

## Estimates Committee 2006 Questions Taken On Notice

( 20/06/2006 to 31/08/2006 )

Date: 23/06/2006 Output: Power & Water Corporation  
Sub Output:  
Subject: Frances Bay Zone Substation - EMF Emissions

**From:** Dr Richard Soon Huat LIM to Power and Water Corporation  
Power and Water Corporation

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**Question:** **11-3**  
In respect of Frances Bay Substation, please provide electromagnetic emission implications and the nature of the construction which may or may not be required to shield the environment from the emissions.

**Answer:**

Answered On: 28/06/2006

Answer:

- No specific risk with respect to Extremely Low Frequency or Power Frequency (50hz) Electromagnetic Fields (EMF) has been identified for the Frances Bay Zone Substation.
- The substation and all equipment is being designed and constructed in accordance with normal industry practice and relevant Australian Standards. As such EMF emissions will be below currently recommended exposure limits and are not seen as a significant issue.
- There is currently no Australian Standard regulating exposure to 50Hz magnetic fields, however the International Commission on Non-Ionising Radiation Protection (ICNIRP) guidelines and the 'Interim Guidelines on Limits of Exposure to 50/60 Hz Electromagnetic fields' approved by National Health and Medical Research Council, Australia defines recommended exposure limits as follows:

Continuous exposure 24hrs per day 1,000 milligauss (mG)  
Exposure limited to a few hours per day 10,000mG

- Typically PWC installations when designed to current standards and practise result in the following EMF exposure levels:

66kV Overhead Line: 20-30mG under the conductors

5-10mG at the edge of the line easement

11kV/415V Distribution Substations: 60-130mG adjacent to the substation

5-15mG at 2m distance

1-4mG at 5m distance

LV Distribution Line: 4-5mG immediately under the Conductors

These values are far below the recommended maximum exposure limits.

· It is expected that EMF emissions from the Frances Bay Zone Substation will be less than other PWC Zone Substations because:

· The Frances Bay Zone Substation is a totally indoor substation and bonding of all reinforcing and other building steel-work to earth will provide additional shielding from EMFs external to the building.

· All HV incoming and outgoing circuits will be via cables either direct buried or in underground tunnels. These inherently result in lower EMF emissions than equivalent rated overhead lines.

· It should also be noted that normal use of electricity in domestic situations result in the typical exposure levels indicated below:

Electric Blankets 5-20mG

Hair Dryer 0-70mG

TV at 30cm 40mG

Electric Cooktop at 30cm 40mG

Personal Computer 2-20mG

These levels are comparable to exposure levels that may be experience adjacent to HV PWC facilities.