

F I N A L R E P O R T

NUCLEAR POWER PLANT OPERATIONS SUBCOMMITTEE OF THE STANDING COMMITTEES ON ENERGY

December, 1978

Membership: Senator James V. Gallagher, Co-chairperson
Representative Linda Svoboda, Co-chairperson
Senator Joseph C. Coleman
Senator James E. Briles
Senator Richard R. Ramsey
Senator Willard R. Hansen
Representative Donald Binneboese
Representative Arlo Hullinger
Representative Richard Welden

Purpose of Study: To examine nuclear power plant operations with an emphasis on the feasibility of using heat dissipated by a nuclear power plant in an agricultural or commercial process. House Concurrent Resolution 147 which requested a study also expressed concerns regarding the disposal and transportation of nuclear fuel and the by-products of the fission process.

ACTIVITIES

The Subcommittee held three meetings during which information pertinent to the study was collected from a variety of sources. The members received testimony from representatives of Iowa Electric Light and Power concerning operations at the Duane Arnold Energy Plant located near Palo, Iowa and the feasibility of using heat generated by the plant for other purposes. The Subcommittee's activities included a tour of the Palo plant. At the first meeting Subcommittee members indicated an interest in exploring the possibility of using what was perceived as "waste" heat from a power plant to distill grain for the manufacture of "gasohol". The Subcommittee met with representatives from Clinton Corn Processing, an Iowa firm that currently manufactures grain alcohol and researchers from Iowa State University who are knowledgeable concerning the economics of and technology for gasohol production.

The Subcommittee also received testimony on the following related issues:

1. A study of the suitability of Iowa geologic formations for the disposal of high and low level nuclear waste being conducted by the Iowa Geological Survey.

2. The federal government's activities and policies on nuclear waste disposal presented by a representative of the United States Department of Energy.

3. A discussion of "soft" vs. hard energy technologies presented by Mr. Amory Lovins, British Representation of Friends of the Earth. "Soft" energy technologies are described as relatively small scale, renewable and diverse energy sources with particular emphasis on the energy sources used to generate electricity as opposed to and using large fossil and nuclear fueled generating plants for the same purpose.

4. The decommissioning of an experimental nuclear reactor at Iowa State University.

CONCLUSIONS

The Subcommittee, perceiving its purpose as primarily educational in nature, did reach the following conclusions based on its efforts:

1. From discussions with representatives from Iowa Electric, Iowa Power, Clinton Corn Processing and Iowa State University it became apparent that there is no "waste heat" or "free heat" available from the Duane Arnold Energy Plant and suitable for gasohol production or another moderate to high temperature process.

There are two types of heat available from a power plant. The first type is live steam taken directly from the boiler or turbine. While this steam is of a temperature sufficient for making alcohol from grain, for example, to "bleed" live steam from the turbine would result in diminishing the efficiency of the plant since that steam would no longer be available for generating electricity. It is possible to design a new power plant to provide steam for another purpose (this has been done in Midland, Michigan) however there is a cost associated with the steam tapped off for the second process--it is in no sense "free".

The second type of steam in a power plant is the steam that has been used to maximum capacity and that is fed into the condensor. This steam is condensed and the heated water is usually emitted into a river or cooling tower. This heat, while essentially free, is not very useful because of its relatively low temperature.

While this low temperature heat has been proven to be suitable for greenhouses and fish hatcheries, its use for gasohol production may not be very economical because low temperature systems are more capital intensive.

2. The Subcommittee is also aware of the efforts of the Hazardous Waste Subcommittee of the Senate Standing Committee on Energy regarding the transportation of hazardous waste. The Hazardous Waste Subcommittee requested the Department of Transportation explore the possibility of establishing by rule a permit system or other procedure to monitor the interstate transportation of hazardous wastes (including radioactive wastes) through Iowa. The Department acknowledges that they do have the authority to establish a permit system or a notification and routing procedure and the members of the Hazardous Waste Subcommittee have urged the Department to continue to pursue this possibility. The Subcommittee endorses those efforts.