RISK MANAGEMENT PROGRAMME FOR PHOTOVOLTAIC ROOF MOUNTED SYSTEMS

The Government defines Microgeneration as the production of heat and/or electricity on a small scale from a low carbon source. These technologies have the potential to achieve climate change targets by providing affordable and reliable energy as an alternative or supplementary energy source for householders, the community and small to medium businesses. Photovoltaic and solar power systems are one energy option which is being rewarded with beneficial feed in tariffs. Retrospectively fitted systems to existing buildings, attract a higher feed in tariff level than new builds.

Photovoltaic systems derive power from cells containing a solar voltaic material that converts solar radiation into direct current electricity which by passing through an inverter, can be converted into alternating current for supply to the grid or for own premises consumption.

The Microgeneration Certification Scheme falls under the control of the Secretary of State for Energy and is designed to set quality standards for equipment and installations, protect consumers and offer guidance through the certification mark. Modules must comply with the relevant IEC qualifications (IEC 61215/61646/61730 for module type). Installations to comply with the MCS/ECA publication – Guide to Installation of Photovoltaic Systems.

The Microgeneration Certification Scheme applies to all systems with a maximum output not exceeding 16 amps per phase and all equipment and installers for schemes under 50KW must be registered with the Microgeneration Certification Scheme to receive the feed in tariff returns. However, this only applies to users who wish to supply to the grid and systems generating power for the users own consumption are exempt.

The following information is provided for guidance purposes only

1) ELECTRICITY SAFETY, QUALITY AND CONTINUITY REGULATIONS 2002

Micro electricity generation is exempt from the above regulations subject to the following:

a) the system to have protection which will disconnect from the mains automatically in the event of a loss of mains supply (inverter panel to be suitably marked for termination procedure

b) the installation to comply with the current edition of BS7671 (Requirements for electrical installations IET guidance note 7, s12)

c) the installer to notify the distribution network operator before or at the time of commissioning the microgenerator.

Consumers are required to employ MCS approved contractors and equipment to ensure appropriate safety standards are enforced and eligibility for feed in tariffs if required.

2) AMPAGE OUTPUT

For installations under 16 amp per phase production

a) the National Engineering Standard G83/1 applies to govern isolation, and non leakage in the event of power outage to ensure network engineer safety

b) Engineering Regulation 113 applies to ensure the distribution network operator is responsible for any variance in output to cater for high and low outputs

c) The District Network Operator will inspect the installation to ensure it complies with the above and forward a letter of acknowledgment.

For installations over 16 amps per phase production:

a) Application to be made to the Distribution Network Operator who will specify the standards for compliance

b) Engineering standard G59/2 will apply and a G59 relay unit to be fitted for the electricity to flow to the grid and these installations are arranged on a specific agreement with the Distribution Network Operator.

3) INSTALLATION REQUIREMENTS

Most domestic installations will not require planning permission as they are exempted under the permitted developments rights. This exemption may be granted to non domestic properties but it must be referred to the local planning authority for confirmation before installation is commenced. Roof mounted installations to comply with the following:

a) a qualified structural engineer to be commissioned to ensure that the roof structure, upon which the installation is mounted, is sufficient to bear the additional weight. The findings to consider not only the weight of the installation, but any additional snow load in adverse weather conditions. Written confirmation of completion to be retained and any recommended remedial structural work completed in accordance

with the engineer's requirements. Guidance is provided in BRE Digests 495 and 489 or BS6399. Lightweight structures are unlikely to be able to bear the additional weight and alternative locations should be sought

b) the installation to comply with the Microgeneration Installation Standard: MIS 3002 ISSUE 2 and sufficient under ventilation provided

c) Solar Photovoltaic Microgeneration systems to be designed and installed in accordance with the DTI guide "Photovoltaics in buildings – Guide to the installation of PV systems" DTI/pub URN 06/1972

d) an inverter supplied from a PV array to be connected via a dedicated circuit to a spare fuseway in the main distribution unit or a fuseway in an additional dedicated distribution board

e) all roof penetrations for fixing including modules, cables of bracketry, to be durably sealed using proprietary products capable of accommodating the movement and temperatures to which they will be exposed. Breaches not to be sealed with mastic or sealant and only purpose made roof tiles and flashings to be employed for the routing of cables

f) any external metalwork used for bracketry or mounting frames to be constructed to correctly support the imposed static and wind loads, adequately ballasted or fixed into a structural member and adequately protected from corrosion for a typical life to first maintenance of at least twenty years. e.g. stainless steel to American Society of Testing and Materials (ASTM) grade 304 or 316 to EN10088

g) the installation to be commissioned in accordance with the requirements of the MIS 3002 standard.

4) ELECTRICAL INSTALLATIONS

Electrical installations present a potential fire inception risk and so strict requirements are necessary and to include the following:

a) electrical installation and maintenance to be undertaken by a 'competent person'. This would include a qualified electrical contractor, ideally recognised by a trade body such as the National Inspection Council for Electrical Installation Contracting (NICEIC), SELECT (Scotland) or similar approved UKAS accredited body

b) for commercial premises, general fixed wiring inspection of the system and premises with IET Certification every 5 years in accordance with the recommendations of The Electricity at Work Regulations

c) suitable protection against power surges to be incorporated and excess cable length avoided

d) consideration to be given to the provision of lightning protection to BS EN 62305:2006 and the inverter be correctly earthed

e) security considerations may be required if the panels are accessible from ground floor level.

5) HOUSEKEEPING

a) The housing of the inverter unit is to be acceptably ventilated to ensure the unit operating temperature is not excessive

b) Storage of combustible materials, flammable liquids, general plant and equipment (other than required for the installation) to be prohibited within the vicinity of the inverter unit.

6) MAINTENANCE

a) All plant and equipment to be inspected, serviced and maintained in accordance with the manufacturer's recommendations by an approved engineer or suitably trained and qualified person

b) Essential maintenance works and servicing to be undertaken by an MCS approved engineer

c) All records relating to periodic inspections, servicing and maintenance to be related as reference for future period inspections

d) All maintenance works and associated works to be undertaken under a strict permit to work system.

7) FIRE RISK MANAGEMENT

For large scale commercial installations the following fire precautions to be considered:

a) fire alarm system to be designed and installed in accordance with BS5839-1:2002. The system to be commissioned and maintained by a company/companies certificated by a UKAS accredited inspectorate with either BAFE adopted LPS 1014 or BAFE adopted SP 203 in their scope in order to guarantee future emergency response from the Fire and Rescue Service

b) remote signalling fire alarm with smoke/heat detectors to be sited within the inverter housing

c) operation of the fire alarm to automatically isolate the equipment and, in addition to the remote signal, to sound a local audible warning device

d) the inverter unit and any grid connections to be housed in an area of non combustible construction or affixed to non combustible materials. Regular thermographic inspection is recommended.

8) FIRE RISK ASSESSMENT – COMMERCIAL PREMISES

A fire risk assessment to be undertaken to identify and evaluate the potential for serious fire in the light of working practices, inception hazards and likely fire spread. For instance, a fire in panels has the potential to breach across internal compartment walls. The Fire & Rescue Services response and fire-fighting policy adoption, owing to the presence of such panels, and provisions of water supplies also to be considered. The results of the assessment to be documented, together with action points, and reviewed periodically. Completion of a fire risk assessment is required in accordance with current legislation Regulatory Reform (Fire Safety) Order 2005.

N.B. All work and working practices shall be in compliance with all relevant Health and Safety regulations and appropriate risk assessments shall be conducted before commencing any work on site. Appropriate warning signage to be in place.