# Appendix L United Utilities

## 12.1 Summary

John Rimell and Sergio Gonzales audited United Utilities (UU) between 15 and 19 July 2002.

Following some concerns about the reliability of the previous HV connectivity model, expressed by Ofgem's consultants at the time of the interim review in October 2001, and subsequent discussions with Ofgem, UU has introduced a new methodology, and it was apparent that the customer measurement systems now employed by UU are inherently accurate.

The audit of HV incidents indicated that the main variances between reported and actual customer numbers were due to use of the previous connectivity model for the period under audit, although over and under reported numbers largely balanced out to leave a small overall variance. Whilst time stamping is automatic for all telecontrol operations, there was evidence of reporting error when customer call times are required to establish the incident start time. This was confirmed during the audit with second or subsequent calls often being used rather than the first (note that this only related to incidents reported prior to implementation of the IIP reporting framework for HV incidents). Further potential for transcription error exists when incidents are transferred between Management Centres, for example, when an incident first thought to be on the LV system, but later recognised to be on the HV system, is transferred from staff at Preston to the Network Management Centre at Manchester. During one incident audited this was found to have resulted in a mis-recording of times.

The audit of LV incidents highlighted that skilled use of the LV Connectivity Model would accurately measure affected customers. Where large variances in reported numbers occurred these were overwhelmingly caused by the connectivity model not having been in place at the time of the incident. As with the HV incidents, accurately recording the start time was seen to be problematic, particularly where the first customer call did not indicate that supply had been interrupted. Auditing customer numbers for incidents affecting only part of an LV feeder proved difficult as office-based staff rely on the information provided by the field operative. For the purpose of the audit, correct transferral of the information from the field into the NaFIRs report is considered to imply accurate reporting.

A contentious issue identified during the audit concerned interpretation of the RIGs when customers agreed to delays in restoration of supplies, or indeed refused permission for access required to affect restoration. UU's practice in such situations is to "stop the clock" for the agreed or enforced period of inactivity, thereby reducing reported CML. Although the impact of this on overall reporting accuracy is very low (approximately 0.01%), nevertheless a consistent interpretation is required from Ofgem on this issue.

UU carried out a Group Corporate audit of last year's reported figures, and in addition commissioned an independent audit. It is not clear whether these identified variances on the scale of those found for LV incidents at this visit. Such a comparison would help UU to validate the effectiveness of its audit process.

UU has set corporate objectives consistent with the direction being set by Ofgem, in the framework of a business-case. This has led to the introduction of pragmatic and workable systems and processes which, if used effectively, should achieve required levels of reporting accuracy.

### 12.2 Introduction

Information reporting under the IIP falls within the responsibility of the Network Management Division, which reports to the Asset O&M Directorate of UU Service Delivery. The Network Management Division comprises the Distribution System Management Centre, the Network Restoration Centre and the Customer Service Department.

The Network Management Division, which manages the day-to-day operation of the distribution system, is organised centrally but is located across 3 locations. The Distribution System Management Centre is based in Manchester and is responsible for the following HV System issues: safety management, fault management, fault reporting and planned interruption reporting. It manages the single HV Control Centre at Manchester, which carries out real-time management of the HV, EHV and 132kV networks. The Network Restoration Centre is in Preston and is responsible for LV system fault management, LV fault reporting and LV planned interruption reporting. The Customer Service Department is located at Preston and Bolton and provides the primary interface with customers.

UU uses a Control Room Management System (CRMS) as the centre of its high voltage fault and incident management process. CRMS contains fault inference software, which interrogates the current system configuration to help operators identify single incidents from diverse inputs. CRMS also holds the HV connectivity model described later. The key data inputs to CRMS are derived from SCADA, PODs (Power Outage Detectors), CIFMS (described below) and field staff.

UU uses a Customer Information and Fault Management System (CIFMS) as the centre of its LV fault management process; approximately 70,000 jobs are managed per annum (including non-IIP reported incidents such as meter faults). Current arrangements are that fault management and resource dispatch are handled from Preston daily between 0700 and 2330 and from the Bolton Call Centre at other times. CIFMS can be accessed from Preston, Bolton and Manchester and any other UU office. The LV fault management team comprises 3 elements:

- LV Fault Controllers – Prioritise jobs, monitor restoration, establish restoration strategies and monitor restoration
- LV Fault Dispatch – Dispatch resources, chase updates of estimated arrival and restoration times from field staff and input field information into FIGS (described later) and PC-NaFIRS
- FIGS input (integral to both of the above elements) – Counts the number of customers affected and submits information to PC-NaFIRS.

Call centre staff enter details of individual ‘no supply’ calls directly onto CIFMS, thus date-stamping all no-supply calls received at the call centre. This “front-end” is also the part of the system from which call-takers can access the latest information on the progress of an incident, thus enabling them to update callers as necessary. Incidents that appear to only affect single customers are dispatched directly to a field-based service electrician. The service electrician is informed of the incident time and is targeted to attend within ¾ hour. He/she will report back to the call centre if the incoming service cable is found to be dead (or any follow-up work is required). In the event of a dead incoming service cable the job is transferred to the Mains Fault Screen on CIFMS, for further action. Some jobs are transferred from the Service Screen to the Mains Screen without the need to dispatch a service electrician, e.g. in the event of receiving further customer calls.

This report describes the audit of the UU distribution licence area undertaken between 15 and 19 July 2002. Days 1, 2 and 3 (morning) were spent at the Distribution System Management Centre in

Manchester. The remainder of the week was spent at the Network Restoration Centre in Preston.

### 12.3 Audit Process

This section defines the step-by-step progress of the audit.

#### 12.3.1 Resources

The visiting auditors were:

- John Rimell of ERA Technology
- Sergio Gonzales of Mott MacDonald.

The UU audit team members were:

- Mike Kay
- Steve Cox
- Mark Williamson
- Mark Preece
- Sue Stelfox

A number of other UU personnel were available during the course of the week. UU provided a very high level of resources to support the audit.

#### 12.3.2 Induction

UU provided the visiting auditors with a thorough induction to the company systems at its Manchester office. With the information presented both prior to the visit and during the induction it was possible to complete a large proportion of the audit questionnaires.

The induction began with an overview of UU Systems and Processes and a tour of the key systems used to create incident reports, comprising:

- capturing ‘no supply’ calls with CIFMS
- creating an incident and dispatching field operatives (CIFMS)
- assessing customers affected by LV incidents (FIGS)
- assessing customers affected by HV, EHV AND 132kV incidents (CRMS)
- preparing NaFIRs reports to record incident details in compliance with RIGs.

All of the above were demonstrated to the visiting auditors.

The visiting auditors were briefed on the new HV connectivity model, which is a new part of CRMS, introduced since the interim review in 2001. The connectivity model references all Primary Traded MPANs to a specific distribution transformer by matching their geographical position to the nearest transformer, using Royal Mail’s PAFS system. UU commissioned a statistical expert from UMIST to undertake an independent assessment of the accuracy of its HV connectivity model. The findings showed that whilst customers could easily be allocated to a wrong (but adjacent) transformer (i.e. inaccurate at the micro level) accuracy levels very quickly converged to 100%, based on asymptotic normality, when the affected customers from further incidents were assessed (i.e. accurate at the macro level). Whilst the visiting auditors accepted the general principle of this argument, it was not possible during the visit to verify absolutely UU's claim that the statistical accuracy level of the customer allocation in CRMS is 100% at the macro level.

Next, the visiting auditors were briefed on the LV customer connectivity model, which is an integral part of its Fault Information Gathering System (FIGS) and aims to accurately model all traded MPANs to specific LV feeders. FIGS uses MapInfo software to populate available map backgrounds with geographically placed MPANs. Macros enable users to draw polygons around feeders or part-feeders affected by incidents and the system thereby counts affected customers.

UU has carried out a reconciliation between customer numbers identified from its HV model (CRMS) and those identified from its LV model (FIGS), and found that correlation occurred after 250 instances. This study has confirmed UU's view that the HV model is accurate at the macro level or, in other words, the "swings and roundabouts" effect of misallocated customers quickly balanced out to provide accurate numbers.

The induction day also included a presentation on the process for capturing new customers as MPANs and for handling disconnections, changes in customer details and re-referencing of customers using the various UU systems.

UU has been pro-active in its approach to IIP and has established a number of controls to ensure that all IIP information is recognised and correctly reported. To support these controls a programme of internal audits has been undertaken during the course of the year. Details of the controls and audits were presented to the visiting auditors during the induction.

### 12.3.3 Questionnaires

A set of questionnaires was used to record the progress of the company since the interim review. The four questionnaires covered the following areas:

- MPANs: checking the company's progress in correctly counting MPANs
- Connectivity model: checking the company's progress in accurately locating MPANs on its network
- RIG definitions: checking the company's interpretation of the Ofgem guidelines
- Template: checking the company's routines for providing Ofgem with the information it requires.

The MPAN and connectivity model questionnaires support Stage 1 of the Audit Framework. The questionnaire used to determine how the company has interpreted the RIG's definitions supports both Stage 1 and Stage 3 of the Audit Framework.

The template questionnaire is designed to check that the company has interrogated its incident data correctly and summated the requisite information before populating the template used to report to Ofgem. The Template questionnaire thus stands apart from the Audit framework.

Much of the detail in the questionnaires was completed by UU prior to the visit; the content was discussed fully and either accepted or altered by agreement. This very much facilitated the process, allowing the available time to be used more effectively to probe the presented detail. The audit of HV and LV incidents involved both visiting auditors working together with members of the UU team to agree the sequence of events for each incident, and their effect on the network and its connected customers.

## 12.4 Accuracy of Measurement Systems and Reporting Process-

### 12.4.1 Stage 1 of the Audit Framework - Accuracy of the Measurement Systems

#### (i) MPANs

During the audit of the MPAN methodology, the opportunity was taken to witness how the company deals with the request for an MPAN. UU has an MPAN Management System, which is operated on its behalf by the service provider VERTEX. The procedure was shown to be both rigorous and robust with mandatory fields requiring completion before the system would issue a core MPAN. The LV connectivity model relies on an accurate postcode to position MPANs accurately onto the FIGS diagram i.e. against its LV feeder. Incomplete postcodes will lead to the MPAN being positioned at a "postcode centroid" on FIGS and therefore possibly not being counted for an LV incident. The HV model would not be adversely affected, since an MPAN would be allocated to its nearest distribution transformer. This would be equally as accurate as for MPANs with complete postcodes.

UU has identified all MPANs by interrogating the metering codes associated with its metered service connections via the Standard Settlement Configuration.

This work has also identified connections where multiple MPANs exist for an individual customer, enabling the company to eliminate these from its count of the total number of customers (MPANs) connected to its distribution system. The company has therefore identified its primary MPANs by this means. The status of the MPAN is held in the company's MPRS system.

The national MPRS system is subject to three separate annual audits, two of which are external to the company. UU places a 99.99% level of accuracy upon the count of customers by Primary Traded MPANs. The small level of estimated error arises from multiple feeder sites where it has proved impossible to distinguish between primary and secondary MPANs that have common meter time switch codes (MTC). There are approximately 50 such sites.

Ofgem has formally approved the method that UU uses to identify its customers by Primary Traded MPANs, including updating of the count. No deviations from this approved method were found during the audit visit.

Random tests were conducted on the company's MPAN database where premises have been connected to the company's distribution system within the year under review. The findings from these tests caused some concern, since UU was unable to demonstrate that MPANs existed for two of the properties. UU was unable to explain the reason for this during the audit. However, subsequent investigations have revealed that one of these properties had been present on the connectivity model but was misplaced as it had only partial postcode details, whilst the other was not present (therefore was part of the identified unplaced MPANs). We are satisfied that UU's estimate of 99.99% for the accuracy of its MPAN count is reasonable.

The opportunity was taken to witness the handling of an MPAN request in real time. This reinforced the view that the company is following the procedure that has been agreed with Ofgem.

### (ii) Connectivity Model

UU has two separate connectivity models for its LV and HV systems. The principles on which each model works have been described earlier (see Section L.3.2). In summary, The LV model (FIGS) positions MPANS onto network diagrams through postcode details and PAFS; staff capture affected customer numbers by drawing a polygon around affected parts of the network, using MapInfo software. The HV model relates MPANS to the geographically nearest distribution transformer, again through postcode details and PAFS. CRMS automatically counts these as affected customers for actual running arrangements. There is no linkage between the 2 models.

UU receives monthly updates of newly traded and newly disconnected MPANs, their addresses and postcodes. Although data clean-up on FIGS has continued since the interim review, UU's future intentions as to whether or not to correct MPAN details, and if so how frequently, has not yet been decided. This will depend on a business-case study that will take into account the levels of inaccuracy caused by poor address details. For the HV model, a monthly update is undertaken to ensure that all MPANs are allocated somewhere on the model

UU estimates that the accuracy of its LV connectivity model is currently of the order of 97.2%. It has estimated that 94.7% of customers are placed within 1 metre of the actual property and that 5.3% are placed on a postcode centroid, due to only having partial postal details. Assuming that 50% of the latter are correctly assigned to an incident affected LV feeder by staff, the estimated figure of 97.2% has been derived. UU estimates that this figure will rise to 98.15% as its programme of data cleansing continues.

UU has identified 2 sources of reporting inaccuracy at LV:

- operator skill in capturing all relevant MPANs when drawing polygons (UU concludes that a normal distribution of such errors tends towards a 0% annual error)
- inability to assign a customer to its feeder e.g. where there are multiple feeders – an error rate of 1.2%

Overall LV reporting accuracy is thus estimated by UU to be 0.972 x 0.988 = 96.03%.

UU estimates that the accuracy of its HV connectivity model is currently of the order of 99.5%. The error rate of 0.5% is due to the possibility of commissioned substations not being represented on CRMS, although regular checks are performed to ensure that all substations within the model are correctly connected within the overall connectivity model. The reporting accuracy at HV has been estimated at 98.1%, giving an overall HV reporting accuracy estimated by UU to be 97.52%.

In order to determine the combined accuracy of its measurement systems, UU has used the ratio of HV CI (85.9%) to LV CI (14.1%) for the audit period. Combined reporting accuracy is therefore estimated by UU to be 0.9752 x 0.859 + 0.9603 x 0.141 = 97.31%. Using the ratio of CML instead produces a combined accuracy level of 97.16%.

The results of the incident audit are presented in Table L-1 and support UU's estimate of HV reporting accuracy, however LV reporting accuracy was found to be lower than UU's estimate.

### (iii) Conclusions

No deviations from UU's method of identifying customers by primary traded MPAN, as approved by Ofgem, were found during the audit visit.

No major inconsistencies have been found in the auditing of UU's MPAN processes. UU was unable to demonstrate that MPANs existed for two of the four properties randomly selected for review, however subsequent investigation resolved this issue to our satisfaction and it can therefore be concluded that the company's estimation of 99.99% for the accuracy of its MPAN count is reasonable.

No inconsistencies were found during the audit of the HV connectivity model. Audit of the LV connectivity model found minor discrepancies but we consider UU's estimate of 97.2% accuracy to be reasonable.

## 12.4.2 Stage 3 of the Audit Framework - Accuracy of the Reporting Process

### (i) Audit of HV Incidents

At the beginning of Day 2 of the audit, the visiting auditors and two of the UU audit members began auditing the HV incident reports. UU had printed out the switching logs and incident logs for each incident to check the customer numbers and times reported on the NaFIRs incident report and check for manual transcription errors. An objective of the audit was to replicate the incident on the network and check the number of customers affected against those reported and explore where variations occurred. It was possible to replicate the incident live on the system, and this ensured that the potential for replication errors were greatly reduced

Each HV incident was replicated in turn, the audited customers and incident durations were entered into the Incident Auditing Workbook for comparison with the reported figures. It was not practical to distinguish reporting inaccuracies in customer numbers from genuine changes to customer numbers or running arrangements since the incident, and this should be seen as a possible source of error in the audit itself. Some difficulty was encountered due to the fact that, at the time of the audited incidents, UU did not keep switching programmes beyond 1 year, making the sequence of restoration difficult to replicate in some instances. UU have now begun to retain switching programmes for a period of 25 months.

Both under and over reporting variances were discovered during the audit, but the overall effect was a small under reporting variance for both CI and CML. The sources of variance discovered during the audit generally related to incidents reported before the required date for IIP compliance, and were:

- Historic "planning" customer numbers had been used rather than those derived from the new connectivity model. This led to both over and under reporting of customers affected, and was the biggest source of variation.
- LV incidents that required shutdown at HV had, for one incident, been double counted i.e. at both LV and HV. Guidance is required as to where these should be reported.
- Some mis-recording of the incident start time when incidents are initiated then transferred between Management Centres e.g. when LV incidents are initiated in Preston then identified as HV incidents and subsequently transferred to Manchester.
- Incorrect rounding-down or up of telecontrol timed operations.

During the course of the HV incident audit, the audit team encountered very few incidents that were too complex to resolve, partly due to UU's desire to resolve all possible issues.

The HV incidents were completed by the middle of Day 3.

### (ii) Audit of LV Incidents

There were no prime documents presented – information was often sparse and the team was unable to confirm that field reported times accurately reflected the actual case, or the sequence of events during the incident. The audit was therefore conducted on the basis of the times and information that had been entered onto CIFMS, in some cases having to assume a particular sequence of events. Single premise incidents were generally straightforward, however mains faults sometimes proved difficult to replicate. There was a significant under-reporting of CI and CML (55% and 58% accuracy respectively).

The sources of variance discovered during the audit generally related to incidents reported before the required date for IIP compliance, and were as follows:

- Reported customers affected were those estimated by field staff on-site as advised to staff at Preston, rather than those derived from the connectivity model.
- First customer call times were not always used as incident start times. In some cases the second or subsequent call times were found to have been used.
- The time when an incident was established as a mains fault, following confirmation from site, was often used as the incident start time, rather than the time of the first call.
- "Stopping the clock" when a customer agreed to defer restoration, or refused access to allow restoration led significantly to under-reported CML on the incident(s) on which this occurred. The overall effect of this practice is, however, very low (approximately 0.01%). (Although evidence of this was not found at the HV audit, UU confirmed that the same approach was used)
- Incidents occurring partway along a feeder proved to be a source of incorrect customer numbers as the dispatcher relies on the estimate given by the field operative and in a number of cases the number of customers affected by a fault was under-estimated by the field operative. This was particularly true where the cable was underground.

### (iii) Interpretation and implementation of the definitions and guidance from the RIGs

UU has produced in-house Codes of Practice, which incorporate working applications of RIGs definitions and guidance. Since the interim review, selected staff from the Network Restoration Centre have been trained in the use of FIGS to ensure compliance with IIP requirements, and appropriate field staff have also been briefed on the new requirements. DSMC staff have also been briefed and a process guide issued to control staff to help ensure correct application of IIP rules.

Code of Practice (COP) 601 sets out the requirement for monthly internal audits of HV, LV and Pre-arranged incidents and a Group Corporate audit has been carried out on last year's reported figures. In addition, UU commissioned an independent audit in June of this year, however, it was not established whether these audits revealed a similar scale of variance as that revealed for LV incidents on this visit.

During the visit to the UU Control Room the visitors witnessed the handling of real incidents on the 11kV system. This provided the visitors with the opportunity to witness how the company records and reports interruptions.

UU is now operating in accordance with the RIG requirement that incident start time is that time at which the company first becomes aware of an incident by any means. Prior to this, the second or third call was sometimes used as the start of the incident. This practice was stopped when the HV connectivity model was implemented. In addition, UU now uses both its LV and HV connectivity models to assess affected customer numbers. The LV connectivity model was not available during the period being audited.

During the visit, the company demonstrated the following:

- when a telephone call is received the time is recorded by the call-taker directly into CIFMS
- for tele-controlled networks CRMS automatically date-stamps the time at which the incident occurs.

Once a call has been logged into the CIFMS or CRMS system it cannot easily be lost or erased. Only certain specifically authorised people have access privileges that allow them to amend any database records. Such amendments are very infrequent and always leave an audit trail.

At the higher voltage levels the disciplined environment of the control room ensures that all unplanned incidents are captured in CRMS.

Because all calls to the UU telephony system are logged in CIFMS, information at LV includes items such as cutout fuse operations and problems concerning metering. These items should not be included in the count of LV incidents and the company has therefore developed an in-house screening process to eliminate them from the PC-NaFIRS reporting system.

Pre-arranged incidents have to be notified to customers in advance. All are controlled via a booking process, and there is a strict discipline to ensure that jobs are not allowed to proceed without one, thus ensuring that start and finish times are documented.

UU has processes in place to record “short interruptions”. PODs are used at strategic locations on the network, so as to recognise auto-reclose operations on the 11 kV system. POD times are automatically recorded onto CRMS and fault inference software is used to interpret its part in the sequence of operations. REZAPs are used on the LV system, and a pro-forma is sent to DSMC whenever it is used. There was not an opportunity during the audit to check the quality of information or number of these, however this is not part of the audit scope of work. .

### (iv) Conclusions

The following general conclusions can be drawn from the HV incident auditing:

- Measurement of time is automatic on the telecontrol HV system and semi-automatic for manual switching operations so the chance of error is low. However, transfer of information into NaFIRS requires manual intervention and the possibility of transcription error exists.
- Measurement of customers is also automatic but recognising reinterruptions is manual and could lead to reporting errors in the final CI count. Some form of automation or warning when customers are reinterrupted would help manage this source of inaccuracy.

- There is potential to double count incidents that occur on the LV system, but require intervention on the HV system. Conversely it is possible for them to be missed entirely. A clearer understanding is required e.g. if the faulted component is on the defined LV system then it is reported there only.
- A consistent interpretation is required from Ofgem on the rules for rounding of telecontrol (and indeed other reported) times.

The following general conclusions can be drawn from the LV incident auditing:

- Recording incident start time is a potential source of error, particularly when the customer calls do not advise that their supply has been interrupted. The audit found that where inaccuracies occurred, these were generally under-reporting of CML.
- LV faults occurring at sub-feeder level had the potential for inaccurate reporting of customer numbers as the dispatcher relied on the field operative to estimate the number of premises off-supply. The LV connectivity model introduced now allows the dispatcher to verify the number of customers attached to a particular feeder provided accurate locations are received from site and this reduces the potential for inaccuracy in this area. However, there is no absolute way to verify the actual customers affected by the fault and the dispatcher must rely on the information provided by the field operative. For the purpose of the audit, correct transferral of the information from the field into the NaFIRs report is considered to be accurate reporting.
- There is a significant issue on the rules concerning "clock stopping" of CML where customers agree to defer restoration of supply. This could equally apply to HV incidents. A consistent determination of the rules is required.

The audit team is of the opinion that UU has correctly interpreted the RIG definitions of an incident and that the company has systems and processes in place to ensure that it complies with them.

### 12.5 Overall Impressions

UU has set corporate objectives consistent with the IIP requirements being set by Ofgem. This has led to the introduction of pragmatic and workable systems and processes, which, if used effectively, should achieve the required levels of reporting accuracy. Due to the support of the UU team it was possible to determine the reasons for the significant variances in the number of customers affected by an LV incident as identified during the workbook audit. The variances were proven to be overwhelmingly due to staff not using the connectivity model during most of the period under audit (as it was not then available). This evidence gave us further confidence in the accuracy of the connectivity model itself. However, UU staff expressed the view that using the LV model was very time consuming and has created resourcing issues. Whilst the commitment of UU senior managers to using the system is not in doubt, much care needs to be taken by them to ensure that it is used comprehensively on all occasions, since it has been shown to significantly impact on reporting accuracy.

### 12.6 Conclusions

Table L-1 presents the results of the 2002 audit of the UU licence area in-line with the auditing framework. Under- and over-reporting are indicated in the table. The overall accuracy results have been determined by extrapolating the audit sample variances to estimated variances in the annual total figures reported to Ofgem and then summing the LV and HV estimated variances to give an estimated overall variance, which is then used to determine accuracy against overall reported figures.

**Table L-1**

| Stage | Item | Accuracy |
|---|---|---|
| Stage 1 | MPAN Measurement | 99.99% |
| Stage 1 | LV Connectivity Model | 97.2% |
| Stage 1 | HV Connectivity Model | 99.5% |
| Stage 3 | LV Incident Reporting Accuracy – CI | 55% (under) |
| Stage 3 | LV Incident Reporting Accuracy – CML | 58% (under) |
| Stage 3 | HV Incident Reporting Accuracy – CI | 97% (under) |
| Stage 3 | HV Incident Reporting Accuracy – CML | 98% (under) |
| Stage 3 | Overall Incident Reporting Accuracy - CI | 87% (under) |
| Stage 3 | Overall Incident Reporting Accuracy – CML | 84% (under) |

It is important to note when considering the above audit results that use of the LV connectivity model was introduced at the very end of the reporting year.

## 12.7 Reporting to Ofgem's information Template

UU uses the EA PC-NaFIRS system to record and report incidents on its distribution networks. EA has previously prepared written responses to the visitor's enquiries regarding the routines used to extract the data from the incident reports with which the template is populated. By agreement, therefore, the majority part of the questionnaire was not answered.

For UU the following template data was audited:

- The reported number of customers shown in the template was in accordance with the RIG definition. The total number of customers taken from MPRS and reported to Ofgem was 2,269,503.
- During the visit the method of capturing circuit identification was witnessed in real time as part of the process of dealing with actual incidents.
- A demonstration on PC-NaFIRS was also given and no inconsistencies were identified. The number of HV circuits affected box and the number of rows in the template both equal 841.
- Using the PC-NaFIRS enquiry system, the number of CI and CML reported as a consequence of the incidents on the 132kV system agreed precisely with the entries in the Ofgem template.
- Three HV circuits were chosen at random from those contained in the Ofgem template. Using the PC-NaFIRS enquiry system the number of CI and CML reported as a consequence of the total number of incidents affecting each of these circuits was calculated. These numbers were then compared to those contained in the Ofgem template. In all three cases, the numbers of CI and CML agreed precisely.

From the dipstick tests described above, it can be concluded that UU is accurately reporting incident data to Ofgem via the IIP template.

## 12.8 Recommendations

The following points are identified as areas for further improvement:

- Communication between site and dispatcher is critical to the accuracy of LV incident reporting; the importance of accurate details from field staff should be reinforced and monitored.
- Attention required to getting incident start times correct for LV incidents. This has been improved since the introduction of the new connectivity model.
- Ensure that the LV connectivity model is used on all incidents
- Pending clarification from Ofgem, cease the practice of "clock stopping"
- Retain HV switching programmes for 2 years, in order to provide a more robust audit trail. This has already been put in hand.
- LV incidents that required shutdown at HV had, for one incident, been double counted i.e. at both LV and HV. Guidance is required as to where these should be reported
- Variances discovered were predominantly under-reporting on LV incidents.

## 12.9 Learning Points

The following points were identified as learning points for the audit process:

- Preparation is vital to a smooth audit. Having all incident reports printed out with their associated supporting information allows the audit to progress quickly. At LV, Information was often sparse and the team was unable to confirm that field-reported times accurately reflected the actual case, or the sequence of events during the incident. The audit was therefore conducted on the basis of the times and information that had been entered onto CIFMS, in some cases having to assume a particular sequence of events. The ability to work from a live system speeds the process.
- A consistent interpretation is required from Ofgem on the rules for rounding of telecontrol (and indeed other reported) times.
- Inaccuracies are contained in individual restoration stages. There may therefore be a case for using the number of restoration stages to determine audit sample size.
- There is a significant issue on the rules concerning "clock stopping" of CML where customers agree to defer restoration of supply. This could equally apply to HV incidents. A consistent determination of the rules is required.
- Questionnaires pre-filled by UU allowed more effective use of audit time.
- Seeing is believing: witnessing a process for real is invaluable in demonstrating the accuracy of the systems.