

# RISK MANAGEMENT PROGRAMME FOR PHOTOVOLTAIC FIELD ARRAYS

The Government defines Microgeneration as the small scale production of heat and/or electricity from a low carbon source. These technologies have the potential to achieve climate change targets by providing alternative affordable and reliable energy or a supplementary energy source for householders, the community and small businesses. Photovoltaic and solar power systems are one energy option which is being rewarded with beneficial Feed-In Tariffs with retrospectively fitted systems attracting a higher level than new builds.

A concern for ground based field arrays is their accessibility and associated theft risk as not only is the technology desirable but also the copper content of the power supply cables and the aluminium used extensively in their construction. This Guidance Note includes recommendations for the improvement of security.

The following information is provided for guidance purposes only

## 1) ELECTRICITY SAFETY, QUALITY AND CONTINUITY REGULATIONS 2002

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

- a) the system to disconnect from the mains automatically in the event of 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)
- c) the installers to notify the Distribution Network Operator before or at the time of commissioning the microgenerator.

Consumers are required to employ Microgeneration Certification Scheme (MCS) approved contractors and equipment to ensure appropriate safety standards are enforced and eligibility for Feed-In Tariffs.

## 2) AMPAGE OUTPUT

Field array installations will generally exceed 16 amps per phase production and therefore The National Engineering Standard G59/2 will apply and a G59 relay unit fitted for the electricity to flow to the grid. Installations to be specifically agreed with the Distribution Network Operator who will inspect them to ensure compliance with the requirements and forward a letter of acknowledgment on completion.

## 3) INSTALLATION REQUIREMENTS

Most field array and commercial installations will require planning permission as they are not currently exempted under the permitted developments rights. An extension may be granted to non-domestic properties but it must be referred to the local planning authority for confirmation before an installation is commenced.

Field array installations to comply with the following:

- a) Microgeneration Installation Standard: MIS 3002 or The National Engineering Standard G59/2
- b) 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
- c) 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
- d) any external metalwork used for bracketry or mounting frames to be constructed to correctly support the imposed static and wind loads, be 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 for Testing and Materials (ASTM) grade 304 or 316 to EN10088-1 2005
- e) the installation to be commissioned in accordance with the requirements of the MIS 3002 standard.



**NFU Mutual**  
Risk Management Services

[nfumutual.co.uk/rms](http://nfumutual.co.uk/rms)

#### 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. A three yearly inspection is normally expected for installations in the open
- b) suitable protection against power surges to be incorporated
- c) consideration to be given to the provision of lightning protection to BS EN 62305:2006 and the inverter to be correctly earthed.

#### 5) HOUSEKEEPING

- a) The housing of the inverter unit 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 retained as reference for future inspections
- d) All maintenance and associated works to be undertaken under a strict permit to work system.

#### 7) PHYSICAL SECURITY

Please refer to your insurer for site specific recommendations. The following is provided as general guidance:

- a) the panels, framework, electrical connections and cabling all present an increased theft risk and so site access to be restricted where possible. It is recommended that the area housing the field array be protected

by security fencing of sufficient height to discourage unauthorised access

- b) any gates to be of the same standard and secured by a good quality closed shackle padlock. Arrays not to be installed in areas where there is a public right of way but if so, this to be fenced off accordingly to discourage trespass on site
- c) all panel serial numbers to be registered with the MCS scheme if energy is being exported to the grid and DNA marking to be considered as an additional deterrent.

#### 8) INTRUDER ALARMS – HIGH VALUE EXPOSURES ONLY

- a) Consider the installation of an intruder alarm system to provide perimeter protection to the field array enclosure linked to the perimeter fencing, and any access gates, plus volumetric coverage to the inverter housing
- b) The supply, installation and maintenance of the system to be undertaken by a UKAS accredited installer and approved by an independent inspection body such as NSI
- c) The installation to inverter buildings to comply with BS4737 or BS EN50131 and the Association of Chief Police Officers (ACPO) Security Systems Policy
- d) The alarm to connect to a NSI approved Alarm Receiving Centre preferably by dual path signalling
- e) The system to use 'sequential' alarm confirmation, enabling the Alarm Receiving Centre to filter alarm signals and avoid unnecessary false alarms
- f) Professional keyholder response may be required to respond to activations of the perimeter detection systems.

## 9) CLOSED CIRCUIT TELEVISION – HIGH VALUE EXPOSURES ONLY

It is recommended that there be CCTV coverage of the external field location of the panel array as follows:

- a) the supply, installation and maintenance of the system to be undertaken by a reputable and experienced installer, preferably approved by an independent inspection body such as National Security Inspectorate (NSI)
- b) the system to comply with British Standard BS8418 (monitored) or European Standard BS EN 50132 as required – please refer to your insurer
- c) the system to provide coverage to the field array and potential access points
- d) sufficient lighting to be provided, or night time vision cameras used, to ensure pictures are of suitable quality during the hours of darkness
- e) to be fully effective the system to be activated, out of business hours, by detectors within the perimeter security of the fenced enclosure and be connected to an NSI approved Alarm Receiving Centre which can arrange an appropriate response.

## 10) FIRE RISK ASSESSMENT – COMMERCIAL PREMISES

A fire risk assessment must be undertaken to identify and evaluate the potential for serious fire in the light of working practices, inception hazards and likely fire spread to any nearby buildings (including inverter housings). The results of the assessment to be documented, together with action points, and reviewed periodically.

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



NFU Mutual

### IMPORTANT NOTE

The information contained herein is designed for guidance only and NFU Mutual cannot accept responsibility for any errors or omissions arising from its use.

NFU Mutual Risk Management Services Limited (No. 3350057). Registered in England. Registered Office: Tiddington Road, Stratford upon Avon, Warwickshire CV37 7BJ. A member of the NFU Mutual group of companies.

For security and training purposes telephone calls may be recorded and monitored.

RM Data Sheet Photovoltaic Field/0215

[nfumutual.co.uk](http://nfumutual.co.uk)