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for information

PROGRESS REPORT

OF THE

WORKING GROUP ON

ELECTRIC & MAGNETIC FIELDS

September 1994

Executive Summary

The main objective of this progress report is to summarise the work of the Working Group on Electric and Magnetic Fields since its formation in early 1993 to closely monitor and review the development of international guidelines on limits of exposure to power frequencies electric and magnetic fields (EMF) emanating from high-voltage electricity current carrying conductor, such as overhead power lines, with a view to serve as an independent authoritative body to advise on power frequencies EMF - related issues in Hong Kong.

Since its formation in early 1993, the Working Group has been actively performing its duties and up to now five meetings were held to interchange and discuss relevant information collected and shared among members. A micro-computer based EMF information exchange and epidemiological studies database has been made available by the China Light and Power Co. Ltd. (CLP) from the Electricity Supply Association of Australia. The database is updated and circulated to members of the Working Group on a regular basis. The two local power companies have been encouraged to carry out field measurements on their installations to ensure that the internationally recognised EMF exposure limits promulgated by the International Radiation Protection Association (IRPA) and adopted by the Hong Kong Government should not be exceeded for both the general public as well as their employees. In that respect, a joint field measurement exercise attended by representatives of the two power companies and Government was arranged to demonstrate how the work was actually conducted on site. On publicity matters, the Working Group had contributed to the publicity pamphlet entitled "Understanding EMF" published by CLP and the production of a video on this topic.

While the Working Group noted hitherto that there is no conclusive scientific evidence of any adverse health effects on the normal individual arising from exposure to such power frequencies EMF, and considered that the current IRPA guidelines adopted in Hong Kong are appropriate, it will continue to monitor the developments in this aspect cautiously.

(Note : The term EMF used in this progress report refers to power frequencies electric and magnetic fields of extremely low values which fall within the IRPA guidelines)

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**Progress Report of the
Working Group on Electric and Magnetic Fields**

Preamble

1. The main objective of this progress report is to summarise the work of the Working Group on Electric and Magnetic Fields since its formation in early 1993 to closely monitor and review the development of international guidelines on limits of exposure to power frequencies electric and magnetic fields (EMF) emanating from high voltage current carrying conductors, such as overhead electricity transmission lines, with a view to serve as an independent authoritative body to advise on power frequencies EMF-related issues in Hong Kong. The Working Group noted hitherto that there is no conclusive scientific evidence of any adverse health effects on the normal individual arising from exposure to such power frequencies EMF, and considered that the current International Radiation Protection Association (IRPA) guidelines adopted in Hong Kong are appropriate.

Introduction

2. Prior to formation of the Working Group, the Electrical and Mechanical Services Department (EMSD) was responsible for monitoring EMF-related matters and producing suitable guidelines for the two power companies i.e. China Light & Power Co., Ltd. (CLP) and Hongkong Electric Co., Ltd. (HEC) in consultation with the Department of Health (DH). The first set of guidelines was drawn up, as summarized in Annex 1, based on the "Interim Guidelines on Limits of exposure to 50/60 Hz Electric and Magnetic Fields" published by the International Non-Ionizing Radiation Committee (INIRC) of the International Radiation Protection Association (IRPA) in collaboration with the World Health Organisation (WHO) and was issued to CLP/HEC in 1990 for compliance. These guidelines have also been included in the new Hong Kong Planning Standards and Guidelines (HKPSG) due to be published by the Planning Department of Hong Kong Government later this year.
3. At the meeting held on 18.1.93, the Chairman of the former Environmental Pollution Advisory Committee (EPCOM), Professor Wang Gung-wu suggested that the health aspects of EMF should be kept under review by a working group, with the major tasks to look into the possible risks, make recommendations on precautionary measures, keep track of any new developments on the power frequencies EMF issue. As a result, the Working Group on EMF was formed in early 1993 with members drawn from representatives of tertiary educational institutions, power companies and government departments. Annex 2 gives the composition of the Working Group. This Working Group is chaired by an Assistant

Director of EMSD and its main aim is to act as an independent authoritative body to advise on EMF-related issues in Hong Kong.

Progress to date

4. Five meetings had been held by the Working Group on 30.3.93, 1.7.93, 7.10.93, 13.1.94 and 21.6.94 respectively since its formation. The terms of reference of the Working Group include (but are not limited to) the following :
 - (a) To interchange and discuss information pertaining to the topic.
 - (b) To monitor studies on the issue as necessary and maintain communication links with other countries on the topic so as to keep abreast of international development.
 - (c) To make recommendation to Government on any development related to the topic.
 - (d) To assess levels of EMF in Hong Kong for comparison against international guidelines.
 - (e) To monitor international guidelines on electromagnetic exposure.
 - (f) To keep EPCOM informed on the progress of the Working Group.
5. One of the main functions of the Working Group is the up-keeping of a list of reference literatures on this topic with the contributions of CLP, HEC, EMSD, Department of Health (DH) and Environmental Protection Department (EPD). An updated list of reference materials is compiled as shown in Annex 3. In addition, CLP has made available from the Electricity Supply Association of Australia (ESAA) a comprehensive PC-based EMF information exchange and epidemiological studies database update for distribution to working group members. Up to now, CLP has provided the sixth version of this computer diskette to working group members which contains a comprehensive reference listing of about 20,000 papers on this subject.
6. The Working Group also maintains communication links and dialogues with relevant bodies in other countries to keep abreast of international developments particularly on the researches and studies being undertaken in these countries. A listing of the researches and studies on this topic being carried out in organisations overseas is given in Annex 4. In addition to the standards promulgated by well recognised international organisations such as the International Radiation Protection Association (IRPA), the US Electric Power Research Institute (EPRI) and the UK National Radiation Protection Board (NRPB), the Working Group had

collected the information on the EMF standards being adopted in some developed countries and had also written to five Asian countries/regions, including South Korea, Singapore, Taiwan, Thailand and India to seek similar information. As it would take some time to analyze the information obtained to make a meaningful comparison of the EMF standards adopted in different countries, the Working Group considered that it would be better to have the results presented in a future progress report.

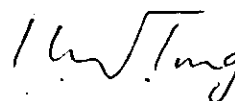
7. The Working Group has recommended that the two power companies carry out further EMF field measurements of their installations, including overhead lines, substations and underground cables for cross-comparison with the guidelines laid down by Hong Kong Government. The results of these measurements will be presented in a future progress report.
8. To exchange knowledge of EMF field measurements, a joint exercise was arranged on 29.3.94 to demonstrate measurements of EMF at Tai Po Extra-High-Voltage (EHV) Substation and Aberdeen Reservoir Park using portable EMF meters by representatives of CLP/HEC/EMSD. A report on the joint exercise was compiled and distributed to members of the Working Group and the measurement results are summarised in Annex 5. It was concluded that the methodology adopted by CLP/HEC were not entirely identical but the results obtained were similar and consistent.
9. The Working Group had contributed to the publicity pamphlet entitled "Understanding EMF" published by CLP in October 1993 and the production of a video also by CLP. Representatives from EMSD had attended a Town Planning Board (TPB) meeting held on 10.6.94 to answer questions on EMF raised by members of the TPB in revising the HKPSG. The relevant planning standards and guidelines for overhead power lines were updated as an integral part of the revised Chapter 7 on Utility Services of HKPSG which was approved by the Land Development Policy Committee and would be published by the Planning Department later this year.
10. The Working Group had compiled a list of court or law suit cases pertaining to EMF happening overseas. So far there were 3 cases in the U.S.A and the U.K. as shown in Annex 6 which were brought to the working Group's knowledge. Moreover, there were 5 local complaint cases received regarding EMF (Annex 7), out of which 4 earlier cases had been discussed and reviewed by the Working Group.

Conclusion

11. The Working Group noted hitherto that there is no conclusive scientific evidence of any significant adverse health effects on the normal individual arising from exposure to power frequencies EMF and considered that the current IRPA guidelines adopted in Hong Kong are appropriate. The Working Group also noted that the IRPA

guidelines had cautioned that even when exposure to power frequencies EMF was within the recommended limits, there might be adverse health effects on persons with cardiac pacemakers. However, the Working Group considered that these persons would be adequately advised by their doctors.

12. Besides the works in progress as stated in paragraphs 6 and 7 above, the Working Group will continue to monitor the developments in this aspect, which notably includes the five-year national study into childhood cancer being carried out in the UK since April 93 (known to be the largest scale of this kind of study to date), as reported in a paper by Dominic Maclaine in Vol 227 No. 10 of the publication "Electrical Review", and mentioned in a technical paper entitled "Extremely Low Frequency (50 Hz) Electromagnetic Fields" presented by Mr. Alan Bielby of CLP in a seminar headlined "The Electromagnetic Environment in Hong Kong" jointly organised by the City Polytechnic of Hong Kong and the Hong Kong Section of the U.K. Institution of Electrical Engineers on 18.6.94.
13. The two power companies had been encouraged to take a proactive approach to improve the occupational health and safety of their workers who might be exposed to EMF in their workplace by making reference to the report of a joint study on cancer risks associated with occupational exposure to magnetic fields among electric utility workers in Ontario and Quebec in Canada and France, and ensuring that internationally recognised health and safety limits will not be exceeded.



(K W TONG)
Chairman
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