GRID CODE REVIEW PANEL

13th September 2001

Data Management During EDT Outages

Paper by National Grid

1. Background

1.1 As part of NETA, National Grid receives a large amount of data by electronic data transfer. National Grid needs to have contingency plans in place for planned and unplanned outages of the data transfer system. The early drafting of the NETA Grid Code, prior to go-live, defined a system of data buffering.

1.2 During the development leading up to go-live it was found that the buffering system would not provide a secure and robust contingency system due to the difficulties in developing such a system in the timescales needed for NETA go-live. The Grid Code was therefore changed to the effect that at the start of the outage the most recent data received and confirmed by National Grid would be used for the duration of the outage.

1.3 This report sets down the reasons for National Grid being unable to develop the software as originally intended. It looks at the practicalities of telephone and fax data transfer and discusses alternative options. It is in response to Ofgem's March 2001 conclusions paper, which proposed that:

> '….NGC should (in due course, after Go-Live) provide a report to the Grid Code Review Panel setting down the detailed reasons for their inability to develop software as originally intended and their concerns on how, if the original proposals had been adopted, to manage a planned outage that became an unplanned outage. Recognising the impracticalities associated with requiring NGC to process large quantities of changes notified by fax or telephone in such circumstances, this should also include a description of the alternative options available for making changes that would better meet the original requirements, together with an analysis of the costs and issues associated with these options. This matter may then be considered as appropriate by the Grid Code Review Panel in due course'..

2. Data Buffering

2.1 The concept of data buffering was intended to minimise the impact of National Grid main NETA systems outages on participants' ability to submit EDT files. It was envisaged that if a form of data buffering were to be introduced, data transfer files from the EDT Trading Points would be held at a National Grid interface during the duration of any main systems outage until communication was re-established. At that time all data would have been processed with retrospective effect.

2.2 The software development for a server to accommodate the buffering would take approximately 6 man months to develop at a cost of £60k-£100k. The main change needed for this system to work as envisaged above is in the way that EDT files are received. At present participants connect to the main NETA server to transmit data. For data buffering, a specialist EDT server would have

to be set up to receive the data. Software, to forward the data on during normal use or buffer during an outage, would have to be developed.

2.3 Data Buffering could be seen as a convenient solution for participants under short outage durations of much less than Gate Closure timescales. However, under outages that encroach on or exceed 3 hours, data would be entered into a buffer that the National Grid Control Room could not access to control the Power System. Control staff would continue to use the pre outage data that had been successfully received earlier. For short duration outages, the impact on the control room may be minimal as the buffered data could still be analysed and acted upon after outage completion. However for longer outages, and certainly for those exceeding Gate Closure timescales, this could potentially lead to inefficient operation of the Balancing Mechanism as decisions would have to be made on the basis of data (including prices) which subsequently could well change. This issue would of course be exacerbated with any move to a shorter Gate Closure.

2.4 One of the drawbacks of a simple buffering mechanism is that it would possess no data validation facility. Therefore, even if data was stored and retrospectively entered on completion of the main systems outage, there is a risk that that data would be invalidated, with no ability to resend. Costs would increase if the data validation rules were duplicated from the NETA main systems to this EDT buffer server.

2.5 If the data buffering system were to fail part way through the main systems outage, National Grid would hold no valid data, as they would be unable to access any data buffered from the beginning of the outage. Additional contingency arrangements would therefore need to be put in place to accommodate this scenario. In addition, even if there was a fully operational buffering system, the potentially large amount of data involved and the effect of seeking retrospectively to apply that data could cause serious problems in practice, leading to an increased risk of post event data substitutions and disputes.

2.6 Therefore, whilst appearing to be a convenient solution, data buffering will increase participants' uncertainty on how to handle EDT file submission during an outage on the main systems, introduce additional complexity for contingency arrangements, and may leave them at risk to late rejection of invalid data.

3. Telephone and Fax Data Transfer

3.1 If it were to be provided for data to be submitted by telephone and/or fax in the event of an EDT outage, it needs to borne in mind that National Grid receives approximately 600,000 items of electronic data per day relating to the Balancing Mechanism. To receive this data using the fax and telephone systems and manually enter it into the electronic data system would require a large increase in the amount of work undertaken during the outage. It is believed that this would be unmanageable. In addition, the NETA systems in use were not designed to accommodate manual data entry and would require modification.

3.2 There are currently over 200 BMUs submitting data to National Grid for each Settlement period. It could take approximately 30 minutes to enter the data for each BMU manually. If this system was used it would result in over 100 man-

hours of extra work per outage. This would inevitably result in the outage being extended in order to keep the system data up to date, compounding the problem further and this is therefore perceived as being unworkable.

4. Current Operation

4.1 At frequent intervals, latest data (and certainly the latest data received and confirmed by National Grid before any outage begins) is entered into the Contingency Logging System (CLOGS) and is used for the duration of the outage. If an unplanned outage occurs, or if a planned outage duration needs to be extended then EDT files will not be accepted until the systems become available, meaning that planned and unplanned outages are treated in exactly the same way.

4.2 This, in effect, means that prior to an outage, gate closure is extended by the duration of the outage. For example, suppose National Grid plan a one-hour outage to take place at 13:00 hrs. In effect, just prior to 13:00 hrs is the last time that a participant would be able to submit data for not just the normal 16:30 hrs gate but also for the 17:00 hrs and 17:30 hrs gates.

4.3 Note, however, that it is still possible for parties to notify changes to values of Maximum Export Limit, Maximum Import Limit and Dynamic Data during the outage by EDL or by telephone.

4.4 However, without buffering of data during planned outages, National Grid is precluding participants from modifying their PN and therefore effectively precluding trading opportunities for the duration of the outage.

4.5 National Grid tries to keep the length of outage to a minimum. Most planned outage since NETA go-live have been under one hour duration and around two thirds of unplanned outages have lasted less than thirty minutes. However, the Grid Code does cater for up to two hours of outage if necessary.

4.6 A major feasibility study is underway within National Grid to look at the architecture of the NETA systems, one of the key factors being to reduce the impact of outages. Any changes to systems as a result of this feasibility study will not be delivered for at least 18 months. There is an ongoing assessment into how each outage is handled, looking into ways of reducing their duration and impact.

5. Alternative Option - Dual Systems

5.1 This option would involve duplicate production servers running in parallel. They would both simultaneously be active in on-line mode, with both machines receiving copies of all EDT files. The system could changeover between machines without interruptions to participants beyond the length of time needed to transfer their logons from one machine to the other. It also has the benefit that all the data seen by the control room is current and therefore the Control Engineers could manage the Balancing Mechanism effectively.

5.2 This option would lead to the shortest planned outages possible by National Grid, a matter of a few minutes. This option involves very little in operational change, but it would incur high set up costs as it would involve duplicating the

entire NETA control system at costs in the region of £5-10 million, and a delivery of 18-24 months.

5.3 As with data buffering, the way that EDT data is received would have to be changed. Two specialist EDT servers would have to be set up to receive, validate and forward the data to the two production servers. Two EDT servers would have to be used, as if only one were used then it would leave the system reliant on a single EDT server which is just as likely to suffer outages as the main NETA server. Again this software would have to be developed and tested at a cost similar to that of Data Buffering.

6. Conclusions

6.1 The system that National Grid currently utilises has the advantage of treating planned and unplanned outages of the main systems in the same manner, removing uncertainty for participants on how to deal with EDT submissions under different NETA control system failure scenarios.

6.2 Data buffering in itself does not provide a secure and robust contingency arrangement as it provides no backup for unplanned outages of the buffering system. The benefits of a buffering system are also eroded with a move to shorter gate closure timescales.

6.3 The alternative option of duplicate production servers would effectively reduce outage time to zero allowing market participants to continue trading. This option is currently being considered as part of a longer term review of NETA system architecture, but if implemented would not be available for at least 18 months.

7. Recommendations

7.1 The Grid Code Review Panel is invited to:

- DISCUSS the points brought out in this paper
- NOTE the conclusions as set down in this report.

The National Grid Company plc
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