

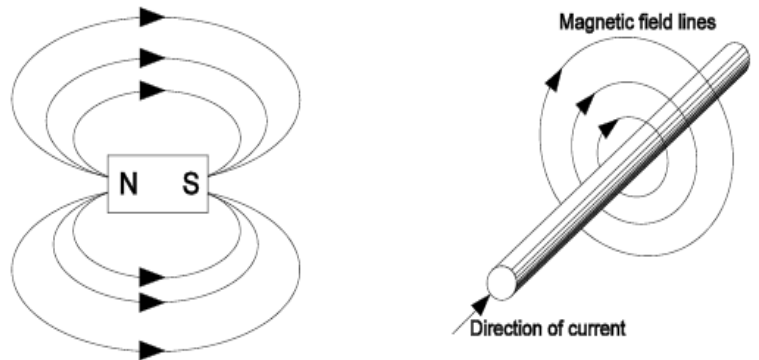


Electromagnetic Fields (EMF's) in power stations and their effect on medical devices

At Hydro, we recently replaced two of our four large 3ph Transformers. We hired an independent expert to complete an EMF survey around Big Red (T4) as part of managing the potential change in risk associated with installing new plant. The last site-wide survey was completed 8 years previously, being arranged after a staff member had a pacemaker installed. Current EMF risk mitigations were developed from the survey results.

The new survey showed us that there is an increase in the electromagnetic field around the Isolated Phase Bus (IPB) between the bellows. The levels are within allowable occupational levels but can still cause visual phosphenes (sparkling in the eyes which can feel a bit like fainting), and dizziness.

Other areas that showed lower readings were still high enough to potentially cause Pacemakers and Insulin pumps to fail which can be life-threatening. We also learnt that EMF's can also affect 'Externally Programmable Cerebral Spinal Fluid Shunt Valves' which some people have fitted.



Working with the NZ standard, and the EMF expert, we are now making progress to further mitigate the risks associated with EMF's. Different levels of EMFs have different exposure limits; identifying the strength of the magnetic fields and mapping them will enable us to erect relevant signage, demarcate restricted access areas for people with fitted medical devices, ensure procedures are reviewed for accuracy, and barrier off certain areas to eliminate access for all while a machine is in service.

We are working with the Engineering Authority to improve the Management of Change process and ensure an assessment of potential EMF changes is included with any relevant future plant changes. A review of any other relevant plant changes made at Hydro since the last survey is underway and if any are found, more surveys will be conducted.

Discussions with other generation sites are underway to determine if they can learn from these findings and whether they need to take any actions to further mitigate the hazards present on their sites.