

1. SCOPE

This document defines PowerSystems’ policy in respect of overhead lines in the vicinity of recreational areas in order to prevent danger to members of the public.

2. ISSUE RECORD

This is a controlled maintained document

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Issue Date	Issue No	Author	Amendment Details
Nov 2005	1	R H Bracey	Initial issue: 11 page document
April 2007	2	S Baker	Flowchart and Appendix A edit

3. ISSUE AUTHORITY

Author	Owner	Issue Authority
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4. REVIEW

This document shall be subject to review in the event of any change in Statutory legislation or, if none, no later than three years after publication.

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6. DEFINITIONS

For the purposes of this policy, the term **recreational area** is defined as all areas used by members of the public for leisure and recreational activities and includes (but is not limited to) the following:

- Caravan sites
- Camping sites
- Sailing waters
- Boat launching areas
- Marinas
- Sports grounds
- Golf courses
- School playgrounds
- Play areas
- Showgrounds for agricultural, festival or similar purposes
- Fishing areas
- Picnic areas
- Leisure areas
- Private flying areas (including gliding, ballooning, hang gliding and similar activities) and their landing approach areas

7. RELATED DOCUMENTS

Statutory Legislation

ESQCR The Electricity Safety, Quality and Continuity Regulations 2002
 S.I. 2002 No. 2665.

PowerSystems documents

EPS-01-002 Hazard Management Policy
EPS-01-004 Policy for Signing and Guarding of Electrical Network Apparatus

Energy Networks Association Technical Specifications (ENA TS)

ENA TS 43-08 Overhead Line Clearances

Health and Safety Executive Guidance Notes

GS6 Avoidance of danger from overhead electric power lines

8. STATUTORY REQUIREMENTS

The ESQCR place a number of requirements on a Distributor. Some of these (Regulation 3 and the associated Guidance Notes) are particularly relevant to overhead lines in the vicinity of **recreational areas**.

8.1 General

- Distributors' equipment shall be so constructed, installed, protected and maintained as to prevent danger.

8.2 Risk assessment

- Distributors shall for each of their overhead lines and substations assess the foreseeable risk of danger from interference, vandalism or unauthorised access.
- This assessment shall have regard to the nature of the equipment and use of the surrounding land.
- Details of the assessment shall be permanently recorded.

8.3 Safeguarding the public

- Distributors shall take measures to safeguard their equipment commensurate with the nature and class of risk to which it gives rise.
- Distributors shall take reasonable steps to ensure that the public are made aware of dangers which may arise from activities carried out in proximity to overhead lines and to indicate the means by which those dangers may be avoided.

9. OVERHEAD LINE CLEARANCES

Where clearances are specified in this policy, they shall be maintained with the line conductors operating at their likely maximum temperature. No clearance shall be less than that specified in ENA TS 43-08.

10. IDENTIFICATION AND RECORDING OF AREAS

Recreational areas shall be identified during the course of overhead line inspections. Their presence shall be noted within AIS and a note appended to the GIS map. All **recreational areas** shall be classified as "High Risk" and must have, as a minimum, appropriate signing and guarding in accordance with EPS-01-004. All defects that may give rise to a risk of danger to the public shall be reported and managed in accordance with EPS-01-002.

11. RISK ASSESSMENT

A list of **recreational areas** identified within AIS shall be made available to the Health and Safety Dept. by the Maintenance Business. Health and Safety Dept. will arrange to complete a more detailed risk assessment at each site and initiate safety-related discussions with the site owner. The output of the risk assessment shall be communicated to Asset Management and the Maintenance Business in order that risk mitigation measures can be implemented.

Assessment of hazards shall take account of the lack of awareness by the public of hazards present in an unfamiliar environment. Allowance must be made for the adventurous instinct of children and for the fact that undesignated areas are often used for play.

PowerSystems has a duty to enquire into what recreational equipment might be brought onto **recreational areas** by members of the public and to consider whether there is a risk of contact with overhead line conductors or associated apparatus.

The possible dangers arising from the use of different types of vehicles and equipment shall be considered. Boat trailers, boats with metal masts, ladders to reach roofs of caravans or chalets, kite flying, fishing, aerials for tv or radio (cb, amateur or commercial), metal frames and ridge poles of tents and the use of carbon-fibre rods by anglers are all examples of recreational equipment which can give rise to danger.

12. RISK MITIGATION MEASURES

Following a detailed risk assessment, one or more of the following measures shall be employed as appropriate to mitigate risks of danger to the public from overhead lines at **recreational areas**:

- Provision of information to landowners and **recreational area** operators/managers.
- Providing additional signing and guarding.
- Increasing the visibility of overhead line conductors with appropriate marking devices.
- Increasing conductor to ground clearances and/or reducing span lengths.
- Installing lightly insulated 11kV conductors (CC or BLX/BLL).
- Installing insulated low voltage ABC or concentric cables.
- Installing Ericsson 11kV aerial cable.
- Relocating pole mounted substations.
- Deviating lines.
- Replacing pole mounted substations by ground mounted alternatives.
- Undergrounding of lines.

The measures chosen must balance cost against risk. Further guidance is provided in Appendix A.

13. NEW SUPPLIES

If a new supply is required to a **recreational area** or to a property on land where the owner/tenant is likely to allow caravans or camping, the new lines must be routed to allow for any future recreational activities which can reasonably be anticipated.

The site operator should be persuaded if possible not to establish **recreational areas** on land crossed by overhead lines. He should be asked to notify PowerSystems before establishing new **recreational areas**, particularly where he knows lines exist, so that safety aspects can be discussed.

Pole-type substations providing supplies shall be placed in the fields adjacent to but not within **recreational areas**. All mains and service connections within a **recreational area** shall be laid underground. Substations within **recreational areas** shall be fully enclosed (ie brick built, prefabricated housing or padmount type).

Efforts should be made to preclude parking in the proximity of a pole type substation and the site owner should be encouraged to erect bollards or similar obstructions for this purpose.

Any additional costs for safety measures which could add to the cost of the proposed supply should be included in the original estimate and taken into account when assessing the capital contribution.

14. ROUTING OF NEW LINES

New overhead lines at any voltage shall not be routed across **recreational areas** unless appropriate risk mitigation measures are incorporated into the design.

15. COSTS

When it is necessary to modify circuits following a risk assessment, the costs will be funded on a prioritised basis from the appropriate overhead line capital expenditure activity code.

When it is necessary to modify circuits at the request of a site operator or when the site obtains direct benefit from the line a contribution should be requested.

APPENDIX A – RISK MITIGATION GUIDANCE

Refer to Process flowchart at Appendix B

A1 ASSESSED AS NORMAL RISK BY HEALTH & SAFETY DEPT.

No further action required except to update AIS to confirm reduction to Category 2.

A2 ASSESSED AS MEDIUM RISK BY HEALTH AND SAFETY DEPT.

A patrol shall be carried out and the site's classification reviewed annually. AIS shall be updated to confirm classification as Category 1.

A3 ASSESSED AS HIGH RISK BY HEALTH & SAFETY DEPT.

Further action shall be taken following the guidelines in Appendix A3 below. AIS shall be updated to confirm classification as Category 1.

A3.1 Advice to Site Operators

The site operator should be asked to provide notices stressing the dangers of flying kites etc. These should be displayed in prominent locations on the site and particularly at the camp entrances and site offices.

He should be issued with public safety leaflets and advised that:

- Compliance with GS6 would satisfy HSE requirements.
- Kites and model aircraft must not be flown in any field below or adjacent to any electric line.
- Radio and tv aerials or similar structures must not be erected within 10 m of any electricity line or structure.
- Poles must not be climbed and
- A minimum horizontal safety clearance of 3.0 m must be maintained between any caravan or vehicle and an overhead electric line pole or structure to prevent any person climbing from caravan or vehicle roofs.

A3.2 Minimum Clearances

Minimum clearances to ground and objects shall be in accordance with ENA TS 43-08. These minimum clearances may be increased to provide additional risk mitigation (see section A2.7).

A3.3 Additional Signing

A3.3.1 Fishing Sites

Signs shall be made available to owners of fishing sites in reasonable numbers. Two designs of sign are available:

- A Warning Notice – used to provide a general warning at the approach to waters.
- A Prohibition Notice – used to signify no fishing within 30 metres of overhead lines.

When no fishing site owner can be identified and/or where inspection reveals that no signs have been fitted then a Warning Notice shall be attached to those overhead line supports that are immediately adjacent to the site, facing in such a direction so as to be most effective.

Where lines cross recreational lakes and rivers, safety signs together with notices indicating safe clearance heights of masts shall be attached to the poles each side of any waterway crossing and indicated on notices on the banks where they can be observed by the boat occupants. The signs shall be erected facing the direction of travel, 20 m before encountering the overhead line in either direction.

A3.3.2 Other Recreational Sites

Signs shall be made available to owners of other recreational sites in reasonable numbers. One design of sign is available:

- A Warning Notice – used to provide a general “look up – look out” warning.

When no site owner can be identified and/or where inspection reveals that no signs have been fitted then a Warning Notice shall be attached to those overhead line supports that are in or immediately adjacent to the site, facing in such a direction so as to be most effective.

A3.4 Additional Guarding

Where 33, 22 or 11-kV lines could constitute a hazard and it is impracticable to divert them, the poles should be fitted with duplicate anti-climbing guards vertically spaced at least one metre apart.

A3.5 Providing Agreed Crossing Points

Where boats or similar craft with upright masts are likely to be transported within a site, crossing points together with associated conductor heights shall be agreed with the site owner and confirmed in writing. Safety signs together with notices indicating safe clearance heights of masts shall be attached to the poles each side of any road crossing. These crossing points shall be in accordance with GS6.

A3.6 Increasing Line Visibility

The visibility of bare wire line conductors can be increased by fitting devices (such as coloured markers or bird flight diverters) to the line conductors in the span(s) affected.

A3.7 Increasing Clearances

Over recreational lakes and rivers the sailing gauge (maximum mast height above water) must be agreed with and confirmed in writing to the appropriate Water Authority or private owner. A pass-under clearance (see table) under maximum high water level conditions shall be provided between the lowest conductor and the top of the mast. Appropriate allowance must be made over tidal waters where particularly high tides can be anticipated.

Where overhead lines could constitute a hazard and it is impracticable to divert them, minimum ground clearances in accordance with the table shall be provided.

The minimum vertical clearance from any structure on which a person might stand (e.g. the roof of any chalet or caravan or fixed facilities as described below) shall be in accordance with the table.

Where spectator facilities, tents, lighting, public address systems, etc, are provided, overhead line poles/structures shall not be within 10 m of radio/tv aerials, stands or similar structures nor within 3.0 m of fences, caravans or vehicles where spectators may be tempted to climb.

These clearances will apply whenever a line is within the tabulated proximity distance of a recreational area.

Line voltage:	Not exceeding 33kV	132kV	275kV	400kV
Proximity distance	3.8m	4.4m	5.4m	6.1m
Sailing pass-under	1.8m	2.4m	3.4m	4.1m
Ground clearance	7.8m	8.4m	9.4m	10.1m
Structure clearance	3.8m	4.4m	5.4m	6.1m

Table A3.7 – proximity distances and clearances

A3.8 Insulated Conductors And Aerial Cables

Where bare conductors of low voltage overhead lines could constitute a hazard, they should be replaced with a fully insulated equivalent (low voltage ABC or concentric service cable).

Where bare conductors of 11kV overhead lines could constitute a hazard, two replacement options are available:

- Lightly insulated conductors (known as Covered Conductor – CC, or by the trade names “BLX” or “BLL”) can be used where infrequent mid-span contact is possible. Such conductors are not recommended for more general application as they are not classed as “fully insulated”.
- Ericsson fully insulated aerial cable erected in accordance with the appropriate PowerSystems’ specification can be used in other situations.

Insulated conductors and aerial cable are not generally available for lines operating at voltages above 11kV.

Note that lightly insulated conductors require the same clearances as for bare conductors. Clearances may be reduced to less than those required for bare conductors when fully insulated conductors and aerial cables are used.

A3.9 Line Deviation And Undergrounding

Deviation or undergrounding of overhead lines shall be only be undertaken if other risk mitigation measures are insufficient or if shown to be cost-effective compared with other options.

APPENDIX B - PROCESS FLOWCHART

