

Magnetfält - osäkerheten om hälsorisker kvarstår 1994-11-01

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Magnetic fields - still uncertainty about the health risks

National Electrical Safety Board report to the Government 1994

(Translation of page 2,3 and 24-27)

The issue of possible health risks as a result of exposure to extra low frequency electrical and magnetic fields, as far as authorities are concerned, primarily affects the National Board of Occupational Safety and Health [*Arbetarskyddsstyrelsen*], the National Board of Housing, Building and Planning [*Boverket*], the National Electrical Safety Board [*Elsäkerhetsverket*], the National Board of Health and Welfare [*Socialstyrelsen*] and the National Radiation Protection Institute [*Statens strålskyddsinstitut*].

During the Spring of 1994, the National Board of Housing, Building and Planning, the National Electrical Safety Board, the National Board of Health and Welfare and the National Radiation Protection Institute assessed that our knowledge of the effects of weak magnetic fields on humans is at present insufficient to establish limits. However, suspicions of a link between cancer and exposure to extra low frequency magnetic fields mean that a certain amount of caution is recommended. Therefore, the following points should be borne in mind when planning and building, if this can be done at a reasonable cost:

- Attempt to design/locate new power lines and electricity facilities in such a manner that the magnetic fields are limited.
- Avoid locating new housing, schools, nurseries, etc. close to existing electricity facilities generating considerable magnetic fields if alternative locations can be utilised.
- Attempt to limit fields of considerable strength in existing homes, schools and places of work.

Two extensive evaluations of the research documentation are currently in progress at the National Board of Health and Welfare and the National Institute of Occupational Health [*Arbetsmiljöinstitutet*]. It will be possible for the authorities concerned to study the results of these evaluations and make up their minds about them at the beginning of 1995 at the earliest. The evaluation outlined in the National Electrical Safety Board's previous report to the Government, "Magnetic Fields and Cancer, 1993", will be reviewed in consultation with other relevant authorities once the results of the evaluations in progress have been published.

The Swedish electricity companies are working on technical solutions to reduce magnetic fields out of consideration for the concern of the general public and the recommendations of the authorities, so that they are prepared for any eventualities should a link between health risks and exposure to magnetic fields be established.

HANDLING OF THE MAGNETIC FIELDS ISSUE IN SWEDEN

Since the mid-1970s, the National Electrical Safety Board has monitored international research into and discussions on possible health risks as a result of exposure to extra low frequency electrical and magnetic fields.

Intensive research into magnetic fields and health risks is constantly in progress, and new results are published at regular intervals. The National Electrical Safety Board continuously monitors developments in research into possible health risks caused by extra low frequency electrical and magnetic fields. In the last few years, the link between cancer and long-term exposure to weak, extra low frequency magnetic fields has been the focus of attention.

In its previous report to the Government, the National Electrical Safety Board emphasised the fact that the National Board of Occupational Safety and Health, the National Board of Housing, Building and Planning, the National Electrical Safety Board, the National Board of Health and Welfare and the National Radiation Protection Institute should, by virtue of different legislation, all bear responsibility should a link between health risks and exposure to extra low frequency magnetic fields be considered to exist.

All the authorities concerned continuously monitor developments in the research into magnetic fields and health risks. As far as primarily the National Electrical Safety Board and its predecessors together with the National Board of Occupational Safety and Health and the National Radiation Protection Institute are concerned, this has been done for a long time.

The collaboration between the abovementioned authorities has gradually developed over the last year. Now this collaboration is implemented in both the National Electrical Safety Board's consultation group for electrical and magnetic fields and in an informal group consisting of representatives of the authorities.

The actions of the Swedish electrical companies

The Swedish electrical companies are investing money in research and development to demonstrate any links between magnetic fields and effects on health. The electricity industry is also evaluating what the reported results for research may mean for its members. These questions relate to:

exposure to magnetic fields as a consequence of their customers' utilisation of various types of electricity, as a consequence of living close to power lines and transformer stations, and the environment in which members' own employees work; and

technical analyses and tests, along with different types of measures to reduce the magnetic fields.

Several of the companies have expressed their ambitions as regards special policy documents. The electricity companies are now co-ordinating their joint development work on magnetic field issues by means of the joint R&D body *Elforsk* [Research into Electricity].

The fundamental features of policy documents at Vattenfall AB, Svenska Kraftnät and the National Association of Electricity Supply Undertakings [*Svenska Elverksföreningen*] are given as examples below. The National Association of Electricity Supply Undertakings' policy on magnetic fields has been drawn up jointly with the Danish and Finnish energy administrations and the Norwegian National Energy Administration [*Norges Energiverksförbund*].

Vattenfall AB, Svenska Kraftnät and the National Association of Electricity Supply Undertakings place great significance on frankness and information in their policy statements. According to their policy documentation, they will also be working towards improving designs and working methods, which may reduce the fields from lines and power stations. This will reduce exposure to magnetic fields on the part of the general public, customers and the company's own staff. Vattenfall and Svenska Kraftnät will contribute, according to their policy statements, by estimating and measuring magnetic fields.

Svenska Kraftnät often investigates whether it is technically possible to modify lines, such as by phase shifting, and thereby to reduce the strength of the fields. In addition, Svenska Kraftnät is investigating the possibilities of co-ordinating activities when installing new lines close to human habitation.

The three policy statements also give expression to the fact that comparisons will be made between new technology and tested solutions when power stations are to be built or existing stations are to be renovated. However, the National Association of Electricity Supply Undertakings does point out that it does not consider it justifiable, given the present uncertain state of the art, to modify existing lines with the sole aim of reducing the fields.

Health risks and magnetic fields - the opinions of the authorities concerned

As can be seen in Section 3.7, the National Board of Housing, Building and Planning, the National Electrical Safety Board, the National Board of Health and Welfare and the National Radiation Protection Institute have jointly produced a brochure with a view to providing information on how

much we know at present and the opinions of the authorities on the matter. The joint approach, as described below, at which the authorities arrived on the subject of assessment of the magnetic field issue, is of central importance.

Our knowledge of the effects of weak magnetic fields on humans is at present insufficient. We therefore have no basis on which to establish limits. However, suspicions of a link between magnetic fields and cancer mean that the National Electrical Safety Board, the National Board of Housing, Building and Planning, the National Board of Health and Welfare and the National Radiation Protection Institute recommend a certain amount of caution. The following points should be borne in mind when planning and building, if this can be done at a reasonable cost:

- Attempt to design/locate new power lines and electricity facilities in such a manner that the magnetic fields are limited.
- Avoid locating new housing, schools, nurseries, etc. close to existing electricity facilities generating considerable magnetic fields if alternative locations can be utilised.
- Attempt to limit fields of considerable strength in existing homes, schools and places of workplaces.

While awaiting further results of research, the then National Energy Administration [*Statens Energiverk*] felt there was reason to implement a precautionary strategy, given the anxiety some people felt. The Authority pointed out that new, concentrated activities for children such as schools, nurseries and playgrounds should not be located so close to power lines that the magnetic fields in such areas exceeded 0.2 - 0.3 μ T until further results of research had been published. The National Electrical Safety Board has found no reason to reconsider this recommendation for the present.

While awaiting the preparation of new evaluations of the amount of knowledge we have at present on the link between exposure to extra low frequency magnetic fields and the occurrence of cancer and other health risks, the National Electrical Safety Board is continuing to work on surveying the number of habitations, schools, nurseries, etc. alongside power lines in Sweden and carrying out a comprehensive analysis of possible technical solutions for reducing the magnetic fields from power lines and the financial consequences associated with this. Possible future regulation with respect to extra low frequency magnetic fields will without exception be implemented in consultation with other relevant authorities.

Debriefing with respect to this work will take place continuously as it is completed, but no less than once a year in connection with the annual report to the Government.

Continuing activities for 1994/95

Despite the fact that new research results are being presented more and more quickly, there is not a lot to suggest that we are on the verge of a scientific breakthrough clarifying whether exposure to magnetic fields in the μT range constitutes a risk to health or not. It is quite possible that the knowledge required to scientifically support a link between weak magnetic fields and health risks will not be developed for many years yet. Therefore, the authorities responsible must agree amongst themselves on what is required to handle the situation which has arisen.

In the opinion of the National Electrical Safety Board, it is at the same time important for research in this area to continue in order to clarify the matter further. Sweden is in a strong position in this respect. This should be maintained, partly because Sweden has unique conditions for parts of this research, and partly because this helps us in this country to rapidly acquire information on new research findings and international opinions.

It can be seen from Section 3.2 ~~that the National Board of Health and Welfare has set up a working group comprising scientific experts and representatives from the authorities concerned.~~ The task of this working group is to evaluate the scientific basis for a link between electrical and magnetic fields and health risks. It is anticipated that this working group's final report will be ready by the end of 1994.

As can be seen from Section 3.1, the National Board of Occupational Health's criteria group for physical risk factors has set up a group of experts to review the criteria documentation from 1990 with respect to work-related exposure to electrical and magnetic fields. It is anticipated that the group's report will be completed this year. After this, the National Board of Occupational Health's criteria group will decide whether the previous criteria documentation needs to be revised. It is anticipated that the criteria group's decision will be made before the end of 1994. The criteria group's decision will be used as a basis for the National Board of Occupational Safety and Health to prepare recommendations for possible measures for limiting exposure to magnetic fields in the workplace.

In the Spring of 1994, the National Board of Health and Welfare, together with the National Radiation Protection Institute, initiated limited surveying of the exposure to magnetic fields in inhabited areas. This included Stockholm and Bollnäs. A report on this is expected in the Autumn of 1994.

The National Electrical Safety Board intends to survey the situation as regards exposure to magnetic fields along the power lines in Sweden and to investigate possible technical solutions for reducing magnetic fields from power lines and the costs such solutions would incur.

As specified above, the authorities concerned will have a reinforced basis for their assessment of the issue of magnetic fields by the beginning of 1995. Given this fact, the National Board of Occupational Safety and Health, the National Board of Housing, Building and Planning, the National Electrical Safety Board, the National Board of Health and Welfare and the National Radiation Protection Institute will together work on the evaluations of the various groups of experts and other documentation in order to draw up a report on the assessments with respect to magnetic fields and health risks and to make a decision on which measures should be implemented.