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Comments on Ausgrid Letter in Respect to EMF.

I would like to formulate the response to Ausgrid critique of our EMF report sitting references to documents published either by Ausgrid or by Transgrid. Both companies engaged in construction and operation of the 132kV lines in NSW.

The following extract printed in italics is reproduced from the TransGrid Easement Guide.

Transmission Line Easements in NSW

Easements are acquired for two essential reasons. The first is so that TransGrid can construct, reconstruct, operate and maintain its lines. The second is to ensure protection of the public by controlling activities under or near the line that may create an unsafe situation.

P E R M I T T E D

1. *Agricultural activities, subject to restrictions in machinery height of under 4.3m*
2. *Most domestic recreational activities (excluding the flying of kites and model aircraft)*
3. *Gardening, provided that mature plant height is under 4m*
4. *Vehicle parking, provided vehicle height is under 4.3m*
5. *Storage of non-flammable materials, under 2.5m*
6. *Minor structures under 2.5m such as washing lines or barbecues (provided that metallic parts are earthed)*

M A Y B E P E R M I T T E D

1. *Operation of machinery exceeding 4.3m*
2. *Building of fencing and yards*
3. *Landscaping*
4. *Use of irrigation equipment*
5. *Installation of utilities such as electricity, telephone and water*
6. *Outbuildings such as sheds, stables, garages and carports*
7. *Additions of unroofed verandas and pergolas to residences*
8. *Sporting and recreational facilities (including tennis courts)*
9. *Swimming pools, if the pool is not within 30m of a transmission line structure*
10. *The development of subdivisions (including the constructions of roads)*
11. *Excavation*
12. *Quarrying activities,*

N O T P E R M I T T E D

1. *The construction of houses, buildings or other substantial structures*
2. *The installation of fixed plant or equipment*
3. *The storage of flammable materials or explosives*
4. *The storage of garbage materials or fallen timber*
5. *Planting vegetation with a mature height which exceeds 4m*
6. *Any obstructions placed within 15m of a transmission line structure or supporting ropes, wires or chains*
7. *Flying of kites or model aircraft*

I would also like to refer to the current Ausgrid Network Standard No: NS143 Easements. This standard was revised in September 2005 and it provides no reference to the draft of ARPANSA Standard, although such draft has already been available in various forms since 2002.

Extract from the Appendix A on page 6 of the NS143 standard is given below in italics:

6. EMF levels.

The limits recommended by the International Radiation Protection Association for EMF exposure for the general public are as follows:

	Electric Field Strength	*Magnetic Field Strength*
Up to 24 hours/day	*5kV/m*	*100uT*
Few hours/day	*10kV/m*	*1000uT*

The Gibbs Report recommended a policy of prudent avoidance for new lines only and then only where the additional cost involved was not too great.

Electric Field Strength
The ESAA leaflet "Electric and Magnetic Fields" states that it is now generally accepted by scientists and doctors that electric fields, at the levels that we experience in our everyday lives, are not detrimental to health. Overhead lines are designed to meet the international guidelines and, therefore, electric fields are not further considered.

Magnetic Field Strength Near a Twin Circuit 132kV Tower Line
The magnetic field strength near a twin circuit tower line has been calculated using the following assumptions:

a) *Minimum conductor ground clearance of 6.7m and 10m*
b) *4m vertical separation between phases*
c) *3m vertical separation between top phase and earth conductor*
d) *Both circuits carrying symmetrical 3 phase current of 2600A (600MVA each circuit).*

Conclusions from the above calculations

a) *The magnetic field strength at a height of 1.8m above ground level is less than the recommended maximum levels <u>for continuous exposure</u> even for the minimum ground clearance of 6.7m. Conductor height is normally significantly higher than this.*

b) *For a 20m wide easement, the magnetic field strength at all points vertically above the easement boundary is below the recommended maximum level <u>for continuous exposure</u> under no wind conditions*

c) *At a horizontal distance of 3m from the conductors (ie under blow-out conditions), the magnetic field strength exceeds the 24 hour/day exposure limit above 4m in vertical height but is well below the 'few hours/day' limit. This is considered acceptable as it is a temporary phenomenon experienced during 'blowout' conditions.*

In summary, easement widths determined using the statutory clearance as the limiting factor are acceptable from an EMF point of view using the IRPA guidelines.

<u>Note:</u> A current of 2600A in both circuits has been used for the above calculations. Although Ausgrid has circuits rated at this level, it would be very unusual and only in an emergency that actual currents could reach this figure and then probably not in both circuits. The actual magnetic field strength, therefore, will be less than that calculated

above. The most onerous condition of phasing - ABC top to bottom on both circuits - has been assumed.

I would like to point out that the above reproduced part of the Ausgrid Network Standard is in direct conflict with the statement in Ausgrid letter on precautionary principle. It appears that in accordance with the NS143 standard both, the electric and magnetic fields within the 132kV power line easement are below the recommended maximum level for continuous exposure.

The closest wall of the closest residential building of the proposed development is 9m away from the power line easement. It should be pointed out that by allowing the 9m separation distance between the edge of the 132kV easement and the closest building of the proposed residential development the developer took into consideration the precautionary principle in minimisation of EMF exposure.

I am puzzled by the Ausgrid letter as I've extensively covered the precautionary principle in my report. It is interesting to note that my statement regarding the ARPANSA draft standard remains correct as the intended document will never be published as an Australian Standard, but rather it would be published as a guidelines.

In addition to the above, any references to a graft standard or guidelines is inappropriate until the document is finally published. At this stage if it is unclear whether the ARPANSA draft would be finally published as a guidelines without any further changes.

One should only check a draft of any Australian Standard to see that on its front page it is clearly written that the draft should never be referred to for compliance until the document is approved and published as a standard.