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ROLE OF A STATE HEALTH DEPARTMENT  
IN AN UNDERGROUND NUCLEAR EXPERIMENT

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ABSTRACT

*When Project Ketch was first announced to Pennsylvania state officials, the Department of Health, under its legal responsibility to protect the health of the citizens of the state, was quick to realize that a thorough, independent review of the proposal was indeed necessary. Although the project was terminated by the sponsoring company before on-site preliminary evaluation work was begun, it is believed that the Department's approach was sound and practical. This study and the planned joint effort of the state and the Bureau of Radiological Health will be discussed in detail.*

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We, in Pennsylvania State Government, were involved for approximately two years in a proposed Flowshare experiment entitled Ketch. Our experiences, our reactions, and the reaction of the public sector is important to discuss, especially if future Flowshare programs are to succeed in the Northeast. This is that story.

Project Ketch is a joint proposal by the Columbia Gas Corporation and the Atomic Energy Commission to create an underground gas storage reservoir with nuclear explosives. Since gas storage is essential in providing adequate service at reasonable cost during times of peak demand, it would seem appropriate to provide such storage capacity in areas removed from the gas fields where demand was increasing beyond the present capacity of the gas delivery system.

The experiment should naturally be carried out in geological formations which would provide adequate safety and

still fulfill the requirements for adequate gas storage. Pennsylvania seemed to be an ideal location for such an experiment because of its location in the rapidly growing Northeast and its tight geological structure.

Early in 1966, we were officially informed that the Columbia Gas System Service Corporation and the Atomic Energy Commission were seriously considering Pennsylvania as a site for the Ketch experiment. My first reaction, and I think the reaction of many state officials, was one of disbelief. A nuclear device being exploded in our backyard? Unbelievable! Nevada, with its sparse population and open spaces, was a far cry from the populated Northeast.

However, after we recovered from the initial shock and began to consider the situation in more detail, we all realized that it was not our responsibility to react from emotion, but only from cold, hard, fact and reason.

What were our responsibilities? Only one--to evaluate the experiment from the standpoint of public health and safety and approve or disapprove of the proposal. But immediately, many other obvious questions arose. What were the facts? What kind of information did we need to evaluate the project? Where would we get the expertise to evaluate information we did receive? And, although it was never really raised in public, one question continued to gnaw in the backs of our minds . . . "Could the Atomic Energy Commission be relied upon to conduct the experiment in the safest possible manner, especially when they were also attempting to promote the use of nuclear explosions by showing that such projects could be conducted at reasonable costs?" Did the AEC have a review mechanism similar to that which has worked so effectively in the reactor licensing program? What was this mechanism?

Very little information was immediately available on the safety aspects of underground nuclear explosives. The literature was almost devoid of good references. How much of the information was classified and could we gain access to it?

Meetings were held with representatives of the various state agencies which would have to be involved. The list is longer than one would imagine. Besides the Department of Health, it included:

1. The Department of Forests and Waters, which was responsible for leasing the use of state lands;
2. The Department of Mines and Mineral Industries, which has responsibilities for gas and oil well drillings;

3. The State Geological Survey, which had interest in the information to be obtained during the evaluation phase of the project;
4. The State Fish and Game Commissions were involved, because of possible effects on the wildlife;
5. The Public Utility Commission, which regulates the local gas industry; and
6. The Department of Commerce, because of its role in the developmental aspects of the atomic energy industry.

In January of 1966, former Governor Scranton signed into law the Atomic Energy Development and Radiation Control Act. This law provided, and I think rightly, that the developmental aspects of atomic energy be placed in the existing Pennsylvania Department of Commerce and that regulatory activities be placed in the Department of Health. It also provided for an Advisory Committee to assist both Departments in the administration of their respective endeavors. These nine committee members were appointed by the Governor, confirmed by the Senate, and represented the varied interests in and aspects of atomic energy, and included individuals from industry, labor, education, medicine, radiology, health physics, and related sciences.

The Committee is directed to make recommendations to the Department of Health, review rules and regulations, and furnish such technical advice as may be required on matters relating to the control of radiation.

The Ketch proposal was discussed in detail, and as more and more information became available, the Governor and the Departments requested a complete evaluation of the project including appropriate recommendations. A special "Ketch" subcommittee was established by the Advisory Committee to provide additional scientific expertise in areas which were not covered by individuals on the main committee. It was chaired by an expert in nuclear engineering and presently the Dean of Engineering at The Pennsylvania State University. Additional experts in the areas of geology, geophysics, and underground engineering were appointed to the Ketch subcommittee.

Besides numerous contacts in Pennsylvania with officials of the AEC Flowshare Program, the Lawrence Radiation Laboratory, the Public Health Service, the AEC Nevada Operations Office, and the gas company, a group of representatives of the subcommittee and the various departments visited the

Nevada Test Site and the Nevada Operations Office to discuss the project in greater detail and to have some additional specific questions answered. At no time were we told that the information was not available.

We were also invited to the Gasbuggy symposium, and I received a personal invitation to work with the Public Health Service's environmental monitoring team during the briefing sessions and during the actual Gasbuggy detonation. There was no question that an effective rapport was being established between the Federal and State Governments to assure that joint decisions concerning the safety of the project could be made.

The "Ketch" subcommittee had, in the meantime, completed its work on reviewing the proposal. The report was accepted and forwarded to the Governor and the Departments concerned. The report and its recommendations are indeed the most significant single document from Pennsylvania on this project.

One of the problems arose from the method in which the "Project Ketch" proposal was submitted. The proposal was separated into five distinct phases as follows:

1. Site evaluation and confirmation
2. Execution
3. Chimney environment measurements
4. Storage facility development
5. Operation

The Phase I portion of the project included exploratory drilling, logging and pressure testing, safety surveys, permeability and high pressure tests, and some surface construction. The Advisory Committee concerned itself primarily with a technical review of Phase I only, since much of the information needed to verify the safety of the project could only be obtained during that phase. Its conclusions and recommendations can be summarized as follows:

The committee believed that adequate details concerning the test work to be done during Phase I could be established by the AEC and the gas company as the Phase I portion proceeded. Therefore, the committee recommended that approval be given to proceed with this phase only provided:

1. That the phase would encompass all data and calculations necessary to confirm the site

acceptability and that certain questions raised in the complete report would receive adequate attention.

2. That an opportunity would be provided at the end of Phase I for an effective safety review by the AEC, utilizing the Panel of Safety Consultants, the Test Evaluation Panel, the Test Manager's Advisory Panel, and for Commonwealth representatives to review the findings before approval would be granted for Phase II.
3. That there would be assurance of appropriate compensation for any property damage or unlikely personal risks.

To quote directly from the report:

"Commonwealth approval to proceed with Phase II and the subsequent phases of the project should be given after the Phase I evaluation, if it is found that a favorable decision by the AEC was based on an adequate and competent safety review to ascertain that the test would be accomplished without injury to people, either directly or indirectly, and without acceptable damage to the ecological system and natural and man-made structures."

Governor Shafer, in letters to Chairman Seaborg and the Columbia Gas Company, granted Commonwealth approval to proceed with the first phase of the project, listing the stipulations of the Advisory Committee's recommendations.

The project, as many of you know, is now in a state of limbo, or in one of the other states in proximity to Pennsylvania. Why was the project postponed?

One of the first recommendations made during discussions with the parties involved, was that an effective, large public information program be established jointly by the AEC, the Commonwealth, and the gas company. It was obvious that the reactions of individuals in the public would be similar to our first reaction. Pennsylvania has been one of the leaders in the atomic energy field. There are now 13 operating or planned power reactors in the state. There has been no adverse public response to these projects, mainly as a result of an effective long-term public relations program. Nuclear reactors are an accepted risk. However, nuclear explosives are not.

The response to our recommendation for a joint public information program went unheeded. Yes, public forums were held in the area; many man-miles were traveled by representatives of the Lawrence Radiation Laboratory, the AEC, the PHS, and the Columbia Gas Company to explain the project in detail to all interested groups. But once the adverse public reaction had begun, primarily out of fear, it was impossible to stop. Citizens groups were formed, signatures were obtained, and vocal critics of the project garnered much newspaper space.

The following slides, which were made from selected newspaper headlines, can tell the story much better than I can.

The title of this presentation is "The Role of a State Health Agency in an Underground Nuclear Experiment." Our role in this experiment ended rather abruptly, but it should have been two-fold--to protect the public health, naturally, but also to inform the public of that role and the steps we were taking to carry it out.

However, we, as a health agency, should not be placed in a position of promoting the project. This is the responsibility of those agencies and companies which are proposing it. I strongly urge that the experience in Pennsylvania not be quickly forgotten, but that an immediate effort be made by the Atomic Energy Commission to establish an effective Plowshare informational campaign. With proper direction, such a program could have stopped the groundswell before it became unmanageable, and would have allowed for a proper and unemotional evaluation of the safety of the project.

What did we all learn? A real lesson in the potent power of public opinion!

QUESTION FOR THOMAS M. GERUSKY

I. From P. R. Frederick:

You have implied informed public opinion will support Plowshare projects. Do you have evidence of this? It seems unrealistic to me based upon Utah's attempted fluoridation of water supply experience! Very formidable and well-organized opposition developed.

ANSWER:

We have information that an uninformed public will react the opposite way. I think an informed public reacted the proper way in the reactor field. I think it can react properly in this field also.