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Some Regulatory Implications of Technology Assessment

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ance and imbalance between major parts of the energy sector. Some examples were:

Emphasis on nuclear technologies versus increased need in non-nuclear sectors;

Emphasis on electric power provision, to the neglect of other activities;

Emphasis on provision with respect to more efficient utilization (*i.e.*, conservation);

Emphasis in the physical and technological aspects, often to the neglect of societal consequences;

Emphasis on long vis-à-vis short-term prospects, where the attention was gratifyingly satisfactory toward long-term technologies; and

Lack of attention to manpower provision or public communication.

Extensive congressional hearings took place during the Spring of 1975, for which the OTA assessment provided a strong background of relevant material.

A similar but enlarged assessment now proceeds at OTA, with respect to the Energy Research and Development Administration's National Plan, revealed to us on June 30. ERDA itself has incorporated in its new plan a number of ideas generated by the earlier OTA activity and the congressional debate. Many of the same issues as before will be covered again, this time with more sophistication, as OTA, the Congress, and the Executive Branch learn the value of such constructive debate.

This brief summary is meant as an example only. The OTA presently has strong programs in materials, ocean-related topics, and many other areas, and these brief remarks are meant to give an indication of the usefulness of technology assessment organized in the right way and in the right places.

As the parts of society become more and more integrated, as common resources dwindle, and as an ever-increasing world population demands an ever-increasing quality of life, better organization of energy, resources, housing, transportation, health care—any major thing you care to name—must be provided. Each area of activity impinges upon many others, as we have seen in current examples; politics affects energy availability, and vice versa; energy and the environment often seem to clash. Technology assessment, an attempt to organize the holistic nature of these coupled activities, becomes increasingly important with time, and hopefully our sophistication grows with time to perform the work.

SOME REGULATORY IMPLICATIONS OF TECHNOLOGY ASSESSMENT

Dr. Michael S. Baram

To conclude this wide-ranging panel discussion, I want to briefly address two aspects of regulation which have been troublesome, and for which Technology Assessment may be particularly useful.

The first aspect, which relates to radiation and other hazardous substances in general, is the increasingly important regulatory function of forcing the development and application of appropriate control technologies on industry—normally, the development and application of devices and techniques to protect public and worker health and safety. The question becomes: Is the regulatory program appropriately forcing and guiding necessary advances in control techniques and their timely use?

We are familiar with the controversy which now surrounds a number of provisions of the Air and Water Pollution Control programs, the Atomic Energy and Offshore Development programs, OSHA, etc.—controversy about the nature and magnitude of adverse effects and the availability, reliability and feasibility of control measures to use.

Should the control requirements to be imposed by agencies on industry, normally in the form of design and performance requirements, be based on the economic feasibility of the techniques, on the basis of health effects and environmental effects, or by some balancing of both considerations? Congress has provided conflicting messages to the agencies in its legislation, and the agencies are left with the difficult value judgments as to what approach is authorized by Congress to be in the societal interest —to allow a firm or industry to continue to discharge hazardous materials until economically feasible controls are developed; to shut down a polluter because of emissions determined by the agency to be possibly dangerous to human health, irrespective of the economic considerations; to use cost-benefit analysis in determining the requirements to be imposed; or what?

Technology Assessment of such problems and their alternative solutions could provide Congress with a better understanding of the nature of the problem, and objective information on industrial ability to respond with new control measures, within certain time frames. Congress could thereupon provide the agencies with more realistic control requirements and schedules and less discretion on the tradeoffs to be made in regulation. Maybe it is unrealistic to assume that technology assessment could bring about the shifting of some of this judgmental burden onto the Congress where it belongs, but it deserves some consideration.

Another way of looking at this or, more accurately, a second facet of regulation for which technology assessment may be useful, concerns what analytical methods should be employed in agency rule-making or standard-setting. Should an agency striving to set various standards for ionizing radiation, for example, standards for radiation discharge, environmental levels, and human exposure, use cost-benefit analysis? The Nuclear Regulatory Commission presently uses this balancing technique —in other words, radiation standards are being set at the balance point between the control costs and the health and other benefits. True cost-benefit requires numbers. It is very difficult to establish numerical values for health benefits such as a reduction of deaths and illnesses. It is also very difficult to get reliable information from industry on what the true costs of imposing new controls to further reduce radiation would be. Should cost-benefit be used in matters involving health and safety at all?

In the highway safety and motor vehicle safety fields, Congress and the agencies have rejected use of cost-benefit in matters involving human life—particularly for sensitive areas such as schoolbus design. Or is cost-benefit the only realistic or rational or democratic way to proceed? Could cost-effectiveness analysis or some systems model provide a more appropriate basis for making decisions on standards with human health implications?

Here is a major task for technology assessment and our lawyers and technical analysts, to assess the analytical techniques that are available for regulation and standard-setting—which can range from Jeremy Bentham's felicific calculus to cost-benefit analysis, systems analysis, and other modern techniques—in order to determine their analytical, ethical, and other limitations and to prescribe their use in regulatory processes accordingly and in full knowledge of these limitations.

We are learning that our problems lie not with stereotypes of agencies and industries, nor with "bad" technologies, but with our analytical and management capabilities for running regulatory programs, capabilities which somehow must be further developed to integrate rationality and humanism in decision-making.

QUESTION AND ANSWER SESSION

JUDGE LEVANTHAL (in response to a question on scientific experts in court): . . . Experts are expected to testify in court differently from what they might say in a conversation where they are just "mind-blowing" or running up the flag of possibilities for reflection. They're not supposed to testify in court unless their method of approach has wide acceptance, but there are differences between experts, and in applying even an accepted method to a particular case, there are borderline issues and questions of judgment. Therefore, there are differences in the results that they reach. But in each case they should have a generally accepted methodology for analyzing the situation. Otherwise, it shouldn't be the subject of testimony. That rule has been evolved for cases where you have a jury. The jury is likely to be very impressed by the scientist—unless the scientist contradicts the jury's own common sense of a situation, in which case they will not be impressed by the expert.

However, in an adversary situation, the lawyers and the scientists are tangling with each other, and we do not have a constructive or corroborative instrumentality for arriving at a disposition. Juries get to be confused, and the courts try to present some picture to the jury without confusing them utterly. The best that the courts have been able to work out is to require of experts accepted methodology or accepted scientific doctrines with some latitude for differences of opinion. If a scientist is willing to say that he has a reasonable scientific certainty about a matter, and if he's willing to testify to that effect, he is permitted to testify—and give his reasons. . . . This is an imperfect situation and tends to slant keeping scientific testimony out unless it has a certain amount of establishment. . . .

For example, about 50 years ago the court said in a rule that is