EnergyAustralia™

ELECTRIC AND MAGNETIC FIELDS ASSESSMENT

Proposed Royal North Shore Zone Substation

November 2008

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Contents

1 Introduction

EnergyAustralia is proposing to construct a new zone substation as part of the larger Royal North Shore Hospital (RNSH) redevelopment. Northern Sydney Area Health (Area Health) has proposed redevelopment of RNSH with projected additional demand, spread over a period of ten years, starting from 2008. The area at the vicinity of RNSH is bounded to the north by the Gore Hill Freeway, east by major railway corridors and south by the Pacific Highway.

The existing RNSH load is supplied from Gore Hill Zone Substation. Although there is space capacity at Gore Hill Zone Substation to initially supply the load increase, it will exacerbate emerging constraints at Willoughby STS. Due to capacity constraint at Willoughby STS, a new 132/11kV zone substation will be developed to supply the proposed spot load at RNSH.

The issue of Electric and Magnetic Fields (EMF) has been an integral part of the process of planning the Royal North Shore Zone Substation. This Report provides a summary of the key EMF considerations for this proposal.

2 Introduction to EMF

EMF are part of the natural environment and are present in the Earth's core and the atmosphere. EMF is also produced wherever electricity or electrical equipment is in use. Power lines, electrical wiring, household appliances and electrical equipment all produce EMF. EMF is sometimes incorrectly referred to as electromagnetic radiation.

The electric field is proportional to the voltage (which can be considered as the pressure with which electricity is pushed through the wires). The magnetic field is proportional to the current, that is, to the amount of electricity flowing through the wires. Both electric and magnetic fields are also dependent on the source geometry (ie conductor heights, cable depths, phase separations and so on). All fields decrease rapidly with distance from the source. Generally, the smaller the object or closer the conductors producing the field, the more rapidly the field will decrease with distance from the source.

3 Typical magnetic fields

Because power frequency magnetic fields are created whenever electricity flows, they are not something unique to power lines or substations. They occur wherever an electric current flows in a conductor or wire. Because of the large number of sources, people move from one EMF source to another for much of the time.

Magnetic fields found in rooms of homes typically are between 0.5 and 5 milliGauss (mG). However, in some instances, the magnetic fields may be higher, depending upon the wiring in the house, the earthing system and the appliances in use at the time. Wide variations can occur from house to house and from room to room.

In relation to magnetic fields in the home, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) advise:

"Magnetic fields within homes can vary at different locations and also over time. The actual strength of the field at a given location depends upon the number and kinds of sources and their distance from the location of measurement. Typical values measured in areas away from electrical appliances are of the order of 2 mG."

To provide an idea of the relative strengths of magnetic fields in Australia, **Table 1** shows typical magnetic field strengths at normal user distances from appliances and around elements of the electricity network. At the surface of the appliance, the magnetic field strength is likely to be much higher. It should be noted that as a result of variations in designs and loadings that magnetic fields may vary from those shown in the table.

Typically, the electric field due to common household appliances can reach 10 - 200 volts per metre (0.01 - 0.2 kV/m) in the region very close to the appliance. This field decreases rapidly with distance.

Table 1Typical magnetic field measurements around common home electrical appliances and electricity network infrastructure

COMMON EMF SOURCES	RANGE OF MEASUREMENTS (mG)
ELECTRIC STOVE	2–30
PC	2–20
TV	0.2–2
ELECTRIC BLANKET	5–30
HAIR DRYER	10–70
REFRIGERATOR	2–5
TOASTER	2–10
KETTLE	2–10
FAN	0.2–2
SUBSTATION	1–8 (AT SUBSTATION FENCE)
TRANSMISSION LINE: – UNDER LINE – EDGE OF EASEMENT	10–200 2–50
DISTRIBUTION LINE: – UNDER THE LINE – 10M AWAY	2–30 0.5–10

NOTE Appliance measurements taken at normal user distance (Source: ARPANSA)

4 Existing Environment

The proposed subject site presently is encumbered by a single storey building housing a breast clinic. Magnetic field measurements were undertaken at the site on the 21 May 2008 at 10:00 AM. Readings along all property boundaries were taken using EMDEX 3-Axis Magnetic Field Survey Meter (low field) with measurements ranging from 0.1 to 3.4 averaging 0.9 mG. Measurements are listed in

Table 2 below.

Table 2 Background Magnetic Field (mG) results for the proposed Royal North Shore Zone Substation site

Northern Boundary	Eastern Boundary	Southern Boundary	Western Boundary	Property Locations
0.3	3.4	0.2	0.2	0.1
0.6	2.4	0.2	0.2	0.1
0.3	3.0	0.1	0.2	2.6
0.2	2.3	0.2	0.2	0.9
0.3	2.7	0.2	0.1	2.3

All readings were taken approximately 1m above the surface of the ground. Sampling points are grouped into the following localities:

- around the boundary of the property at approximately 5m intervals;
- random sampling locations within the property itself;

Refer to **Figure 1** for localities and sampling points.

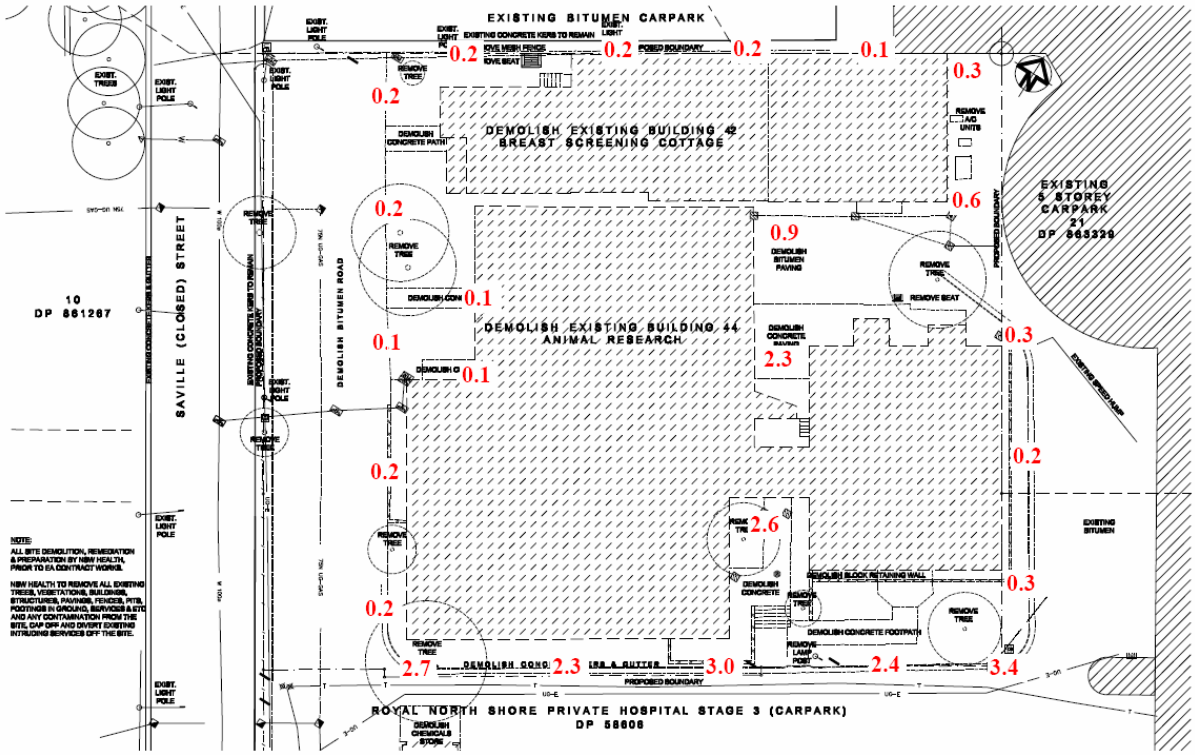

Figure 1 Sampling Points of Magnetic Field Measurements (mG) for the proposed Royal North Shore Zone Substation site

Magnetic fields will vary over time and also spatially, depending on the loadings on the various electrical infrastructure at the particular time. As such, these measurements can only be taken to represent the magnetic fields at the time they were measured, and may vary over time.

5 EMFs from the Proposed Substation

Magnetic fields

Substations produce magnetic fields that drop off rapidly with distance. Magnetic fields from the proposed substation will vary over time and also spatially, depending on the loadings on the various components of the substation at the particular time. Within a substation, there are a multiplicity of sources of varying physical size and electrical characteristics, all interacting with one another. For this reason, the characterisation of the magnetic fields associated with a substation is a complex exercise. While it is theoretically possible to calculate the resulting fields at a particular point for a particular set of circumstances, such calculations are very specific to the point studied and the assumed loading conditions on each item of equipment in the substation. Such calculations are considered to be of little practical value, as the results can vary markedly, depending on the assumptions made.

For this reason, it is both useful and practical to rely on magnetic field measurements undertaken at an existing substation with similar equipment the one proposed. These measurements can then be used as indicative of fields likely to be associated with the proposed substation.

In this case, magnetic field measurements were performed at EnergyAustralia's Campbell Street Zone Substation, an indoor substation with equipment types similar to that proposed for the Royal North Shore Zone Substation. Measurements were taken on 14 November 2007 at 2pm. The specific equipment profiles used for the assessment are illustrated in *Figure 2*.

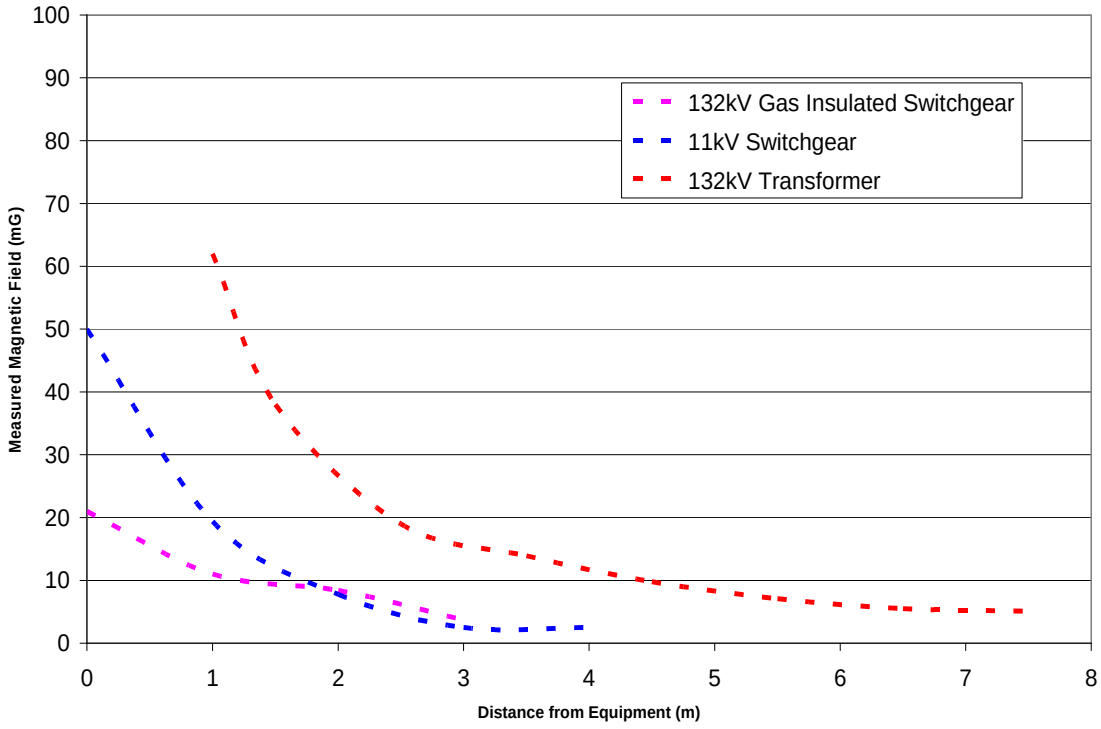

Figure 2 Measurements taken at EnergyAustralia's Campbell Street Zone Substation

Electric Fields

As most of the electrical equipment associated with the substation will be indoors, it will produce little or no electric field external to the equipment enclosure. It is understood that the only

unenclosed high voltage connections within the substation will be short sections within the transformer enclosures. These enclosures would only be accessible to authorised persons.

Based on the design, measurements at Campbell Street Substation and substation loading conditions, the electric and magnetic fields produced by the proposed Royal North Shore Zone Substation at adjacent receivers will be well below the exposure limits described in Section 5.3 under all loading conditions.

EnergyAustralia has advised Area Health that EMF produced by the substation can interfere with the operation of devices and equipment, including devices and equipment used in health facilities. However, the impact of EMF on the operation or functionality of any device or equipment or any procedure or treatment is outside EnergyAustralia's area of expertise. As such, EnergyAustralia will produce for Area Health's review a concept design of the substation in order to enable Area Health to complete EMF investigations.

Measures used to further reduce the magnetic fields produced by the substation are discussed in Section 8.

6 EMF and Health

EnergyAustralia is aware of concerns in the community and some scientists regarding the possibility of adverse health effects from exposure to EMF. In recent years, scientific research has focussed on magnetic fields rather than electric fields, and the remainder of this assessment reflects that focus.

All of the research has been extensively reviewed over the last 30 years by Australian and international inquiries and expert panels established for the purpose of trying to determine whether or not human exposure to EMF is related to adverse health effects.

There is scientific consensus that health effects have not been established, but that the possibility cannot be ruled out. Some scientists argue that there is a need for ongoing high quality scientific research in order to give better answers to the questions which have been raised. Others hold the view that no further research is required and that EMF should not be regarded as a risk to health.

It is well accepted by scientists that no study considered in isolation will provide a meaningful answer to the question of whether or not EMF can contribute to adverse health effects. In order to make an informed conclusion from all of the research, it is necessary to consider the science in its totality. Over many years, governments and regulatory agencies around the world have commissioned independent scientific review panels to provide such an overall assessment.

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), as part of the Health and Ageing Portfolio, is a Federal Government agency charged with responsibility for protecting the health and safety of people, and the environment, from EMF.

ARPANSA advises that:

> *"On balance, the scientific evidence does not indicate that exposure to 50 Hz EMFs found around the home, the office or near power lines is a hazard to human health."*
>
> *"… the majority of scientists and Australian radiation health authorities in particular, do not regard chronic exposure to 50 Hz electric and magnetic fields at the levels commonly found in the environment as a proven health risk. Moreover, the evidence we have is inconclusive and does not allow health authorities to decide whether there is a specific magnetic field level above which chronic exposure is dangerous or compromises human health."*
>
> *"At the present time there is no evidence that exposure to electric fields is a health hazard (excluding of course electric shock)."*

7 Exposure limits

A key part of EnergyAustralia's efforts to manage EMF exposure is to design new electrical infrastructure, including power lines and substations, to comply with any relevant Australian health guidelines for public exposure to EMF.

Since 1989 EnergyAustralia and the Australian electricity industry have followed interim guidelines for exposure to EMF as developed by the National Health and Medical Research Council (NHMRC).

Under these guidelines the recommended magnetic field public exposure limit is 1,000 milliGauss (24 hour exposure).

These guidelines have been officially rescinded ahead of the release of an Australian Standard.

It should be noted that the standard upon which the NHMRC limits are based has been subsequently reviewed and the relevant public exposure limit remains unchanged.

In December 2006, ARPANSA released the Draft Radiation Protection Standard for Exposure Limits to Electric and Magnetic Fields 0 Hz - 3 kHz1 taking into account the latest scientific research. This new draft standard relates to EMF of extremely low frequency (ELF) such as those found around an electricity network. The draft standard had public exposure limits similar to the NHMRC guidelines.

Following public comment this Draft Standard is expected to be finalised and implemented in 2008.

In 1998, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) published its revised electric and magnetic field exposure guidelines for the general public and workers2. Under these guidelines the recommended magnetic field public exposure limit is 1,000 milliGauss.

In 2002, the Institute of Electrical and Electronics Engineers (IEEE) published electric and magnetic field exposure guidelines for the general public and workers. Under this standard the recommended magnetic field public exposure limit is 9,040 milliGauss.

EnergyAustralia operates its powerlines, substations and other electrical infrastructure well within Australian (rescinded and draft) and International guidelines.

8 Public Policy Considerations

Health effects related to short-term, high-level exposure have been established and form the basis of two international exposure limits (ARPANSA Draft Standard, NHMRC 1989, ICNIRP, 1998; IEEE, 2002). At present, these bodies do not consider the scientific evidence related to possible health effects from long-term, low-level exposure to EMF sufficient to justify lowering these quantitative exposure limits.

This section deals with the issue of possible health effects from long-term, low-level exposure to EMF and the positions provided by the Gibbs Inquiry, ARPANSA, ENA and EnergyAustralia.

8.1 Gibbs report

On 28 May 1990 the Minister for Minerals and Energy for the State of New South Wales (the Minister) authorised former Chief Justice of Australia The Right Honourable Sir Harry Gibbs G.C.M.G., A.C., K.B.E. to conduct an inquiry into community needs and high voltage transmission line development in the State of New South Wales. On 3 July 1990 the Minister wrote Sir Harry Gibbs a letter which included the following paragraph:

[1] ARPANSA's Draft Radiation Protection Standard for Exposure Limits to Electric and Magnetic Fields 0 Hz - 3 kHz is available at http://www.arpansa.gov.au/publications/drafts/dr_elf.cfm

[2] ICNIRP documents are available at http://www.icnirp.de/

"Without in any way limiting or restricting the nature of the terms of reference of your Inquiry, I would like to request that you specifically include in your investigations the question of electromagnetic fields and their relationship to health." [1.1.4]

On 28 February 1991 Sir Harry Gibbs delivered to the Minister a report (the Gibbs Report) which included chapters dealing with matters which are central to EMF and the installation of power infrastructure.

The Gibbs Report dealt with this aspect of the health issue as follows:

"It then becomes a question of policy what action should be taken to avert a possible risk to public health when it cannot be said either that it is probable that the risk exists or in what circumstances a risk; if one exists, arises. A suggestion has been made in the United States that a policy of prudent avoidance should be adopted." [5.11.6]

"It would not be prudent, but foolish, to make radical or expensive changes to existing lines until further scientific studies have resolved the doubts. On the other hand, when new lines are being constructed, it may be prudent to do whatever can be done without undue inconvenience and at modest expense to avert the possible risk; remembering that if that is not done and future research establishes the existence of a real risk to health, serious problems may arise which can be remedied only at great cost." [5.11.9]

The findings and recommendations contained in the Gibbs report regarding EMFs and health are consistent with subsequent inquiries and are as relevant today as they were in 1991.

8.2 Draft ARPANSA Standard

In December 2006 ARPANSA – the national health authority now responsible for this area – released the Draft Radiation Protection Standard for Exposure Limits to Electric and Magnetic Fields 0 Hz - 3 kHz[3] taking into account the latest scientific research. This new draft standard relates to EMF of extremely low frequency (ELF) such as those found around an electricity network.

The Draft Standard sets limits on the exposure to ELF fields for persons in the occupational and general public settings. These limits are designed to prevent established biological effects which could lead to adverse health outcomes due to induced electric currents within the body and are set at a level that includes a safety margin.

Following public comment this Draft Standard is expected to be finalised and implemented in 2008.

The exposure limits in the Draft Standard are outlined in Section 5.

Regarding the issue of potential health effects at levels below the limits specified in the Draft Standard, these are dealt with in Section 5.7e and Annex 6 of the Draft Standard. An excerpt from this section is reproduced below:

"*In view of these factors, and even after fully allowing for the legitimate desire by society to err on the safe side, it seems likely that only very low-cost measures will be justified."*

8.3 Energy Networks Association policy response

The Energy Networks Association (ENA) is the peak national body representing gas and electricity distribution businesses throughout Australia. The owners of electricity networks are Associate Members and as such, are full and active participants in ENA asset management policy issues such as electric and magnetic fields.

ENA is committed to taking a leadership role on relevant environmental issues including power frequency EMF. ENA and its members are committed to the health and safety of the community including their own employees.

Adverse health effects from EMF have not been established, but there remains a lack of scientific consensus about whether or not they can occur. Because of this lack of scientific consensus, the question of whether EMF can cause adverse health effects is important both for the Australian

[3] ARPANSA's Draft Radiation Protection Standard for Exposure Limits to Electric and Magnetic Fields 0 Hz - 3 kHz is available at http://www.arpansa.gov.au/publications/drafts/dr_elf.cfm

community and the electricity supply industry. ENA recognises that there is concern within the Australian community about EMF and is committed to addressing it by the implementation of appropriate policies and practices.

ENA is committed to a responsible resolution of the issue where government, the community and the electricity supply industry have reached public policy consensus consistent with the science.

ENA policy statement

This policy was originally approved as an industry policy statement by the ESAA (Electricity Supply Association of Australia) Board on 15 June 2001 and was reconfirmed by the EMF Committee of ENA on 30 March 2006:

1. ENA recommends to members of the energy supply industry that, within Australian health guidelines, they design and operate their electricity generation, transmission and distribution systems prudently.1

2. ENA will closely monitor engineering and scientific research, including reviews by scientific panels, and overseas policy development.

3. ENA will communicate openly with all stakeholders including assisting its members in conducting community and employee education programs, distributing information material including newsletters, brochures, booklets and the like, liaising with the media and responding to enquiries from members of the public.

4. ENA will cooperate fully with any bodies established by governments in Australia to investigate and report about power frequency electric and magnetic fields.

Prudence embraces a range of actions which it is sensible to take, having regard to the current state of scientific uncertainty. Such actions could include monitoring research; sponsoring research; continually reviewing policies in the light of the most up to date research findings (with particular emphasis on the findings of scientific review panels); providing awareness training for electricity supply business employees and keeping them informed; sharing information freely with the community; measuring fields levels and practising prudent avoidance when designing and siting new transmission and distribution facilities.

Prudent avoidance has been defined in an Australian context by the former Chief Justice of the High Court of Australia, Sir Harry Gibbs as “doing what can be done without undue inconvenience and at modest expense to avert the possible risk to health from exposure to new high voltage transmission facilities. In practical terms, this means designing new transmission and distribution facilities having regard to their capacity to produce EMF, and siting them having regard to the proximity of houses, schools and the like.”

8.4 EnergyAustralia’s position

EnergyAustralia’s position on EMF has been adopted in the light of authoritative reviews having concluded that no adverse health effects from exposure to low level EMF have been established, but recognising that there is, within the community, some genuine public concern about the issue which must be addressed.

The following is EnergyAustralia’s position on EMF, which largely reflects the policy of the energy industry representative body, the Energy Networks Association:

- to provide balanced, accurate information to our employees and customers, including electric and magnetic field measurements and advice
- take reasonable steps to limit field exposures from new facilities by locating and operating our electrical installations prudently within the latest Australian health guidelines
- closely monitor engineering and scientific research, overseas policy development and major reviews of scientific, medical and engineering research regarding electric and magnetic fields and health
- cooperate fully with any bodies established by governments in Australia to investigate and report about power frequency electric and magnetic fields.

9 Mitigation measures

EnergyAustralia's policy includes taking reasonable steps to limit field exposures from new facilities by locating and operating our electrical installations prudently within the latest Australian health guidelines.

Prudent avoidance has been defined in an Australian context by the former Chief Justice of the High Court of Australia, Sir Harry Gibbs as *"doing what can be done without undue inconvenience and at modest expense to avert the possible risk to health from exposure to new high voltage transmission facilities. In practical terms, this means designing new transmission and distribution facilities having regard to their capacity to produce EMF, and siting them having regard to the proximity of houses, schools and the like."*

At the 23rd Annual Conference of the Australasian Radiation Protection Society Inc held at Ballarat in Victoria in October 1998, Mr Kevin Nuttall presented a scientific paper which he had authored with Mr P J Flanagan and Mr G Melik. The paper was entitled *"Prudent Avoidance Guidelines for Power Frequency Magnetic Fields"*. The abstract of the paper states:

"This paper provides practical guidance to electricity transmission and distribution utilities and other interested stakeholders in the application of prudent avoidance to the design and siting of new electrical facilities. The paper provides background information and a range of general measures which might prudently be applied. It is not the authors' intention to provide precise instructions for the application of prudent avoidance but, rather, to provide a series of guiding principles which may be applied to particular situations, having regard to the specific design practices and other policies of individual electricity utilities."

It is suggested that these guidelines are consistent with the principles in the Gibbs Report and provide a useful tool when implementing a policy of prudent avoidance.

The paper outlines a range of general measures which might be prudently applied. The guidelines state:

"The application of prudent avoidance in the design and construction of new electrical facilities is a process of assessing the extent to which people may be exposed to fields produced by them and considering what "low cost" and "no cost" measures might be taken to reduce such exposure within acceptable constraints."

EnergyAustralia has taken a number of steps to minimise EMF from the proposed substation. These measures were technically reasonable and within the context of prudent avoidance - "doing whatever can be done at modest cost and without undue inconvenience to avoid the possible risk (to health)" (Gibbs, 1991).

The mitigation measures primarily related to the layout of equipment within the substation include;

- Access to the site will be restricted with the use of security fencing, thus limiting exposure to higher fields within the substation to the general public;
- Where possible (taking into account the site constraints), equipment which produces the highest magnetic fields such as cables, busbars, transformers and switchgear have been positioned furthest from sensitive receivers (adjoining property boundaries);
- Where possible (taking into account the site constraints), items which produce the lowest magnetic fields such as control rooms, equipment rooms, amenities, stairs, walkways, air vents/ducts and pilot isolation rooms have been positioned closest to the sensitive receivers (adjoining property boundaries);
- 11kV and 132kV loads will be balanced;
- Where possible, cables will be positioned in trefoil arrangement to reduce phase separation distances. Trefoil has the lowest fields compared to other configurations;
- Where possible, phase-by-phase grouping of single core cables in parallel circuits will be avoided.

- Where possible, cable trays will be positioned away from adjacent adjoining sensitive receivers (property boundaries);
- No exposed busbars will be present within the substation apart from the transformer connections within the transformer bays. Separation between the phases in the transformer bays is controlled by the transformer design and phase separation requirements.
- The incoming and outgoing connections will be installed underground using the most compact construction technically practicable.

EnergyAustralia has advised Area Health that EMF produced by the substation can interfere with the operation of devices and equipment, including devices and equipment used in health facilities. However, the impact of EMF on the operation or functionality of any device or equipment or any procedure or treatment is outside EnergyAustralia's area of expertise. As such, EnergyAustralia will produce for Area Health's review a concept design of the substation in order to enable Area Health to complete EMF investigations. Area Health may request EnergyAustralia adopt certain recommendations resulting from their EMF investigations. Area Health will bear the cost of any additional EMF mitigation measures adopted at Area Health's request.

10 Conclusions

10.1 General

Considering the currently available information on EMF worldwide, the following conclusions may be drawn:

- EMFs are created whenever electricity flows, they are not something unique to power lines or substations.
- The body of scientific literature on the issue is both complex and voluminous, and public policy initiatives should be based on independent and authoritative reviews and reports.
- Adverse health effects from human exposure to EMF have not been established, but the possibility cannot be ruled out.
- Conventional science cannot guarantee absolute safety for exposure to environmental factors such as EMF.
- There is no basis to establish human exposure limits for EMF other than those which presently exist, and, in particular there is no scientific basis to support arbitrary exposure limits below the guidelines as a prudent avoidance measure.
- EnergyAustralia should continue to act prudently in relation to the issue of EMF. This includes implementing prudent avoidance measures in accordance with the principles established by the Gibbs Report and in this regard, the prudent avoidance principles referred to in *Section 8*.

10.2 Compliance with health guidelines

The proposed Royal North Shore Zone Substation will comply with relevant local (rescinded and draft) and international health guidelines or standards for public exposure:

- International Commission on Non-Ionizing Radiation Protection (ICNIRP) (1998)
- Institute of Electrical and Electronics Engineers (IEEE) C95.6 (2002).
- *Rescinded* - The NHMRC (National health and Medical research Council) interim guidelines (1989). NOTE: The standard upon which the NHMRC limits are based has been subsequently reviewed and the relevant public exposure limit remains unchanged.
- *Draft* - The Draft ARPANSA (Australian Radiation Protection and Nuclear Safety Agency) EMF standard (2006)

10.3 Consideration of prudent avoidance principles

Taking into account the above considerations, the application of prudent avoidance principles has been a key element in determining the proposed Royal North Shore Zone Substation.

The final design has been prepared with regard to the following issues:

- Liaising with the community to ensure they are educated in regards to EMF;
- Closely monitoring engineering and scientific research, overseas policy development and major reviews of scientific, medical and engineering research regarding EMFs and health;
- Cooperating fully with any bodies established by governments in Australia to investigate and report about power frequency EMFs; and
- Taking reasonable steps to limit field exposures by locating and operating the electrical installation at Royal North Shore Zone Substation prudently within the latest Australian health guidelines.

The mitigation measures primarily related to the layout of equipment within the substation include;

- Access to the site will be restricted with the use of security fencing, thus limiting exposure to higher fields within the substation to the general public;
- Where possible (taking into account the site constraints), equipment which produces the highest magnetic fields such as cables, busbars, transformers and switchgear have been positioned furthest from sensitive receivers (adjoining property boundaries);
- Where possible (taking into account the site constraints), items which produce the lowest magnetic fields such as control rooms, equipment rooms, amenities, stairs, walkways, air vents/ducts and pilot isolation rooms have been positioned closest to the sensitive receivers (adjoining property boundaries);
- 11kV and 132kV loads will be balanced;
- Where possible, cables will be positioned in trefoil arrangement to reduce phase separation distances. Trefoil has the lowest fields compared to other configurations;
- Where possible, phase-by-phase grouping of single core cables in parallel circuits will be avoided.
- Where possible, cable trays will be positioned away from adjacent adjoining sensitive receivers (property boundaries);
- No exposed busbars will be present within the substation apart from the transformer connections within the transformer bays. Separation between the phases in the transformer bays is controlled by the transformer design and phase separation requirements.
- The incoming and outgoing connections will be installed underground using the most compact construction technically practicable.

EnergyAustralia has advised Area Health that EMF produced by the substation can interfere with the operation of devices and equipment, including devices and equipment used in health facilities. However, the impact of EMF on the operation or functionality of any device or equipment or any procedure or treatment is outside EnergyAustralia's area of expertise. As such, EnergyAustralia will produce for Area Health's review a concept design of the substation in order to enable Area Health to complete EMF investigations. Area Health may request EnergyAustralia adopt certain recommendations resulting from their EMF investigations. Area Health will bear the cost of any additional EMF mitigation measures adopted at Area Health's request.