

PV Installers Newsletter March 2011

Here is some information about what SSE Power Distribution does and how it gets involved in the installation of PV systems in the UK.

SSE is a large company based in Perth, Scotland and was formed in 1998 by the merger of Scottish Hydro Electric and Southern Electric. For most of the time since then it's been called 'Scottish and Southern Energy' but it is now in the process of changing its name to just 'SSE'

SSE run two large distribution networks in the areas previously served by Southern Electric in south central England and Scottish Hydro Electric in the northern part of Scotland. They also operate distribution networks across the rest of GB which are embedded in the networks of other Distribution Network Operators (DNOs). In the same way other DNOs might operate networks embedded in the main SSE networks.

Meter Point Administration Number - MPAN

With this patchwork of ownership it could be quite difficult to identify which DNO you need to contact in order to send in a G83 notification. However someone thought of this when electricity networks were being opened up to competition and created a unique number for each metering point in the UK. The number is called the Meter Point Administration Number or MPAN and the first two digits identify the DNO responsible for the supply cable into a building and hence the DNO you need to send a notification to.

SSE has two MPAN identifiers, numbers starting with 20 are in England and Wales, numbers starting with 17 are in Scotland. There is a table enclosed showing where you should send notifications to for each number.

For installations up to and including 50kW

Starting 20 000 nnnn nnn submit your forms electronically to south.microgen@sse.com by fax to 01202 784874 or by post to Microgeneration Connections Team, Poole Depot, PO Box 2004, Poole BH12 1YT

Starting 17 000 nnnn nnn submit your forms electronically to north.microgen@sse.com by fax to 01463 728247 or by post to Microgeneration Connections Team, Hydro Contracting, 10 Henderson Road, Inverness, IV1 1SN

For installations over 50kW submit your forms electronically to MCC@sse.com (Over 25kW on Shetland)

It is important that you correctly identify the MPAN of a customer before sending a notification to a DNO. Customers who already have a supply will have the number included on their bills, though unfortunately they don't have the identifier MPAN against the number. If you are quoting for a job then it should be easy to ask the customer to let you see a bill for you to identify the number and to keep it with your record of the quote until it's required on a notification.

The following table shows the other DNOs and their MPAN identifier:

Region	MPAN	DNO	Website
South Scotland	18....	SP Energy Networks	http://www.spenergynetworks.com/
North East England	15....	C E Electric UK – NEDL	http://www.ce-electricuk.com/
North West	16....	Electricity North West	http://www.enwl.co.uk/
Yorkshire	23....	C E Electric UK - YEDL	http://www.ce-electricuk.com/
East Midlands	11....	E.On Central Networks – East Midlands	http://www.eon-uk.com/distribution/
West Midlands	14....	E.On Central Networks – West Midlands	http://www.eon-uk.com/distribution/
Eastern England	10....	UK Power Networks – Eastern Power Networks	http://www.ukpowernetworks.co.uk/products-services/networks/index.shtml
South Wales	21....	Western Power Distribution – South and West Wales	http://www.westernpower.co.uk/
London	12....	UK Power Networks – London Power Networks	http://www.ukpowernetworks.co.uk/products-services/networks/index.shtml
South East England	19....	UK Power Networks – South Eastern Power Networks	http://www.ukpowernetworks.co.uk/products-services/networks/index.shtml
South West England	22....	Western Power Distribution – South West England	http://www.westernpower.co.uk/
Cheshire, Merseyside and North Wales	13....	SP Energy Networks - Cheshire, Merseyside and North Wales	http://www.spenergynetworks.com/

System ratings

DNOs in general are really concerned with the maximum output power at 230v AC, as it is this which has to be fed on to our network and may cause undesirable effects on the network. The effect which concerns us most is the rise in voltage caused by power flowing in the opposite direction when the PV output is greater than the customers own load. The electricity network in the UK has been designed for power flows from higher voltages down to lower voltages and finally to the customer. No allowance was made in the system design for power flowing in the opposite direction. For a single property with the maximum generation allowed under G83, of 3.7 kW, there will be many times when power is been exported from a property. Most of this will be absorbed by adjacent properties and will not feed back in to higher voltage systems and will generally not cause a problem, though it might do in some circumstances.

However where larger installations are required, or where multiple installations are proposed, it is more likely that power will flow in the opposite direction to that for which the system was designed. Under these circumstances you must notify the DNO of a proposal and await confirmation that the proposed installation can go ahead before installing a PV system. If we determine that it can't be connected without reinforcing our network then you should not carry out the installation. If reinforcement is required then a charge will be made by the DNO for the work involved and could result in the customer deciding not to go ahead with the installation.

So back to the size of PV system outputs. In order to get these consistently across all installers and therefore make sure you are all treated equally, I would like every one to use the same method of working out the capacity of a system when notifying SSE, or applying for large or multiple installations.

The proposed calculation is as follows and some people are already using this.

Power pv = peak output of the panels installed

Power inv = maximum rated output of the inverter in Watts

Power declared = smaller of Power pv, or Power inv.

I've included a couple of examples, but if you need any extra help please give one of us a call.

There are 16 by 210W panels on the roof, the inverter is rated at 2500W

Power pv = $16 \times 210 = 3360\text{W}$

Power inv = 2500W

Therefore Power declared would be 2500W 10.9A

There are 14 by 175W panels on the roof, the inverter is rated at 2500W

Power pv = $14 \times 175 = 2450\text{W}$

Power inv = 2500W

Therefore power declared would be 2450W 10.7A

To covert the declared power from watts to amps divide by 230

LV networks

The method of working outlined above gives SSE a reasonably accurate way of assessing the peak output from the PV system, which is smaller than has been declared for some jobs in the past. Smaller more realistic figures reduce the chance of an application being rejected. Or if reinforcement is required, ensure that only the work really required is done.

Of course you should not deliberately install a larger system than you declare as this could cause problems and may result in the system having to be disconnected and then downsized to the acceptable figure for the particular network.

There is the possibility of diversity with multiple installations, due to them being on roofs facing in different directions. If anyone has any ideas about how this should be calculated please let me know and if we can agree on a formula then I'll arrange for it to be distributed to all known installers in our area.

The maximum allowable voltage rise created by generation on existing LV networks is 1.2%. If a new LV network is required then we can alter the design to allow a higher amount of generation in relation to the load. We have had one or two applications where we have been able to do this but they have been at a very late stage in the design. We really need to get the information before the new LV network has been designed. A new cable from an existing transformer is not regarded as a new LV network, just an extension of an existing one. A new LV network must have a new transformer which we can set up to give out a lower voltage than in our older designs. This allows a higher voltage rise because of the generation, but still keeps the customer with the highest voltage within the statutory voltage limits.

Balanced loads across a three phase network cause lower voltage rises than unbalanced loads, therefore when a three phase connection is available you should arrange for the output to be balanced as closely as possible across the three phases.

Costs Involved

When installing a single system under 3.7kW per phase there is no requirement to apply under G83/1-1 stage 1 and no costs are involved. Notification must be sent in within 30 days of commissioning.

When installing more than one system under 3.7kW per phase within the same postcode then you must apply under G83/1-1 stage 2 and charges apply. To carry out a network impact assessment we quote £250.00 plus VAT and this is payable prior to commissioning. To carry out a network impact assessment and additional works required to accept the generation at that point we will quote accordingly.

When installing a single system between 3.7kW per phase and 17kW per phase this falls under G59/2 and you must apply under G59/2 and charges apply. To carry out a network impact assessment we quote £250.00 plus VAT and this is payable prior to commissioning. To carry out a network impact assessment and additional works required to accept the generation at that point we will quote accordingly.

Protection

The third item I'd like to let you know about is what protection is required at different output levels. For installations under 16A (3.7 kW) per phase there is no change, you must use equipment certified as meeting the requirements of G83. For installations between 16A (3.7 kW) per phase and 10kW per phase then SSE are happy for you to use equipment certified for use under G83 provided you apply G59 settings. ***Above 10kW per phase you can use inverters certified for use under G83 and apply G59 settings but must also fit a relay which complies with G59 which is arranged to trip a circuit breaker. You then will need to have some system of re-closing the circuit breaker (CB) after the supply has returned to normal. If the premises are manned 24-7 then this could be manual but if not you might need to add a suitable circuit to close the CB. When using G59 relays the settings on the inverters must be equal to or outside the envelope of settings of the G59 relay. So for example G59 requires under frequency to be set to 47Hz 0.5 second delay, a setting on the inverter of higher than 47Hz or quicker than 0.5 seconds is not acceptable as this would cause the inverter protection to operate first.

*** Inverters that are type tested to G59/2 negate the need for a separate G59 relay

National Grid are particularly concerned about under frequency settings being higher than 47Hz, as during a low frequency event when the UK needs to keep as much generation on as possible we could lose generation and make the situation worse. At the moment PV provides a minute amount of generation but the rate of installations is rising quickly. In the last 9 months of 2008 PV installed in the old southern electric area was reported as 224kW, in the last 9 months of 2009 the figure had risen to 655kW almost 3 times as much.

Multiple installations

Where we give approval for multiple installations you still need to inform us within one month that a connection has been made, on the other hand we don't need 20 drawings or commissioning schedules for 20 identical plots. A sample of each design showing which properties it will apply to is sufficient when the first installation is completed. If electrically you have two identical designs but one type of house has the inverter in the garage and another in the loft then this should be recorded as two different designs. Thereafter if you can send an updated list each month of the installations connected in the preceding month showing that they are to a standard design which has already been submitted to SSE at an earlier stage of the job, we will regard this as fulfilling your obligations under G83.

The schedule sent each month needs to include the following for each property as a minimum.

Address, Post code, MPAN, size of system, design ref, date of commissioning.