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While research completed to date is sufficient to raise serious questions it is not sufficient to provide satisfactory answers or to point the way to action. Electric power plays a critically important role in the health of our nation. Already concerns have prompted vigorous public intervention and litigation which has significantly impeded the ability of private and public utilities to construct new power transmission facilities. Such protests will probably grow and it seems likely that similar concerns about fields will soon be raised at other levels. Without adequate science on which to base answers, the resulting contention could go on for many years and have costs significantly greater than the costs of the needed research.

While legislators, regulators and risk managers all have a role in determining the /eve/of research that is undertaken, they should obviously not become involved in specific decisions about the details of the research to be conducted. But, beyond the issue of level of support, there are several issues of research management that should concern these groups:

1. Because of its highly interdisciplinary nature (involving biology, biochemistry, physics and electrical engineering) a high level of quality control is required for research on the health effects of low frequency electromagnetic fields. Failure to exercise such control can lead to serious confusion. The current private and public research support programs have developed adequate quality control. If other actors, such as additional individual states, begin to support research, they need to take care to exercise similar control.
2. The overall program of research should include a balanced mixture of a) cellular level and other biological studies of mechanisms; b) whole animal studies; and c) epidemiological studies. No single type of study is likely to lead to the kind of complete understanding which will be necessary to make informed judgments about risk assessment and management. For example, while epidemiological studies maybe able to demonstrate health impacts *in* humans, cellular and animal studies are likely to be necessary to identify the dose-response mechanisms needed to develop effective strategies for risk management.
3. Care must be taken not to define the scope of the program too narrowly. The fundamental science of this problem appears to be complex and may still lead in unexpected directions. It is important to define the scope of the research widely enough so that important but unexpected developments will not be missed. An example will clarify this point. In the early years of work on this topic it was common for some observers to complain that any study done at a frequency other than 60 Hz was irrelevant. Had this position been enforced on the research then occurring, the important discovery of frequency windowing (Section 3) would have been missed and the correct interpretation of a number results would be impossible.
4. Management of the research program must be flexible and adaptive so as to be able to redirect attention as understanding evolves. For example, in the past the federal research program was too slow in phasing down support for rodent behavioral studies. Recently it has been too slow in mounting a series of laboratory animal cancer promotion studies. In order to avoid such problems regular strategic program reviews based on independent critical advice from health scientists, engineers and risk analysts, are necessary.
5. There is a risk of becoming too fixed on cancer as a single health effect of concern, The breadth of cellular and animal findings suggest that other public health effects, including psychological effects such as chronic depression, deserve some attention.
6. Insufficient attention has been directed at field exposures that result from sources other than high voltage transmission lines. A systematic characterization of the entire low frequency field environment to which people are exposed in normal modern life, is needed.
7. There has been almost no attention given to techniques for eliminating 60 Hz field exposures in modern life. A series of engineering studies, designed to explore the technical and economic feasibility of exposure avoidance, are needed.

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