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RELEASED

B-164105

SEP 17 1973

1. The Honorable Daniel J. Flood
House of Representatives



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2 Dear Mr. Flood:

Your letter of July 18, 1973, requested that the General Accounting Office reappraise the potential cost to the Government which could result from the fuming melt-down of a nuclear power reactor. As agreed with your office on August 20, 1973, we are providing you a summary of the information we have obtained on the past and current efforts of the Government in this area and our suggestion for obtaining the data that would be developed by the requested reappraisal.

1 Under section 103 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2133), the Atomic Energy Commission (AEC) is responsible for licensing the construction and operation of nuclear power plants. Section 170 of the act, which was enacted in September 1957 (Public Law 85-280) and is commonly referred to as the Price-Anderson Act, provides a system of private insurance and Government indemnity totaling \$560 million to pay public liability claims for personal injury and property damage resulting from a nuclear accident. 743

Section 170 requires that AEC licensees of facilities producing substantial amounts of electricity (100,000 electrical kilowatts or more) carry the maximum amount of liability insurance available from private sources. The maximum underwriting capacity currently available from the insurance industry is \$95 million for each facility.

Section 170 also requires licensees to execute an indemnity agreement with AEC providing Government indemnity for the difference between the statutory ceiling of \$560 million and private insurance. Therefore, under existing law, the cost to the Federal Government in the event of a nuclear power reactor accident would be limited to \$465 million (\$560 million statutory ceiling less \$95 million in private insurance).

2 In the event of a nuclear accident resulting in public claims in excess of the statutory ceiling of \$560 million, the opportunity exists for after-the-fact congressional reassessment of the situation. The May 1957 report of the Joint Committee on Atomic Energy on the bill which eventually became the Price-Anderson Act states that the \$560 million ceiling on the indemnity and insurance "could be subject to upward revision by the Congress in the event of any one particular incident in TN T 100

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which, after further congressional study, the Congress felt more appropriations would be in order."

Since there has never been a nuclear reactor accident which has affected the public, no one really knows what the consequences of such an accident would be in terms of fatalities, injuries, and property damage. However, AEC has conducted studies in the past and is currently studying the possible consequences of various types of possible nuclear reactor accidents.

In July 1956, the Joint Committee on Atomic Energy, in connection with its consideration of the then proposed Price-Anderson legislation, asked AEC to undertake a study of the possible effects of a serious reactor accident. The study, which was conducted by AEC's Brookhaven National Laboratory and completed in March 1957, was entitled "Theoretical Possibilities and Consequences of Major Accidents in Large Nuclear Power Plants."

In the 1957 study the consequences of what AEC considered three highly improbable but theoretically conceivable accidents were identified and analyzed. Using various assumptions, AEC concluded that in the worst case studied--50 percent release to the environment of all fission products in the reactor--(1) human fatalities could range up to about 3,400, (2) the number of persons injured could range up to about 43,000, (3) the number of persons that would have to be evacuated could range up to about 460,000, (4) property damage could range from about \$0.5 million to about \$7 billion, and (5) land areas of up to 150,000 square miles could be affected to the extent that there would be moderate restrictions on the use of the land or crops.

In May 1964 the Joint Committee asked AEC to update its 1957 study on reactor accidents to assist the Committee in considering the need to extend the Price-Anderson Act, which was due to expire in August 1967. AEC's Brookhaven National Laboratory undertook the reexamination but the study was never completed because AEC determined that it could answer the questions posed by the Joint Committee without carrying out all the complex details of the study.

In its response to the Joint Committee in June 1965, AEC stated that

"* * * assuming the same kind of hypothetical accidents as those in the 1957 study, the theoretically calculated damages would not be less and under some circumstances would be substantially more than the consequences reported in the earlier study." (Underscoring provided.)

In September 1972, AEC initiated another study entitled "Probabilistic Reactor Safety Study," under the direction of a nuclear engineering consultant from the Massachusetts Institute of Technology (MIT). The study, which is intended to be a realistic assessment of nuclear power plant accidents, is being conducted at AEC Headquarters and various AEC laboratory and contractor locations. AEC estimated that this study would cost about \$2.0 million and would involve about 50 individuals from various fields of expertise, such as nuclear physics and engineering, meteorology, reactor safety, and fission product movement.

According to AEC, the ongoing study, which will include use of analytical methods recently developed for predicting the reliability of the performance of individual reactor components, is expected to provide a more precise quantification of the probabilities and consequences of nuclear accidents. The MIT consultant to AEC told us that the study would cover the probability of various types of accidents occurring and the consequences of those accidents in terms of human fatalities and injuries, potential cancer and genetic effects, and property damage in dollars, including evacuation costs. He stated that the study would also include a comparison of the risks associated with the operation of nuclear energy systems with several other technological risks, such as hydro-electric dams, which society is continuously taking.

The MIT consultant said that he expected the first draft report on the study to be submitted to AEC about January 1974 and that the final report should be completed by about May 1974. According to AEC, the study will be released to the public and may be used by AEC to assist the Congress in its forthcoming consideration of the Price-Anderson Act, which will expire on August 1, 1977. AEC officials told us that the scope and progress of the study would be discussed during hearings on nuclear reactor safety before the Joint Committee on Atomic Energy, which are scheduled for September 25-27, 1973.

We believe that the study you requested our Office to make would duplicate the study currently being conducted by AEC. In view of the cost and technical expertise required to make such a study and since the AEC study will provide information on the potential cost of various types of possible reactor accidents, we suggest that you consider requesting AEC to provide you with a copy of its study when it is completed.

If, after reviewing the AEC study, you feel that our Office can be of assistance, we will be glad to help you in any way we can.

Sincerely yours,

R.F.KELLER

(Deputy Comptroller General
of the United States

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