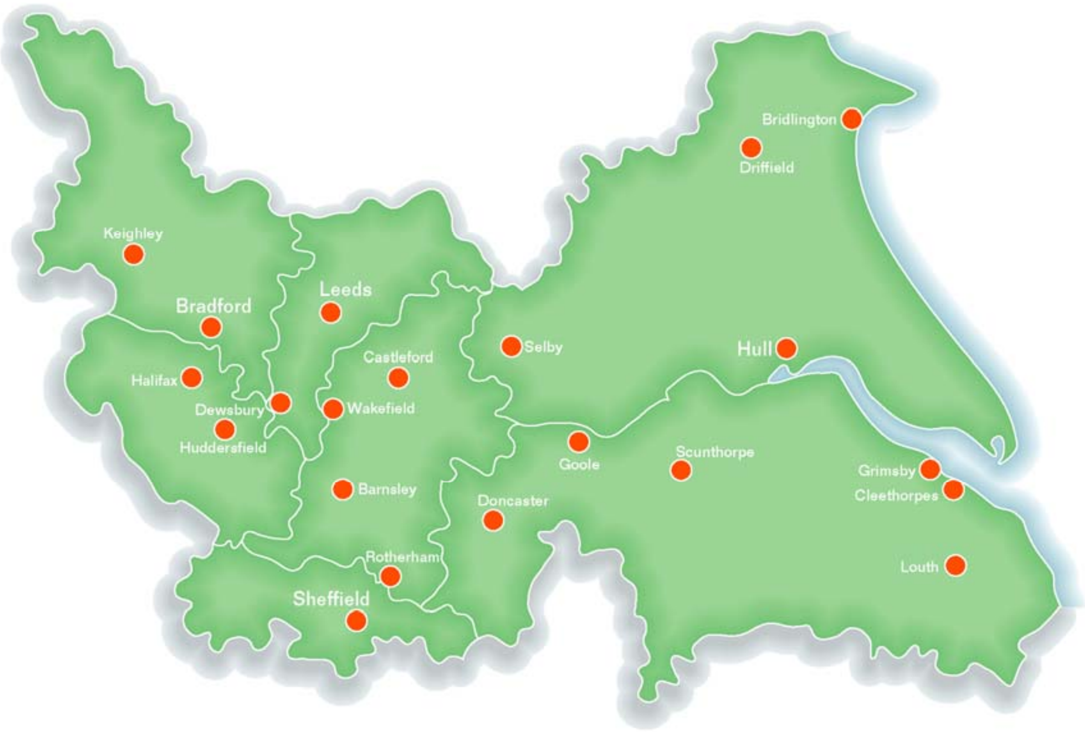


Long-term development statement

October 2009

Foreword

Although every effort has been made to ensure the accuracy of the data provided in this statement, YEDL does not accept any liability for the accuracy of the information contained herein, and in particular neither YEDL nor its directors or its employees shall be under any liability for any misstatement or opinion on which the recipient of this statement relies or seeks to rely.

Table of Contents

Introduction

1 Purpose of statement

This long-term development statement has been compiled in accordance with distribution licence standard condition 25, to assist existing and future users of YEDL's system in assessing opportunities available to them for making new or additional use of the system.

The aim of the long-term development statement is to:

- Improve the availability of information about YEDL's distribution system
- Furnish developers with sufficient information to carry out initial assessments of system capability
- Inform users of our distribution system development proposals
- Inform relevant people of the correct points of contact within YEDL for specific enquiries

This statement is revised and published by 31 October each year. Any comments on the usability, quality or content of the statement would be welcomed, along with any suggestions for future improvements. Such comments should be addressed to the long-term development statement (LTDS) co-ordinator, whose contact details are included in section 4.

2 Content of statement

The statement contains information regarding the 132kV, 66kV and 33kV systems (and the transformation to 11kV) that are owned and operated by YEDL. Whilst detailed system data is provided at these voltage levels, only generic statements on the design and operation of the 11kV and LV systems are included. This approach has been taken in recognition of the volume of data associated with the 11kV and LV systems and the speed with which it can become invalid. More detailed information and data on the 11kV and LV systems are available on request.

The information in this statement is intended to present an overview of the distribution system and indicate the potential opportunities for users. It is recognised that more site-specific information will be required in order to develop a specific project and this additional information will be made available on request, in accordance with our distribution licence. In recognition of the bespoke nature of providing additional information, a separate charge will be made.

A price list for the provision of additional information and data is included as Annex 1.

Information on the commercial terms for using our system is contained in our distribution licence standard condition 14 statement, which is available from our website: www.ce-electricuk.com. Technical requirements relating to connection and use of the distribution system are detailed in the Distribution Code and a number of other documents that are referenced in the Distribution Code. Details of how to obtain these documents and other useful contacts are shown in Annex 2.

Information on the 400kV and 275kV transmission system can be found in the Seven-Year Statement of the transmission system operator for Great Britain, which is available from the National Grid website: http://www.nationalgrid.com/uk/Electricity/SYS/.

The long-term development statement comprises three main parts:

Introduction

An overview of the long-term development statement intended to enable users and potential users of the system to understand the scope of the information provided and to assess if it would be of use to them.

Summary information

A generic description of the design philosophies and practices appropriate to the whole of the distribution system. Included in this section is a small-scale geographic plan providing an overview of the 132kV and EHV systems and substations described in the 'detailed information' section.

Detailed information

A series of tables, diagrams and narratives containing the following information:

- Schematic diagrams detailing the connectivity and normal operating configurations of the distribution system;
- Geographic diagrams of the distribution system;
- Circuit data;
- Transformer data;
- Load information;
- Fault-level information;
- Distributed generation data;
- An outline of authorised system development proposals, including details of work proposed, expected timescales and impact on the distribution system; and
- Number of third party enquiries for a connection.

3 Cost

The 'introduction' and 'summary information' parts of the long-term development statement are available free of charge on our website at www.ce-electricuk.com. The complete long-term development statement, including the 'detailed information' section, is available in CD-ROM format at a cost of £77 plus VAT.

4 Contact details for further information

Requests for a copy of the full long-term development statement or for assistance in interpretation and clarification of the information contained in the statement should be made to:

LTDS Co-ordinator
Asset Management
CE Electric UK
98 Aketon Road
Castleford
WF10 5DS

Telephone: 01977 605916

Enquiries concerning new or modified connections should be addressed to:

YEDL Connections
Cargo Fleet Lane
Middlesbrough
Cleveland
TS3 8DG

Telephone 0845 070 2703
E-mail network.connections@ce-electricuk.com

Summary information

5 Design philosophies and practices

5.1 Background

YEDL has a functional philosophy that underlies the development of the distribution system at all voltages. This ensures that the whole distribution system satisfies the following fundamental design criteria throughout the planning period:

- compliance with all legal and statutory requirements;
- compliance with all regulatory requirements, including the Grid Code and the Distribution Code;
- compliance with all relevant national and international standards; and
- ability to meet the demands placed upon it in terms of customer requirements, supply performance (availability and reliability) and supply quality (voltage and waveform quality).

The distribution system must also be capable of being operated, maintained, repaired, extended and replaced as necessary during its life, without exceeding design levels of risk to the customers it serves. This section describes the philosophies and practices adopted to achieve these aims. In addition there are a number of nationally recognised Engineering Recommendations that are pertinent to the design of new connections. These are cited in Annex 2.

5.2 Operational environment

The distribution system has to be designed such that it is capable of continuous operation under the range of climatic conditions that can be reasonably expected in the geographic region covered by YEDL's distribution system.

5.3 Technical characteristics of the distribution system

The distribution system and the electricity supplies derived from it will have the technical characteristics detailed below in order to fulfil the requirements set out above.

5.3.1 Frequency

The Distribution Code requires that the system be designed to enable the normal operating frequency supplied to customers to comply with the Electricity Safety, Quality and Continuity Regulations 2002. The Regulations require us to declare a frequency of 50Hz for our supplies, and allow a variation not exceeding one per cent above or below the declared frequency. Currently distribution systems are reliant on NGET (National Grid Electricity Transmission)-connected generators to maintain frequency in accordance with the Grid Code, which requires the frequency of the transmission system to be controlled within the limits of 49.5 – 50.5Hz unless exceptional circumstances prevail. Additional performance requirements of users are given in section CC6.1.3 of the Grid Code.

Under the terms of the Grid Code, NGET requires us to provide facilities for reducing demand by automatic load shedding of discrete blocks of load if the system frequency falls below certain threshold points.

5.3.2 Voltage levels and control

The distribution system will operate at the following nominal voltages: 132kV, 66kV, 33kV, 11kV, 6.6kV and 400/230V. 6.6kV is a non-preferred legacy voltage.

The Distribution Code requires that the distribution system, and any user connections to it, be designed to enable the voltages supplied to customers to comply with statutory regulations. The regulations require us to declare the voltage at which the supply is delivered to connected customers, and set limits for that voltage of +10%/-6% at low voltage, ±6% at high voltage (above 1kV but below 132kV), and ±10% at 132kV or above. The distribution system will be designed such that the voltage at all points where customers' premises are connected lies within statutory limits.

The distribution system will also be designed to enable the voltage at the lower voltage levels of a transformer to be maintained in accordance with the principles of Engineering Recommendation P10 - Voltage control at bulk supply points - for the specified operating scenarios.

The voltage at the source substation 132kV, 66kV, 33kV and 11kV busbars will normally be held sensibly constant by means of automatic voltage regulator (AVR) relays (or an automatic voltage regulator system provided by NGET) controlling the tapchangers of the transformers feeding that busbar. Voltage control systems at the different transformation levels will be time-graded to minimise the number of tapchanger operations.

Line-drop compensation is installed at substations with 11kV as the lower voltage, but it is generally not operational.

Tap changing facilities at 11/0.433kV transformers will only be suitable for off-load operation.

Under the terms of the Grid Code, NGET may under certain circumstances instruct us to reduce demand on the distribution system; this is normally achieved by blanket voltage reductions applied remotely to the 11kV distribution system.

5.3.3 Voltage and waveform quality

When designing new or modified connections to the distribution system, we take care to ensure that the voltage disturbances and harmonic emissions from the new equipment are within the limits set out in the following Engineering Recommendations:

- P28 – Planning limits for voltage fluctuations caused by industrial, commercial and domestic equipment in the United Kingdom;
- P29 – Planning limits for voltage unbalance in the United Kingdom;
- G5/4 – Planning levels for harmonic voltage distortion and the connection of non-linear equipment to transmission systems and distribution systems in the United Kingdom.

This helps to ensure that the voltage and waveform quality of the distribution system is acceptable to all customers.

Single-phase distribution transformers and loaded spurs will be connected to the 11kV system so that the load on the main line is equally distributed (balanced) across all three phases. This will minimise voltage imbalance and reduce losses.

The following parts of the YEDL system have been designed as an integral part of a customer connection in order to accommodate equipment with high harmonic or voltage distortion levels. New connections to these parts of the system are unlikely to be feasible.

Fullerton Road T1 11kV busbar
Pitsmoor 1/2 33kV busbar
Mexborough T3 11kV busbar

5.3.4 Electromagnetic compatibility

Satisfactory operation of the distribution system and users' equipment is only obtained where electromagnetic compatibility (EMC) exists between them.

Appropriate component parts of the distribution system must conform to the Electromagnetic Compatibility Regulations (SI 1992/2372). These Regulations, which implement the EU EMC Directive in the UK, seek to limit the disturbances present in the distribution system to levels below the immunity levels at which equipment function and performance are likely to be impaired.

Engineering Recommendation G5/4 helps to fulfil the objective of the EMC Regulations by limiting the harmonic emissions of customers' non-linear loads and generating plant.

5.3.5 Neutral earthing

The Distribution Code requires that the arrangements for connecting the distribution system with earth be designed to comply with the requirements of the Electricity Safety, Quality and Continuity Regulations 2002 and relevant European and British standards.

The 132kV system will be multiple-earthed both at source and at transformation points to lower voltages. Each 400/132kV and 275/132kV autotransformer at a grid supply point substation (GSP) will normally be solidly earthed at the star point of its 132kV winding. There may, however, be situations at sites where existing substations are being refurbished or at sites with four transformers where measures such as the introduction of neutral earthing resistors are required to keep short-circuit levels within the rating of existing plant (such as cable sheaths). In addition every 132kV/lower-voltage transformer will be solidly earthed at the star point of the 132kV winding.

The star point of each 33kV and 66kV system will be earthed at its source only, where earthing transformers will be used to earth the lower-voltage delta windings of each 400, 275 or 132/33kV or 66kV transformer. The characteristics of the earthing transformers will ensure that the earth fault current does not exceed the full-load current of the associated 400kV, 275kV or 132kV/lower-voltage transformer. In consequence the short-circuit rating of equipment on the 33kV and 66kV system need only take account of the maximum short-circuit phase-to-phase fault current.

11kV system neutrals will be earthed at source only (that is, at the star point of the lower-voltage winding on 132, 66 or 33/11kV transformers). Earthing will be either direct or via a neutral earthing impedance, which may take the form of an arc suppression coil.

Protective multiple earthing (PME) or protection neutral bonding (PNB) will normally be applied to all low voltage distribution systems. Existing systems using separate neutral & earth (SNE) cables may continue to be earthed at a single point (that is, at the LV neutral terminal of the 11kV/LV transformer).

5.3.6 System phasing and vector groups

Vector groups of transformers and phase connections at each voltage level will be in accordance with YEDL's policy on system phasing to ensure that operational parallels can be made between different parts of the system that operate at the same voltage.

The red-phase vector on the 132kV system is the reference vector for phasing on the distribution system, and is in phase with the red-phase vector on the 400kV and 275kV systems, all of which are taken to be at 0º. Standard 132/66, 132/33 and 132/11kV transformers will be of vector group Yd1 (connected Yd9), resulting in the red-phase vector on the 66kV, 33kV or 11kV busbar being at +90º with respect to the reference.

Standard 33 and 66/11kV transformers will be of vector group Yy0, resulting in the red-phase vector on the 11kV busbar also being at +90º.

Standard 11/0.433kV distribution transformers will be of vector group Dy11, resulting in the red-phase vector on the 0.433kV busbar being at +120º.

5.3.7 Current ratings

Current ratings of plant will normally be co-ordinated using switchgear and busbar current ratings selected from preferred International Electrotechnical Commission (IEC) values. These requirements will usually be satisfied when standard plant and components are used. Standard current ratings of equipment are given in the relevant section of this document.

5.3.8 Short-circuit levels

YEDL design policies are based on the use of two standard impedance transformers operating in parallel at 132kV, 66kV and 33kV/lower-voltage substations. The resulting maximum prospective short-circuit levels are summarised below. New plant for use on the distribution system will be rated at these values as a minimum.

Voltage level	Short-circuit level (MVA)
132kV	5700
66kV	2500
33kV	1145
11kV	250
LV	25

There will, however, be existing systems where the rating of the equipment is lower than the design fault level and may require the short-circuit levels on the system to be limited to the rating of the equipment. In situations where infeed from distributed generation or customers' plant would result in higher short-circuit levels than those outlined above, and if it is not practicable to limit the current using equipment (e.g. reactors) in customers' circuits, it may be considered appropriate to design the system for higher short-circuit levels.

When any modification to the system is being designed, including the provision of new or modified customer connections, the calculated fault levels are assessed against a design fault level rating, which is 95% of the system fault level capability for new designs and which is the system fault level capability for modifications to existing designs.

Engineering Recommendations P25/1 (The short-circuit characteristics of public electricity suppliers' low voltage distribution systemss and the co-ordination of over-current protective devices on 230V single-phase supplies up to 100A) and P26 (The estimation of the maximum prospective short-circuit current for three-phase 415V supplies) provide more detailed guidance on the likely maximum fault levels at specific customers' LV exit points.

In addition the LV distribution system will be designed such that the typical maximum fault loop impedance is no greater than the value set out in Engineering Recommendation P23/1 – Customers' earth fault protection for compliance with the IEE wiring regulations for electrical installations.

5.4 System design criteria

5.4.1 System voltage, configuration and topology

The choice of system voltages, system configuration and system topology is governed by a variety of factors. These include the required levels of security, interconnection and supply performance, voltage profile and waveform quality, load density and growth rate, the rating and short-circuit capability of plant.

In general LV, 11kV, 33kV and 132kV systems are normally based on radial circuits, often with tapered conductor sizes, whereas 66kV systems are either radial or based on closed rings. Limited interconnection will be provided at all voltage levels to meet required levels of security and supply performance. Interconnection at LV and 11kV will be supplemented where necessary by providing facilities for connecting mobile generators during system outages.

5.4.2 Security of supply

Both our distribution licence and the Distribution Code require us to plan and develop our distribution system to a standard not less than that set out in Engineering Recommendation P2/6 – Security of supply (July 2006 revision).

Where customer connection arrangements make use of non-firm system capacity in excess of the firm capacity available, an alarm/trip load management scheme may be applied at the customer's premises in order to prevent overload of the distribution system under outage conditions. The details of any such scheme will be recorded in the customer's connection agreement.

5.4.3 Interfaces with connected parties

Arrangements at interfaces with NGET will comply with the relevant obligations of the Grid Code. The interface arrangements with other system operators and with customers will comply with the relevant obligations of the Distribution Code.

Customer connections to the high-voltage system will include a ground-mounted isolatable metering circuit breaker.

5.5 Plant requirements

5.5.1 General requirements

All plant used on the distribution system must be capable of safe operation under all anticipated operating conditions and duties within the expected range of climatic conditions and within the distribution system parameters set out in the table below.

	Parameter	LV	11kV	33kV	66kV	132kV	Units
1	Design voltage	0.23/0.4	11	33	66	132	kV rms
2	Power frequency withstand to earth	3	28	70	140	275	kV rms
3	Lightning impulse withstand to earth	-	95	170	325	650	kV peak
4	Rated frequency	50	50	50	50	50	Hz
5	Current rating of plant	Range of ratings					A
6	Short-circuit levels	Range of ratings					kA
7	Neutral earthing point	Multiple	source	source	source	all ends	-
8	Earth fault factor	1.73	1.73	1.73	1.73	1.40	-
9	Rated voltage of plant	0.6/1	12	36	72.5	145	kV rms

5.5.2 Auto-switching of plant

Delayed auto-reclosing facilities are usually provided on all 132kV, 66kV and 33kV circuits containing overhead lines. The switching sequences and corresponding timings are determined on an individual basis depending upon the system configuration and protection arrangements. Generally the auto-reclose sequences will be complete within 60 seconds. Where practicable, and of benefit to customers for quality of supply purposes, auto-isolation of faulty equipment (for example transformers) will be implemented as part of an integrated scheme to restore supplies to healthy plant by auto-reclosure. Primary substations having only a single 66/11kV or 33/11kV transformer will be equipped with an alternative connection from the 11kV system, with remote or auto-switching to restore supplies.

All 11kV circuit breakers controlling 1km or more of overhead line will be capable of multi-shot auto-reclose operation and will be fitted with delayed auto-reclose features. The standard auto-reclose sequence is 2 instantaneous trips plus one inverse definite minimum time (IDMT) trip with a dead time of 10 seconds and a reclaim time of 5 seconds. Operation of sensitive earth fault protection does not initiate the reclose sequence. Circuit-breaker maintenance lock-out facilities will be provided. The last trip before maintenance lock-out will be an IDMT trip. Excess fault frequency inhibit logic will be provided to reduce circuit-breaker wear during excessive lightning storms.

5.5.3 Remote control of plant

At all substations where there is equipment operating at system voltages of 33kV and above, all circuit breakers and other plant capable of remote control and/or monitoring will be provided with SCADA facilities.

YEDL is currently installing remote-control facilities on the rural 11kV system. This involves providing remote-control facilities for pole-mounted auto-reclosers that have been installed as part of the 11kV overhead line protection programme and the selective introduction of new auto-reclose equipment. This work is expected to be essentially complete by the end of 2009.

In addition, a modest ongoing programme of work was started during 2005 to install remote-control facilities on 11kV feeders with large customer numbers.

5.5.4 Earthing and bonding

Substation earthing systems will be designed such that touch and step potentials within and adjacent to the substation are maintained within safe limits and, where practicable, such that the substation is classified as 'cold'.

Earthing and bonding of insulated-sheath cables (and where necessary the application of sheath-voltage limiters) will be in accordance with Engineering Recommendation C55/4 – Insulated-sheath power cable systems.

5.6 Protection and control

YEDL's overall philosophy for protection and control is to ensure that there are sufficient automatic and manual switching points to minimise disruption to the distribution system when clearing a fault (i.e. the protection should disconnect the minimum amount of healthy equipment) and to restore supplies following disconnection of the faulty equipment. The correct operation of protection and control systems is particularly dependent upon the integrity of the substation battery system. Hence, where it is necessary for protection and control systems associated with customer connections to be extended beyond the boundary of the YEDL substation, this is achieved by the use of voltage-free contacts to interface with the customer's independent battery system. An overview of the protection system at each voltage level is given in the relevant section of this document.

5.7 Transient stability

The distribution system should remain in a stable condition following a major disturbance (for example a severe fault or loss of a generating set), with all connected generation remaining in synchronism wherever possible.

Engineering Recommendation G75/1 - Recommendations for the connection of embedded generating plant to public distribution systems above 20kV or with outputs over 5MW - states that the design of the distribution system should seek to maintain system stability and prevent the loss of synchronism of generating plant under all normal operating conditions. It also recommends that, if studies detect a risk of instability, suitable protection should be provided to detect the condition, trip the generating plant and protect the system.

6 System demand data

At substations where there is equipment operating at system voltages of 33kV and above, SCADA facilities will be used to record the average half-hourly demands on the substations and their associated feeders. This data will be used both for real-time system control and for planning purposes.

The detailed section of this statement includes a table showing the maximum demand at each substation with equipment operating at 33kV or above. To assist users of the statement, the following charts show examples of demand curves and demand profiles at substations on the YEDL system.

Chart 1 shows a historical demand profile for the whole of the YEDL system over a one-year period. The annual system demand profile is fairly consistent from year to year, with the maximum and minimum demands normally occurring in winter and summer respectively. The minimum-demand scaling factor for any given year, defined as the ratio of the minimum demand to the maximum demand, is approximately 30%.

Chart 1. Annual system demand profile

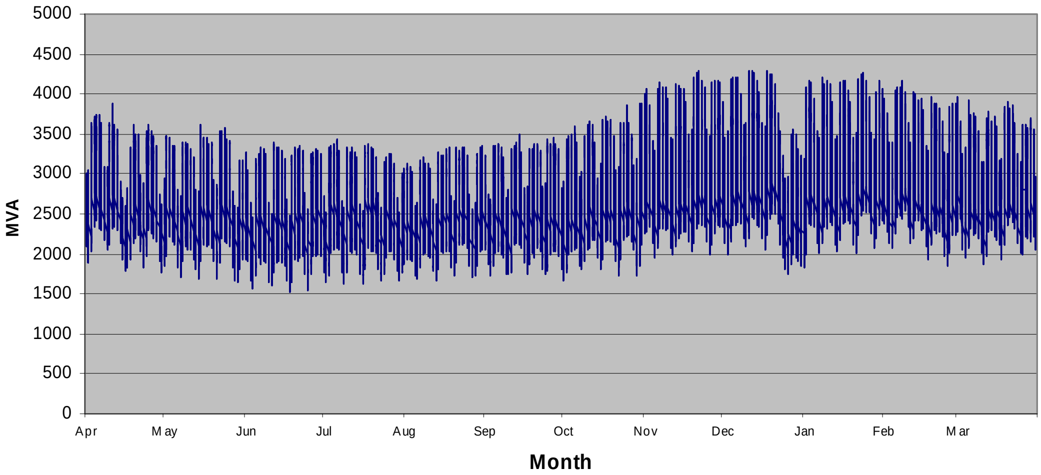


Chart 2 shows the amount of time, over the year, that the system demand in the above profile exceeded a percentage of the system maximum demand. For example, the system demand exceeds 50% of the maximum demand for approximately 80% of the year.

Chart 2. System demand duration curve

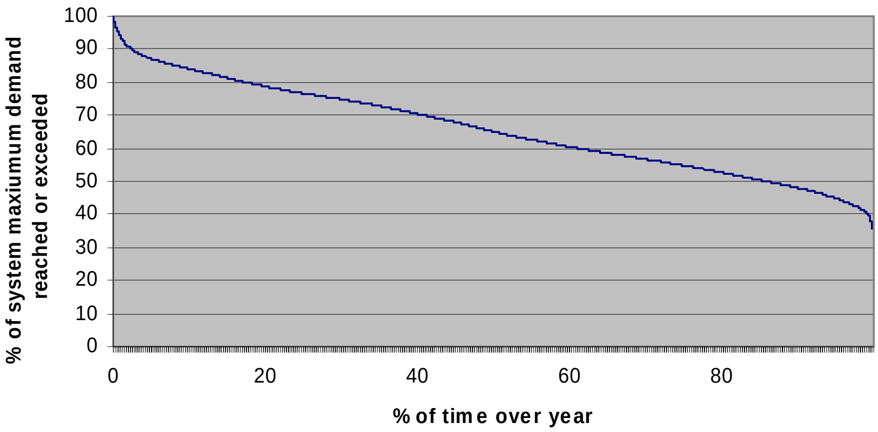
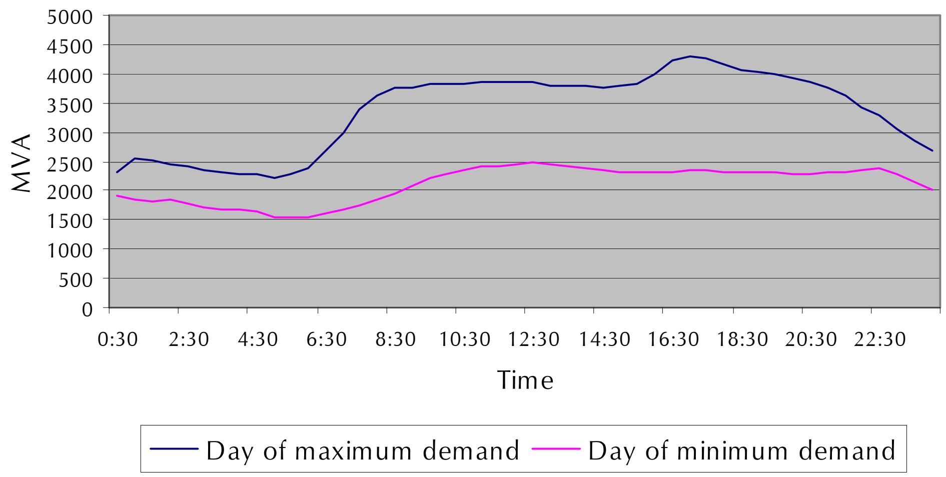


Chart 3 shows the system daily load curve in hour blocks, for the days of the system maximum and minimum demands from the historical load profile above. While the overall profile shape varies from year to year, the timings of the maximum and minimum demands are fairly consistent.

Chart 3. Demand profile on the days of system maximum and minimum demand



The overall demand profile is fairly predictable on the higher-voltage systems, with exceptions generally occurring only where large single-point demand or generation is connected to the system.

Demand profiles at primary-substation level are not as consistent as those at higher voltage levels. While any specific primary substation may have a reasonably consistent annual demand profile year on year, the variation between substations is much greater. Maximum demands may occur at any time throughout the year, including over the summer period. Minimum demands may occur in the winter. The minimum demand scaling factor tends to vary between 5% and 40%. Charts 4, 5 and 6 show examples of annual demand profiles of substations with different demand profiles.

The minimum demand on a substation can be particularly important when considering the connection of distributed generation. As the minimum-demand scaling factor can vary between 5% and 40%, an initial working assumption of 10% is recommended. Where available, a site-specific demand profile will be provided upon request.

Chart 4. Example of a substation without a distinct peak

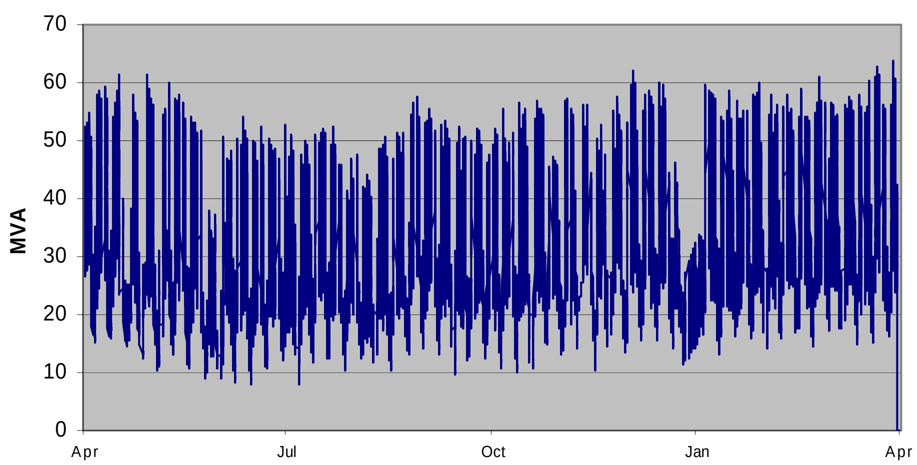


Chart 5. Example of a substation with a winter peak

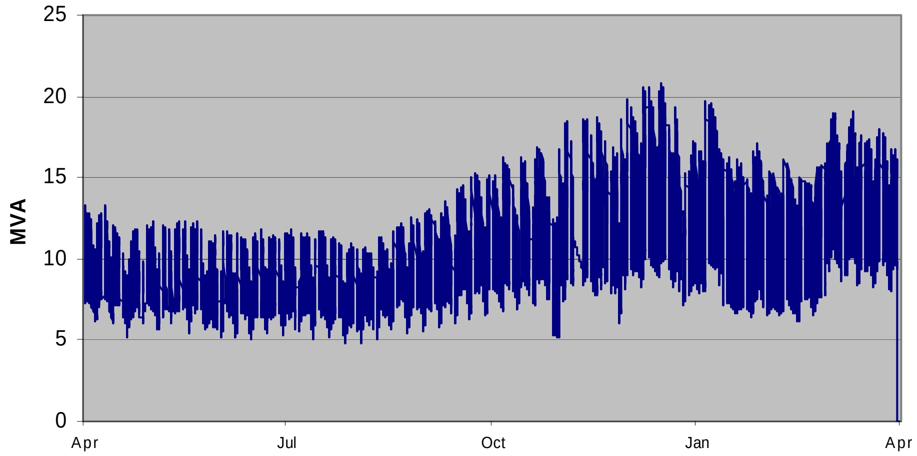
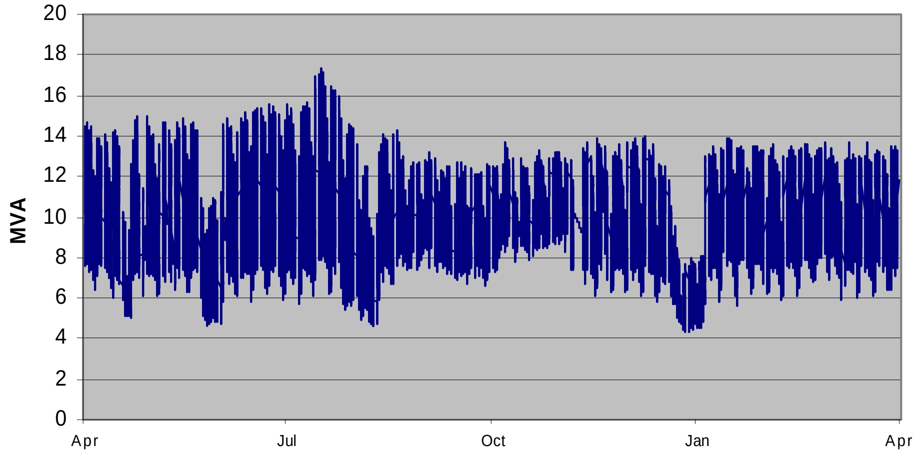


Chart 6. Example of a substation with a summer peak



7 132kV system

7.1 System configuration

The 132kV system in YEDL serves in a distribution role between the NGET system (at 400kV or 275kV) and the 33kV or 66kV systems. Exceptionally, direct 132/11kV transformation may be economically justified.

The preferred circuit arrangement will be radial circuits from the nearest grid supply point (GSP) substation feeding individual 132/66kV or 132/33kV transformers. However, depending on the particular circumstances, more complex interconnected circuit arrangements may be adopted provided that the requirements of Engineering Recommendation P18 (Complexity of 132kV circuits), which sets out the normal limits of complexity of 132kV circuits, are taken into account.

The design of the 132kV system will comply with the general principles of Engineering Recommendation P19 - Procedure for the planning and design of 132kV systems.

7.2 System security

In order to comply with Engineering Recommendation P2/6 (Security of supply), substation arrangements will normally enable two 132/33 or 132/66kV transformers to be operated in parallel with protection designed to provide a continuous firm supply to the lower-voltage busbar. In some high load-density areas the parallel operation of three 132/33 or 132/66kV transformers will facilitate the economical provision of capacity and security. It will normally be necessary for some 33kV and 66kV circuits to be arranged as interconnectors between 132/33kV and/or 132/66kV substations, with appropriate normal open points. Such circuits will be provided where convenient and economic in order to comply with the requirements of Engineering Recommendation P2/6 for minimum supply to be met after first-circuit and second-circuit outages.

7.3 Selection and application of plant

7.3.1 Transformers

Transformers with nominal ratings in the table below and conforming to British standard BS EN 60076 (IEC 60076) and Engineering Recommendation P1/3 will be the normal standard.

Operating voltage	132/66kV	132/33kV	132/11kV
Standard transformers ONAN/OFAF (MVA)	45/90	45/90	15/30
	75/150	60/120	

In special cases, which are likely to be rare, smaller sizes than 45/90 MVA may be used to replace an existing transformer where this is required to be compatible with an existing smaller unit that is to be retained. Transformers with different ratings operating in parallel should have the same per-unit impedance such that the load is shared in proportion to their ratings.

It is important that, where there is export from a site, the continuous site export should not exceed the capability of a transformer without any cooling fans and oil-circulating pumps operating, as transformers are not generally designed for such auxiliary equipment to operate on a continuous basis.

7.3.2 Switchgear

Switchgear will be 2000A rated and comply with the standard specified in ENATS 41-37 Switchgear for use on 66kV to 132kV distribution systems. Single 132kV busbars will be the normal arrangement, though double 132kV busbars (main and reserve in two sections) will normally be provided at substations which accommodate, or are likely to be extended to accommodate, more than two grid transformer or material generation infeeds, or where there are more than 9 bays of switchgear in total. Double-busbar arrangements may also be adopted where the additional cost can be justified by the resulting improved system reliability, security of supply and maintainability.

7.3.3 Overhead lines

The normal standard for transformer feeder 132kV double-circuit 3-phase overhead line is ENATS 43-7 132kV steel tower transmission lines: specification L4(M) issue 2 1985 (amended 1993), equipped with 175mm^2 aluminium conductor steel-reinforced (ACSR) conductors. In situations where a greater capacity is required, its derivatives L4(M)/2 with 300mm^2 or 500mm^2 all-aluminium alloy conductor (AAAC) conductors may be employed.

7.3.4 Underground cables

When selecting the size of cable to be used on the 132kV system, consideration is given to minimising system losses and maintaining sufficient capacity for the future. This implies that a cable with the largest cross-sectional area that can be reasonably justified will be used. In most cases this will enable a standard circuit comprising three single-core XLPE insulated cables with a 400mm^2 Cu conductor to be used for new 132kV underground transformer circuit feeders. Larger sizes may be used where, for example, required by the system configuration, where the proximity to other cables materially de-rates the cable and where there is greater requirement for interconnection capacity.

7.3.5 Short-circuit levels

The range of 132kV switchgear normally obtainable has a maximum short-circuit rating of up to 40kA 3-phase, 40kA phase to earth. This rating is needed at GSP substations where there may be four 400 or 275/132kV transformers installed and will permit three transformers to be operated in parallel to meet the required security standard or where system X/R ratios are high. Historically, where there were only two 400 or 275/132kV transformers at a GSP substation (and this was considered the ultimate development), 132kV switchgear rated at 16kA 3-phase, 18kA phase to earth was specified. However, with rising short-circuit levels on the system and infeeds from generation likely to rise further, a rating of 40kA, based on a system with an X/R ratio of 14, is the minimum that will be specified for all new 132kV equipment.

7.3.6 Protection

All items of plant will be covered by systems of main protection and back-up protection.

The main protection will be fully discriminative i.e. cover all types of phase and earth faults whilst disconnecting only the faulted system elements. Fault detection will occur in less than 50ms, with total fault clearance achieved in 100ms to 200ms. This fault clearance time will be irrespective of the number of circuit ends. This specification for fault clearance times may need to be shortened where necessary to ensure stability of distributed generation.

The back-up protection will be arranged to limit the disruption of supplies in the event of failure of the main protection or the associated circuit breaker.

8 66kV and 33kV systems

8.1 System configuration

The 33kV and 66kV systems in YEDL serve in a distribution role between the 132kV or NGET systems and the 11kV system, since direct 132/11kV transformation is only economically justified in special cases. There are a small number of industrial loads that it is appropriate to supply at 33 (or 66) kV. In addition these systems generally provide additional security by interconnection between 132/33 (or 66) kV substation lower-voltage busbars to allow for double 132/33 (and 66) kV outage conditions.

Historically, the 66kV systems, which are mainly overhead with outdoor-type substations, were developed in rural areas between the large urban conurbations. 33kV systems were developed in urban areas as they were more economic for underground cable installation and indoor metal-clad substations.

The preferred arrangement is for a matched pair of 33/11kV or 66/11kV transformers at a primary substation to be operated in parallel to provide a continuous firm supply to the 11kV busbar. Wherever possible, symmetrical feeding arrangements will be used for the two transformers as this will generally minimise losses and circulating currents and will help to avoid voltage control problems when generation is connected.

In localities with low load-density requiring an injection point to the 11kV system to provide adequate voltage support, a single-transformer primary substation may be installed to supply demands of less than 12MW. Single-transformer primary substations may also be used to supply abnormal loads or to meet the specific requirements of customers.

Radial transformer feeder circuits from the nearest 400, 275 or 132/33kV or 66kV substation will be the preferred circuit arrangement. On 33kV overhead circuits, particularly in rural areas, it will often be economic and practicable to connect two transformers to a single overhead line. This may require the uprating of an existing line to ensure that the capacity of the refurbished line matches its potential future requirement. In urban areas where underground circuits are required, individual consideration will be given to the possible connection of second transformers, dependent upon loads and circuit capacities.

Where larger-size cables are already installed, but are feeding only one transformer, these will be used to connect an additional transformer in appropriate cases. In such cases, outage conditions will be carefully considered to ensure, for example, that the four transformers at two substations are not supplied from only two 33kV cables.

Where appropriate, 33kV development will make use of local switchgear at a primary substation to create 'three-circuit development' arrangements. (Three-circuit developments traditionally comprised one circuit breaker, one isolator and a busbar end box: however, modern units tend to comprise two circuit breakers and an isolator). These may be used to connect two transformers at different substations to a single feeder, and also to provide interconnection.

Extensions to the 66kV system will normally maintain the same system configuration as the existing system, i.e. radial or closed ring.

8.2 System security

At primary substations, two 33/11 or 66/11kV transformers operating in parallel, with appropriate protection to provide continuous firm supply to the 11kV busbar, will be the normal arrangement to meet the standard economically. Single-transformer primary substations may be installed in rural areas to supply demands of less than 12MW, with a switched firm 11kV supply provided by means of an auto-closing arrangement (using SCADA facilities where appropriate), the alternative feeds being provided by 11kV interconnection.

8.3 Selection and application of plant

8.3.1 Transformers

Transformers conforming to BS EN 60076-1, rated at 15/30MVA under CER conditions, generally in accordance with ENATS 35-2 – Emergency rated system transformers 33/11.5kV delta/star and star/star connected (at 30°C ambient temperature) and impedance of 80% on a 100MVA base, with star-connected windings, will be the normal standard. However, there are situations where other transformers can be used. For example, in high-density city centre areas where future substation sites are likely to be unavailable, 20/40MVA CER transformers may be used. 12/24MVA CER transformers may be used for single-transformer primary substations in rural locations supplying a demand of less than 12MW where this is more economical than using 15/30MVA CER transformers.

It is important that, where there is export from a site, the site export should not exceed the capability of a transformer without any cooling fans and oil-circulating pumps operating, as transformers are not generally designed for such auxiliary equipment to operate on a continuous basis.

8.3.2 Switchgear

Single-busbar non-oil type metal-clad switchgear will be the normal standard at 33kV, and outdoor single-busbar non-oil type switchgear at 66kV. The following minimum current ratings will be specified:

Rating	11kV at primary substations	33kV	66kV
Busbar & bus-section	2000A *	2500A	2000A
Transformer	2000A *	2500A	2000A
System feeder	630A	1250A	1250A

* Where there is no likelihood of the ultimate load on the substation exceeding 24MVA (for example at primary substations initially equipped with a single transformer), the use of 1250A-rated busbars, bus-section and transformer circuit breakers is acceptable.

8.3.3 Overhead lines

Overhead lines will meet the appropriate plant specification. 175mm^2 ACSR conductors will be the normal standard at 33kV and 200mm^2 AAAC conductors will be the normal standard at 66kV. Lines with 200mm^2 AAAC conductors may also be used at 33kV in circumstances requiring the increased rating or lower voltage drop that they offer.

8.3.4 Underground cables

Standard-size underground cables will be used wherever economical and practical. The minimum-size cable for use at both 33kV and 66kV is 300mm^2 Cu XLPE single-core cable. Cable ratings will normally be chosen to match the nominal rating of the associated plant to which it will be connected.

8.3.5 Short-circuit levels

In order to facilitate future uprating of the short-circuit capability of the distribution system, for example to permit connection of additional generation, all new switchgear installed on the 33kV and 66kV distribution systems will be specified with a three-phase symmetrical short-circuit breaking rating of 31.5kA, based on a system X/R ratio of 14. As higher-rated plant (e.g. 40kA) becomes available on the market, this will be specified where economical. It should be noted, however, that existing equipment is likely to impose a constraint on the maximum short-circuit capability of the distribution system as a whole.

8.3.6 Protection

All items of plant will be covered by systems of main protection and back-up protection.

The main protection will be discriminative i.e. disconnect only the faulted system elements for all likely faults on the protected plant. Fault detection will occur in less than 50ms, with total fault clearance achieved in 100ms to 200ms. This complete fault clearance time will be longer when fault-throwing switches, LV directional overcurrent or neutral displacement protection are necessarily employed as a means of, or substitute for, intertripping. Clearance times exceeding 200ms will also occur on feeders protected by zone 2 distance and directional earth fault protection. However, the total clearance time for any of these situations will not exceed 1 second. This specification for fault clearance times may need to be shortened where necessary to ensure stability of distributed generation.

The back-up protection will be arranged to limit the disruption of supplies in the event of failure of the main protection or the associated circuit breaker.

9 11kV and 6.6kV systems

9.1 System configuration

The main purpose of the 11kV system is to distribute electricity into and around local urban and rural areas in an economic, efficient, safe and secure manner whilst meeting the needs of customers. There is a very limited amount of 6.6kV infrastructure, which tends to be limited to older industrial (e.g. dockside) systems. It is envisaged that, over time, the 6.6kV system will be uprated to 11kV and the 6.6kV systems will not be developed.

The general design principle for configuring the distribution system is based on primary substations with duplicate transformers and 11kV busbars, providing a continuous firm 11kV supply. In low load-density localities, a single-transformer primary substation supplying demands of less than 12MW may be installed with a switched firm supply, the alternative being provided by 11kV interconnection.

The 11kV feeders radiating from primary substations will either form interconnectors with other primary substations, or rings connected to the busbar on either side of the bus-section at duplicate transformer substations. Sections of non-interconnected 11kV feeder, and the development of rings on rings and cable cross-ties that produce an excess of under-utilised cable capacity, will be avoided wherever possible. Figure 1 illustrates examples of these.

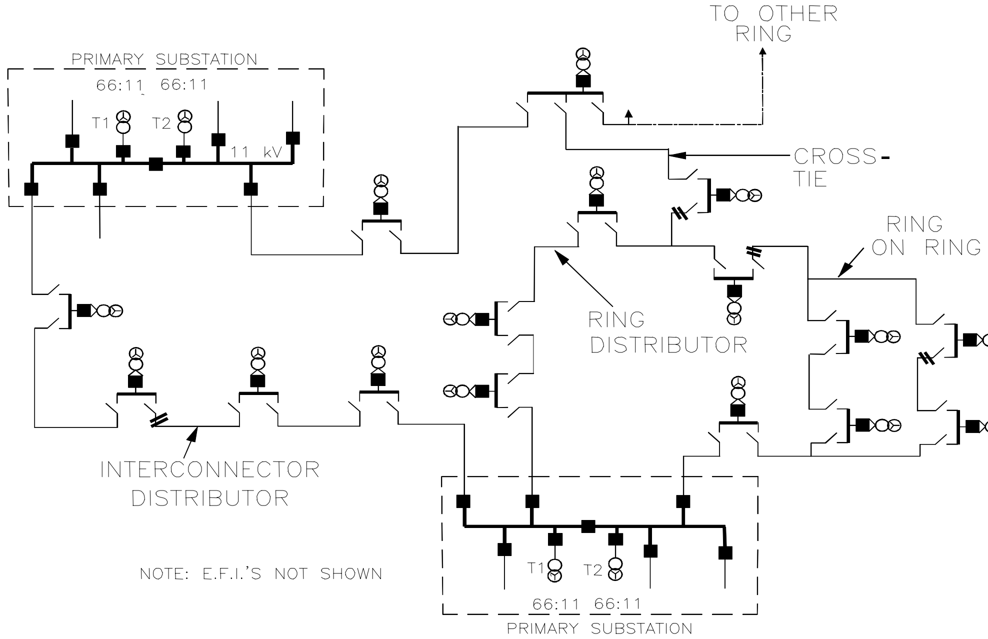


Figure 1: Concepts of interconnector and ring distributors, cross-ties and rings on rings.

Ring and interconnector distributors will normally be operated as radial feeders, with the open point selected for ease of operational access to minimise customer minutes lost, whilst taking account of the need to meet security requirements and minimise system losses and voltage drops.

Urban systems will normally comprise underground cables with distribution substations looped-in en route. In order to preserve the quality of supplies to customers afforded by the existing system topology, teed connections to 11kV underground cables are not acceptable other than in exceptional circumstances, e.g. where the tee provides the dedicated main or alternative connection to an 11kV customer.

In order to maintain quality of supply standards, cable tees are not permitted in the first electrical section of the 11kV distribution system out of a primary substation; overhead line tees in such circumstances will be avoided wherever possible. Similarly there should be no more than two tees made to any one electrical section of an underground cable system.

Rural overhead systems will be developed to follow the same basic system configuration as shown in Figure 1, comprising mainly interconnectors between primary substations. These will normally be supported by strategically-placed cross-ties between adjacent interconnectors in order to provide alternative means of securing and restoring supplies in the event of a fault. Tee-connected pole-mounted transformers will normally be used to connect individual point loads along the route of the line, with teed spurs added as necessary between switching points to supply loads remote from the main line.

9.2 System security

In order to meet the expectations of customers, the 11kV system is generally designed in excess of the minimum requirements specified in Engineering Recommendation P2/6 – Security of supply. Ideally, particularly in cable systems, it should be possible to restore supplies to all customers by 11kV switching of the demand onto an alternative feeder.

The first-choice alternative feeder in an 11kV distributor ring or interconnector should be capable of picking up the full load of the circuit after fault, without the need for initial 'off-loading'. The design will ensure that initial restoration of all feeder load will be possible with a single switching operation on either side of an isolated faulty section, based on cyclic cable ratings and/or spring/autumn overhead line ratings. Subsequent switching operations may be necessary to redistribute feeder loads.

Interconnection will be provided to support the LV system of a substation fed from a tee, or of existing substations that require regular dead-tank maintenance, if it can be achieved economically from a LV system with an independent HV source.

9.3 Selection and application of plant

9.3.1 Distribution substations

Where economic and practicable, new ground-mounted distribution substations will be selected from the approved range of standard unit distribution equipment (UDE) or ring main units (RMU). They will normally be looped-in to the existing underground or overhead distribution system. In all other situations, free-standing 11kV indoor metal-clad non-oil type switchgear of 630A rating will be used.

New distribution substations will normally be equipped with a single 11/0.433kV ground-mounted transformer of vector group Dy11, with a rating of up to 1000kVA for multiple or single customers and up to 1600kVA for a single customer only. These transformers are normally fitted with an off-load tapchanger having a range of ±5% in 2.5% steps.

25kVA pole transformers will be the minimum size used for connection to domestic property. 16kVA pole transformers will only be used for connections to street furniture and communication equipment with a low continuous load.

9.3.2 Overhead lines

Bare-wire 11kV overhead lines will be constructed from 50mm² aluminium alloy conductor as a minimum. The size and type of conductor used will depend on the requirements of the system to which it will be connected. The equivalent-sized copper conductor will be used in harsh environments and where lines are subject to salt pollution (normally situations within 8km of the coast). Covered conductor may be used in locations where it provides justifiable benefits.

9.3.3 Underground cables

Triplex XLPE and single-core XLPE cables in standard sizes, namely 185mm² Al and 300mm² Al, will be used wherever possible. To avoid the possibility of cables becoming over-stressed when the system is reconfigured, 185mm² Al or equivalent will be the minimum size for new cables. New sections of cable will at least maintain the rating of the circuit in which they are installed. Copper cables of 185mm² or 300mm² cross-sectional area will be used where aluminium is impracticable, for example in city centres where higher circuit ratings need to be maintained or where the cables are to be installed in extensive duct runs.

To maintain operational flexibility and minimise electrical losses, 300mm² Al cable will be used for the first electrical section of the 11kV underground distribution system out of a primary substation.

9.3.4 Short-circuit levels

The maximum prospective 11kV short-circuit level for design purposes is 250MVA. However, new ground-mounted 11kV switchgear will be specified with a minimum rating of 20kA for the distribution system and 25kA for primary substation switchgear, based on a system X/R ratio of 14.

9.3.5 Protection

All plant will be protected against phase and earth faults. In general the protection will be time-graded and arranged to limit the disruption of supplies in the event of a system fault. Systems that are required to run interconnected will be equipped with discriminative protection that will disconnect only faulty system elements for all likely faults. The exceptions are sections of busbars and small zones at primary substations.

If second-stage protection is applied to a feeder, the feeder will be checked for generation and intertripping provided if necessary for an island situation.

Where the generation capacity connected to a system is equal to or more than half of the minimum demand between the generation and the nearest point of automatic disconnection, the generation will be considered to be physically capable of supporting the system in an island situation and appropriate protection will be required to prevent island mode (and unearthed system) operation.

10 Low voltage system

10.1 System configuration

LV systems will be developed in an efficient and cost-effective manner to deliver electricity to the LV supply terminals of our connection customers whilst meeting statutory obligations. The general objective in developing LV systems is to obtain a simple and robust, minimum-overall-cost system, taking into account the initial capital investment, system losses, maintenance and operational costs over the life of the asset. Any development of LV systems should seek to improve the quality and reliability of the supply provided and to reduce potential customer minutes lost.

The LV system will normally be developed as a system of radial mains supplied from a distribution substation placed near to the load centre. Interconnection will be provided to support the LV system of a substation fed from a tee, or of existing substations that require regular dead-tank maintenance, if it can be achieved economically from a LV system with an independent HV source. Otherwise, interconnection should be provided only where opportune so to do.

LV customer connections will be provided using a service termination unit on their premises, which is connected to a nearby LV main using a dedicated service cable. All customer premises will have only one location at which all supply cables should terminate. Customers requiring connections to very large three-phase LV loads may be supplied by more than one LV cable directly from a single distribution substation on their site, such that these cables do not enter the public highway or cross third-party land.

10.2 System security

The security requirements specified in Engineering Recommendation P2/6 for demand supported by LV systems are minimal. However, interconnection will be provided to support the LV system of a substation fed from a tee, or of existing substations that require regular dead-tank maintenance, if it can be achieved economically from a LV system with an independent HV source. Otherwise, interconnection should be provided where opportune so to do.

For interconnection design purposes, the cyclic rating of LV interconnecting cables and short-term overload rating of transformers will normally be used, unless the interconnected load is known to have an essentially flat load curve at peak times, in which case continuous ratings will be appropriate.

10.3 Selection and application of plant

10.3.1 Distribution substations

Where economic and practicable, new ground-mounted distribution substations will be selected from the approved range of standard unit distribution equipment (UDE) or ring main units (RMU). They will normally be looped-in to the existing underground or overhead distribution system. In all other situations, free-standing 11kV indoor metal-clad non-oil type switchgear of 630A rating will be used.

New distribution substations will normally be equipped with a single 11/0.433kV ground-mounted transformer of vector group Dy11, with a rating of up to 1000kVA for multiple or single customers and up to 1600kVA for a single customer only, fitted with an off-load tapchanger having a range of ±5% in 2.5% steps.

25kVA pole transformers will be the minimum size used for connection to domestic properties. 16kVA pole transformers will only be used for connections to street furniture and communication equipment with a low continuous load.

10.3.2 Overhead lines

New overhead mains will only be installed where underground mains are either not economical or not practical. This will normally be limited to rural areas and where routes can be selected to minimise the impact on the environment and local amenity.

Where LV overhead mains are to be installed, approved 4-core ABC conductor will be used.

10.3.3 Underground cables

LV underground mains will be designed using approved three-phase CNE cables having a cross-sectional area of 300 mm^2 other than for short tail-end spurs carrying less than 120A per phase (e.g. residential cul-de-sacs), where 95 mm^2 cable will be used. Approved SNE three-phase cables may occasionally be used to replace existing LV cables.

10.3.4 Protection

All plant will be protected against phase and earth faults. In general the protection will be time-graded and arranged to limit the disruption of supplies in the event of a system fault.

11 Operating voltage

The following tables indicate the target voltages employed within the YEDL region. These are generic and local conditions may dictate that a different target voltage is adopted.

Voltage level	Target voltage	Comments
132kV	134kV	Except Drax & Kirkstall - 132kV Grimsby West – 135kV Saltend North, Skelton Grange - 136kV Ferrybridge B - 138kV
66kV	66kV	Bandwidth: +/- 1.5%
33kV	33kV	Bandwidth: +/- 1.5%
11kV	11.3kV	Bandwidth: +/- 1.5%

12 Geographic maps

The small-scale geographic maps included in the links below provide an overview of the 132kV and EHV systems and substations described in the 'detailed information' section. Two maps are provided, one detailing the 132kV system and associated substations and a further map detailing the 33kV and 66kV systems and associated substations.

Appendix No	Drawing Name
132kV system map	Drawing No Y005M22099
33/66kV system map	Drawing No Y005M22098

These maps are stored in Adobe Acrobat (.pdf) format and a viewer can be downloaded from the following web site: -

Adobe
(http://www.adobe.com/)

13 Load management areas

There are no areas of the YEDL distribution system affected by a general load management scheme. Load management schemes will be employed on an individual-customer basis to provide connections that meet the security requirements of the customer. Apart from these individual load management schemes, there are no areas where operational constraints or restrictions are used to maximise system utilisation.

14 Other interconnected systems

The main interconnection with other systems is with the National Grid Electricity Transmission system via grid supply point substations. There are also a number of customers whose premises are connected directly to NGET's system and have interconnections with the YEDL system to provide alternative supplies. Further information can be obtained from:
National Grid Electricity Transmission
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

There are a number of other interconnections at 132kV and EHV and these are detailed below:

Part of the NEDL system is currently supplied via three 132kV circuits from Ferrybridge B GSP. Further information can be obtained from:
LTDS Co-ordinator
Asset Management
CE Electric UK
98 Aketon Road
Castleford
WF10 5DS

Fullerton Road primary substation is supplied from Templebrough 275/33kV substation, which is owned by Corus. Further information can be obtained from:
Corus
30 Millbank
London
SW1P 4WY

Annex 1 - System information price list

Additional information

The information in this statement is not intended to present full system information, only to provide a general overview and an initial indication of the potential development opportunities. In order to assess those opportunities further, a developer may approach YEDL either formally or informally to discuss potential projects, or may request more detailed information so that he can make a more informed judgement.

The following list is intended to represent the information that it is anticipated will be more frequently requested. Other information will also be available:

Description	Price
Geographic maps and schematic diagrams – paper copies	
Geographic maps showing 132kV, 66kV and 33kV systems, entire YEDL geographic region	£62 per set
1:10,000 scale (covering approx 25km^2) and 1:500 scale (covering approx 200m x 200m) geographic maps showing 132kV, 66kV, 33kV and 11kV systems	£31 for 4 maps or part thereof
Set of 66kV and 33kV schematic diagrams	£62 per set
11kV schematic diagrams (up to six) *Further sheets (per sheet)*	£62 per set *£10.30*
System data	
Zero sequence circuit impedance data (tabular format)	Hourly rate
Circuit susceptance data for circuits <132kV not included in appendix 3 (tabular format)	Hourly rate
Details of each contribution to fault current at a node (tabular format)	Hourly rate
11kV circuit impedance and rating (tabular format)	Hourly rate
11kV load data (tabular format)	Hourly rate
Protection settings (tabular format)	Hourly rate
Substation half-hourly demand data for the previous year (tabular format)	£31 per data stream
Plant data	
Circuit breaker rating – continuous, asymmetrical peak make and symmetrical rms break ratings (tabular format)	£41 per circuit breaker
Transformer rating, impedance, zero sequence reactance, tap range, tap step (tabular format)	£41 per transformer
Transformer earthing details including statement if the site is a "hot" substation site (tabular format)	Hourly rate
Details of limitations on a firm capacity (narrative format)	Hourly rate
Calculated level of rms break currents decremented to the expected protection operation time (tabular format)	Hourly rate
Details of limitation on fault level rating at a specified node (narrative format)	Hourly rate
Indicative cost of relieving the limitation and the resulting increase in fault level headroom (narrative format)	Hourly rate

All the above prices will be subject to VAT, to be charged at appropriate current rates

Requests for information requiring system studies to be carried out will be priced individually at an indicative hourly rate of £62 per hour, plus VAT.

Requests for discussion or further information should be directed to:

LTDS Co-ordinator
Asset Management
CE Electric UK
98 Aketon Road
Castleford
WF10 5DS

When requesting further information, the requester should specify the area of interest, including details of the substation group and the substation or busbar node names, and the information required, selected from the options provided in the table above.

Terms

Information will normally be supplied within 10 working days of receipt of the request: however, we reserve the right to extend this to 60 working days.

In the event that enquiries need information from third parties (e.g. to assess enhanced ratings, reverse power capability etc.) we shall use reasonable endeavours to obtain this, but cannot be held responsible for non-provision or delayed provision of such information. Where the third party requires payment for such information, the costs of obtaining it will be advised before the request is progressed.

Although reasonable efforts will be made to ensure the accuracy of the data provided, we shall have no liability in contract, tort or otherwise to the enquirer or any other person for any loss or damage resulting from any delay in providing the data or any reliance placed upon it, whether or not we are proved to have acted negligently.

We reserve the right to exclude information that may be considered confidential to an individual customer.

Annex 2 - Useful documents and contact details

Distribution Code

The Distribution Code sets out the technical requirements related to connections to, and the operation of, the distribution system. It references a number of planning and design standards that should be complied with. A copy of the Distribution Code is available from the Distribution Code website:

www.dcode.org.uk

Engineering Recommendations

The following list of Engineering Recommendations may assist anyone considering the detailed design of a connection to the YEDL distribution system.

Engineering Recommendation C55/4 – Insulated-sheath power cable systems.

Engineering Recommendation G54 – 1 Planning levels for harmonic voltage distortion and the connection of non-linear equipment to transmission systems and distribution systems in the United Kingdom.

Engineering Recommendation G12/3 - Requirements for the application of protective multiple earthing to low voltage networks.

Engineering Recommendation G59/1 - Recommendation for the connection of embedded generating plant to the public electricity suppliers' distribution systems.

Engineering Recommendation G74 – Procedure to meet the requirements of IEC 909 for the calculation of short-circuit currents in three-phase a.c. power systems - using a computer-based model.

Engineering Recommendation G75/1 - Recommendations for the connection of embedded generating plant to public distribution systems above 20kV or with outputs over 5MW.

Engineering Recommendation P1/3 – 275/33kV, 132/33kV and 132/11kV supply point transformers.

Engineering Recommendation P2/6 - Security of supply.

Engineering Recommendation P10 - Voltage control at bulk supply points.

Engineering Recommendation P14 - Preferred switchgear ratings.

Engineering Recommendation P18 - Complexity of 132kV circuits.

Engineering Recommendation P19 - Procedure for the planning and design of 132kV systems.

Engineering Recommendation P23/1 – Customers' earth fault protection for compliance with the IEE wiring regulations for electrical installations.

Engineering Recommendation P24 - AC traction supplies to British Rail.

Engineering Recommendation P25/1 - The short-circuit characteristics of public electricity suppliers' low voltage distribution networks and the co-ordination of overcurrent protective devices on 230V single-phase supplies up to 100A.

Engineering Recommendation P26 - The estimation of the maximum prospective short-circuit current for three-phase 415V supplies.

Engineering Recommendation P28 - Planning limits for voltage fluctuations caused by industrial, commercial and domestic equipment in the United Kingdom.

Engineering Recommendation P29 - Planning limits for voltage unbalance in the United Kingdom.

Technical Specification 41-24 - Guidance for the design, installation, testing and maintenance of main earthing systems in substations.

Engineering Recommendation S34 - A guide for assessing the rise of earth potential at substation sites.

Engineering Recommendation G83/1-1 Recommendations for the connection of small-scale embedded generators (up to 16A per phase) in parallel with public low-voltage distribution networks.

Energy Network Association Technical Specifications

ENATS 35-2 – Emergency rated system transformers 33/11.5kV delta/star and star/star connected.

ENATS 41-37 - Switchgear for use on 66kV to 132kV distribution systems.

ENATS 43-7 - 132kV steel tower transmission lines: specification.

A number of other Engineering Recommendations are also referenced in the Distribution Code. All of these can be obtained from:

Engineering Library
Energy Networks Association
6th Floor, Dean Bradley House
52 Horseferry Road
London SW1P 2AF

Tel 020 7706 5100

Standard licence conditions 13, 14 and 36
Information relating to YEDL's use of system charging methodology, use of system (UoS) charges, connection charging methodology, connection charges, legacy metering and data services charges can be found by following the website links below.

YEDL's use of system charging methodology and connection charging methodology and statement can be found on the following page of CE Electric UK's website.

http://www.ce-electricuk.com/page/systemcharges.cfm
http://www.ce-electricuk.com/page/Connection_Charges.cfm

In addition, the following Ofgem website link has been included as this details all aspects of Ofgem's work relating to changes (modifications) made to a distribution network operator's (DNO's) connection charging methodology statement and use of system charging methodology statement.

http://www.ofgem.gov.uk/Networks/ElecDist/Policy/DistChrgMods/Pages/DistChrgMods.aspx

Competition in connections

Information relating to new connections to the YEDL system by independent connections providers can be found by following the link below to the connections page of CE Electric UK's website. Since 1st October 2007, we have been required by our regulator, Ofgem, to aim to meet a range of overall standards in relation to non-contestable activities. These cover providing quotations, responding to design submissions and completing final works and phased energisations. Further information can also be found by following the links below:

http://www.ce-electricuk.com/page/connections2.cfm

http://www.ce-electricuk.com/page/news.cfm