Appendix G South of Scotland (SP Distribution)

7.1 Summary

Tony Wright and Chee K Lee audited the South of Scotland licence area of SP Distribution on 15th to 19th of July 2002.

The audit team agrees with the company's estimate of its MPAN count accuracy of 99.5%.

The company has a connectivity model at HV/LV transformer level where the attachment of customers to the transformer was achieved by a geographic proximity model and improved through shutdown and fault information during the past five years. The present criterion for identifying customers by LV feeder is to disaggregate this number to individual LV feeders by dividing the total number of customers by the number of LV feeders. Previously the number of customers affected by an LV incident was agreed between field and office staff.

The company is currently implementing a new connectivity model to provide accurate customer numbers at LV feeder level. The target completion date of the new connectivity model has slipped since the interim review due to unforeseen difficulties but the strategy presented then to capture data at LV feeder level is unchanged and has been followed. Having witnessed the present progress it is considered the September 2002 completion date for SP Distribution is realistic and achievable providing no further unforeseen difficulties arise.

SP Distribution's present estimate of the accuracy of customers connected to its network is 97.5%. This is based on the MPAN accuracy of 99.5% which is discounted by approximately 2% of customers not currently in Trouble Call and ICOND. It was not possible to verify the accuracy of the company's new connectivity model as it had not been completed at the time of audit.

The audit of LV incidents showed significant variances between reported and audited number of customers interrupted (CIs). A significant part of this was due to changes in the method of counting customers during the reporting period. This variance should be reduced with the implementation of the new connectivity model and completion of all outstanding training programmes. For faults on part of an LV feeder, the dispatcher normally relies on estimates provided by field operatives, which has a potential for inaccurate reporting. Reporting of incident start time also proved to be a source of error. The majority of errors associated with Trouble Call Incident Log entries occur during increased workload on the personnel, for example during bad weather and other difficulties.

The HV incident auditing showed that the variances in customer interruption times were primarily due to errors by the control engineers in transferring the respective incident start and end times from the switching logs to the report.

The audit team is of the opinion that SP Distribution has correctly interpreted the RIGs definitions and that the company is operating in accordance with them. Furthermore, the linkages between the pre and post IIP reporting requirements are consistent and information flowing into Ofgem's reporting template is accurate.

As reported at the interim review, SP Distribution's in-house contractor, SP PowerSystems Ltd., has a highly motivated and enthusiastic team behind the IIP project. The company's commitment to the project is proven by the extensive training programmes employed, the setting up of the Data Capture

Bureau at Glenrothes and internal audit team.

7.2 Introduction

SP Transmission and Distribution is responsible for two separate electricity distribution licences – SP Distribution Ltd. covering South of Scotland and SP Manweb plc. Information reporting under the IIP is under the responsibility of one System Analyst at each of the two PowerSystems Management Centres – Hamilton for the SP Distribution area and Prenton for the SP Manweb area. This report focuses primarily on SP Distribution Ltd.

SP Distribution uses the GE Harris Energy Network Management and Control System (ENMAC) for its EHV, HV and LV network. The Integrated Control Operational Diagram (ICOND) is part of the ENMAC system and contains HV connectivity, customer numbers attached to HV/LV transformers, creation of EHV and HV switching logs as well as EHV and HV control. Trouble Call is the Electronic Fault Management System, again part of the ENMAC system and records customer incident calls, with links to the Customer Directory and LV incident management.

This appendix describes the audit of SP Transmission and Distribution's South of Scotland distribution licence area undertaken from 15th to 19th of July. Days 1 and 5 were spent at the PowerSystems office at St Vincent Crescent, Glasgow. The rest of the week was spent at the PSMC (PowerSystems Management Centre) in Hamilton with Day 4 spent in the Data Capture Bureau at Glenrothes.

7.3 Audit Process

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

7.3.1 Resources

The visiting auditors were:

- Tony Wright of British Power International
- Chee K Lee of Mott MacDonald.

The audit team members were all drawn from their in-house contractor SP PowerSystems:

- Phil Bridgewater
- Barry Judd
- Neil Aitken
- Tom Kane
- Anne Baikie

Other SP PowerSystems personnel who assisted in the audit process included Gilbert Little and dispatchers David & Paul, Graham Johnston, Alistair McNaught, Stewart Knox, Mary McNaught, Stuart Sinclair, Craig Arthur, Joyce Murdoch, George Richardson. In addition, Kenny Craigie and Andy Marshall from ASA Data Services Ltd. (PowerSystems data capture contractor) also assisted us.

7.3.2 Induction

On Day 1, SP PowerSystems provided the visiting auditors with a comprehensive induction to the company's IIP systems in its St Vincent Crescent office in Glasgow.

The visiting auditors emphasised that the aim of the audit was to look for potential sources of inaccuracy – Stage 1 to check accuracy of linkages between company reporting systems and Ofgem's template (measurement) and Stage 3 audit actual incidents for accuracy (incident reporting).

A summary of the induction programme on Day 1:

- Phil Bridgewater gave a brief introduction and objectives of the audit. The proposed audit programme for the visiting auditors for the entire week was reviewed.
- Barry Judd then gave an overview of the IIP system architecture.
- Fiona Muir provided an update of the Call Centre process since the interim review – the IT vendors have been identified and progress is on schedule. This aspect of the RIGs is not part of this audit process.
- Tom Kane gave a review of the improvement to SP Distribution's measurement systems which includes incident creation and RIGs definitions. As Tom was to be away for the rest of the week, the questionnaire on RIGs definitions was discussed and completed at this time.
- Neil Aitken gave an overview of the process involved with Short Interruptions. This aspect of the RIGs is again not part of this audit process.
- A visit to the Dispatch Centre at St Vincent Crescent where the visiting auditors were briefed by Gilbert Little.

Day 2 involved a visit to PowerSystems Management Centre, Hamilton. Ian Malkin gave a brief introduction to the functions of the centre. Ian explained that on weekdays between 08:00 and 16:00, delegated control was provided at several of the distribution centres available. These are West – St Vincent Crescent, Glasgow and Leven St, Motherwell and East – Portobello, Edinburgh. The Dispatch function is similarly delegated at the centres at Glasgow and Edinburgh. Outside this time, control and dispatch work is returned to Hamilton. EHV (33kV) control is held at Hamilton and is not delegated. The dispatchers and distribution centres are to be centralised in September 2002 with delegated control still to be used at the outposts during adverse weather conditions.

Volume of traffic through the control room and dispatchers for 2001 was at 33kV – 426 faults, 11kV – 2993 faults, LV – 9188 faults, 7000 switching programmes and 20000 safety documents issued. A total of 80000 incidents passed to electricians from dispatchers.

7.3.3 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 RIGs 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.

7.4 Accuracy of Measurement Systems and Reporting Process

7.4.1 Stage 1 of the Audit Framework - Accuracy of the Measurement Systems

(i) MPANs

The MPAN questionnaire was completed by Tony Wright with SP PowerSystems's Phil Bridgewater and Barry Judd.

SP Distribution has identified its primary traded MPANs by running the algorithms described in Document IIP-13-001 Issue No. 2.1, on data extracted from the Meter Point Administration System (MPAS). This document received Ofgem approval through letter dated 18 June 2002. Multiple MPANs are identified by having the same Network Property Link (NPL) – this is an SP Distribution generated number that is a unique ID to a single exit point. The IIP data engine removes all duplicate entries against any NPL.

The company is satisfied that scripts and algorithms accurately account for the primary traded MPANs hence is very confident in quoting an accuracy of greater than 99.5%. The 0.5% is basically work in progress and the company estimated that there are 15 – 16000 customers/connections that are connected but not being traded. This figure represents the present identified number of inaccuracies found in the 60% of exit points in Scotland on a pro rata total customer base. The recently created LV Data Capture Bureau at Glenrothes identifies missing or inaccurate placement of MPAN information. These are investigated, remedial action taken and then accurately captured under clean up exercises.

In order to update the MPAN count, the company uses scripts and reports on MPAS/Trouble Call/Unmetered Supplies and a reconciliation spreadsheet to track the updated figures month on month. The data Management Section is part of the MPAN generation process and when the LV connectivity is complete and they will take over data updates from the Bureau. It is proposed that they become the one-stop shops for maintenance updates.

The visiting auditor selected four new domestic and one commercial premise. Tony Wright witnessed and confirmed that the company handled the request and subsequently the issue of primary traded MPANs for the selected premises as detailed in document BUPR-22-014 issue No.3.

The procedure the company uses to authorise the connection of the new meter points to the live network and the MPANs becoming traded is outlined in document BUPR-22-014 issue No. 3 – Sub section "Connection and Site Responsibility Agreement System" (CSRAS). Although the precise step by step information flow was not audited, all five properties were identified as energised and were held in the Bureau awaiting attachment to the LV connectivity model but were attached to the Trouble

Call system for customer number counts in the RIGs reporting process.

(ii) Connectivity Model

The connectivity questionnaire was completed by Tony Wright with SP PowerSystems's Phil Bridgewater, Barry Judd and Graham Johnston during a visit to the LV Data Capture Bureau at Glenrothes.

SP Distribution has a connectivity model at transformer level. This is held in the Faults Management system called Trouble Call. The Customer figures held against each transformer in Trouble Call are passed to ICOND (Integrated Control & Operation Network Diagram). The attachment of customers to the HV/LV transformer was achieved by a geographic proximity model and the present criteria for identifying customer numbers by LV feeder is to disaggregate this number to individual LV feeders by dividing the total number of customers by the number of LV feeders.

Document IIP – 13 – 003, Issue No. 1.3 details the methods by which SP Distribution intend, and indeed are, linking customers to LV feeders and aggregating to HV/LV substations. This work is being undertaken at a 36 seat Data Capture Bureau built and manned with 50 full time equivalent staff at Glenrothes. The staff is employed by ASA Data Services and their training programme for new recruits was examined and the accuracy audit procedure witnessed. The work involves accurately establishing customer to LV feeder associations. As well as the two stage audit carried out by ASA Data Services, the company carries out its own QA and of the 300 networks checked, the error rate to customer connected was less than 0.001%. This process was witnessed by the visiting auditor and proved to work correctly when, at the first stage, a team leader in the Bureau found customers attached to the wrong LV feeder.

This programme was intended to be completed by April 2002 but unforeseeable difficulties since the interim review have caused the target completion date to be extended to September 2002 for SP Distribution. Working practice changes have been introduced to achieve the optimum capture rate consistent with accuracy and revised target dates of March 2003 have been set for the whole company for its two distribution licences.

The current strategy of physical association from existing records by the capture bureau has almost eliminated proximity matching in the networks dealt with to date. It is anticipated that less than 5% of customers will be proximity matched. The initial data capture will provide a step change in accuracy. The long-term trend will be an accuracy and confidence level growth as planned and unplanned incidents arise and the data held (feeder and/or phase details) is confirmed.

Five LV feeders in the new connectivity model were selected at random with the customer numbers connected to each feeder confirmed against existing mains records. The results are shown in Table G-1 below.

Table G-1

Substation	LV Feeder Reference	Mains Record	New LV Connectivity Model	Variance
Cuthbert	67	30	30	0
Wotherspoon Dr Boness	45	86	86	0
Dumyat Road	43	13	13	0

Barnton Place	67	64	64	0
Graham Avenue	57	55	55	0

As can be seen from Table G-1, the five feeders checked in the new connectivity model were found to be consistent with the existing mains records. However, it is not possible at this time to provide comment on the overall accuracy of the new connectivity model. A review of the new connectivity model will be undertaken when completed.

(iii) Conclusions

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

No inconsistencies have been found in the auditing of SP Distribution's MPAN processes and it can therefore be concluded that the company's estimation of 99.5% for the accuracy of its MPAN count is correct.

The present connectivity model at transformer level has been shown to be inaccurate when disaggregated to LV feeder level and indeed the company could not give a level of accuracy for the model at this level. It was not possible to verify the accuracy of the company's new connectivity model as it had not been completed at the time of audit.

The target completion date of the new connectivity model has slipped since the interim review but having witnessed the present progress it is considered that the September 2002 completion date for SP Distribution is realistic and achievable providing no further unforeseen difficulties arise.

7.4.2 Stage 3 of the Audit Framework - Accuracy of the Reporting Process

(i) Audit of LV Incidents

The audit of the incidents started on Day 2 in Hamilton after a brief introduction to the functions of the PowerSystems Management Centre by Ian Malkin. Phil Bridgewater proposed that the LV Incidents be looked at first due to the shortage of staff for the week. A total of 100 LV Incidents from April 2001 to March 2002 were examined by Chee K Lee with SP PowerSystems's Mary McNaught and Stewart Knox. SP Distribution had prepared a pack for each incident containing a "related calls summary", "incident logs" in Trouble Call and the Prosper reports.

Procedures for reporting CI and CML were covered during comprehensive training programmes and in the "Prosper Guidance Folder" for the company's Control Engineers, dispatchers and field staff. However due to the unforeseen difficulties between November 2001 and February 2002, the training programmes were delayed and hence between 1st April 2001 and 31st March 2002, the Prosper reporting guidelines were not strictly followed. Furthermore the completion date of the LV Connectivity Model was extended to September 2002 due to unforeseen difficulties and hence not applied during the 2001/2 reporting year.

The following methodology was applied when auditing each LV incident:

- Where incidents involve a single premise or premises on the same service cable, the audited customers were taken to be that reported by the field operative. This information is deemed accurate as any errors in the estimate as the number of customers affected is small.

- Where incidents involve blown or removed fuses on an outgoing feeder of an HV/LV substation, the audited customers were obtained by dividing the customer numbers for the relevant transformer by the number of feeders (one third for one phase etc) in line with SP Distribution's Prosper guidelines. The number of feeders was obtained from GND (SP Distribution's existing geographical network diagram) and the number of customers attached to the transformers from the current ICOND model. This approach was taken to obtain a consistent audit on the number of Customer Interruptions unless additional information was available to disprove the use of the formula.

- Where incidents occur partway along a feeder, there is no viable method of confirming the customers involved except than to rely on the estimate given by the field operative to the dispatcher as recorded in the Incident Log.

It is understood that once the LV Connectivity Model is completed, it will be interfaced with ICOND and dispatchers will have access to the number of customers on each feeder from the HV/LV substations. When the dispatchers are given access to the LV Connectivity Model, they will be able to verify the number of customers estimated by the field operatives when network links are removed or any alternative feeding arrangements utilised. This would be deemed more accurate and consistent.

The variance in CI showed both over-reporting and under-reporting had occurred. Analysis of the variances found that it was not possible to identify any trends in the over- and under-reporting seen in the audit. It is therefore likely that these variances are not due directly to a systematic error and are more likely to be due to the inability of the dispatchers to check the customer numbers because the LV connectivity model was not available. In these situations, customer numbers were often derived through estimates from the field operatives or from the number of customers that reported a fault.

In some incidents, where the customer refused a temporary connection or agrees to remain off supply, SP Distribution assumed that the customer had its supply back on and the CML count was halted. SP Distribution has interpreted this to be compliant with Section 2.12 (3) of the RIGs. However, in these cases, when work on the fault restarted the additional work was usually accounted for under a separate incident. As the supply was only restored for Prosper purposes and was not physically restored for the customer, any additional repair time once the repair work resumes should be added to the original incident and not raised as a new incident. SP PowerSystems acknowledged this problem and advised us, during the audit, that they had discovered this problem with their IIP reporting during 2001. Their investigation of the problem showed that it resulted from a software code error in their new IIP Prosper computer system. We understand that this error was corrected during the first quarter of 2002, and the company believes that similar reporting will correctly comply with the RIGs for the whole 2002/3 fault-reporting year.

The audit also discovered one restoration stage missing and one additional restoration stage added which were due to errors in interpreting the incident logs.

The majority of errors associated with Trouble Call Incident Log entries occur during increased workload on the personnel – bad weather and other difficulties. However, most errors would be identified by the normal audit routines performed, for example, duplicate incident reporting picked up as multiple entries of similar transformer tags on the same date and time would be flagged up from the routines.

Reporting incident start times also proved to be a source of error. In a number of situations the dispatchers used the time that the incident was first created in Trouble Call as the start time rather than

the time that the company first became aware of the fault, such as the first customer call reporting no supply as recorded in Trouble Call.

In one incident, a customer had called in to report the smell of burning and was advised to isolate supply; this call time was used as the start of the incident. Upon examination of the incident logs, the audit has instead taken the start time to be the time when the field operatives arrived at site and removed the supply fuse to allow them to fix the problem. The extent of this audit (as defined by Ofgem) is only as far as the supply meter. Hence, confirmation of supply isolation can only be made when the field operative arrives at site and removes the supply fuse as the incident log documents. It is acknowledged that the company's decision to start the time after advising the customer to isolate supply is sensible and is an area where the RIGs would benefit from more detail.

The audit of LV incidents was completed just after lunch on Day 3.

(ii) Audit of HV Incidents

During the afternoon on Day 3 of the audit, Chee K Lee and SP PowerSystems's Alistair McNaught began auditing the 24 HV incident reports for the period between April 2001 and March 2002.

SP PowerSystems had prepared Trouble Call records, alarm/query lists, switching logs and incident logs for each incident to check the customer numbers and times reported on the Prosper incident report. All the HV Incident Reports are deemed to be IIP compliant.

The following methodology was applied when auditing each HV incident:

- The SPD representative would bring up the section of the ICOND network relating to that particular incident. This is an archived model dated 21st February 2001 which was thought to give a close representation to all the incidents selected. Both the visiting auditor and the SPD representative would then go through the switching logs to understand the cause of the incident and verify the starting times from either Trouble Call records or the alarm lists.

- The audit customer numbers cannot be accurately confirmed because the network model for the particular incident date was not available, however the numbers obtained from the archived model gave satisfactory indications that the number of customers interrupted stated by the control engineers were accurate.

- SP PowerSystems had also prepared print outs of the current (1 week prior to the audit) ICOND network with customer numbers written on each HV/LV substation, this was used to determine the system customer numbers.

The variation in customer numbers between the audited and reported customers was mainly due to new customer connections to or customers removed from the relevant HV/LV substations. Where, larger variations occurred, this was shown to be either network connection changes or an abnormal operating condition at the time of the incident.

The variances in Customer Interruption times were primarily due to errors by the control engineers in transferring the respective incident start and end times from the switching logs to the report. There is also a potential source of error with the manual transfer of information from the Transmission Report to the Prosper Report.

One of the incidents involved a Transmission Customer with a contract with SP PowerSystems to control and maintain its 33kV and 11kV distribution network. At present, any switching operations on this customer's network would be recorded in ICOND and reported in Prosper for completeness. As this is not SP Distribution's customer as defined under the RIGs, this should not be included in the Prosper reporting data. However, this would have negligible effect on the overall accuracy count.

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

The information required for this questionnaire was largely gathered by the visiting auditors on Day 1 during the induction meeting with Phil Bridgewater and Tom Kane.

SP Distribution has included detailed definitions and guidance on the RIGs application in the following internal documentation:

- Prosper HV User Guide (Draft form at the Hamilton Control Centre)
- Prosper Guidance Folder, Doc – 00 – 270 (issued to appropriate staff) containing:
  - LV Troubleshooting Guide, IIP – 14 – 016
  - HV Troubleshooting Guide, IIP – 14 – 017
  - IIP Rules Guide, IIP – 14 – 018

SP Distribution's interpretation of "Re-Interruptions" as contained in Section 4 of the IIP Rules Guide is – "If a customer or group of customers loses supply within three hours of ALL customers being restored from a previous interruption, this is considered as a Re-interruption within the same incident".

HV incidents are picked up by the tele-control system and ICOND automatically date stamps the time at which the incident starts. With incidents such as a first visit from a no supply Trouble Call report which turns out to be an HV incident with no telemetry indication, the start time is obtained manually by the control engineer from the original report in Trouble Call and entered into the incident report. An electronic link between Trouble Call and ICOND would overcome the possibility of any human errors. The numbers of customers affected are derived directly from the sum of the counts that are entered against each transforming point and held in ICOND. This is carried out by the Control Engineer by means of an ICOND Trace algorithm which places customer numbers at each restoration stage into the front end of Prosper.

The start of LV incidents is the time at which the first "no supply" call is received. An incident log is then created with the start time manually entered by the dispatcher once confirmed by a field operative. The number of customers affected by an LV incident is estimated by the on-site resource and the dispatcher assisting by indicating the total customers supplied by the secondary transformer which supplies the affected network and application of standard criteria (dependant on incident type).

An incident is complete when supplies are restored to all customers involved in the incident and all the equipment involved in the incident is returned to service where this occurs within three hours of the final customer restoration; times are entered manually into the system.

As part of the ISO accredited process which is operated by the Systems Performance Analysts in the control centres (Hamilton & Prenton), a monthly audit of incidents is carried out. This audit picks a day at random during the month and examines every incident which occurred on that day. In addition to the ISO audit an internal audit of 5% HV and 1% LV incidents has been carried out monthly. This

is being brought into the ISO process. This audit concentrates on CI and CML accuracy for HV and correct allocation of reports for LV incidents. From these audits a series of Reporting Accuracy KPIs has been produced in the form of a "Prosper Issues Register" which identifies problem areas and attaches ownership for correction. This information is fed back formally into the management chain for corrective action.

All Operational and support staff received a roadshow on IIP requirements followed by 450 staff receiving specific training. Comprehensive training course details were provided to the visiting auditors and included typical fault scenarios, which were supplemented by a multiple-choice questionnaire to confirm understanding. Any queries that could not be answered on the course were collated, answers obtained and a feedback document produced so that no question went unanswered.

Due to unforeseen difficulties experienced across the business for a period of 4 months (November 2001 to February 2002), approximately 60% of staff have received the appropriate training. Outstanding training is currently being reviewed with follow on courses and e-learning being planned – completion is programmed for October 2002. In addition, staff are also able to access the company intranet site where they can obtain a process map and step by step information on the relevant part of the process.

(iv) Conclusions

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

- For complete feeder outage, SP Distribution's present guideline states that the number of customers interrupted are obtained by dividing the customer number of a transformer with the number of feeders (one third for one phase etc). This approach was taken to obtain a consistent audit of the number of Customer Interruptions. Since unforeseen difficulties delayed the implementation of this guideline, the audit results show variances between audited and reported number of Customers Interrupted.

- For faults affecting only part of an LV feeder or service cables, the dispatcher normally relies on estimates provided by field operatives. This may lead to inaccurate reporting. With the LV Connectivity Model completed, the dispatcher should be able to independently verify the customer numbers quoted by the field operative.

- Where a customer refuses a temporary connection or agrees to remain on no supply, SP Distribution assumes that the customer has its supply back on. SP Distribution has interpreted this to be compliant with Section 2.12 (3) of the RIGs. As the supply was only restored for Prosper purposes and was not physically restored for the customer, this additional repair time should be added to the original incident and not raised as a new incident.

- The majority of errors associated with Trouble Call Incident Log entries occur during increased work load on the personnel – bad weather and other unforeseen difficulties.

- Reporting of incident start time also proved to be a source of error with dispatchers using the time that the incident was first created in Trouble Call as the start time rather than the time that the company first became aware of the fault.

- In some incidents, where a customer had called in to report a problem other a loss of supply (e.g. the smell of burning), the time of their call was used as the incident start time. However, it was

apparent upon examination of the incident logs that the customers were only interrupted when the field operatives arrived at site and cut the supply to allow them to fix the problem.

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

- The variances in Customer Interruption times were primarily due to errors by the control engineers in transferring the respective incident start and end times from the switching logs to the report. There is also a potential source of error with the manual transfer of information from the Transmission Report to the Prosper Report.

The audit team is of the opinion that SP Distribution has generally interpreted the RIGs definitions correctly and that the company is operating in accordance to them. SP Distribution records all Interruptions within 3 hours since ALL customers were restored as "Re-Interruptions".

7.5 Overall Impressions

SP Distribution, through their in-house contractor, SP PowerSystems has a highly motivated and enthusiastic team behind the IIP project. SP PowerSystems's commitment to the project is proven by the extensive training programmes employed, setting up of both the Data Capture Bureau at Glenrothes and the internal audit team.

It is in the opinion of the audit team that the accuracy of the MPAN count methodology, RIGs interpretation/implementation and the company's links to the Ofgem reporting template are sound. The process of developing the new LV Connectivity model is also sound.

7.6 Conclusions

Table G-2 presents the results of the 2002 audit of the SP Distribution South of Scotland 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 G-2

Stage	Item	Accuracy
Stage 1	MPAN Measurement	99.5%
Stage 1	HV Connectivity Model	
Stage 1	LV Connectivity Model	
Stage 3	LV Incident Reporting Accuracy – CI	94% (over) [ξ]
Stage 3	LV Incident Reporting Accuracy – CML	96% (under) [ξ]
Stage 3	HV Incident Reporting Accuracy – CI	100% [ξ]
Stage 3	HV Incident Reporting Accuracy – CML	100% [ξ]
Stage 3	Overall Incident Reporting Accuracy – CI	99% (over) [ξ]
Stage 3	Overall Incident Reporting Accuracy – CML	99% (under) [ξ]

[ξ] Note that incidents have been audited against the systems in place at the time of the audit as the new connectivity model had not been completed at that time.

The audit team agrees with the company's estimate of accuracy of its MPAN count. It was not possible to verify the accuracy of the company's new connectivity model as it had not been completed at the time of the audit.

The Stage 3 HV and LV Incident Reporting Accuracy was derived by the audit team based on the 100 LV Incident and 24 HV Incident samples audited. It is again emphasised that when considering the above LV Incident Audit results, that the LV Connectivity Model at feeder level was not completed by the time of the audit and the company's Prosper Guidelines were not fully implemented. The LV incident reporting results are based on information provided, in the main, by the field operatives.

It should be noted that the stage 3 results for both SP Distribution and SP Manweb differ from other companies since the incidents have been audited using the existing connectivity model rather than a connectivity model by LV feeder.

7.7 Reporting to Ofgem's Information Template

This questionnaire was completed by Tony Wright with SP PowerSystems's Anne Baikie.

All incidents when transferred from ICOND or TroubleCall are processed by a piece of software written by Calanais to SP Distribution's specification. This piece of software applies and ensures compliance with the IIP Rules. Population of the IIP information template occurs using SP PowerSystems's Business Objects reporting tool and reports written against the Prosper database.

The following summarises the template data audited for SP Distribution's South of Scotland distribution area:

- The number of customers, confirmed by the IIP project LV connectivity manager, for the twelve months ended 30th September 2001 was 1,906,498 and is the figure included in the reporting Template for SP Distribution.

- HV circuits in SP Distribution are identified by a five digit code – 3 digits defining the bus bar and 2 digits identifying the feeder reference.

- 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 are as shown in Table G-3 below:

Table G-3

SP Distribution Circuit Reference	CI from PC-NaFIRS	CI from Ofgem template	CML from PC-NaFIRS	CML from Ofgem template
66224	523	523	65968	65968
82223	1961	1961	407803	407803
91811	106	106	33134	33134

The following are queries raised by SP Distribution with regards to Ofgem's reporting template:

- Section 3.1.2, page 9 of the "Final Template Guide" – HV circuit for HV faults. "Faults" has been identified in accordance with the RIGs "incident" definition including Pre Arranged and not just faults. The same interpretation has been applied to RIG 2.66 regarding interruptions ie including Pre Arranged. Confirmation required by Ofgem?

- The Ofgem template does not give a "Total" box for input regarding information on incidents. Is there a specific reason for this or could it be included?

7.8 Recommendations

The following points were identified by the joint audit team as areas for further improvement:

- At present ICOND models of the HV network are archived once annually. It is understood that SP Distribution is planning in future to archive its ICOND models of the entire HV network and LV Connectivity models once a month. This monthly archiving should be implemented as it would confirm any major changes in network configurations and would aid in the audit trail.

- When temporary connections are provided to customers via a back-feed supply or an abnormal feeding arrangement, it is usually not stated in the incident logs that the original connection was restored. This information is important in order to keep an accurate 'live' working network of the LV Connectivity Model and to aid in the audit trail. Hence through the appropriate training, the field operatives and dispatchers should work together to ensure that the incident logs are detailed with appropriate information and that this information on any network changes is transferred to the respective departments responsible for maintaining the LV Connectivity model.

- In general, it would be useful to reduce the requirements for manual data/information entries to avoid potential human errors. The areas identified for possible electronic/automatic linkages are:

  – At present, dispatchers would sieve through Trouble Call records to identify the first "no supply" call, an automatic algorithm could be produced to pick up this start time.

  – Where HV incidents occur with no telemetry indication, the start time is obtained manually by the control engineer from the original report in Trouble Call and entered into the ICOND incident report. An electronic link could be developed to transfer the start time from the Trouble Call logs into the ICOND incident logs.

  – Where HV incidents are caused by a Transmission operation, this involves a manual transfer of information (start time) from the Transmission Report to the Prosper Report. An electronic link could be developed to automate this process.

- Although not an audit issue, it was felt that there was a vulnerability to the company regarding the System Analyst post. This is held by one person and is key to the reporting process.

- It is hoped that SP Distribution would fully utilise all available resources to ensure that the LV Connectivity Model is completed by the stated date.

7.9 Learning Points

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

- The company would appreciate earlier notification of incidents to be audited due to the volume of work entailed.
- For consistency and time saving the same two auditors should in future be attached to both audits.