RISK MANAGEMENT PROGRAMME FOR SMALL SCALE WIND TURBINES AND BUILDING MOUNTED SYSTEMS

This Guidance Note is intended to provide risk management advice on smaller wind turbine installations either as standalone or building mounted systems generating up to 500W of power rather than larger scale turbine installations. It should be noted that building mounted systems are not always favoured by turbine installers and it is recommended that professional advice should always be taken before proceeding.

Only systems from a suitable proprietary manufacturer should be considered with approved CE markings and it is recommended that installation should always be undertaken by a professional installer who will have the necessary experience, apply the appropriate safety measures and have public liability insurance in force for such work.

The following information is provided for guidance purposes only

1) THE INSTALLER

a) Most building mounted and small scale turbine units are designed for self installation but it is strongly recommended that installers holding accreditation with the Microgeneration Certification Scheme (MCS) under Microgeneration Installation Standard: MIS 3003 – Requirements for Contractors Undertaking the Supply, Design, Installation, Set To Work Commissioning and Handover of Micro and Small Wind Turbine Systems are always utilised

b) Ensure the installer or any appointed contractor(s) operate a quality management system meeting the requirements of Microgeneration Installation Standard: MCS 001 – Installer Certification Scheme Requirements

c) Further details of the these schemes are available at www.microgenerationcertfication.org

d) The installer should also be a member of the Real Assurance Scheme provided by Renewable Energy Assurance Ltd, which requires adherence to strict Codes of Conduct. Further details are available at www.realassurance.org.uk

e) Refer to the local authority for any necessary planning permission or to ascertain if local byelaws need to be considered

f) If the system is to be connected to the grid approval is required from the District Network Operator.

2) THE INSTALLATION

a) Only proprietary equipment with a recognised brand name with appropriate CE markings and declarations of conformity to be used

b) The installation to be designed, installed and maintained in accordance with the requirements of the current Building Regulations. Planning requirements to be discussed with the local Buildings Control Officer prior to work commencing

c) The suitability of the building housing the turbine to be professionally assessed by a qualified Structural Surveyor and any strengthening work carried out in accordance with the Surveyor's requirements

d) Installation and/or erection to be carried out strictly in accordance with the manufacturer's instructions. Any fixings must not loosen under vibration, any breaches into roofing or walling structures to be correctly weather sealed and all mountings to be corrosion resistant

e) The potential for vibration damage to be fully considered when selecting the building on which the turbine will be mounted e.g. render finishes may work loose during regular turbine movements

f) Erecting turbines on residential accommodation is not recommended and consideration to be given to the potential resonance that can be induced in buildings

g) All work, and working practices, must be in compliance with relevant Health and Safety regulations and appropriate risk assessments to be conducted before work on site is commenced. Care to be taken to ensure that the siting of the unit does not expose any persons to the danger of moving parts when in operation

h) A formal record of receipts, manuals, certificates, warranties and maintenance planning to be kept

i) Proprietary lifting platforms/access towers or Mobile Elevated Lifting Plant (MELP) to be used for work at height rather than ladders or other unstable means of access. All access plant to be erected by suitably competent/ trained persons, properly footed and secured in accordance with manufacturer's or supplier's guidance

j) The number of persons required to lift awkward and/or heavy parts to be carefully assessed and appropriate personal protective equipment such as gloves, eyewear and footwear to be provided

k) As much of the installation process to be completed at ground level as possible

l) Work only to be undertaken during suitable weather conditions

m) The path of the blades never to be entered when the turbine is operational. All installation operatives to be made aware of the risks of injury

n) Appropriate safety training and safe systems of work to be devised for any employees or family members exposed to the risks of injury

o) A safe system of work to be in place for regular maintenance and cleaning and to ensure that the blades are secured and the turbine power isolated before any work commences. Isolator switches to be clearly marked for on and off positions.

3) TURBINE LOCATION

a) The turbine to be positioned in accordance with manufacturer's instructions and normally to be set 2 metres over the roofline and a minimum of 3 metres above ground level to protect against possible personnel or livestock presence

b) The turbine not to be exposed to prevailing winds

c) The surrounding environment to be levelled, smoothed or cut back to reduce turbulence in accordance with manufacturer's/installer's guidelines. Excessive turbulence can cause fatigue and shorten the turbine's lifespan

d) Suitable lightening protection to be incorporated or the turbine incorporated within the building's existing protection system and suitably earthed

e) Turbines not to be located near public roads. A separation distance of at least 20m is recommended

f) Cabling from the turbine to the control equipment to be of suitable voltage and, if involving ground cables, to be buried to a distance of at least 600 mm. Consideration to be given to housing the cabling within theft resistant tubing or armoured cabling

g) Control and inverter equipment to be installed in suitably secured and ventilated buildings and kept clear of all combustible and/or flammable materials (min 2m distance). Smoke detection to be provided where possible to this area to provide early warning

h) Keys to the isolation controls to be removed from the housing to prevent illicit isolation and tampering.

4) ELECTRICAL REQUIREMENTS

a) Electrical installations and any electrical monitoring systems to be installed in accordance with current IEE Regulations (BS7671) and to only be undertaken by approved electrical contractors

b) The installation to be routinely examined by qualified electrical contractors in accordance with the manufacturer's instructions. Repairs or improvements to be undertaken promptly in accordance with the report and appropriate certification issued

c) Wherever possible electrical equipment including wiring, switchgear and controls to be located within secured housings or cabinets

d) Appropriate stop switches or emergency shut off facility to be fitted in accordance with the manufacturer's instructions

e) A regulator to be utilised when the system is being used for battery charging to reduce the risk of damage through overcharging

f) Consider installation of a digital battery monitor to record charging activity

g) Batteries to be routinely inspected and replaced in accordance with manufacturer's guidelines

h) The charging area to be kept clear of combustible goods and materials

i) As turbines can produce high voltages when running, the risk of electric shocks during the installation process to be considered

j) Appropriate fuse rating provisions to be made in accordance with the manufacturer's instructions. Higher rated fuses are not to be permitted. Routinely blown fuses to be treated as a product/installation fault and professional advice taken

k) Polarity to be correct when connecting to an electrical circuit. Reverse polarity may damage the turbine unit.

5) BATTERY SYSTEMS

Significant amounts of energy can be stored within a battery and may deliver large fault currents and so the following protection to be provided:

a) a circuit breaker device installed on the positive wire line of suitable rating and size

b) cable ratings to comply with BS7671

c) method of battery isolation to be provided

d) batteries to be housed in well ventilated areas with restricted access and guarded against accidental contact.

6) SERVICING/MAINTENANCE

a) The turbine and associated equipment to be subject to formal servicing and maintenance provided by an MCS approved installer which should continue after expiry of any installation warranty period

b) Any recommendations made during servicing/repairs to be fully implemented and adhered to

c) Repairs by non-approved persons not to be permitted, as this can affect manufacturer's warranties

d) Proprietary replacement parts and approved lubrication materials to be used for all repairs

e) Systems to be visually checked regularly. Unusual movement or noise to be reported to an approved installer immediately and corrective action taken. All damaged or chipped blades to be replaced

f) Stop controls to be clearly labelled and employees trained to use the brake system in the event of malfunction

g) The machine to be isolated, batteries disconnected and blades secured during routine maintenance.

7) GENERAL RECOMMENDATIONS

a) The housing equipment to be ventilated to ensure operating temperatures are not excessive

b) Consider the risk of ice build up in cold weather

c) Any installation by approved persons to include full commissioning and testing with a suitable compliance certificate issued and retained.