identification of DN data relevant to the NEMT in developing a restoration strategy. Reflection of these requirements and data exchange within transporters E3's	Transporters to define data requirements including modelling required for development of restoration strategies. Work to be progressed by transporters through <ul style="list-style-type: none"> • Transporter workshop focussed on restoration (Sep 2010) • Simulated exercise with modelling and data exchange (Oct 2010) 	Transporters / EPT	October 2010

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11	Sharing of non specific Day Two NTS Site Questionnaire information	To be progressed through the appropriate industry forum	EPT	February 2010
12	Improve the quality of data available to the NEMT	E3 alignment group to examine the appropriate use of target times for the exchange of relevant data	E3 Alignment Group	August 2010
13	The impact and response rate through the DN demand profile should be examined to understand where improvements may be made	DN transporters to assess the impact and response rate through their demand profile to ensure accurate profiling of demand reduction. <ul style="list-style-type: none"> • 2010 exercise programme to facilitate testing of assumptions 	Transporters	December 2010
14	Alteration of GNCC E3 to accommodate implementation actions within a restoration strategy	Following the restoration workshop specific changes to the GNCC E3 will be required	EPT	September 2010
15	Identification of appropriate DN modelling required through an emergency including the information required (as inputs) and guide timescales for delivery.	DN's to examine existing modelling tools for both demand reduction and restoration and to provide information requirements, timescales and guidance as to appropriate modelling for demand reduction and isolation	NEC Safety Case Working Group	October 2010
16	Testing of the BGE Process	Ensure testing of the E3 procedures with BGE in the 2010 exercise programme	EPT	November 2010
17	Intervention by observers when exercise is a simulation	In simulation exercises issues may occur where observers may intervene rather than just observe. This should be assessed and briefed by the exercise co-ordinator prior to the exercise.	EPT	As part of exercise planning programme

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Appendix 1

Shipper percentage performance for Emergency Interruption of non VLDMC Distribution Network Loads.

National Grid Gas Distribution

Request for interruption 11:22am	+1.5 hrs	+2 hrs	+2.5 hrs	+3 hrs	+3.5 hrs	+4 hrs
GDF	91.00	91	98.4	98.4	98.4	98.4
BGT/Centrica	45.00	100	100	100	100	100
Total	5.00	5	60	60	60	60
Corona			100	100	100	100
Statoil	35.00	68	68	68	68	68
Shell	70.00	97	99	99	99	100
SSE				100	100	100
EON			3	3	82	82
EDF						
RWE						
Wingas						
Scottish Power				100	100	100
ENI	85.00	99	99	99	99	99
BP						
Npower		50	50	50	100	100
Gazprom Retail			80	80	80	98
Smartest Energy	100	100	100	100	100	100
North Sea Gas				100	100	100
Royal Bank of Scotland				100	100	100
Scottish & Southern					100	100

Scotia Gas Networks

Request for interruption 12:14pm	+30 mins	+2 hrs	+2.5 hrs	+3 hrs	+3.5 hrs	+4 hrs
GDF	68.26	100		100		100
BGT/Centrica	45.00	100		100		100
Total	20.00	20		20		96
Corona	100.00	100		100		100
Statoil		44		69		94
Shell	48.00	100		100		100
SSE	100.00	100		100		100
EON	80.00	80		84		84
EDF	100.00	100		100		100
RWE		91		91		100
Wingas	0.00	46		100		100
Scottish Power	100.00	100		100		100
ENI	85.71	100		100		100
BP	100.00	100		100		100
Gazprom Retail		67		84		100

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Wales and West Utilities

Request for interruption 13:18am	+1 hour	+1.5 hrs	+2 hrs	+2.5 hrs
GDF	100	100	100	100
BGT/Centrica	100	100	100	100
Total	15	15	60	60
Corona		100	100	100
Statoil	22 only	22 & 50	22 & 50	33*
Shell	100	100	100	100
EON		100	100	100
Scottish & Southern	100	100	100	100
RWE	100	100	100	100
Wingas		100	100	100
ENI	100	100	100	100
Gazprom Retail	100	100	100	100
Smartest	100	100	100	100

Northern Gas Networks

Request for interruption 11:19am	+3 hrs	+3.5 hrs	+4 hrs
GDF	100	100	100
BGT/Centrica	100	100	100
Total	51	51	51
Corona	100	100	100
Statoil	67	67	67
Shell	97*	97*	97*
SSE	100	100	100
EON	100	61**	61**
RWE	100	100	100
Wingas	75	0	0
Scottish Power	100	100	100
ENI	66	66	66
BP	~	~	~
Gazprom Retail	87.5	87.5	87.5

National Grid

Appendix 2

LDZ Firm Load Shedding data for Exercise Quartz and Exercise Prelude

Exercise Quartz Firm Load Shedding Results by Local Distribution Zone (LDZ)

LDZ	Calls	Unsuccessful Contacts	Can Turn off	Cannot Turn Off	% Unsuccessful Contacts	% Can Turn Off	% Cannot Turn Off	SOQ Can Turn Off	Total Site SOQ	% of Site SOQ Isolated
East Anglia	250	107	92	51	43%	37%	20%	11,040,403	23,906,187	46%
East Midlands	250	87	122	41	35%	49%	16%	27,308,973	44,625,619	61%
North London	250	94	115	41	38%	46%	16%	15,000,495	25,695,787	58%
North West	250	45	114	91	18%	46%	36%	25,259,095	41,432,069	61%
West Midlands	250	109	131	10	44%	52%	4%	23,828,908	37,252,186	64%
North	200	76	109	15	38%	55%	8%	24,280,626	30,827,678	79%
Yorkshire	200	57	83	60	29%	42%	30%	10,653,272	21,061,306	51%
Scotland	250	74	157	19	30%	63%	8%	16,144,693	22,977,705	70%
South East	226	86	138	2	38%	61%	1%	12,369,313	17,694,886	70%
South	250	98	106	46	39%	42%	18%	12,330,880	22,262,857	55%
South West	397	105	247	45	26%	62%	11%	18,967,651	26,776,246	71%
Wales North	361	105	175	81	29%	48%	22%	8,098,920	11,526,368	70%
Wales South	393	86	220	87	22%	56%	22%	17,093,105	24,450,319	70%
Total	3527	1129	1809	589	32.01%	51.29%	16.70%	222,376,334	350,489,213	63.45%

Exercise Prelude Firm Load Shedding Results by Local Distribution Zone (LDZ)

LDZ	Calls	Unsuccessful Contacts	Can Turn off	Cannot Turn Off	% Unsuccessful Contacts	% Can Turn Off	% Cannot Turn Off	SOQ Can Turn Off	Total Site SOQ	% of Site SOQ Isolated
East Anglia	250	89	116	45	35.60%	46.40%	18.00%	12,506,879	22,142,222	56.48%
East Midlands	250	88	160	2	35.20%	64.00%	0.80%	32,525,507	44,287,912	73.44%
North London	250	113	136	1	45.20%	54.40%	0.40%	12,612,226	22,237,806	56.72%
North West	250	52	143	55	20.80%	57.20%	22.00%	22,413,063	34,313,721	65.32%
West Midlands	250	68	139	43	27.20%	55.60%	17.20%	28,000,470	44,288,691	63.22%
South	253	111	98	44	43.87	38.74	17.39	21,963,737	36,896,900	59.53
South East	250	114	103	33	45.60	41.20	13.20	10,437,046	19,783,831	52.76
Scotland	230	57	117	56	24.78	50.87	24.35	14,490,031	24,674,016	58.73
Wales South	200	61	106	33	30.50%	53.00%	16.50%	13,366,614	18,652,569	71.66%
Wales North	200	78	91	31	39.00%	45.50%	15.50%	6,051,179	8,594,134	70.41%
South West	200	50	105	45	25.00%	52.50%	22.50%	10,874,989	17,807,322	61.07%
North	200	38	141	21	19.00%	70.50%	10.50%	26,037,580	30,273,534	86.01%
Yorkshire	200	62	103	35	31.00%	51.50%	17.50%	13,351,242	21,086,311	63.32%
Total	2983	981	1558	444	32.89%	52.23%	14.88%	224,630,563	345,038,969	65.10%

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Appendix 3 DN Responses

The following returns by National Grid Gas Distribution and Northern Gas Networks are related to the additional actions they completed during and after Quartz in relation to paragraph 3.4.7 of the report.

National Grid Gas Distribution

Firm Load Shedding – Friday 16th October

A Secondary exercise was undertaken on Friday 16th October, this was to try and improve the success of Firm Load Shedding by using National Grid collated and validated data.

Customer Services were able to improve the success of Firm Load Shedding, on Friday 16th October due to a number of changes made, namely:

- Use of National Grid collated data rather than Shipper
- Call handlers were more experienced
- Focus on the larger demand sites

Firm Load Shedding of >25,000 tpa < 2,000,000

During the secondary exercise, 74.2% of contactable customers confirmed ability to switch off their Gas supply. This was an increase of 3% on the actual exercise Quartz.

Area	Site	Could Turn Off		Unable to Cease		Contactable		Non Contactable	
		No.	%	No.	%	No.	%	No.	%
East Anglia	250	102	40.80%	50	20.00%	152	60.80%	98	39.20%
West Midlands	250	136	54.40%	8	3.20%	144	57.60%	106	42.40%
North West	250	125	50.00%	82	32.80%	207	82.80%	43	17.20%
East Midlands	250	133	53.20%	36	14.40%	169	67.60%	81	32.40%
London	250	123	49.20%	39	15.60%	162	64.80%	88	35.20%
Totals	1250	619	49.52%	215	17.20%	834	66.72%	416	33.28%

Results of DM Sites

During the secondary exercise, 100% of contactable customers confirmed ability to switch off their Gas supply. This was an increase of 37.4% on the actual exercise Quartz

Special Sites		Could Turn off		Unable to Cease		Contactable		Non Contactable	
Area	Sites	No.	%	No.	%	No.	%	No.	%
East Anglia	7	7	100.00%	0	0.00%	7	100.00%	0	0.00%
West Mids	29	29	100.00%	0	0.00%	29	100.00%	0	0.00%
North West	17	17	100.00%	0	0.00%	17	100.00%	0	0.00%
East Mids	20	20	100.00%	0	0.00%	20	100.00%	0	0.00%
London	10	10	100.00%	0	0.00%	10	100.00%	0	0.00%
Total	83	83	100.00%	0	0.00%	83	100%	0	0.00%

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The table below shows the comparison of SOQ data for Thursday 15th and Friday 16th October.

The SOQ data provided includes

- 1) Percentage of above AQ 25,000tpa SOQ for the total LDZ
- 2) Percentage of above AQ 25,000tpa SOQ for the sample load
- 3) Percentage of peak day demand

15/10/2009	% of above 25,000tpa SOQ (total LDZ)	% of above 25,000 tpa SOQ (sample data)	% of peak day demand shed
East Anglia	22.6	46.2	7.4
East Midlands	35.7	61.2	10.5
North London	19.9	58.4	7.0
North West	33.4	61.0	10.6
West Midlands	31.3	64.0	8.6
Total	29.1	59.2	8.9

16/10/2009	% of above 25,000tpa SOQ (total LDZ)	% of above 25,000 tpa SOQ (sample data)	% of peak day demand shed
East Anglia	32.0	65.5	8.3
East Midlands	44.1	75.7	11.6
North London	23.6	69.3	7.8
North West	40.4	73.7	11.9
West Midlands	33.8	69.1	9.1
Total	35.0	71.4	9.9

Appendix 3 (continued)

Northern Gas Networks

In order to try and explain the varying results over the past three years exercise I have produced the table below which should be read in conjunction with the following points.

LDZ Load Profile

NE LDZ has a marginally higher demand than NO. However, NO has a larger proportion of large Firm loads, whilst in NE more of these are interruptible. This means that NO will have better Firm Load contact details (the larger sites invariably provide more robust contact information) and it will also be easier to get a better overall Firm Load shedding result. Note: it will be interesting to see how interruption reform will affect this situation – Analysis carried out to date indicates that there will be more parity between the two NGN LDZs.

Exercise Opus

The use of site visits was restricted to the Daily Metered sites only this meant that the increase in numbers was not dramatic over telephone contact. However the extra 7 daily metered site sites shed by site visits in NO had a significant effect on the overall load shed.

Exercise Prelude

This was the first year that steps were taken to improve the telephone contact success rate. This involved the use of a ‘specialist’ load shedding team with operational experience, to make contact with the larger loads and making repeated attempts to make contact (‘Recycling’ the contact sheets). This was a success particularly, again with the larger loads in NO. If telephone contact was not successful by repeated attempts then site visits were made.

Exercise Quartz

For this years Exercise recycling the contact sheets was largely restricted to the larger Daily Metered loads in NO. This resulted in the successful telephone contact success rate falling dramatically. It did; however, mean that that site visits could be arranged more quickly resulting in an increase in overall performance, particularly in NE where the smaller number of Daily Metered sites has made this difficult in the past.

Exercise	LDZ	Telephone Only		Telephone & site visit	
		Successful number of Sites	% load shed of top 200 sites	Successful number of Sites	% load shed of top 200 sites
Opus	NO	104	58.3%	111	79.0%
	NE	93	52.7%	103	64.3%
Prelude	NO	141	86.0%	146	89.3%
	NE	103	63.3%	112	74.8%
Quartz	NO	110	78.8%	140	90.8%
	NE	83	50.6%	136	86.6%

Summary

By utilising lessons learned from previous years, NGN have been able to steadily improve its performance in Load Shedding Exercises as illustrated above.

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Appendix 4 Quartz Firm Load Shedding – Shipper Performance

Shippers	Calls	Unsuccessful Contacts	Can Turn off gas	Cannot Turn off gas	% Unsuccessful Contacts	% Can Turn Off	% Cannot Turn Off	% of Site SOQ Isolated
TOTAL GAS & POWER LIMITED	695	197	389	109	28.35%	55.97%	15.68%	65.52%
BRITISH GAS TRADING LIMITED	447	171	198	78	38.26%	44.30%	17.45%	57.23%
EON UK GAS LTD	418	104	249	65	24.88%	59.57%	15.55%	70.86%
SHELL GAS DIRECT LIMITED	377	109	203	65	28.91%	53.85%	17.24%	62.88%
GDF SUEZ SOLUTIONS LIMITED	373	104	205	64	27.88%	54.96%	17.16%	70.63%
CORONA ENERGY RETAIL 4 LIMITED	328	106	144	78	32.32%	43.90%	23.78%	48.00%
GAZPROM RETAIL LIMITED	250	98	107	45	39.20%	42.80%	18.00%	46.92%
SOUTHERN ELECTRIC GAS LTD	139	51	76	12	36.69%	54.68%	8.63%	54.66%
CORONA ENERGY RETAIL 2 LIMITED	138	71	43	24	51.45%	31.16%	17.39%	26.54%
NPOWER COMMERCIAL GAS LTD	89	28	44	17	31.46%	49.44%	19.10%	43.26%
WINGAS UK LIMITED	78	37	32	11	47.44%	41.03%	14.10%	60.16%
ENI UK LTD	54	13	36	5	24.07%	66.67%	9.26%	81.16%
STATOIL (UK) LTD	49	13	31	5	26.53%	63.27%	10.20%	74.72%
EDF ENERGY PLC	39	13	20	6	33.33%	51.28%	15.38%	49.89%
REGENT GAS	22	4	14	4	18.18%	63.64%	18.18%	60.73%
SCOTTISH POWER ENERGY MANAGEMENT	11	5	5	1	45.45%	45.45%	9.09%	86.40%
CONTRACT NATURAL GAS LIMITED	7	3	3	1	42.86%	42.86%	14.29%	18.52%
EON UK INDUSTRIAL SHIPPING LI	7	2	5	0	28.57%	71.43%	0.00%	81.49%
SSE ENERGY SUPPLY LTD	3	0	2	1	0.00%	66.67%	33.33%	69.40%
BP GAS MARKETING LTD	1	0	1	0	0.00%	100.00%	0.00%	100.00%
BUSINESS ENERGY SOLUTIONS LIM	1	0	1	0	0.00%	100.00%	0.00%	100.00%
NPOWER DIRECT LTD	1	0	1	0	0.00%	100.00%	0.00%	100.00%
Total	3527	1129	1809	591	32.01%	51.29%	16.76%	63.45%

National Grid

Appendix 5.

Analysis of Large DN Loads.

Exercise Quartz Large Distribution Network Loads

LDZ	No of Large DN Loads	Total SOQ of Large DN Loads	No of Large DN Loads shed by phone	SOQ of Large DN Loads shed by phone	No of Large DN Loads visited in exercise	SOQ of Large DN Loads shed by visit in exercise	Predicted No of Large DN Loads shed in 4 hours	% SOQ of DN Large Loads reduced in 4 Hours	Minutes to deliver maximum load shed of Large DN Loads
East Anglia	7	5,540,048	3	1,920,753	4	3,619,295	7	65.33%	240
East Midlands	20	17,446,424	16	15,396,050	4	2,050,374	20	100.00%	300
North London	10	6,837,851	9	6,258,716	1	579,135	10	100.00%	240
North West	17	9,377,039	8	5,082,020	5	2,508,770	13	80.95%	360
West Midlands	30	16,272,436	22	13,106,674	4	2,040,006	26	93.08%	360
North	20	16,112,680	20	16,112,680	0	0	20	100.00%	55
Yorkshire	9	4,642,911	5	2,534,922	4	2,107,989	9	100.00%	75
Scotland	12	8,598,876	12	8,598,876	0	0	12	100.00%	120
South East	5	2,699,641	5	2,699,641	0	0	5	100.00%	120
South	5	5,464,086	5	5,464,086	0	0	5	100.00%	120
South West	9	5,255,217	9	5,255,217	0	0	9	100.00%	240
Wales North	6	4,172,559	6	4,172,559	0	0	6	100.00%	240
Wales South	13	7,932,870	13	7,932,870	0	0	13	100.00%	240
TOTAL	163	110,352,638	133	94,535,064	22	12,905,569	155	95.62%	

Exercise Prelude Large Distribution Network Loads

LDZ	No of Large DN Loads	Total SOQ of Large DN Loads	No of Large DN Loads shed by phone	SOQ of Large DN Loads shed by phone	No of Large DN Loads visited in exercise	SOQ of Large DN Loads shed by visit in exercise	Predicted No of Large DN Loads shed in 4 hours	% SOQ of DN Large Loads reduced in 4 Hours	Minutes to deliver maximum load shed of Large DN Loads
East Anglia	6	4,081,723	6	4,081,723	0	0	6	100.00%	240
East Midlands	19	17,777,629	18	16,177,629	1	1,600,000	19	100.00%	240
North London	9	6,177,995	4	3,405,494	3	2,772,501	7	85.45%	360
North West	17	9,732,846	15	8,876,252	2	856,594	17	100.00%	480
West Midlands	30	16,754,805	17	11,254,804	3	5,500,001	20	79.18%	480
North	19	15,823,818	19	15,823,818	0	0	19	100.00%	180
Yorkshire	8	4,293,532	5	3,149,389	3	1,144,143	8	100.00%	180
Scotland	12	8,427,975	9	5,661,907	3	2,766,068	12	100.00%	180
South	7	9,854,086	5	7,354,086	2	2,500,000	7	100.00%	180
South East	5	2,903,122	4	2,542,162	1	360,960	5	100.00%	180
South West	8	4,557,001	7	4,207,001	1	350,000	8	100.00%	180
Wales North	4	3,257,850	4	3,257,850	0	0	4	100.00%	90
Wales South	13	7,907,011	12	7,146,798	1	760,213	13	100.00%	150
TOTAL	157	111,549,393	125	92,938,913	20	18,610,480	145	96.07%	

National Grid

Appendix 6

The Quartz Briefing Pack – This was issued to industry in advance of Quartz and is reproduced alongside this document .

Appendix 7 - Glossary

ANS	Automatic Notification System
BGE	Bord Gáis Eireann
DECC	Department of Energy and Climate Change
DN	Distribution Network
DNCC	Distribution Network Control Centres (collective term used in this document for all Distribution network control rooms)
E3	Gas Supply Emergency Procedure
ESP	Emergency Strategy Programme
EPT	Emergency Planning Team
FLS	Firm Load Shedding
GAS	Gas Availability Status reports
GNCC	Gas National Control Centre
GS(M)R	Gas Safety (Management) Regulations 1996
HSE	Health and Safety Executive
IT	Information Technology
JRT	Joint Response Team
LDZ	Local Distribution Zone
LGSE	Local Gas Supply Emergency
NEC	Network Emergency Co-ordinator
NEMT	Network Emergency Management Team
NGSE	Network Gas Supply Emergency
NTS	National Transmission System
OCM	On the Day Commodity Market
OIC	Officer in Charge
OPN	Offtake Profile Notice
SC2004	System used for Interruption
SRT	Strategic Response Team
tpa	Therms per annum
TGL	Terminal Group Leaders
UKD	UK Distribution
VLDMC	Very Large Daily Metered Consumer

