

SIERRA CLUB



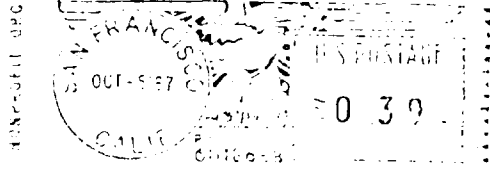
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September 13, 1987

Stewart Norris
187 Heather Drive
Atherton, California 94025



10/5/87

Sorry for the delay in getting this letter off to you. We had a little trouble tracking down the article that we referred to.

Thanks for your patience.

Public Information office

Dear Mr. Norris,

I apologize for the delay in answering your letter of July 28. Over the years, the Sierra Club has taken policy stands with regard to a number of nuclear energy issues, including commercial fission reactors, waste disposal, uranium mining and decommissioning of nuclear plants. In November 1986, the Board of Directors adopted policy on the subject of fusion reactors. Their resolution reads:

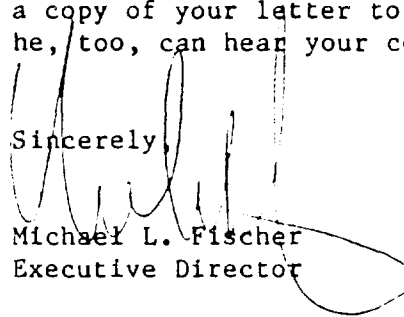
The dangers posed by the probable releases of tritium used by fusion plants, the problems with decommissioning these plants, and the high costs lead the Sierra Club to believe that the development of fusion reactors to generate electricity should not be pursued at this time. We are not opposed to safe and proper research as long as it is not at the expense of more benign "soft energy path" technology.

This Sierra Club policy was developed by the Club's National Energy Committee, one of our many issue committees composed of interested, knowledgeable members from around the country. Policies are adopted only after careful consideration by many volunteer leaders within the organization. I am enclosing for your interest the background sheet that the committee presented to the Board that details the rationale for the policy.

I am also enclosing a copy of my remarks to the Commonwealth Club that you refer to. While it doesn't include a transcript of the question and answer period, it should give a general idea of the Club's views on energy. I also include a recent article from the San Francisco Examiner on the subject.

I appreciate your taking the time to express your thoughts on this country's energy situation. I will forward a copy of your letter to the chair of the National Energy Committee so that he, too, can hear your concerns.

Sincerely,


Michael L. Fischer
Executive Director

enc.
MLF/vw

POLICY STATEMENT ON FUSION REACTORS

The dangers posed by the probable releases of tritium used by fusion plants, the problems with decommissioning these plants, and the high construction costs lead the Sierra Club to believe that the development of fusion reactors to generate electricity should not be pursued. *(note: this statement was amended to that which appears in my letter to you)*

BACKGROUND

Princeton, MIT and Livermore Laboratories, as well as other research institutions, have active fusion reactor programs. The fusion program, like the breeder program, is aimed at providing an essentially unlimited supply of energy, based on the 0.016% occurrence of deuterium, hydrogen-2, in natural hydrogen. The addition of a neutron to deuterium in a "heavy water" reactor results in tritium. Such a potential abundance of fuel makes possible the building of an unlimited number of fusion reactors and the correspondingly increased problems of tritium release and waste from reactor decommissioning.

To date fusion has only been achieved in bombs. The plasma chamber is one means being researched for attaining fusion. Temperatures reached in plasma reactors are far below that needed to cause fusion. Even so, the internal surface of the plasma chamber develops a layer of contamination which interferes with reattaining plasma conditions. There is also a laser energized reactor concept. In any event it appears that controlled fusion, if it is achieved, will require very large equipment and maintenance costs and be of uncertain reliability.

1. Tritium, hydrogen-3, is a fuel component in the most active fusion research. It is radioactive and has a half-life of 12 years. The EPA, in estimating the consequences of tritium released to the atmosphere from just the fission reactor program, projected hundreds of additional deaths annually by the year 2000.
2. It is likely that tritium fusion research receives stronger support than alternative fusion processes because it has military utility.
3. Large releases have occurred in the production of tritium for weapons. The increased manufacture of tritium would, in all likelihood, result in increased releases.
4. Transportation of tritium for fusion reactors would increase risk of accidental releases.
5. Tritium releases from fusion plants are highly probable.

6. A fusion reactor will, like a fission reactor, become highly radioactive from neutron activation. Fusion reactors will present decommissioning problems similar to those of fission reactors.

7. Sustained fusion has not been realized. If electrical generation by controlled fusion is to be realized it will require a great expenditure in human and material resources which would be better employed in the search for benign solutions to energy problems.

ARGUMENTS FOR THE POLICY

1. This policy affirms the Sierra Club's commitment to changing the direction of national energy policy toward further development of conservation and environmentally benign energy sources. This is the Club's first policy statement on fusion.

2. The policy statement contributes to public awareness of the hazards of a means of electricity generation which has been represented to the public as virtually nonpolluting but which, in fact, because it is not limited by fuel availability, has the potential for releasing more radioactivity and resulting in more long-lived radioactive wastes than the present generation of fission reactors. Tritium, in the course of production, transport, storage, and utilization operations, will enter the atmosphere, become distributed and incorporated in plants, animals and people. It is estimated that the ingestion of 6 mg by a person would be fatal. A body level of one part per billion would result in fatality in less than a year.

3. In developing a comprehensive policy regarding nuclear generation, the Club should speak to fusion as well as fission.

ARGUMENTS AGAINST THE POLICY

1. Fusion is not a presently available energy source and may never become one.

2. There are so many urgent issues that the Club should not concern itself with fusion.

3. The production, transport and containment of tritium should not be questioned because it is in the interest of national security to continue to build hydrogen bombs.

GLOSSARY

Fusion. Certain atomic nuclei combine at very high temperatures resulting in a new nucleus, a neutron and a large energy release.

Tritium. Radioactive hydrogen with triple the normal mass.