ANNEX 1 - DETAILED DATA ON COMMERCIAL QUALITY

TABLE 1 – ACTUAL LEVELS OF COMMERCIAL QUALITY (YEAR 2001)

	FRANCE	IRELAND	ITALY	PORTUGAL
Average waiting time in customer centres	> 20 min	< 1 min per payment transaction	n.a.	n.a.
No. of Visits per 100 customers in customer centres	30	400 (mainly pay bill)	n.a.	n.a.
Average waiting time in call centres	n.a.	101 sec	n.a.	162 sec
No. of calls per 100 customers in call centres	100	154	n.a.	102.3
No. of complaints per 100 customers	n.a.	0.64	0.17[1]	0.70
Average response times to customer complaints	n.a.	n.a.	10.29 work days	19.75 work days
Average response times to customer written queries	n.a.	n.a.	10.29 work days	n.a.
Average annual meter reading per customer	1.78	3.8	0.947 (LV)	2.0 1.96 (LV)
Average annual self meter reading	0.09	3%	n.a.	n.a.
Percentage of estimated bills	0.13 %	33.61%	n.a.	18.5%[2]
No. of revised bills per 100 customers	0.8	2.3	0.045 (% LV)	3.17
Average response time for LV supply quotations	n.a.	16 days	9.45 days, E 7.49 days, O	n.a.
Average time to connect a new LV customer	n.a.	22 weeks	1.16 days, E 2.28 days, O	n.a.
Average time to provide meter and supply after supply contract	n.a.	n.ap.	5.72 days, E 2.28 days, O	2.8 days (LV)

n.a. = not available, n. ap. = not applicable

Italy has reported separate figures for the incumbent Enel (E) and/or for Others (O) (as distinct from national averages) for the last thee indicators.

1 For the incumbent (Enel)

2 For LV, power < 41.4 kVA

TABLE 2 – SURVEY RESULTS OF COMMERCIAL QUALITY STANDARDS

SERVICE	GS/ OS	FRANCE		GREAT BRITAIN		IRELAND		THE NETHERLANDS		ITALY		PORTUGAL		SPAIN	
		Standard	Penalty	Standard	Penalty[3]	Standard	Penalty[4]	Standard	Penalty	Standard	Penalty[5]	Standard	Penalty[6]	Standard	Penalty
Responding to failure of supplier's fuse	GS	3 hrs (breakdown service)	€25	3hrs weekdays 4hrs on any other day	€29.05	3 hrs if call between 08.30 - 23.00, otherwise the following day	€35					4 hrs in Area A and B; 5 hrs in Area C (rural areas)	€15 * **		
	OS							2 hours							
Restoring supply	GS			18hrs GB also pays € 72.63 penalty for multiple interruptions (4 or more interruptions of not less than 3 hours over 12 month period	€72.63 €145.26 for non-domestic	If without power for 24 hours – penalty applies. After 24 hours, further € 35 for every additional hour without power	€65								
	OS			99.5% within 18 hrs		95% within 4 hrs						80% within 4 hours			
Connection (supply and meter)	GS	2 working days (99,9 % success)	€25	2 days domestic 4 days non-domestic	€29.05	Meter Connection - 3 working days for domestic customers, 5 working days for businesses. For a new Connection within 2 weeks of receipt of ETCI certificate (provided the customer has applied and paid for the connection at last 10 weeks prior to the completion of electrical installation	Metering €50 Connection €50			5 working days LV 7 working days MV	€25.82 * **			5 working days following contract sign	Max. of €30 or 10% of the first full bill
	OS		€25	100% in 30 days domestic, 40 days non-domestic								90% within 2 working days following contract signature			

[3] Penalty payment reported for Great Britain is for domestic customers. For a given Guaranteed Standard, payments to non-domestic customer are the same as for domestic customers unless stated otherwise. For comparison purposes payments are converted from Sterling into the Euro equivalent, exchange rate 1.45255.

[4] Penalty payment reported for Ireland is for domestic customer. Payments to business customers are €130 and are marked by *.

[5] Penalty Payment reported for Italy is for LV domestic customer. Payments to LV Business are €51.65 (and are marked by*) and to MV customers are €103.29 (and are marked by**)

[6] Penalty Payment reported for Portugal is for LV domestic customer, P < 20.7 kVA. Payments for LV P> 20.7 kVA are €25 (and are marked by*) and to MV, HV, VHV customers are €75 (and are marked by**)

TABLE 2 - (CONTINUE) SURVEY RESULTS OF COMMERCIAL QUALITY STANDARDS

SERVICE	GS/ OS	FRANCE		GREAT BRITAIN		IRELAND		THE NETHERLANDS		ITALY		PORTUGAL		SPAIN	
		Standard	Penalty	Standard	Penalty[3]	Standard	Penalty[4]	Standard	Penalty	Standard	Penalty[5]	Standard	Penalty[6]	Standard	Penalty
Estimating Charges for Simple works	GS	8 days (= 6 working days)	€25	5 days simple jobs 15 days other jobs	€58.10	7 Working days when no site visit is required, 15 working days when site visit required. > 100KW or MV connections –90 Working days.	€65 *			Within 15 working days for simple works LV	€25.82			LV: a) supplies <15 kW: within 5 days; b) Other without Substation investment: within 10 days; c) Other supplies with Substation investment: within a range of 20 to 30 days. MVHV: (new supplies): a) 1-66kV: within 40 days; b) >66kV: within 60 days	Max. of €30 or 10% of the first full bill.
	OS											95% within 20 working days for simple LV works			
Notice of supply interruption	GS			2 days	€29.05 €58.10 for non-domestic	Minimum 2 working days.customer must claim within 1 month of supply interruption	€65 *								
	OS							3 days in advance				36 hours in advance[5]		Minimum of 24 hours in advance	Incl. in continuity of supply Penalty
Voltage complaints	GS			Reply within 5 days or visit within 7 days	€29.05	10 working days to contact complainant, further 10 working days to investigate	€35					Respond or visit within 20 working days	€15 * **		
	OS							For non-eligible customers, visits within 2 hours, response to mail 10 working days		90% LV and 95% MV reply within 10 working days					
Meter problems	GS			Reply within 5 days or visit within 7 days	€29.05	Within 5 working days for Meter accuracy check	€35					Visit within 20 working days	€15 * **	Customers: < 15 kW: within 5 working days Rest: within 15 working days	Max. of €30 or 10% of the first full bill

[5] This is not an overall standard defined in the Quality of Service Code, but a commercial regulation established in the Commercial Relations Code.

TABLE 2 - (CONTINUE) SURVEY RESULTS OF COMMERCIAL QUALITY STANDARDS

SERVICE	GS/ OS	FRANCE		GREAT BRITAIN		IRELAND		THE NETHERLANDS		ITALY		PORTUGAL		SPAIN	
		Standard	Penalty	Standard	Penalty[3]	Standard	Penalty[4]	Standard	Penalty	Standard	Penalty[5]	Standard	Penalty[6]	Standard	Penalty
	OS							For non-eligible customers, visits within 2 hours, response to mail 10 working days		90% LV and 95% MV reply within 10 working days					
Queries on charges and payments	GS			5 days	€29.05	5 working days	€35					Respond within 20 working day	€15 * **	Customers: < 15 kW: within 5 working days Rest: within 15 working days	Max. of €30 or 10% of the first full bill.
	OS							within 10 working days		90% LV and 95% MV within 15 working days					
Appointments scheduling	GS	2 hours (99.6 % success)	€25	Am or pm, or timed if customer requests	€29.05	AM or PM offered	€35			Within 3 hours range	€25.82 * - **	Within 3 hours range	€15 * - **		
	OS							Time blocks of two hours							
Payments notice under standards	GS			10 days to pay	€29.05	within 10 days	€35								
	OS														
Prepayment meter fault	GS			3hrs weekdays 4hrs weekends	€29.05										
	OS														
Correction of voltage faults	GS					12 weeks, except where significant network reinforcement is required	€50								
	OS			100% in 6 months											
Visits to customers who required a meter move	GS					AM or PM appointments	€35			Included in execution of simple works	€25.82 *				
	OS			100% in 30 days											
Meters changed when required	GS														

TABLE 2 - (CONTINUE) SURVEY RESULTS OF COMMERCIAL QUALITY STANDARDS

SERVICE	GS/ OS	FRANCE		GREAT BRITAIN		IRELAND		THE NETHERLANDS		ITALY		PORTUGAL		SPAIN	
		Standard	Penalty	Standard	Penalty[3]	Standard	Penalty[4]	Standard	Penalty	Standard	Penalty[5]	Standard	Penalty[6]	Standard	Penalty
	OS			100% in 30 days											
Number of meter readings within a year	GS													Min. of 6 times per year	Max. of €30 or 10% of the first full bill
	OS	2 (1.77 realised)		100%, one reading per year		Currently 5 times, to be phased to 4				95% LV and 95% MV with at least 1 within a year		98% with, at least 1 reading, within a year (only for LV)			
Response to customers letters	GS	8 days (= 6 Work days) (99.8 % success.)	€25, if letter really necess.												
	OS			100% in 10 days		95% within 10 working days (substantive response)		within 10 working days		90% LV and 95% MV within 20 working days		90% within 20 working days			
Response to customer claims	GS	8 days (=6 work days)	€25, if claim really necess.			Refund guarantee on both electricity bill and connection charge –within 5 working days of agreeing amount to be repaid	€35							Customers: < 15 kW: within 5 working days Rest: within 15 working days	Max. of €30 or 10% of the first full bill
	OS					75% calls to contact centre answered within 20 seconds		within 10 working days		90% LV and 95% MV within 20 working days		95% within 20 working days			
Execution of simple works	GS	15 days(= 11 work days), after payment of estimate)	€25							Within 15 working days for LV customers	€25.82	95% within 30 working days (LV works)		LV: (new supplies) Without LV network extension: within 5 working days following connection rates payment. With LV network extension: within 30 working days following connection rates payment	Max. of €30 or 10% of the first full bill
	OS							Within 3 day							

TABLE 2 - (CONTINUE) SURVEY RESULTS OF COMMERCIAL QUALITY STANDARDS

SERVICE	GS/ OS	FRANCE		GREAT BRITAIN		IRELAND		THE NETHERLANDS		ITALY		PORTUGAL		SPAIN	
		Standard	Penalty	Standard	Penalty[3]	Standard	Penalty[4]	Standard	Penalty	Standard	Penalty[5]	Standard	Penalty[6]	Standard	Penalty
Desactivation on customer's request	GS	2 working days (99.8 % successf)	€25							Within 5 working days LV Within 7 working days MV	€25.82 **			Within a month	Max. of €30 or 10% of the first full bill
	OS														
Reconnection following lack of payment	GS									Within 1 working day (including Saturday)	€25.82 **	LV – until 5 PM next day Non LV – within 8 hours	€15 * **	A maximum of 24 hours after paying the bill	Max. of €30 or 10% of the first full bill
	OS	24 h (except week end)		100% by end of the day											
Estimating charges for complex works	GS														
	OS									85% LV and 80% MV within 40 working days					
Execution of complex works	GS														
	OS							Within 10 days		85% LV and 80% MV within 60 working days					
Accuracy of bills made on estimations	GS														
	OS									Δ<150% 85% LV house hold and Δ<250% LV industry (*)					
Attendance in customers centres	GS														
	OS											90% within 30 minutes			

TABLE 2 - (CONTINUE) SURVEY RESULTS OF COMMERCIAL QUALITY STANDARDS

SERVICE	GS/ OS	FRANCE		GREAT BRITAIN		IRELAND		THE NETHERLANDS		ITALY		PORTUGAL		SPAIN	
		Standard	Penalty	Standard	Penalty[3]	Standard	Penalty[4]	Standard	Penalty	Standard	Penalty[5]	Standard	Penalty[6]	Standard	Penalty
Attendance in telephone service	GS														
	OS	95% must get a personal (rather than recorded) answer (98% success)				75% within 20 seconds (call centre phone), 5% call abandonment rate						75% within 60 seconds			

GS – Guaranteed Standards;

OS – Overall Standards

TABLE 3 – OVERVIEW OF GUARANTEED AND OVERALL STANDARDS

SERVICE	GS/ OS	FRANCE	GREAT BRITAIN	IRELAND	ITALY	THE NETHERLANDS	PORTUGAL	SPAIN
		Standard	Standard	Standard	Standard	Standard	Standard	Standard
Responding to failure of ssupplier's fuse	GS	●	●	●			●	
	OS					√		
Restoring/ reconnecting supply	GS		●	●				
	OS		√	√			√	
Connection (supply and meter)	GS	●	●	●	●			●
	OS		√				√	
Estimating Charges for Simple Works	GS	●	●	●	●			●
	OS						√	
Notice of supply interruption	GS		●	●				
	OS					√	√*	√
Voltage complaints	GS		●	●			●	
	OS				√	√		
Meter probems	GS		●	●			●	●
	OS				√	√		
Queries on charges and payments	GS		●	●			●	●
	OS				√	√		
Appointments scheduling	GS	●	●	●	●		●	
	OS					√		
Payments notice under standards	GS		●	●				
	OS							
Prepayment meter fault	GS		●					
	OS							
Correction of voltage faults	GS			●				
	OS		√					
Visits to customers who required a meter move	GS			●	●			
	OS		√					
Meters changed when required	GS							
	OS		√					
Number of meter readings within a year	GS							●
	OS	√	√	√	√		√	

* It is not an overall standard defined in the Quality of Service Code, but a commercial regulation established in the Commercial Relations Code.

TABLE 3 – (CONTINUE) OVERVIEW OF GUARANTEED AND OVERALL STANDARDS

SERVICE	GS/ OS	FRANCE	GREAT BRITAIN	IRELAND	ITALY	THE NETHERLANDS	PORTUGAL	SPAIN
		Standard	Standard	Standard	Standard	Standard	Standard	Standard
Response to customers letters	GS	●						
	OS		√	√	√	√	√	
Response to customer claims	GS	●		●				●
	OS			√	√	√	√	
Execution of simple works	GS	●			●			●
	OS					√	√	
Desactivation on customer's request	GS	●			●			●
	OS			√				
Reconnection following lack of payment	GS				●		●	●
	OS	√	√					
Estimating charges for complex works	GS			●				
	OS				√			
Execution of complex works	GS							
	OS				√	√		
Accuracy of bills made on estimations	GS							
	OS				√			
Attendance in customer centres	GS							
	OS						√	
Attendance in telephone services	GS							
	OS			√			√	
Tot No. of Guaranteed Standards	GS	8	11	13	7	0	6	9
Tot No. of Overall Standards	OS	2	8	7	9	10	9	1
Tot No. of Performance Standards	Total	10	19	20	16	10	15	10

√= where Overall Standard (OS) is in place; ● = where Guaranteed Standard (GS) is in place

TABLE 4 - OVERVIEW OF GUARANTEED AND OVERALL STANDARDS

TABLE 4.1 HAS THE REGULATOR CHANGED THE COMMERCIAL QUALITY REGULATION TO ADAPT IT TO THE LIBERALISATION PROCESS (ESPECIALLY IN RESPECT OF SUPPLY LIBERALISATION AND/OR SEPARATION BETWEEN DISTRIBUTION AND SUPPLY)?	
AUSTRIA	The regulator has not changed commercial quality regulation yet.
FINLAND	The Electricity Market Act defines the responsibility of the network owner. The regulator have very little to do with the commercial quality regulations which are in most cases only recommendations made by the Finnish Electricity Association.
FRANCE	There is no commercial quality regulation in France: the only rules are based either on contractual relations or on good behaviour principles.
GREAT BRITAIN	Commercial quality standards are split to reflect the distinction between distribution and supply. These are referred to as Guaranteed and Overall standards of performance. The distribution standards deal with network issues and the supply standards with supplier hub activities.
IRELAND	Yes, Connection Agreement and Metering Codes contain certain commercial quality elements. Separate Customer Charters for Networks and Supply have been developed. The Networks charter contains 12 guaranteed standards and the Supply Charter has 7 guaranteed services.
ITALY	Yes, it did. Distribution and supply have been unbundled for eligible customers. Commercial quality standards have been divided in two groups: distribution standards and supply standards. The distribution standards apply to both eligible and non eligible customers. The supplier is allowed to change supply standards only for eligible customers, if they subscribe a specific contract.
THE NETHERLANDS	Due to the implementation of the liberalisation process agreements are made and put in codes within the sector on some elements of commercial quality. Before this there was nothing on commercial quality regulation.
NORWAY	Metering points shall be read upon change of provider and upon termination of electricity supply.
PORTUGAL	No. Quality of Service Code revision is a responsibility of the General Directorate of Energy. The code does not take in account these issues.
SPAIN	The commercial Quality Regulation is a responsibility of Ministry of Economy, but the regulator advise the Ministry of Economy. The actual regulation about commercial quality only refers to the distribution companies and obliges the distribution companies to comply with the standards established.

TABLE 4.2 WHICH COMMERCIAL QUALITY STANDARDS HAVE BEEN PUT ON DISTRIBUTORS AND WHICH ONES ON SUPPLIERS?	
AUSTRIA	There are no commercial quality standards defined.
FINLAND	Guarantees common to both Charters include Charter Arbitrator settlement guarantee, payment guarantee, appointment guarantee and refund guarantee.
FRANCE	There is no commercial quality regulation in France: the only rules are based either on contractual relations or on good behaviour principles.
GREAT BRITAIN	Network operators are responsible for the standards relating to the operation of the network. [The Network being the point the electricity leaves the transmission system (Transmission exit point) and arrives at the customers premises]. These include: • Responding to failure of mains fuse • Restoration of supply following a fault • Multiple interruptions • Estimating charges for connection • Notice of planned interruption to supply • Investigation of voltage complaints • Making and keeping appointments • Notifying customers of payments owed under the standards • Respond to customer letters within 10 working days Suppliers are responsible for standards relating to electricity the supply of electricity. These include: • Providing a meter • Meter disputes • Pre-payment meters • Estimate of charges for repositioning a meter • Charges and payments • Appointments • Payments/Billing
IRELAND	The Networks charter contains 12 guaranteed standards and the Supply Charter has 7 guaranteed services. The DSO charter includes (for example): • Network Repair Guarantee • Planned Supply Guarantee • Connection quotation Guarantee • Voltage Complaint Investigation The PES Charter includes (for example): • Reconnection Guarantee • Billing/metering accuracy Guarantee • Payment query guarantee
ITALY	The supply standards are three: - reading (at least 90% of LV customers with at least 1 meter reading per year), - maximum times to respond to queries on payments (at least 90% of LV customers queries responded within 15 days), - minimum number of bills with maximum exceeding in respect of estimation (at least 85% of bills made on actual reading must be not greater than 150% in respect of the average bill made on estimation for the same customer). Furthermore, the standard on written queries and claims apply to each supplier for its own claims. All the supply standards are OS.

continued

TABLE 4.2 (CONTINUE) WHICH COMMERCIAL QUALITY STANDARDS HAVE BEEN PUT ON DISTRIBUTORS AND WHICH ONES ON SUPPLIERS?	
THE NETHERLANDS	Specific commercial quality standards are in place for distributors on behalf of the captive customers (< 3x80 A connection). Specific commercial quality standards are in place for distributors on behalf of the eligible customers (> 3x80 A connection). The law gives also an obligation to report on commercial quality for suppliers of captive customers, but it is not worked out (yet) into standards.
NORWAY	Network owners are responsible for ensuring that energy consumption/energy flows at metering points is metered and read. Network companies are responsible for ensuring that invoicing of network services to households (billing) is in accordance with the provisions of these regulations.
PORTUGAL	There is not a legal distinction between supplier and distributor in the Quality of Service Code. All standards have been put on the distribution companies (supply business + wire business).
SPAIN	The commercial quality standards have been put on distribution companies only. The suppliers are not obliged to comply with these standards for eligible customers, but if they give wrong advice to the customers, then the customers can change supplier.

TABLE 4.3 HOW IS METERING REGULATION IN RESPECT OF COMMERCIAL QUALITY ASPECTS (READING, BILLING, METER INSTALLATION, METER VERIFICATION) DEFINED?

AUSTRIA	The Network operator is responsible for metering (reading, data aggregation, billing, installation, maintenance). He acts on basis of his general terms and conditions.
FINLAND	Some metering regulations are defined in the Electricity Market Degree. The distribution net operator is responsible for acquiring, owning and installing the measuring equipment needed in the retail sale and transmission of electricity, for inspecting and maintaining the measuring equipment, and for reporting measurement data to the parties to electricity trade. The net operator may offer the services as his own work, or he may purchase the services from outside partners, including other parties to electricity trade. The buyer of electricity is also entitled to acquire and own the measuring equipment and that meet the net operator's technical requirements.
FRANCE	There is no commercial quality regulation in France; the only rules are based either on contractual relations or on good behaviour principles. Metering is not open to competition.
GREAT BRITAIN	There are a number of standards on metering activities. These are covered by the supply standards.
IRELAND	Metering is not open to competition. Customer service obligations for metering are covered by the Metering Code and the Networks charter. The latter covers the more non-technical issues such as connection and meter maintenance. The Metering Code (which as of March 2003 was the subject to public consultation) sets minimum standards for measurement and recording of metered quantities for the purposes of electricity trading.
ITALY	There is not yet a complete regulation of metering. So far, metering standards are included in distribution standards, because the distributor is in charge of metering services, (excluding reading that is in the charge of suppliers). The situation of metering regulation could be changed soon.
THE NETHERLANDS	Metering in the Netherlands is a free market. Regulation is described in a 'code' and provides standards on how different parties of interest make use of the meter data. Commercial quality aspects aren't really integrated.
NORWAY	Reading: All metering points shall be read at least once per calendar year and refer to Mondays. Metering points belonging to households with expected annual electricity consumption higher than 8000 kWh shall be read every third, every second or every single month (periodic reading). Metering points with an expected annual energy out-take or energy input higher than 400 000 kWh shall be read each hour (hourly metering). Billing: Households with an expected annual electricity consumption in excess of 8,000 kWh shall be invoiced in arrears at least every third month on the basis of meter readings. The invoicing periods shall be of approximately equal duration. If obtaining meter readings entails unreasonable cost or inconvenience for the network owner, invoicing may be based on stipulated consumption and this shall be stated by the invoice.
PORTUGAL	There are guarantee standards and overall standards related with reading, billing and metering services.
SPAIN	There is not any specific regulation of metering. The distribution companies are in charge of metering services. Besides, the billing of the tariff supply and access to networks shall be carried out by the distribution companies on the basis of the reading of metering equipment installed for that purpose.

TABLE 4.4 IS THERE ANY REGULATION FOR SWITCHING SUPPLIER? IS THERE SOME STANDARD ABOUT SWITCHING?	
AUSTRIA	There is a market rule introduced by the regulator which defines the process for switching supplier (required data exchange, time limits, data formats, etc.).
FINLAND	At the moment according to the Electricity Market Act it is possible to change the supplier once without any costs. According to the draft of a proposed law it would be possible for the consumer to change the supplier once a year without any costs.
FRANCE	There is no regulation about switching supplier in France.
GREAT BRITAIN	Yes there is a process in place for switching supplier in GB. The Master Registration Agreement (MRA) is an electricity supply agreement that sets out the requirements for the change of supplier process. It is a multi-party agreement that all Ofgem licensed Suppliers and Distribution Business enter into, that governs the essential interactions between them when retail customers wish to change their supplier from one company to another. Electricity distribution companies and suppliers are obliged to sign and comply with the MRA under Standard Licence Condition 14 of the distribution licence and Standard Licence Condition 20 of the electricity supply licence. Version 1 of MRA was first signed in June 1998 on the opening of the GB electricity market to full competition.
IRELAND	Yes the Process is as follows: 1. New supplier sends Registration Form to Meter Registration Service Operator (MRSO), 2. MRSO validates registration request, 3. MRSO ensures that the customer's connection agreement is currently valid, 4. MRSO advise outgoing supplier, 5. Process normally 3 to 4 days for Eligible Customers, 6. MRSO arrange change-over meter reading for contract start date, 7. New supplier/old supplier advised of contract start date & change over reading, 8. MRSO begin the issue of meter data from the contract start date, 9. Outgoing supplier issues closing bill to customer, 10. New supplier begins invoicing customer. There is no fee for this process.
ITALY	Eligible customers have a right to sign off their current contract with a notice of 30 days. There is no standard for switching yet.
THE NETHERLANDS	Yes, there is a procedure in the Dutch 'netcode' that regulates switching and movement. This procedure describes which steps have to be taken by connected customers, suppliers, network operators and 'programme-responsibles' in order to process the administration of the switch.
NORWAY	Invoices shall provide a ready overview, be easily understood and shall contain a graphic comparison of the year's consumption in each settlement period with the same period of the previous year. Furthermore the invoice shall contain Enova SF's free phone number for advice on energy efficiency and on switching to other energy sources. Lastly the invoice shall contain clearly set out information on what particulars must be provided for the household to change to another electricity provider. Information needed to change supplier is metering point ID, supply commencement date, end user's name and postal address, and installation and invoicing address, if different from the end user's postal address.
PORTUGAL	All that is needed is a notification to the Offers System for switching supplier when the supplier is responsible for use of grid and use of system tariffs payment.
SPAIN	The term of tariff supply contracts and network access contracts shall be annual and shall be tacitly extended for the same periods of time. Notwithstanding the above, the consumer may finish the contract before that term, provided that proper notice is given to the distribution company at least five working days before the date on which the said consumer wishes to stop the supply and all without prejudice to the resulting economic conditions under the current tariff legislation in force. Currently (2003), there is a proposal in Spain for switching supplier whereby the customer will pay the costs incurred

TABLE 4.5 IS THE SUPPLIER THE ONLY CUSTOMER INTERFACE OR CAN THE ELIGIBLE CUSTOMER HAVE DIRECT RELATIONS WITH THE DISTRIBUTION NETWORK OPERATOR (FOR INSTANCE FOR CONNECTIONS)?

AUSTRIA	DSOs have direct contact to the customer in all cases concerning connections to the grid and metering. Hence the supplier is not the only customer interface.
FINLAND	The customer can have relations with both the supplier and the distribution network operator. In the matter of buying the electricity the consumer is usually in contact with the supplier and in the matter of delivery the customer interface is the distribution network operator.
FRANCE	Customers usually have direct relations with the distribution network operators. But regulation allows supplier to be the only customer interface if the customer has only one supplier.
GREAT BRITAIN	Customers can have direct relations with both the distributor and supplier. Customers may contact their supplier with supply related issues such as billing and metering. Customers may contact their distributor with distribution related issues such as loss of supply and requesting a new connection.
IRELAND	Customers usually have a direct relation with a network operator for their connection. However the customer is required to have a supplier before the connection agreement is enforced. Customers have relations with both the supplier and the DSO.
ITALY	Eligible customers have direct relations with distribution network operators for connection services. The supplier can offer to be the only customer interface.
THE NETHERLANDS	What is called the 'suppliers model' is the preferred option to customers, though not obligatory. Some customers like to interface with both the supplier as the network operator ('network model').
NORWAY	The customer can have direct contact with the network operator. Agreements containing terms and conditions for connection to and use of the network shall be entered into directly between the network owners and the individual customer.
PORTUGAL	In the liberalised market customers have relations with the distributor (customers have to sign the Access and Operation of Networks Agreement with the distributor) and with the supplier.
SPAIN	Eligible customers have direct relations with the distribution network operator for connections but the supplier can do it on behalf of them. The eligible consumers can choose if want to do this directly or with the supplier.

TABLE 4.6 IS THE BILLING UNIQUE TO THE ELIGIBLE CUSTOMER OR DO THEY RECEIVE SEPARATE BILLS FOR DISTRIBUTION AND SUPPLY?	
AUSTRIA	The customer can choose whether he wants separate bills for supply and distribution. Some suppliers offer to submit bills which include distribution and supply (not all suppliers offer this service). Customers who have not switched supplier yet get only one bill for distribution and supply. Distribution and supply costs have to be listed separately on the bill.
FINLAND	There is only one bill but the costs of supply and distribution are specified in the bill.
FRANCE	Eligible customers receive separate bills.
GREAT BRITAIN	Customers receive a single bill from their supplier which includes the costs of generation, transmission, distribution and supply. These costs are shown as an aggregated total and are not separated out.
IRELAND	Eligible customers receive one bill that includes their Networks and Supply charges. Suppliers sometimes vary the presentation of these charges.
ITALY	So far only customers with annual consumption > 9,000 MWh/year are eligible (some thousands); most of them have unique billing thanks to direct agreement between the supplier and the distributor. The number of eligible customers is now changing: in 2003 customers with more than 100 MWh/year will become eligible (more than 200,000 customers, even in low voltage). A final decision has not yet been made by the Regulatory Authority.
THE NETHERLANDS	One bill for the “suppliers model”, two for the “network model”.
NORWAY	The network owner can decide whether they would like to have joint invoicing with a supplier or not. If the network owner decides to do joint invoicing with one supplier, the company have to agree on the same deal with all other suppliers that would also like to participate in joint invoicing. In case of joint invoicing of network services and electrical energy, invoicing shall be in accordance with the provisions applying to the invoicing of the network services. Furthermore, the invoice shall identify who is the network company and who is the seller of electrical energy.
PORTUGAL	It depends on the customer choice. The Supplier can be responsible for the payment of the tariffs on behalf of the customer.
SPAIN	The contracting of access to the networks shall be formalised with distributors through the signing of a contract. Afterwards the eligible consumers can choose. If they choose to pay the bill for access to the network directly to the distributor, they will have two separated bills. If they want to pay it through the supplier, the supplier can bill the eligible consumers for supply and distribution together. The supplier can be responsible for the payment of the tariffs on behalf of the eligible consumers.

ANNEX 2 - DETAILED DATA ON CONTINUITY OF SUPPLY

TABLE 1 – INDICATORS - COMPARISON TABLE

COUNTRIES	FINLAND	FRANCE	GREAT BRITAIN	IRELAND	ITALY	THE NETHERLANDS	NORWAY	SPAIN	PORTUGAL
Unplanned interruptions (unnoticed)	Duration > 3', no notice in advance	Duration > 3', no notice in advance	Duration > 3', no notice in advance	Duration > 3', no notice in advance	Duration > 3', no notice in advance, included planned interruptions without notice.	The Dutch 'codes' don't differentiate over length of interruptions	Only interruptions originating in networks above 1kV are monitored	Duration > 3', no notice in advance	Only considered unplanned interruptions longer than 3'
Planned interruptions (noticed)	Duration > 3', notice in advance at least 1 day	No minimal duration	Duration > 3', no notice in advance at least 2 days	Duration > 3', notice in advance at least 1 day	Duration > 3', notice in advance at least 1 day	Not available.	Duration > 3', notice in advance at least 1 day	Duration > 3', notice in advance at least 1 day	Duration > 3', notice in advance at least 36 h
Nation-wide data	Not compulsory. Approx 80-90% of total MV-network length included	Whole continental country (Corsica and overseas areas are not included.	Mainland G. B. Only		99% of the customers are included				99,5% of the country is included.
Indicators	Statistic based on transformer districts.		All customers weighted the same; CMLs (customer minutes lost) are measured per 100 customers.		Minutes lost are weighted on number of LV customers; the same for number of interruptions per customer		Weighted on number of transformers (distribution and transmission)	Hours lost per consumer and number of interruptions per consumer	System Average Interruption Duration Index - SAIDI and System Average Interruption Frequency Index - SAIFI

TABLE 2 – RESPONSIBILITY ANALYSIS - COMPARISON TABLE

	FINLAND	FRANCE	GREAT BRITAIN	ITALY	IRELAND	THE NETHERLANDS	NORWAY	PORTUGAL	SPAIN
Acts of god	Thunder and lightning, snow and ice burden, fallen tree (due to snow burden), wind and storm, other weather related conditions, animals.	Transmission and Distribution System Operator don't really distinguish Act od God and 3rd parties damages. Exceptionals circumstaces are events of cause beyond control: acts of war, riots, plunders, sabotages, attacks or criminal attacks; damages as fires, explosions or fall of planes; natural disasters preview by laws; atmosferic phenomena (e.g. frost, sticking snow, storm) as soon as at the time of the same day and for the same cause, at least 100.000 cutomers supplied with the public network; strikes; outages for reasons of defence or public safety; sudden, fortuitous and simultaneous unavailability several generation stations.	DNO may make a claim to the regulator to have their performance adjusted for events they believe were exceptional and had a material and adverse impact on performance. The regulator then determines whether the event was exceptional and the extent of any adjustment taking into account whether the company to all reasonable steps to restore customers in an effective manner.	Acts of God are considered the following situations: intervention by the authorities, exceptional natural events for which the competent Authority has been declared the emergency state or natural events (for example earthquake), strikes, etc.	Weather external factors, major storms, unknown.	Weather influences		"Fortuitous or force majeure cases" considers the following situations: intervention by the authorities, war, public order, altercation, fire, earthquake, flooding, gale, direct lightning strikes, misdeeds, duly proven third party intervention, strikes, as well as any other comparable cases of an unforeseeable or compelling nature.	For example: the atmospheric phenomena that are deemed usual or normal in each geographical area in accordance with the statistical data available.
3rd parties damages:	Careless timbering, Digging, other action by 3rd party, disorderly conduct.		Companies are not required to report interruptions caused by third-party damage as a separate category.	3rd parties damages: Damages to networks by third parties, interruptions due to customers, thefts, fires, etc.	Damage to networks by 3rd parties, such as cable dig-ins etc.	Digging activities		Not defined.	These are due to the action of somebody outside of the distribution company. For example: acts of vandalism, digger.

TABLE 3.1 UNPLANNED INTERRUPTIONS

MINUTES LOST PER CUSTOMER PER YEAR (1999 - 2001)

	1999	2000	2001
Finland (1)	188	161	199
France	55	46	59
Great Britain	69.76	62.7	77.8
Italy	228.25	209.2	171.09
Ireland	254	256	197
The Netherlands	26	27	34
Norway	186	234	234
Portugal	n.a.	n.a.	530.74
Spain	n.a.	n.a.	179.4

n. a. = not available

TABLE 3.2 UNPLANNED INTERRUPTIONS

NUMBER OF INTERRUPTIONS PER CUSTOMER PER YEAR (1999 - 2001)

	1999	2000	2001
Finland (1)	3.3	4.2	4.69
France	1.22	1.2	1.2
Great Britain	0.729	0.775	0.806
Italy	4.21	3.81	3.46
Ireland	1.13	1.54	1.35
The Netherlands	0.44	0.41	0.67
Norway	2.5	2.7	3
Portugal	n.a.	n.a.	7.51
Spain	n.a.	n.a.	3.3

n. a. = not available

(1) To allow fair comparison with previous years, continuity data for Finland in year 2001 presented in these tables are net of estimated effects of two very serious and rare storms (Pyry and Janika) that occurred in Finland in year 2001.

TABLE 3.3 UNPLANNED INTERRUPTIONS

DENSITY LEVEL ANALYSIS - MINUTES LOST PER CUSTOMER PER YEAR (1999 - 2001)

	Urban	Semi-urban	Rural
Finland (1)	73	140	509
France	26	53	93
Great Britain	n.a.	n.a.	n.a.
Italy	79.63	188.39	249.92
Ireland	118	n.a.	233
The Netherlands	n.a.	n.a.	n.a.
Norway	n.a.	n.a.	n.a.
Portugal	154.98	256.19	637.53
Spain	n.a.	n.a.	n.a.

n. a. = not available

TABLE 3.4 UNPLANNED INTERRUPTIONS

DENSITY LEVEL ANALYSIS - NUMBER OF INTERRUPTIONS PER CUSTOMER PER YEAR (1999 - 2001)

	Urban	Semi-urban	Rural
Finland (1)	1.2	2.3	7.6
France	0.99	1.28	1.34
Great Britain	n.a.	n.a.	n.a.
Italy	1.93	3.5	5.18
Ireland	0.88	n.a.	1.55
The Netherlands	n.a.	n.a.	n.a.
Norway	n.a.	n.a.	n.a.
Portugal	2.53	4.41	8.43
Spain	n.a.	n.a.	n.a.

n. a. = not available

TABLE 3.5 UNPLANNED INTERRUPTIONS

RESPONSIBILITY ANALYSIS - MINUTES LOST PER CUSTOMER PER YEAR (1999 - 2001)

	Acts of God	3rd parties damages	Any other causes
Finland (2)	347	74	35
France	14	9	36
Great Britain	n.a.	n.a.	n.a.
Italy	11.53	37.52	122.04
Ireland	116.01	14.9	66
The Netherlands	0.9	8.1	25.1
Norway	n.a.	n.a.	n.a.
Portugal	117.88	n.a.	412.86
Spain	40.2	26.4	112.8

n. a. = not available

TABLE 3.6 UNPLANNED INTERRUPTIONS

RESPONSIBILITY ANALYSIS - NUMBER OF INTERRUPTIONS PER CUSTOMER PER YEAR (1999 - 2001)

	Acts of God	3rd parties damages	Any other causes
Finland (2)	4.25	0.91	1.42
France	0.02	0.3	0.88
Great Britain	n.a.	n.a.	n.a.
Italy	0.11	0.63	2.72
Ireland	n.a.	n.a.	n.a.
The Netherlands	0.039	0.112	0.518
Norway	n.a.	n.a.	n.a.
Portugal	1.61	n.a.	n.a.
Spain	0.37	0.49	2.44

n. a. = not available

(2) Continuity data for Finland in year 2001 presented in these tables include all interruptions, even due two very serious and rare storms (Pyry and Janika) that occurred in Finland in year 2001.

TABLE 3.7 UNPLANNED INTERRUPTIONS

VOLTAGE LEVEL ANALYSIS - MINUTES LOST PER CUSTOMER PER YEAR (2001)

	Generation, transmission & HV networks	Distribution MV networks	Distribution LV networks
Finland (2)	n.a.	456	n.a.
France	3	48	8
Great Britain	5.5	57.47	14.17
Italy	10.2	139.53	21.3
Ireland	n.a.	153	44
The Netherlands	8.7	20.9	4.6
Norway	29	205	n.a.
Portugal	n.a.	n.a.	n.a.
Spain	n.a.	n.a.	n.a.

n. a. = not available

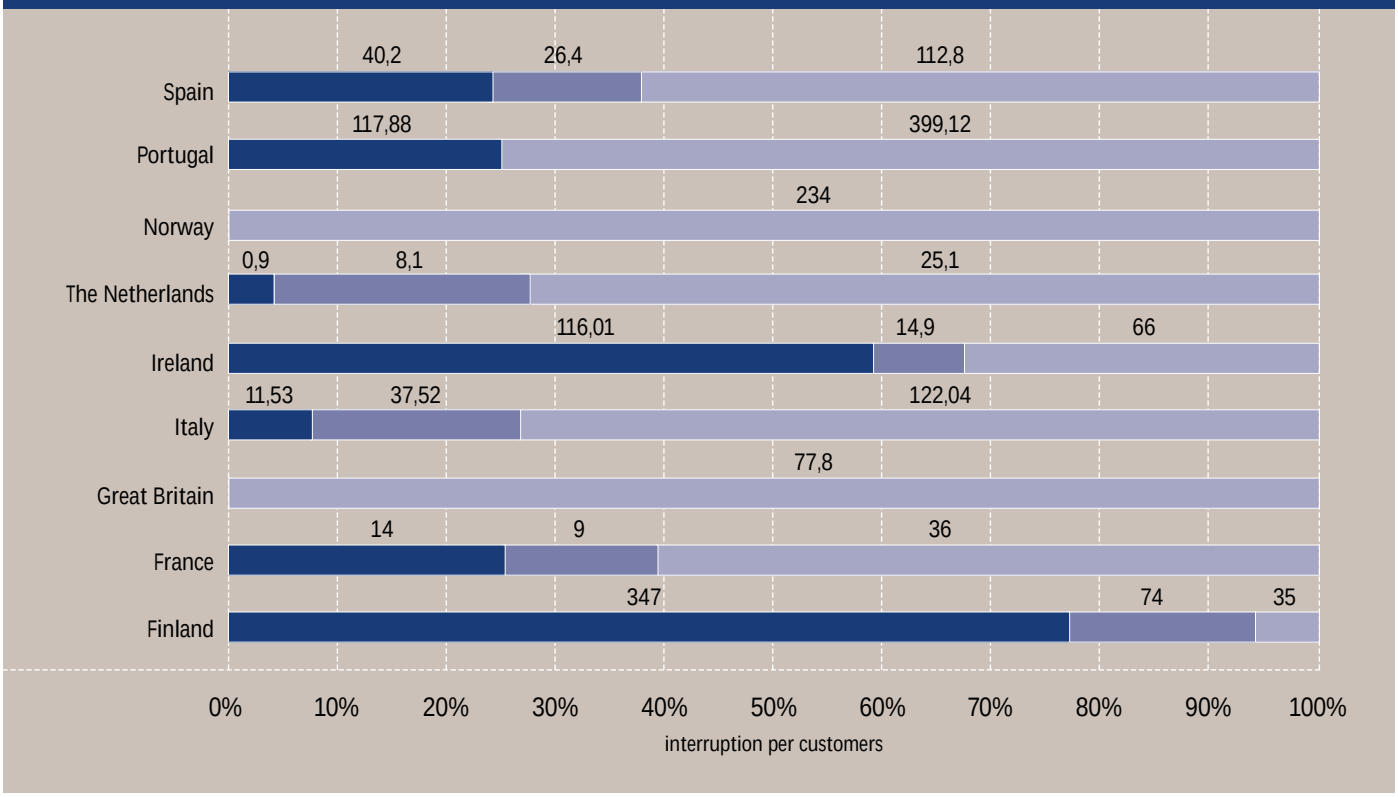
TABLE 3.8 UNPLANNED INTERRUPTIONS

VOLTAGE LEVEL ANALYSIS - NUMBER OF INTERRUPTIONS PER CUSTOMER PER YEAR (2001)

	Generation, transmission & HV networks	Distribution MV networks	Distribution LV networks
Finland (2)	n.a.	6.55	n.a.
France	n.a.	1.02	0.03
Great Britain	0.12	0.56	0.06
Italy	0.32	2.97	0.16
Ireland	n.a.	1.1	0.25
The Netherlands	0.416	0.229	0.024
Norway	0.5	2.5	n.a.
Portugal	n.a.	n.a.	n.a.
Spain	n.a.	n.a.	n.a.

n. a. = not available

FIG. A – UNPLANNED (UNNOTICED) INTERRUPTIONS - RESPONSIBILITY ANALYSIS
MINUTES LOST PER CUSTOMER PER YEAR (2001)



Acts of God

3rd parties damages

Any other causes or splitting not available

FIG. B – UNPLANNED (UNNOTICED) INTERRUPTIONS - RESPONSIBILITY ANALYSIS
INTERRUPTIONS PER CUSTOMER PER YEAR (2001)

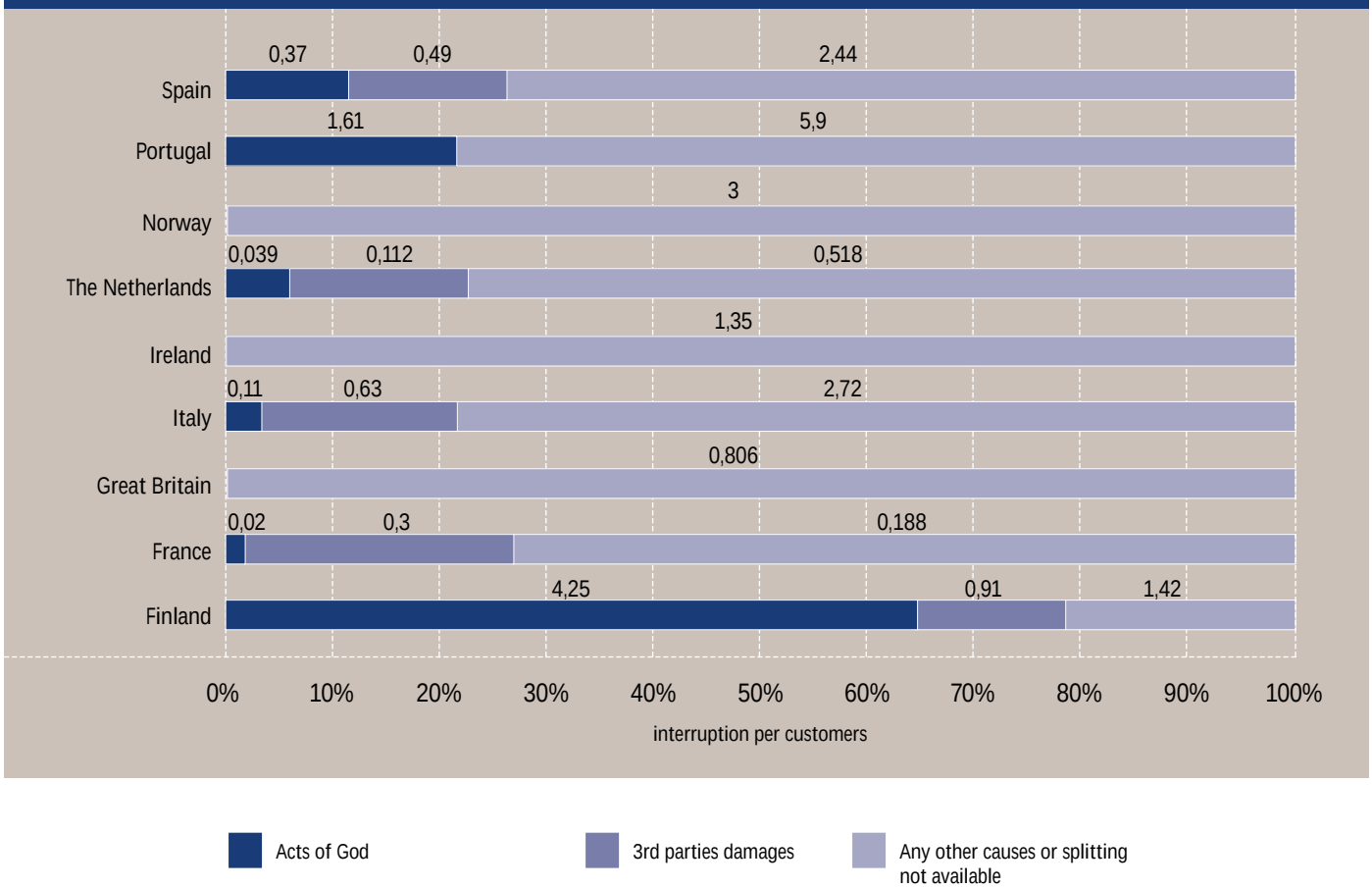


TABLE 3.9 – UNPLANNED REGIONAL DATA (2001)

COUNTRY	REGIONS	MINUTES LOST PER CUSTUMER	NUMBER OF INTERRUPT. PER CUST.	DISTRIBUTED ENERGY AT MV & LV (TWH)	LENGTH OF MV CIRCUITS (KM)	NUMBER OF LV USERS (MILLIONS)	AREA (KM²)
GB	London Power Networks	43.00	0.40	24.193	9,073	2.07	665
NOR	Oslo (County in the south-east of Norway)	47.00	0.70	9.2	3,552	0.507	454
GB	Manweb	55.00	0.53	14.497	19,421	1.44	12,200
GB	Yorkshire Electricity Distribution	56.00	0.70	22.274	20,509	2.07	10,700
E	País Vasco	56.40	0.92	n.a.	11,078	1.049	7,234
E	Navarra	59.40	1.16	n.a.	15,266	0.283	10,391
GB	NORWEB (Now United Utilities)	60.00	0.54	23.575	19,239	2.26	12,500
I	Friuli - Venezia Giulia	62.74	1.66	5.23	7,187	0.7	7,844
GB	Eastern Electricity	66.00	0.69	32.7	36,354	3.35	20,300
E	La Rioja	66.00	1.5	n.a.	1,264	0.178	5,045
GB	Southern Electric Power Distribution	69.00	0.74	29.37	27,500	2.69	16,900
GB	Western Power Distribution (South West)	70.00	0.87	14.245	17,179	0.99	14,400
GB	SEEBOARD Energy	75.00	0.89	19.054	16,555	2.15	8,200
FIN	Lappland (northern part of Finland)	81.00	2.20	n.a.	10,937	n.a.	93,004
I	Valle D'Aosta	84.13	1.80	0.55	1,268	0.11	3,264
I	Liguria	89.08	2.46	4.89	6,565	1.21	5,420
I	Lombardia	89.86	1.79	44.22	35,446	5.07	23,872
I	Umbria	90.61	2.26	2.88	7,622	0.48	8,456
E	Asturias	91.20	1.37	n.a.	9,015	0.589	10,604
E	Madrid	92.40	2.66	n.a.	33,641	2.531	8,028
I	Marche	102.17	2.46	5.26	10,289	0.82	9,694
GB	Northern Electric Distribution Limited	110.00	0.98	14.089	20,098	1.50	14,400
GB	Scottish Hydro-Electric Power Distribution	111.00	1.32	n.a.	25,239	0.66	54,390
GB	East Midlands Electricity Distribution	112.00	0.91	27.093	26,736	2.42	16,000
E	Cantabria	112.20	2.37	n.a.	6,551	0.311	5,321
E	Aragón	112.20	2.5	n.a.	9,214	0.737	47,720
I	Trentino Alto Adige	113.25	3.36	2.47	5,362	0.33	13,607
E	Castilla-León	115.20	2.42	n.a.	20,893	0.165	94,223
I	Veneto	115.32	2.69	21.38	23,529	2.49	18,364
I	Emilia-Romagna	115.34	2.09	20.06	27,752	2.51	22,123
I	Piemonte	118.81	2.58	17.71	27,096	2.72	25,399

continued

TABLE 3.9 – (CONTINUE) UNPLANNED REGIONAL DATA (2001)

COUNTRY	REGIONS	MINUTES LOST PER CUSTUMER	NUMBER OF INTERRUPT. PER CUST.	DISTRIBUTED ENERGY AT MV & LV (TWH)	LENGTH OF MV CIRCUITS (KM)	NUMBER OF LV USERS (MILLIONS)	AREA (KM^2)
I	Toscana	119.51	3.30	14.58	23,982	2.19	22,993
GB	Western Power Distribution (South Wales)	123.00	1.58	9.357	23,486	1.36	14,400
IRL	Dublin	133	0.93	n.a.	3,911	0.463853	n.a.
UK	GPU Power Networks (Now Aquila)	143.00	1.48	26.073	26,222	2.26	13,300
I	Lazio	143.02	3.44	17.12	26,766	3.11	17,227
E	C. Valenciana	145.80	3.78	n.a.	26,742	2.603	23,255
GB	SP Distribution	152.00	0.92	n.a.	32,059	1.91	22,950
I	Molise	161.88	4.02	1.04	3,480	0.2	4,438
E	Canarias	171.60	4.4	n.a.	8,827	0.825	7,242
E	Murcia	176.40	3.84	n.a.	4,344	0.597	11,313
I	Abruzzo	180.50	3.39	4.49	9,115	0.78	10,795
E	Cast-La Mancha	186.60	4.08	n.a.	27,081	1.054	79.463
E	Extremadura	202.80	4.54	n.a.	6,777	0.555	41,634
I	Mid-western	205	1.52	n.a.	25,478	0.368593	n.a.
E	Andalucía	215.40	3.78	n.a.	38,686	3.621	87,597
I	Northern	229	1.65	n.a.	26,538	0.362114	n.a.
E	Cataluña	229.80	3.54	n.a.	55,466	3.705	32,114
I	Campania	235.91	4.92	12.85	21,647	2.63	13,595
IRL	Southern	238	1.40	n.a.	24,410	0.391795	n.a.
P	Grande Porto	252.83	2.92	n.a.	9,181	0.592	735
I	Puglia	258.31	3.62	9.41	24,889	2.2	19,362
NOR	Akershus (County in the south-east of Norway)	270.00	2.40	7.1	5,677	0.47	4,916
P	Península de Setúbal	271.78	6.11	n.a.	5,200	0.407	1,519
P	Grande Lisboa	276.8	3.42	n.a.	7,212	0.82	567
P	Algarve	284.4	5.7	n.a.	8,871	0.318	4,990
FIN	Coast	307	2.60	n.a.	37,008	n.a.	n.a.
E	Galicia	310.20	5.12	n.a.	29,597	1.444	29,574
I	Sicilia	311.48	5.80	11.7	33,216	2.82	25,707
NOR	Finnmark (County in the north of Norway)	327.00	3.50	1.4	3,488	0.074	48,649
I	Calabria	327.05	8.19	4.18	15,219	1.19	15,080
P	Beira interior	378.17	8.09	n.a.	8,234	0.269	11,463

continued

TABLE 3.9 – (CONTINUE) UNPLANNED REGIONAL DATA (2001)

COUNTRY	REGIONS	MINUTES LOST PER CUSTUMER	NUMBER OF INTERRUPT. PER CUST.	DISTRIBUTED ENERGY AT MV & LV (TWH)	LENGTH OF MV CIRCUITS (KM)	NUMBER OF LV USERS (MILLIONS)	AREA (KM²)
I	Basilicata	435.03	4.91	1.82	8,831	0.34	9,992
P	Trás-os-Montes	440.29	8.34	n.a.	8,980	0.27	11,383
I	Sardegna	486.32	7.37	4.75	14,230	0.94	24,090
FIN	Inland	506	9.30	n.a.	59,226	n.a.	n.a.
P	Ave-Sousa	507.2	8.18	n.a.	8,124	0.392	3,155
E	Baleares	576.00	4.19	n.a.	8,122	0.533	4,992
P	Alentejo	667.91	10.24	n.a.	7,827	0.227	21,159
P	Minho	685.64	7.36	n.a.	10,491	0.373	3,887
P	Oeste	699.49	9.22	n.a.	3,972	0.347	1,938
P	Litoral Centro	721.21	9.34	n.a.	7,692	0.299	3,833
P	Coimbra	782.3	10.78	n.a.	8,685	0.349	6,121
P	Vale do Tejo	921.19	14.33	n.a.	7,915	0.278	11,987
P	Beira Litoral	1001.24	11.65	n.a.	11,922	0.452	6,072

TABLE 4.1 PLANNED INTERRUPTIONS

MINUTES LOST PER CUSTOMER PER YEAR (1999 - 2001)

	1999	2000	2001
Finland	103	38	32
France	4	6	6
Italy	n.a.	126.57	127.4
Great Britain	10.95	8.1	8.12
Ireland	170	172	188
The Netherlands	n.a.	n.a.	n.a.
Norway	109	106	70
Portugal	n.a.	n.a.	57.37
Spain	n.a.	n.a.	36.6

n. a. = not available

TABLE 4.2 PLANNED INTERRUPTIONS

NUMBER OF INTERRUPTIONS PER CUSTOMER PER YEAR (1999 - 2001)

	1999	2000	2001
Finland	1.8	1.3	0.6
France	0.03	0.04	0.04
Italy	n.a.	0.83	0.79
Great Britain	0.05	0.04	0.04
Ireland	0.46	0.44	0.51
The Netherlands	n.a.	n.a.	n.a.
Norway	0.64	0.63	0.52
Portugal	n.a.	n.a.	0.32
Spain	n.a.	n.a.	0.42

n. a. = not available

TABLE 4.3 PLANNED INTERRUPTIONS

DENSITY LEVEL ANALYSIS - MINUTES LOST PER CUSTOMER PER YEAR (2001)

	Urban	Semi-urban	Rural
Finland	34	7	14
Great Britain	n.a.	n.a.	n.a.
Italy	28.94	144.19	215.84
Ireland	23	n.a.	261
The Netherlands	n.a.	n.a.	n.a.
Norway	n.a.	n.a.	n.a.
Portugal	n.a.	n.a.	n.a.
Spain	n.a.	n.a.	n.a.

n. a. = not available

TABLE 4.4 PLANNED INTERRUPTIONS

DENSITY LEVEL ANALYSIS - NUMBER OF INTERRUPTIONS PER CUSTOMER PER YEAR (2001)

	Urban	Semi-urban	Rural
Finland	0.1	0.1	0.6
Great Britain	n.a.	n.a.	n.a.
Italy	0.29	0.84	1.36
Ireland	0.06	n.a.	0.72
The Netherlands	n.a.	n.a.	n.a.
Norway	n.a.	n.a.	n.a.
Portugal	n.a.	n.a.	n.a.
Spain	n.a.	n.a.	n.a.

n. a. = not available

TABLE 4.5 PLANNED INTERRUPTIONS

RESPONSIBILITY ANALYSIS - MINUTES LOST PER CUSTOMER PER YEAR (2001)

	Acts of God	3rd parties damages	utility responsibility
Finland	n.a.	n.a.	n.a.
France	n.a.	n.a.	6
Italy	0.1	1.5	125.75
Ireland	n.a.	n.a.	188
The Netherlands	n.a.	n.a.	n.a.
Norway	n.a.	n.a.	n.a.
Portugal	n.a.	n.a.	n.a.
Spain	n.a.	n.a.	n.a.

n. a. = not available

TABLE 4.6 PLANNED INTERRUPTIONS

DENSITY LEVEL ANALYSIS - NUMBER OF INTERRUPTIONS PER CUSTOMER PER YEAR (2001)

	Acts of God	3rd parties damages	utility responsibility
Finland	n.a.	n.a.	n.a.
France	n.a.	n.a.	0.04
Italy	n.a.	0.01	0.78
Ireland	n.a.	n.a.	0.51
The Netherlands	n.a.	n.a.	n.a.
Norway	n.a.	n.a.	n.a.
Portugal	n.a.	n.a.	n.a.
Spain	n.a.	n.a.	n.a.

n. a. = not available

TABLE 4.7 PLANNED INTERRUPTIONS

VOLTAGE LEVEL ANALYSIS - MINUTES LOST PER CUSTOMER PER YEAR (2001)

	Generation, transmission & HV networks	Distribution MV networks	Distribution LV networks
Finland	n.a.	32	n.a.
Great Britain	n.a.	n.a.	n.a.
Italy	0.07	110.99	16.33
Ireland	n.a.	179.6	8.4
The Netherlands	n.a.	n.a.	n.a.
Norway	8	62	n.a.
Portugal	n.a.	n.a.	57.37
Spain	n.a.	n.a.	n.a.

n. a. = not available

TABLE 4.8 PLANNED INTERRUPTIONS

VOLTAGE LEVEL ANALYSIS - NUMBER OF INTERRUPTIONS PER CUSTOMER PER YEAR (2001)

	Generation, transmission & HV networks	Distribution MV networks	Distribution LV networks
Finland	n.a.	0.6	n.a.
Great Britain	n.a.	n.a.	n.a.
Italy	n.a.	0.63	0.16
Ireland	n.a.	0.49	0.02
The Netherlands	n.a.	n.a.	n.a.
Norway	0.05	0.47	n.a.
Portugal	n.a.	n.a.	0.32
Spain	n.a.	n.a.	n.a.

n. a. = not available

5.1 CASE EXAMPLE - ITALY

Quality can be measured only by companies. The regulatory authority determines the measurement rules and checks measurement procedures by means of sample inspections. Quality certification according to the Iso 9000 scheme is a useful device with which to introduce quality management procedures and systems, but it may not be enough *per se* to ensure the regular assessment of quality indicators.

Because the data on continuity levels are provided by utilities, the Italian Regulatory Authority (AEEG) checks that interruptions are recorded in a complete and satisfactory manner, according to the measurement rules defined by AEEG itself.

AEEG recognizes that some interruption events are out of the control of distribution utilities. For this reason, a system has been developed to separate responsibilities of the distribution utilities:

- as regards measurement of continuity, the distributors can label interruptions as attributable to force majeure (acts of God) or to users' or third parties' acts; in this case the distributor must provide documentation of the cause of interruption;
- as regards regulation, interruptions due to acts of God or to users' or third parties' acts are excluded by the system of penalties and incentives; furthermore, a 2-year rolling average has been adopted to avoid meteorological volatility of continuity data and a +/- 5% deadband is assumed to sterilise little variations;
- as regards control, during the audits special attentions is devoted by the regulator to verify the documentation of interruptions that have been excluded by the distributor labelled as "force majeure" or "acts of users or third parties"; a correctness index has been devised to check this aspect and, should the distributor abuse of the two clauses that exclude interruptions from economic regulation, a presumed value of continuity would be calculated by the regulator and sanction can apply.

The whole Italian territory has been divided in about 300 district in order to regulate continuity separately in each district. Audits are carried out by internal personnel on a randomly selected sample of districts. In each sampled district AEEG inspectors examine a sample of interruptions to determine whether they have been exactly recorded, both automatically and manually, and that continuity indicators have been adequately calculated, in compliance with measurement rules defined by the Authority (see attached synthesis).

Each interruption must be recorded both automatically (by the SCADA system) and manually (for restoring operations). For transient and short interruptions a 2 years delay has been allowed to implement the automatic recording system. The automatic recording of interruptions on HV-MV networks is a specific requirement put on distribution networks operators by the AEEG. To ensure the trackability of data provided by the utilities, high and medium voltage lines shall be subject

to a remote control system able to detect and record every interruption event occurring at these voltage levels. A similar requirement has not been applied to the low voltage network, because of the high costs involved, and because interruptions originating in the low voltage network have an average effect on the continuity indicators, which is about 10% of the total.

During the audits, particular attention is devoted to verify that:

- All the interruption events are recorded and that manual recording is consistent with automatic recording via SCADA system (accuracy);
- The continuity indicator deriving from the sampled interruptions is sufficiently close to the declared indicator for the same interruptions (precision);
- The causes of the interruptions are correctly attributed and documented, especially for the clauses of measurement rule that allow to exclude interruptions from regulation when they are caused by acts of God or by users and third party damages (correctness).

The AEEG has defined three indexes to evaluate these controls, based on the figures referred to the interruptions sampled during the audit:

- An accuracy index, which measures whether all events have been recorded; a conventional scale has been defined to measure accuracy in recording interruptions, that fixes the weight of the worst case (interruption not recorded) equal to 1, and therefore the weights of some other cases, less severe, between 0.5 and 0.01. Should all the interruptions sampled result non recorded, the accuracy index assumes value equal to 0; on the contrary, in the case all the interruption sampled are accurately recorded, the index is equal to 100%.
- A precision index, that measures the approximation of customer minutes lost; the index compares the continuity indicator deriving from the sampled interruptions with the declared continuity indicator for the same interruptions. The index can assume positive or negative value because errors in customer minutes lost can be compensated; if the indicator is equal to 0, it means that the precision of declared indicator is absolute.
- A correctness index, which refers only to interruptions excluded from the regulation because they have been labelled by the utility as caused by acts of God or by users and third party actions. The correctness index aim to verify that documentation for excluding these interruptions from regulation is fair enough to avoid abuse.

An audit may last of one or two days and is conducted in site at the SCADA operating centre (generally, one SCADA operating centre is related to more than one district). The interruptions audited are both randomly sampled and strategically selected. Generally, about 10% of the total number of HV-MV interruption events is verified during an audit. The audit is concluded with a report that can be obtained by the relevant utility on request.

Audits results are used to validate or not data provided by the distributors. The following thresholds have been set:

- At least 90% of accuracy is required;
- A maximum +/- 3% of approximation is allowed;
- The correctness index shall assume values that assure that the incorrectly excluded interruptions do not overpass the 3% (in customer minutes lost) of declared indicator used for regulation.

Should one of the three conditions be not respected, the continuity data declared by the distributor are considered not valid, and are substituted with a "presumed value" calculated by the AEEG on the base of the audit results. In particular, the presumed value is equal to:

$$A_{pres} = \frac{A+Bx(1-IC)}{(1-IP)}$$

where:

- A_{pres} is the presumed value for the regulated indicator (CML, net of excluded interruptions);
- A is the declared value for the regulated indicator;
- B is the declared value of CML referred to excluded interruptions;
- IC is the index of correctness;
- IP is the index of precision.

As a sanction, when the presumed value must be calculated, the distribution utility can not gain in the relevant district, neither when the actual presumed value is better than the relevant standard. Furthermore, if the data submitted are false, AEEG is empowered by law to impose a financial sanction upon the distribution utilities. This has actually happened in May 2001 for Enel, after a proceeding that has recognised Enel submitted false data for continuity levels in 3 Southern regions (about 6 millions LV users).

RECORDING AND MEASUREMENT OF THE INTERRUPTIONS OF SUPPLY.

Synthesis of rule n. 128/99 of the Italian Regulatory Authority for Electricity and Gas

Types of interruptions

Interruptions: actual voltage < 1% of the nominal voltage

- Interruptions with notice (generally 1 day in advance)
- Interruptions without notice:
  - long (duration > 3 minutes[1])
  - short (duration < 3 minutes and > 1 second)
  - transient (duration < 1 second)

1 Consistent with technical standard EN 50160

Classification of interruptions' causes

(*applicable to interruptions without notice, both long and short*)

- force majeure:
  - acts of public authorities
  - natural disasters
  - severe weather conditions only if design requirements are overpassed
- external causes:
  - damages by third parties
  - interruptions caused by users
  - loss of supply from national transmission grid
  - loss of supply from other distributors
- causes attributable to the distributor
  - all other causes not indicated in "force majeure" or external causes

Classification of interruptions' origins

(*applicable to all interruptions*)

- national transmission grid
- HV network (> 35 kV)
- MV network (> 1 kV and < 35 kV; includes also HV/MV transformers if the fault does not cause the interruption in the HV line)
- LV network (< 1 kV; includes also MV/LV transformers if the fault does not cause the interruption in the MV line)

Classifications of areas

(*applicable to all MV and LV users*)

- Urban ("high density") areas: territory of municipalities with more than 50,000 inhabitants
- Sub-urban ("medium density") areas: territory of municipalities with more than 5,000 and less than 50,000 inhabitants
- Rural ("low density") areas: territory of municipalities with less than 5,000 inhabitants
- Only for municipalities with more than 50,000 inhab., providers can ask the Authority for a reclassification of rural and sparse areas inside the same municipality (about 90 cities partly reclassified)

Required devices for automatic recording of interruptions without notice

- Remote control device on every HV and MV line
- Alternatively, an appropriate recorder on every HV and MV line
- Distributor may ask the Authority for a reasonable time to install devices (3 years for remote control device, 1 year for quality recorders)

- No automatic recording is required on the LV network; interruption originated on the LV network are recorded only through the reports of the operators

Required records of interruptions

For each type of interruption, the distributor must record the following items:

- Interruptions with notice
  - origin of the interruption
  - notice procedure
  - start (day-hour-minute)
  - list of HV users affected and duration for each HV user affected
  - list of MV users affected per area and duration for each MV user affected
  - number of LV users affected per area (estimate; see below)
  - duration for each LV group of users affected by the same duration of interruption, per area
  - finish (day-hour-minute for the last LV user affected)
- Interruptions without notice, long (duration > 3min):
  - origin of the interruption
  - cause of the interruption
  - start (day-hour-minute)
  - list of HV users affected and duration for each HV user affected
  - list of MV users affected per area and duration for each MV user affected
  - number of LV users affected (estimate; see below)
  - duration for each LV group of users affected by the same duration of interruption
  - finish (day-hour-minute for the last LV user affected)
- Interruptions without notice, short (duration < 3min and > 1sec):
  - origin of the interruption
  - cause of the interruption
  - start (day-hour-minute)
  - list of HV users affected
  - list of MV users affected per area (estimate; see below)
  - number of LV users affected per area (see below)
  - finish (day-hour-minute for the last LV user affected)
- Interruptions without notice, transient (duration <1sec):
  - origin of the interruption
  - start (day-hour-minute)
  - list of HV users affected
  - list of MV users affected per area (estimate; see below)
  - finish (day-hour-minute for the last LV user affected)

Estimate of the number of LV users affected

For interruption with or without notice, long:

- Interruptions with origin in the HV or MV network
  - Number of LV users affected = number of MV/LV transformer affected multiplied by the ratio LV users per MV/LV transformer (calculated at municipality level, taking account of different areas)
- Interruptions with origin in the LV network
  - Number of LV users affected = number of LV lines affected multiplied by the ratio LV users per LV line (calculated at municipality level, taking account of different areas)

Estimate of the number of MV users affected

For interruption without notice short or transient:

- Standard network configuration

Continuity overall indicators for LV and MV users

For both interruptions with and without notice, long

- Average number of interruptions per user (weighted on the number of users)
  - Separately per MV and LV users
  - Separately per provinces
  - Separately per origins and per causes
  - Separately per areas
- Cumulative duration of interruptions per user (weighted on the number of users)
  - Separately per MV and LV users
  - Separately per provinces
  - Separately per origins and per causes
  - Separately per areas

For interruptions without notice, both short and transient

- Average number of interruptions per user (weighted on the number of users)
  - Separately per MV and LV users
  - Separately per provinces
  - Separately per origins and, only for short interruptions, per causes
  - Separately per areas

Continuity individual indicators for MV and HV users

- Number of interruptions for each single user
- Duration of every interruptions for each single user (only for interruptions with or without notice, long)

Audits

- Distributors provide Authority the continuity indicators and must assure the traceability of every interruption record used in the calculation
- Authority audits on field the data provided by distributors
- Audits take place sampling some interruption events and verifying:
  - the actual implementation of procedures for recording interruptions
  - the completeness of required documentation for each interruption
  - the right calculation of the continuity indicators
- In case of mistakes, distributors are prosecuted and can be sentenced to pay a fine

5.2 CASE EXAMPLE - GREAT BRITAIN

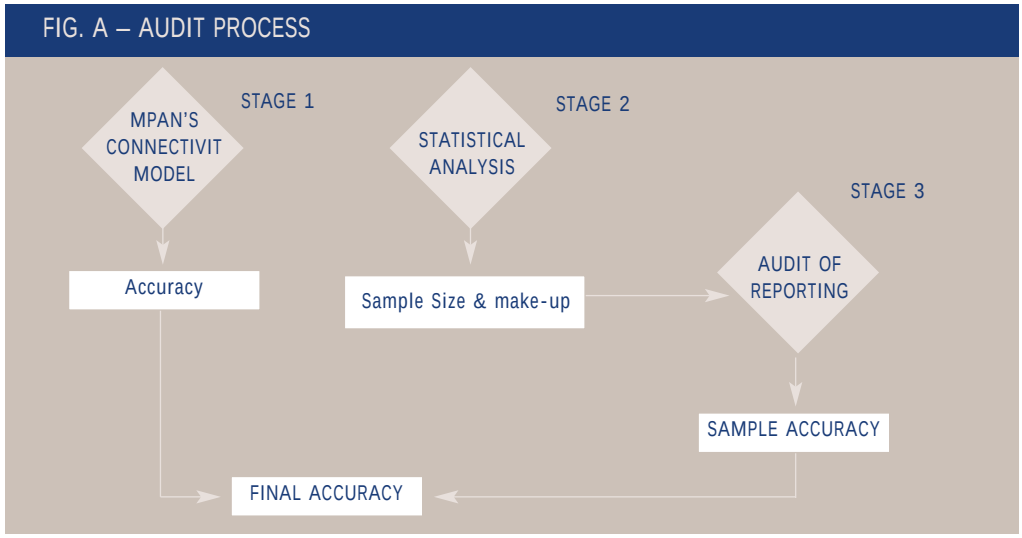
General reporting requirements

Ofgem has introduced standard definitions and guidance and minimum levels of accuracy that Distribution Network Operators (DNOs) must meet for reporting quality of supply. These are set out in the Regulatory Instructions and Guidance (RIGs), a document first published by Ofgem in February 2001. The number and duration of interruptions must be measured to a level of accuracy of at least 90 per cent at low voltage and at least 95 per cent for the overall network. (This includes higher and low voltage interruptions). In order for Ofgem to be satisfied that the DNOs are complying with the definitions and accuracy levels it has introduced an annual audit of measurement systems and incident reporting.

Audit process

Ofgem, together with its consortium of audit consultants (Mott MacDonald, British Power International and ERA Technology) have developed a framework for auditing quality of service information provided by the DNOs. The audits are carried out by Ofgem's consultants and involve a three-stage process illustrated in Figure A below.

FIG. A – AUDIT PROCESS



Stage 1: Audit of measurement systems

The first stage of the audit process focuses on assessing the accuracy of DNOs' measurement systems by looking at the way in which DNOs have counted customers in their connectivity models and the underlying assumptions that DNOs have used, for example on linking customer information to their network models.

Stage 2: Statistical analysis

DNOs experience on average 2,000 to 3,000 incidents a year on their higher voltage systems and 10,000 to 15,000 incidents a year on their low voltage systems. The second stage of the audit involves using statistical sampling techniques to determine a representative sample of incidents to use in the final stage of the audit.

The first step in the statistical analysis is to determine the statistical distribution that best describes the population of incidents. Once this has been established, the sample size is determined for a given confidence level. Further analysis of the data is then undertaken to stratify the sample. This is necessary to help ensure that the sample chosen for each DNO is representative and takes into consideration factors outside the DNO's control that may have a significant impact on the accuracy of reporting.

Stage 3: Audit of incident reporting

Stage 3 of the audit involves a visit to each of the companies and a detailed examination of each of the incidents in the sample. This involves an assessment of whether:

- the number of customers affected by each incident as reported by the DNO corresponds to the numbers that the DNOs' latest measurement systems identify;
- each incident has been captured by the measurement systems by looking at customer and incident reports and by checking that logged network events relate to the relevant incident reports;
- and incident start times, restoration stages, new incidents and re-interruptions are logged correctly, and in accordance with the regulatory definitions.

At the end of this stage, the accuracy of the samples is calculated and combined with the accuracy resulting from Stage 1 to find the final accuracy of reporting[2]. The methodology for combining the accuracy levels to determine the final accuracy is still under development and needs to be finalised prior to completion of the 2003 audits.

A more detailed explanation of the audit process and the audit results for the 2001/2 reporting year can be found on Ofgem's website at:

http://www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/2249_dno.pdf

2 As most DNOs were in the process of introducing measurement systems during 2001/02 the stage 1 and stage 3 accuracies have not been combined for that year. This is because some of the data will have been reported using the old measurement systems and therefore stage 3 of the audit will have picked up inaccuracies in the old measurement systems as well as other reporting errors.

5.3 CASE EXAMPLE - PORTUGAL

According to the Quality of Service Code distributors are obliged to collect and register all the information necessary to verify the Code fulfilment.

Each quarter distributors must send to the regulator information about continuity and voltage quality indicators defined in the Quality of Service Code.

Information about quality of service should be maintained available during, at least, a period of 5 years.

Distributors are obliged to perform internal audits covering the following fields:

- Information collection systems
- Information register procedures
- Methods and criteria utilised to calculate quality of service indicators.

Internal audits should be performed by distributors with a maximum interval time of two years. Distributor must send the results of internal audits to the regulator with a maximum delay of one month after their conclusion.

5.4 CASE EXAMPLE - NORWAY

Norwegian Water Resources and Energy Directorate (NVE) has set the rules for the mandatory reporting of interruption data and cost of energy not supplied in the secondary legislastion to the energy act. In this legislation there is a reference to the FASIT-requirement specification (software specification). FASIT is the fault and interruption collection tool owned by The Electricity Association (EBL). FASIT is used to record information on faults and disconnections at all network levels in the power system. This tool can register disconnections in the network, i.e. the duration of the disconnection, disconnection costs and non-delivered energy at every individual delivery point[3] in the network. Interruption statistics for NVE and fault statistics can be generated easily. The FASIT-specification is reviewed every year by a working group with members from NVE, EBL, Statnett (the transmission system operator), Sintef Energy Research (Sintef) and 3 network companies. All the network companies in Norway have to use FASIT-software that fulfils the requirements in the specifications for the given year of reporting data. Several software companies have developed FASIT-software. Each year the software is revised and checked by Sintef.

In 1998 NVE, EBL and Statnett SF made a mutual definition pamphlet connected to registration of fault and disconnections. This pamphlet was revised in 2001 and is based on international standards:

- IEC 50(191): International Electrotechnical Vocabulary, Dependability and quality of service
- EN 13306: Maintenance terminology
- EN 50160: Voltage Characteristics Of Electricity Supplied By Public Distribution Systems

3 A delivery point is a medium or high-voltage end-user or a distribution transformer.

- IEEE Standard Terms for Reporting and Analyzing Outage Occurence and Outage States of Electrical Transmission Facilities (IEEE Std 859-1987)

Every year NVE audit the network companies reporting of interruption data in several ways:

- unannounced visits to some of the network companies (interruption data must be stored for 10 years)
- comparing data from different sources (fault statistics, annual accounts etc)
- each utility has to give NVE the name of the person responsibel for the FASIT-system in the company.

Data collected annually (by NVE):

- Long interruptions of the supply voltage (> 3 minutes)
- Incident location (> 1 kV)
- Energy not supplied (ENS) because of capacity constraints in the transmission networks.
- Key figures for each delivery point connected to the main grid, the regional grid or the distribution networks (overhead, mixed or cable networks):
  - number of interruptions,
  - interruption duration [h],
  - energy not supplied (ENS) [MWh],
  - divided in to notified and non-notified interruptions.
- ENS is reported for 26 different customer groups; households, agriculture, health and social, manufacturing of wood products, iron and steel, commodity trade, public administration, education etc.
- Incident location - voltage level
  * 1-22 kV: [1,33>
  * 33-110 kV: [33,110]
  * 132 kV: <110,150]
  * 220-300 kV: <150,350]
  * 420 kV: <350>
- Name of company responsible for the ENS – this is only network companies with revenue caps.

Data related to faults in the HV and EHV network (>35 kV) is collected annually by the TSO (mandatory reporting).

Data related to faults in the MV (and LV) network (<35 kV) is collected annually by the EBL (voluntary reporting).

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