

DATE: March 25, 1976

TO: The National Research Council: Samuel Abramson, Staff Officer.
Committee to Assess the Biological and Ecological Impact of
Project Seafarer: J.W. Hastings, Chairman.

FROM: Andrew A. Marino, Ph.D., and Robert O. Becker, M.D., Veterans
Administration Hospital, and Upstate Medical Center, Syracuse,
New York.

We hereby submit the following information and comments, for the record, in lieu of a personal appearance before the Committee to Assess the Biological and Ecological Impact of Project Seafarer (committee). We regret that the procedures adopted by the committee, and our lack of personal resources, do not permit an appearance or a more detailed presentation.

COMPOSITION OF THE COMMITTEE

The committee is composed of approximately 16 members; 13 have no connection with Sanguine/Seafarer (S/S) in particular, or with the field of extremely low frequency (ELF) biological effects in general. The remaining 3 members, Dr. Morton Miller, Dr. Herman Schwan and Dr. Sol Michaelson, have worked or written in the ELF area, and Miller and Schwan have performed S/S research for the Navy.

Miller, Schwan and Michaelson have submitted testimony to the New York State Public Service Commission in connection with high voltage transmission lines. The transmission lines have a frequency and magnetic field comparable to the proposed S/S system, and an electric field that is roughly ten million times stronger than the proposed S/S system.

Miller has stated:

"...it is my considered professional opinion that the current state of the art with respect to the potential of adverse biological effects from the electric and magnetic fields associated with the proposed transmission lines is adequate to insure the public that there will be no unreasonable risks to health or safety or harm to the environment as a result of electric and magnetic fields resulting from the operation of these lines" (1, at pg. 23).

Most of the experimental research conducted by individuals in the academic community for S/S has demonstrated a biological effect associated with the S/S fields (2). Miller is an exception. By letter dated March 9, 1976, directed to the chairman of the committee, we urged that Dr. Eugene Goodman and/or Dr. William Southern, who belong

to the larger group of investigators described above, be appointed to the committee for balance. We regret that our recommendation was not favorably considered.

Schwan has stated:

"It is my firm conclusion that exposure to the proposed lines' electric and magnetic fields will not be harmful or unsafe" (3, at pg. 9).

Harking back to Theophrastus, Gilbert, Galvani and Maxwell, among others, Schwan argues on theoretical grounds that ELF electric fields cannot affect biological systems (3,4,5). One cannot imagine an individual with scientific views more closely associated with this conclusion. His presence on the committee is inconsistent with the notion of a fair inquiry.

Michaelson has stated:

"There is no demonstrable biological effect which may be hazardous to health or safety or to the general biological environment as a result of the presence of the proposed lines' electric and magnetic fields" (6, at pg. 29).

Michaelson is an expert in the field of thermal effects of microwaves. He has spoken strongly against the possibility of non-thermal biological effects at low frequencies, or in fact at any frequency.

All three individuals have therefore stated publically that the ELF fields associated with transmission lines will not cause harmful biological effects. Bearing in mind that the transmission line electric field is roughly ten million times stronger than the S/S electric field, it is inconceivable that the three named individuals will find that the S/S is an environmental hazard, regardless of the evidence adduced.

Thus the committee is composed of 13 individuals unfamiliar with the ELF area, and three who are conversant therewith. The latter three have repeatedly and strongly stated publically their position in favor of one side of the issue that is being considered by the committee. We respectfully urge that the composition of the committee is inimical to the pursuit of truth.

ROLE OF THE COMMITTEE

We have been unable to determine whether the committee is designed to be primarily adjudicative or investigative. It appears that the committee cannot merely judge the evidence presented to it, since the only detailed, in-depth presentation encompassing all aspects of the S/S system that it is likely to obtain will be from the proponents of the system. We conclude therefore that if the process is

genuine, the committee is investigatory. We are deeply troubled, however, by the apparent dearth of staff, money and time necessary to conduct an investigation.

NAVY IN-HOUSE RESEARCH

We wish to call the attention of the committee to the research performed at the Naval Air Development Center, Johnsville, Pa., from 1970 to 1974. This work is briefly described in Bioeffects Project Resume MR041.08.01-0100, June, 1973, Office of Telecommunications Policy, Executive Office of the President. The observations made in the course of these investigations do not appear to be consistent with the Navy's present position regarding S/S. We have been unable to obtain any data from the Navy regarding the Johnsville Project, other than that it existed.

With the exception of the Johnsville Project, the only in-house Navy research project which has shown a biological effect due to ELF fields is, to our knowledge, that of Beischer (7). Reviewing Beischer's work, and data from the S/S Wisconsin Test Facility, an Ad Hoc Committee assembled by the Navy in 1973 recommended (8): "Priority 1-Urgent and Absolutely Necessary. The reports of elevated serum triglycerides in humans exposed to experimental ELF magnetic fields for short periods of time as well as in individuals working at or near the Sanguine Wisconsin Test Facility cause this area to have the highest priority for scarce research resources. Most emphasis should be placed on controlled laboratory studies. Detailed animal experiments on triglyceride levels should be undertaken simultaneously with a continuation of the human experimentation." No further human experimentation has been conducted, nor has the absence thereof been explained or justified by the Navy.

We believe that both the secrecy surrounding the Johnsville Project, and the failure to follow up Beischer's work, reflect adversely upon the Navy's position in relation to S/S, and that both areas should be studied by the committee.

SANGUINE/SEAFARER

We have sent to the chairman of the committee, under separate cover, copies of testimony submitted to the New York State Public Service Commission in connection with transmission line electric and magnetic fields (9,10). Based on our study of the literature contained therein, which includes but is not limited to work sponsored by the Navy, we believe that the S/S electric and magnetic fields may cause biological and ecological effects, and that a great deal more research is needed. The net result of the Navy S/S research program has been to make the possibility of ELF field biological and ecological effects more credible than would have been the case in the absence of the

program. It therefore seems impossible to us to sustain the view that the research done to date is adequate to support a decision in favor of building S/S. We recognize also that the environmental and health hazards posed by S/S may be outweighed by considerations of national defense or other factors not in the scientific domain.

Respectfully submitted,

Andrew A. Marino

Andrew A. Marino, Ph.D.

Robert O. Becker, M.D.

Robert O. Becker, M.D.

REFERENCES

1. Morton Miller, Testimony Before the State of New York Public Service Commission in Cases 26529 and 26559.
2. Compilation of Navy Sponsored ELF Biomedical and Ecological Research Reports, Volumes I and II, February, 1975.
3. Herman Schwan, Testimony Before the State of New York Public Service Commission in Cases 26529 and 26559.
4. Biological Hazards from Exposure to ELF Electrical Fields and Potentials, Herman Schwan, NWL Technical Report TR-2713, March, 1974.
5. Some Guidelines for the Development of EM Radiation Standards, Herman Schwan, in NWL Technical Report TR-3110, March, 1974.
6. Sol Michaelson, Testimony Before the State of New York Public Service Commission in Cases 26529 and 26559.
7. D. Beischer, J. Grissett and R. Mitchell, Exposure of Man to Magnetic Fields Alternating at Extremely Low Frequency, Naval Aerospace Research Laboratory, NAMRL-1180, AD770140, July, 1973.
8. Proceedings of the Ad Hoc Committee for the Review of Biomedical and Ecological Effects of ELF Radiation, Bureau of Medicine and Surgery, Department of the Navy, Washington, D. C., December, 1973.
9. Andrew A. Marino, Testimony Before the State of New York Public Service Commission in Cases 26529 and 26559.
10. Robert O. Becker, Testimony Before the State of New York Public Service Commission in Cases 26529 and 26559.