

A Proposal for Monitoring Nuclear Power Plants

Professors Fred Schmidt and Gene Woodruff of the University of Washington have proposed at the 1977 Meeting of the American Physical Society in Washington, D.C., an international monitoring system which could have significant impact on efforts to control the spread of nuclear weapons. The system involves surveillance of nuclear power plants and transmittal of operational information via existing communications satellites.

Schmidt and Woodruff envision a tamper-proof electronics system which would measure such things as control rod positions, soluble neutron absorber concentrations, and reactor power levels. This information would be constantly transmitted via satellite to an international control center. The system could detect both unscheduled shutdowns and abnormal fuel loadings. These features, together with internationally controlled fuel supply and reprocessing, would make it very difficult for a country to secretly obtain weapons material from nuclear power plants.

The primary advantages of this approach are the constant surveillance and the reduction in the need for on-site inspections. It may also prove to be advantageous for the country in which the reactor is located by assisting in more efficient operations.

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Is Recombinant DNA Research Dangerous?

The answer to the question, "Is recombinant DNA research dangerous?" seems to be "no" and "maybe." The "maybe" types of experiments have all been forbidden by the National Institutes of Health Guidelines, some version of which is likely to become law very soon. For example, it isn't known whether all or part of the DNA of smallpox virus inserted into a plasmid inside the bacterium *E. coli* can transmit the disease. Nevertheless, this is a banned experiment. There is no valid reason to believe that the recombinant DNA molecule work which is permitted under the Guidelines with different levels of physical and biological containment is hazardous.

Some of the confusion on the recombinant DNA research hazards results from the rather meaningless term "absolutely safe." It isn't "absolutely safe" to do anything. The Guidelines are extraordinarily conservative. For example, the containment level required to work with DNA from lower mammals put into *E. coli* is P3 EK2, while agents causing polio, pneumonia and gonorrhea are permitted to be manipulated in much less contained P2 laboratories in hospitals and research institutions. Thus more precautions are required in a situation where there is no known disease-producing agent than are required for biological material which is known to produce serious human disease.

There can be no guarantee of "absolute safety" in any of these procedures, but an estimate of probability of escape of the recombinant DNA has been made for each type of experiment, and in most cases the Guidelines were made considerably more conservative than would be indicated by these probability numbers. Even the most conservative animal virologists tell us that the probability of creating a monstrous infectious agent by recombinant DNA techniques is so vanishingly small that it should not be considered.

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Request for TAS Nominations for Fellows

The Fellows Committee (Dr. James X. Corgan, A. P. S. U., Clarksville, TN 37040; Dr. Diane Nelson, E. T. S. U., Johnson City, TN 37601; and Dr. S. K. Airee, U.T.M., Martin, TN 38238) invites nominations from any member for fellows to be elected at the fall meeting of the Academy. The nominees should:

- 1) be active members of the Academy
- 2) have participated enthusiastically in the activities of the Academy *in more than one of the following ways:*
 - a) Section chairman
 - b) Editor
 - c) Field trip leader
 - d) Committee service
 - e) Publication in J.T.A.S.
 - f) Paper presentations at meeting of the Academy
- 3) be a researcher, educator, administrator or a professional involved in science endeavors in Tennessee

Please submit your nomination with a brief resumé to any member of the committee before September.
