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LEVEL II

REPORT BY THE

Comptroller General

OF THE UNITED STATES

Congress Should Increase Financial Protection To The Public From Accidents At DOE Nuclear Operations.

In the event of a nuclear accident at a Department of Energy (DOE) facility, liability protection for public injury would be covered by the Price-Anderson Act. The act establishes the sources and amount of funds to cover public injury and provides a basis for relatively speedy compensation. The act also limits the amount of funds that are readily available for compensation.

GAO believes that since it is the Nation's policy to foster the continued development of nuclear power, the protection provided DOE contractors by the Price-Anderson Act is needed, especially since alternative methods for insuring the public against the potential hazards of a catastrophic nuclear accident do not provide as much financial protection as does the Price-Anderson Act.

In GAO's opinion, public protection under the Price-Anderson Act should be increased for DOE contractor operations. Certain provisions in the Price-Anderson Act and its implementation (1) serve to provide less public financial protection from accidents occurring at DOE contractor-operated facilities than at licensed commercial facilities and (2) may not adequately protect the public from the financial consequences of a catastrophic nuclear accident. Finally, the act does not clearly establish whether compensation costs in all cases would be covered. GAO recommends that the Congress correct these problems.

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-197742

The Honorable Marilyn L. Bouquard
Chairman, Subcommittee on Energy
Research and Production
Committee on Science and Technology
House of Representatives

Dear Madam Chairman:

In response to your request dated May 21, 1981, we examined the Price-Anderson Act as it governs nuclear accident liability of Department of Energy (DOE) contractors. Specifically, you requested that we (1) determine the number of DOE contractors protected by the Price-Anderson Act and (2) render an opinion on the necessity for continuing such protection.

The Price-Anderson Act provides protection to both DOE contractors and the public to cover liability resulting from a nuclear accident. Although 75 DOE prime contractors are specifically protected by the Price-Anderson Act, this protection is also extended to the many thousands of subcontractors working at DOE facilities as well as anyone else causing a nuclear accident to occur. Appendix II contains a list of the DOE prime contractors covered by the act.

Regarding your second question, we believe the protection provided by the Price-Anderson Act should be continued. We arrived at this conclusion after carefully considering the current U.S. position to develop nuclear power and the availability of other forms of insurance for nuclear activities. However, we believe certain provisions in the act should be changed and/or clarified to provide better public protection from catastrophic nuclear accidents. For example, implementing the act's provisions serves to provide more financial protection for accidents resulting from a commercial activity than those resulting from a Government operation. Further, the current limit on liability may not provide sufficient public financial protection to adequately compensate victims of catastrophic nuclear accidents. Moreover, in our judgment, the act's definition of a nuclear incident is unclear. As a result, liability arising from some nuclear accidents may not be covered. The details of our evaluation are discussed in appendix I of this report.

In order to answer the two questions you posed, we

--researched the act's legislative history and evaluated its major provisions as they pertain to DOE contractors;

--reviewed DOE's methods for determining contractor eligibility and coverage under the act; and

--interviewed officials of DOE and five major DOE contractors as well as officials of the Nuclear Regulatory Commission (NRC), the Federal Emergency Management Agency, nuclear transporters, public interest groups, and the nuclear insurance industry to obtain a broad spectrum of views and concerns pertaining to the act and to identify any problems areas or gaps in the act.

Since our review was limited to examining the Price-Anderson Act as it applies to DOE contractors, we did not examine the act's coverage of licensed commercial facilities. In a recently completed study of commercial coverage under the Price-Anderson Act, we found that the act's coverage may not be adequate and should be redefined. In our earlier report issued on August 18, 1980, entitled, "Analysis of the Price-Anderson Act" (EMD-80-80), we recommended that NRC assess the various accidents that could occur at a commercial nuclear facility and redefine for the Congress the act's limit on liability.

Also, we did not examine the current status of the major social, economic, and institutional issues surrounding the need for nuclear power that have been the subject of debate in recent years. Rather, our approach was to do a broad review of the act and its major provisions in light of the Nation's existing policy to foster the continued development of nuclear energy and nuclear weapons.

NRC and DOE commented on our report, and both agencies generally agreed with the report's contents, with one exception. NRC disagreed with the recommendation that would require that it assess the financial consequences of nuclear accidents that could occur at commercial nuclear facilities. Our evaluation of NRC's comments is on page 14 of appendix I, and the complete text of its comments is included as appendix IV.

Your office requested that we make no further distribution of the report prior to committee hearings, at which time the report will be released. Following the hearings, we will send

copies to DOE, NRC, and other interested parties. We will make other copies available upon request.

Sincerely yours,

Milton J. Socolar

Acting Comptroller General
of the United States

Contents

ABBREVIATIONS

DOE	Department of Energy
NRC	Nuclear Regulatory Commission

EVALUATION OF THE PRICE-ANDERSON ACT AS IT APPLIES TO DEPARTMENT OF ENERGY CONTRACTORS

BACKGROUND AND HISTORY OF THE PRICE-ANDERSON ACT

The Atomic Energy Act of 1954 produced a major change in national policy toward nuclear development by authorizing private industry to engage in a variety of nuclear activities. This redirection in policy brought with it a new problem--the reluctance of private industry to participate in nuclear power development without adequate liability insurance. Although a serious nuclear accident was considered to be highly unlikely, the effect of one could be extremely serious and economically disastrous to any one organization. At the time, private insurance in amounts sufficient to cover a nuclear accident--estimated to be many billions of dollars--was not available. Consequently, private companies viewed the possibility of a nuclear accident--while very remote--as a substantial roadblock to their participation in the development of nuclear technology. Similarly, private companies operating nuclear facilities for the Government were also concerned with the extraordinary financial risk associated with developing nuclear energy.

Exposing the industry to a potentially huge financial liability did not, at the same time, guarantee financial protection to the public. Victims of a nuclear accident would have to sue for damages, a process that could take several years. And, even if a judgment were awarded, actual compensation would depend on the solvency of the particular company involved.

The Price-Anderson Act of 1957 was designed to deal with these problems. The major objectives of the act are to

--assure the availability of funds to the public to satisfy liability claims in case of a catastrophic nuclear accident and

--remove the deterrent to private participation in the development and use of nuclear energy presented by the threat of enormous liability claims in case of an accident.

Initially, the act was to cover a 10-year period and provide two layers of liability coverage--private insurance and Government indemnity. During the 10-year period, it was hoped that enough experience would be gained so that the insurance industry would have a basis for developing a sound program of its own with no Federal subsidy to the nuclear industry. However,

this did not occur. Since its enactment, the Price-Anderson Act has been amended several times and extended twice, and for commercial nuclear reactors, a third layer of liability coverage has been added. Current coverage is now available through 1987.

In the event of a catastrophic nuclear accident at a Department of Energy (DOE) facility, liability for injury to the public would be covered under the Price-Anderson Act. The act establishes the sources and amount of funds that will be available to cover public injury and provides a basis for relatively speedy compensation to victims of a nuclear accident. The act also imposes a legal limit on liability which provides a cap on the amount of funds that are readily available. As currently implemented by DOE, the limit on liability for DOE contractor operations is $500 million, which has remained unchanged since the act's inception.

MANY DOE CONTRACTORS ARE COVERED BY THE PRICE-ANDERSON ACT

The Price-Anderson Act authorizes DOE to enter into indemnity agreements with its contractors, which frees the contractor of liability resulting from a nuclear accident. DOE may enter into these agreements for constructing or operating any nuclear production or utilization facility 1/ or any other activity that poses a risk to the public from a nuclear accident. The act also allows DOE to require contractors to maintain any type or amount of additional financial protection DOE considers appropriate to cover liability. DOE has broad discretion in deciding who will be indemnified and how much additional protection is required. In general, the DOE policy is to provide Price-Anderson liability protection to contractors operating production and utilization facilities or any other nuclear operation where $60 million or more in damages could occur. DOE, however, does not currently require its nuclear contractors to carry any additional financial protection, beyond the $500 million provided for in the act, since the cost of private insurance would generally be paid for by DOE as a reimbursable cost.

The Price-Anderson Act is probably unique in its application of what is commonly referred to as "umbrella coverage." In addition to covering the contractor with whom DOE has executed an indemnity agreement, the act also covers subcontractors, vendors, suppliers, architect-engineers, and transporters who are performing work in connection with that contractor's nuclear activity. The act even covers past work that could cause an

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1/A production facility produces nuclear material which is used for reactor fuel or in weapons, while a utilization facility uses nuclear material in its operations.

accident at some future date. Thus, the contractor who performed past work would be covered even though he no longer has an active contract. Under the umbrella coverage, a member of the general public, including a terrorist or saboteur, would even be covered. Accordingly, the public would be compensated, regardless of who causes an accident (1) at a nuclear facility covered under the Price-Anderson Act or (2) during the transportation of nuclear material to or from that facility. This coverage applies equally to commercial licensees and Government contractors.

At our request, DOE provided a listing of all active prime contracts containing specific Price-Anderson indemnity agreements and its best estimate of the number of active subcontracts protected under the umbrella coverage of the act. The listing, included as appendix II, shows that as of June 16, 1981, 75 active prime contracts contained Price-Anderson indemnity coverage, and an estimated 71,000 active subcontracts were covered under these indemnity agreements.

To place this in perspective, we also obtained the Nuclear Regulatory Commission's (NRC's) most recent data on the number of licensed commercial activities that would be covered by the Price-Anderson Act. As of September 30, 1980, 178 NRC-licensed activities were covered by the Price-Anderson Act as compared to the 75 under DOE's jurisdiction. It should be noted, however, that many DOE contractors are responsible for operating DOE-owned complexes where a number of different nuclear activities are carried out at one location by one contractor. For example, DOE's Savannah River Plant (South Carolina) is operated by Dupont and consists of about 20 major facilities which include facilities such as nuclear materials production reactors, a reprocessing facility, 1/ and high-level nuclear waste storage facilities. Accordingly, DOE estimates that its nuclear operations are being carried out at approximately 280 different facilities.

THE PRICE-ANDERSON ACT SHOULD BE RETAINED

Liability protection provided DOE contractors still appears to be necessary because many of the reasons for originally passing the Price-Anderson Act still exist today. For example, catastrophic nuclear accidents causing severe public consequences could still occur; sufficient private insurance to cover such consequences is still unavailable; and, based on our discussions with DOE and contractor officials and officials from private companies outside of the DOE nuclear complex, it appears that private industry is still unwilling to assume the risks of such

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1/A reprocessing facility chemically recovers the unused fissionable material from spent reactor fuel.

accidents without adequate financial protection. Moreover, the public is provided greater protection with the act than without it.

The most significant feature of the Price-Anderson Act--the limit on liability--has long been viewed as a necessary condition for private industry involvement in nuclear power development. The DOE contractors we talked to still view the limited liability as essential. Without such protection, contractors expressed an unwillingness to perform DOE nuclear activities. DOE officials also believe that contractors would be unwilling to assume the risk of loss from a nuclear accident without some type of protection for losses that could occur. DOE officials pointed out that more than half of DOE's nuclear contractors are performing defense-related work, without which our national security could be jeopardized. In addition, both DOE and contractor officials contend that without such protection it would be difficult, if not impossible in some cases, to find companies willing to perform essential subcontract activities.

In our view, it is difficult to determine whether these arguments are really valid. Although we believe DOE officials and contractor representatives responded to our questions candidly and to the best of their ability, it may be difficult for these officials to be completely objective. Should the act's protection be removed, contractors would no longer be totally protected from the financial risks of a nuclear accident, which many perceive to be a direct Federal subsidy. Consequently, whether eliminating Price-Anderson coverage for DOE contractors would indeed affect DOE's ability to attract qualified contractors to operate its nuclear facilities is uncertain and may never be known unless the act's protection is actually removed.

Nevertheless, in our view, there are other factors that argue in favor of retaining the act's coverage for DOE nuclear facilities. These are basically the same factors that led to passage of the act in the first place. Although the Price-Anderson Act limits the amount the public could collect for damages resulting from a nuclear accident, it does assure that some funds will be readily available when needed. Without the Price-Anderson Act, victims of nuclear accidents would have to sue for damages, a process that surely would take longer and could take several years. And, even then, the right to sue does not guarantee one's ability to collect. Without any protection--Government or private--a catastrophic nuclear accident could bankrupt a contractor, and thus, injured members of the public would have no assurance they could recover adequate compensation, if indeed they could get any compensation at all.

Moreover, if DOE contractors were to provide protection by purchasing private insurance to cover nuclear accidents, the potential hazards from catastrophic accidents would be far greater than the amount of insurance available. The maximum

amount of insurance contractors could purchase from the nuclear insurance industry is $160 million--an amount substantially smaller than coverage available under the Price-Anderson Act. 1/

Even if DOE nuclear contractors were covered by the more conventional self-insurance policies of the Federal Government--as is now done for some DOE non-nuclear contractors--the public would receive less financial protection than that currently provided for catastrophic nuclear accidents by the Price-Anderson Act. Such shortcomings would generally include the following:

--Public compensation would be subject to the availability of appropriated funds. As a result, the amount of coverage would be uncertain. Under the Price-Anderson Act the public is assured of up to $500 million.

--Protection from the actions of subcontractors and suppliers would not automatically be provided through Government self-insurance. On the other hand, the Price Anderson Act's umbrella coverage provides this unique feature.

--Certain contractor actions, such as acts of willful misconduct or gross negligence, could void Government self-insurance coverage. Thus, victims of a nuclear accident would be left without any coverage under these circumstances.

--Victims of a nuclear accident would have to establish that the accident occurred because of some fault on the part of the contractor. The Price-Anderson Act provides protection regardless of why the accident occurred.

For these reasons, we believe that the financial protection provided DOE contractors and the public still appears to be desirable today and should be retained. In our earlier report, we concluded that removing the act's protection for commercial facilities without replacing it with comparable liability coverage would not be in the Nation's best interest. We believe the same applies to DOE contractor activities. However, in examining the act's provisions, we found certain inadequacies that need to be corrected to provide a more equitable scheme of protection for nuclear accidents. These are discussed below.

1/DOE contractors must meet requirements established by the private insurance pool to be eligible for coverage. If these requirements are the same as those established for commercial licensees, policies may exclude coverage for accidents involving an assembled nuclear weapon.

THE PRICE-ANDERSON ACT SHOULD BE CLARIFIED TO PROVIDE MORE CONSISTENT PROTECTION FOR DOE-CONTRACTOR OPERATIONS

In examining the major provisions of the Price-Anderson Act, we found certain inadequacies and inconsistencies that should be corrected. First, we found that the total amount of money available to the public to cover catastrophic accidents is greater for an accident occurring at a commercial nuclear facility than at a DOE contractor-operated facility. Second, as a result of the legal limit on liability, the public's potential loss continually increases as inflation erodes away their assured level of financial protection. Finally, because the definition of a nuclear incident is unclear, we were unable to determine whether the act's protection would cover the costs of an evacuation prompted by a radiation release which appeared imminent but never occurred.

Public financial protection for commercial activities is greater than for contractor operations

Originally, the Price-Anderson Act provided two layers of liability protection for commercial nuclear activities--$60 million in private insurance and $500 million in Government indemnity. In 1957, when the act was passed, the first layer (private insurance) was set at $60 million because that was the maximum amount of insurance then available. The second layer (Government indemnity) was limited to $500 million because at the time, the Congress believed that that amount would not seriously disturb the estimated $65.9-billion Federal budget. Thus, the $500-million limit on liability was not based upon the offsite consequences of a particular nuclear accident but rather upon the willingness of nuclear insurance companies and the Federal Government to provide liability coverage.

In 1975, the Congress amended the Price-Anderson Act to include a third layer of coverage for commercial reactors. This layer, called a retrospective premium, is paid by each commercial reactor operator but not until after an accident occurs. The premium, now set at $5 million per reactor, 1/ is intended

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1/In a prior report entitled, "Analysis of the Price-Anderson Act," EMD-80-80, Aug. 18, 1980, we recommended that NRC reassess the amount currently being charged for the premium. We also recommended that the Commission define for the Congress a more realistic limit on liability. However, NRC believes that it is more appropriate that the Congress determine whether to increase either the retrospective premium or the limit, and thus plans no action.

to eventually phase out the Government indemnity layer of protection. For example, with the addition of the retrospective premium as well as the increased amount of private insurance coverage that has become available since 1957, Government indemnity has been reduced to only $35 million. Current coverage is now provided from the following sources:

	Coverage (million)
Private insurance	$160
Retrospective premium ($5 million x 73 reactors)	365
Government indemnity	35
Total	$560

Claims would first be paid by private insurance and then by the retrospective premium. When funds from both private layers are exhausted, Government indemnity payments would then be made. Once 80 reactors are licensed to operate, now estimated to be around 1982, Government indemnity will be phased out.

In addition to phasing out Government indemnity, the retrospective premium also serves to allow the limit on liability to increase as more reactors are licensed to operate. For example, in 1987, when the Price-Anderson Act is due to expire, NRC projects that 134 reactors will be operating. With 134 reactors operating, the limit will increase to $830 million (134 reactors x $5 million = $670 million + $160 million of private insurance), and even this is assuming private insurance coverage stays at the $160-million level that is now available and the retrospective premium remains the same.

Liability resulting from DOE contractor activities, on the other hand, is limited to the $500 million in Government indemnity plus any additional financial protection DOE may require. The act gives DOE broad discretion to determine how much, if any, additional financial protection its contractors are to maintain. Since DOE contractors, for the most part, have cost-reimbursable contracts, the cost of insurance purchased by the contractor would be reimbursed by DOE. Thus, DOE has chosen not to require any private insurance coverage. In addition, the act does not require DOE to establish a retrospective premium for its contractors. As a result, the maximum liability for DOE contract activities is currently $60 million lower than for commercial nuclear reactors, and under current DOE practices will remain so unless (1) DOE requires contractors to purchase insurance or (2) the Congress raises the Government indemnity portion

of the act. In addition, this gap will widen as more reactors are licensed to operate and the commercial limit rises. Thus, the public receives less financial protection from the consequences of catastrophic nuclear accidents resulting from a DOE-contractor operation than from a licensed commercial activity. In our opinion, it is difficult to justify two different levels of public financial protection from catastrophic nuclear accidents depending upon such an artificial distinction as whether a nuclear accident occurs at a licensed commercial activity or a Government-contractor operation.

Public financial protection may not be sufficient to cover many accidents that could occur

In examining the act's limit on liability, we found that the public may not be adequately protected from the financial consequences of a catastrophic nuclear accident. While the act assures that $500 million will be available in the event of a nuclear accident, the public is not guaranteed that it will receive additional compensation should damages exceed the limit. Moreover, while the total amount of available funds has remained the same over the years, the potential costs of a catastrophic accident have risen due to inflation. As a result, the public receives less financial protection today than it did in 1957 when the act was initially passed. For such a scheme to be equitable, we believe the limit on liability should be increased. 1/

In our view, the Price-Anderson Act has succeeded in removing the financial deterrent to private sector participation in DOE nuclear activities since DOE contractors incur no financial responsibility for potential liability claims or, for that matter, any liability claim resulting from a nuclear accident. Liability claims resulting from a contractor's nuclear activity covered by the Price-Anderson Act would be paid for by the Government.

Public financial protection provided under the act, on the other hand, is limited. During our review, we attempted to determine whether the $500-million limit on liability would cover catastrophic accidents resulting from DOE contractor operations. However, when asked what the financial impact of the most serious nuclear accident would be, DOE field office officials did not know. Several headquarters officials, however, told us that such

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1/Our earlier report disclosed a similar situation for commercial reactors and, as noted earlier on p. 6, we recommended that NRC redefine for the Congress the limit on liability.

accidents could far exceed the $500 million limit on liability. In fact, some DOE reactor operations could experience serious accidents comparable to those projected for commercial nuclear reactors. Projected property damage from a major nuclear accident at a commercial reactor ranges from a low of $10 million to a high of $100 billion. Further, if personal injuries are included, damages could be substantially higher.

Although the limit on liability was not based on the consequences of any specific nuclear accident at the time the act was passed, the Congress believed that the amount would cover most accidents that could occur. Since that time, however, inflation has served to erode the $500-million level of protection. For example, $500 million in 1957 dollars is only worth about $183 million today. Or, to be equivalent to the 1957 coverage, the limit would have to be increased to about $1.4 billion. Even if the limit were based on the Federal budget, coverage would have to be increased to $5.3 billion to remain at the same level as it was in 1957. For example, in 1957, $500 million represented 0.76 percent of the estimated Federal budget. Taking 0.76 percent of the estimated Federal budget for 1982 would provide $5.3 billion in Government indemnity coverage.

By a 1975 amendment to the act, the Congress specified that should damages exceed the limit, it would thoroughly review the accident and take whatever action it considered necessary and appropriate to protect the public from the financial consequences of such a disaster. Most of the DOE and contractor officials we interviewed believed that because of this provision, public protection is not limited. They claim that should the limit be exceeded, the Congress will act to provide additional compensation. However, this provision only obligates the Congress to review the accident, and does not obligate the Congress to authorize or appropriate additional funds. A look into history provides a good example--in fact the only example--of what can happen when a Government contractor is involved in a major accident where no Federal remedy has been prescribed for handling liability claims.

The incident occurred in 1947 when two ships carrying ammonium nitrate under a Government contract exploded at a dock in Texas City, Texas, killing 590 people and injuring 3,500. The explosion virtually destroyed an entire dock and about 1,000 homes, industrial plants, and other buildings. Although approximately $100 million in liability claims resulted from this accident, actual damage estimates ranged from a low of $60 million to several billion dollars. It was not until 8 years after the accident that the Congress passed the Texas City Disaster Relief Act, allowing the Army to pay out $17.1 million in claims. Under a 1959 amendment, an additional $4 million in payments was permitted. The last payment was made in 1962--15 years after the disaster.

Although the Texas City accident did not involve nuclear material, it shows what can happen by waiting until after a disaster occurs to cope with its consequences. Should the consequences of a nuclear accident be within the $500-million limit, we believe the Price-Anderson Act would provide for a swifter means of compensating victims than was available to victims of the Texas City incident. However, should the consequences of a catastrophic accident significantly exceed the limit, then the Price-Anderson Act may provide only token coverage unless the Congress decides to provide additional relief. In our view, the total amount of protection the Government is willing to provide should be determined prior to an accident so that swift and just compensation can be made.

Since inflation has eroded the public's assured level of financial protection over the years, the Price-Anderson Act may no longer be sufficient to cover many contingencies that could occur. Thus, to determine the amount of public financial protection that should be provided, we believe the actual consequences of potential nuclear accidents at DOE facilities should be assessed. In our earlier report on the Price-Anderson Act, we recommended that NRC assess the accidents that could occur at commercial facilities to define a limit on liability for the Congress. Similarly, because of the unique nature of DOE's weapons-related and research activities, we believe such a study should also be performed for DOE facilities.

The definition of a nuclear incident is unclear

Whether the Price-Anderson Act covers liability resulting from an accident causing damages to the public even though there is no radioactive release is unclear. The act defines a nuclear incident as an occurrence causing damages as a result of the radioactive properties of nuclear materials. It is not clear, however, whether this definition is broad enough to cover liability resulting from an occurrence where a radiation release appears imminent and a precautionary evacuation is ordered but no release actually occurs. Such a situation is not specifically addressed by the act or its legislative history. This uncertainty applies equally to commercial licensees and Government contractors.

According to NRC officials, however, commercial licensees carry protection through private insurance for such evacuation costs. Should an evacuation occur because there was "imminent danger" of a radioactive release, private insurance would pay for these costs. DOE contractors, on the other hand, are not required to maintain private insurance, and thus, it is uncertain whether any evacuation costs arising from a precautionary evacuation would be covered since neither the act nor its legislative history specifically addresses this situation. We believe that

should a precautionary evacuation take place and later it is found there was no release, these costs may not be included under the protection provided by the Price-Anderson Act.

CONCLUSIONS

Since the Federal Government is still committed to fostering private industry involvement in nuclear energy, and since alternative methods of insuring the public against the potential hazards of a catastrophic nuclear accident do not provide as much financial protection as does the Price-Anderson Act, we believe that the financial protection provided DOE-contractor operations is still needed.

Differences in the treatment of DOE-contractor operations under the Price-Anderson Act, however, serve to provide less financial protection to the public against losses from nuclear accidents from DOE-contractor operations than from licensed commercial activities. Because DOE contractors are covered by only one layer of financial protection, current coverage is $60 million lower than for commercial licensees. Thus, the public may not be equally compensated if damages exceed $500 million. Further, as more commercial reactors are licensed to operate and the limit on liability rises on the commercial side, this gap in coverage will widen. In our opinion, public financial protection should be consistently applied, regardless of who is performing the nuclear activity.

Consequently, we believe that at a minimum, the Congress should increase coverage for DOE contractors to provide protection that is comparable to that provided for commercial activities. This could be done by

--requiring DOE contractors to purchase private insurance,

--raising the legal limit on Government indemnity, or

--some combination of both.

If contractors are required to purchase private insurance, however, the cost of this insurance, under current DOE procurement practices, would be paid for by DOE.

Even if the Congress raises the limit for DOE-contractor operations so that coverage is equal to licensed commercial activities, compensation to victims of a nuclear accident may still be inadequate since the limit on liability is not based on an assessment of damages that could actually occur. Although the Congress believed that the limit was sufficient to cover most accidents that could occur at the time the act was passed, there is little assurance that this remains true today. In fact, just the opposite is true. Since costs have continued to rise over the years

due to inflation and the limit on liability has remained the same, the level of assured public financial protection has decreased. As stated earlier for DOE facilities, $500 million in 1957 dollars is only worth about $183 million today. Similarly, in the case of commercial licensees, $560 million in 1957 dollars is only worth $205 million today.

We believe that the Congress should assure that the financial protection available to the public is equitable. Thus, we believe that the limit on liability should be reexamined and studies should be performed to assess the potential consequences of catastrophic nuclear accidents that could occur from both commercial and DOE-contractor activities. These studies would then serve as a basis for the Congress to determine to what extent, if any, the limit should be raised. In our earlier report, we recommended that NRC assess various accident scenarios to define for the Congress a limit on liability. However, NRC disagreed and said that it was more appropriate for the Congress to determine what the limit should be.

While we agree that the Congress must make the decision, we believe that it cannot determine what the limit on liability should be without sufficient information for making such a judgment. Consequently, in our opinion, NRC should still perform an assessment of the potential financial consequences that could occur at commercial nuclear facilities, and DOE should perform a similar study for its contractor operations. Once the potential financial consequences are assessed, the Congress could then determine whether to set a new limit or provide for periodic adjustments to the limit based on some predetermined index. Using this approach, the Congress could base its decision on the potential liability that could occur, the impact such an amount would have on the Federal budget, and any other factors it might deem relevant, such as those affecting national security.

Limited coverage of DOE contractors is further compounded by the uncertainty concerning what constitutes a nuclear incident. Under the act's current provisions, should a precautionary evacuation occur around a DOE facility and it is later found there was no radioactive release, it is uncertain whether the victims of the evacuation would receive the financial protection provided by the Price-Anderson Act. We believe the act should be amended to provide such protection. Further, commercial activities provide such protection through private insurance. Since DOE contractors do not carry private insurance, such an amendment would also assure that contractor activities are equally protected.

RECOMMENDATIONS TO THE CONGRESS

As long as the Price-Anderson Act remains in effect, we believe that the Congress should assure that arbitrary distinctions are

corrected and that the financial protection provided the public is consistent. Thus, we recommend that the Congress:

--Amend the Price-Anderson Act to increase protection for DOE-contractor activities to provide public protection equal to that for licensed commercial activities. This amendment should also include provisions to assure that as commercial coverage increases, contractor coverage also increases. (See app. III for recommended legislative language.)

--Amend the definition of "nuclear incident" contained in chapter 2, section 11 (q) of the Atomic Energy Act of 1954, Public Law 83-703, as amended, by adding the following at the end of the definition: "And provided further, that it shall include any occurrence where the Commission, or the Department of Energy in relation to its contractors, determines a release of radiation may be imminent."

Further, we believe that the Congress should reexamine the limit on liability to assure public financial protection is equitable. Thus, the legislative committees for DOE and NRC should require both agencies to perform such assessments and identify for the Congress the potential consequences that could occur. This would then serve as the basis for congressional review. We therefore recommend that the legislative committees for DOE and NRC require both agencies to perform studies assessing the financial consequences of catastrophic nuclear accidents that could occur from activities performed by both commercial licensees and Government contractors. Based on these studies, the Congress should reexamine the limit to determine whether a new limit needs to be set and/or whether the limit should be tied to an index to allow for periodic readjustment.

AGENCY COMMENTS AND OUR EVALUATION

Both NRC and DOE generally agreed with our report. NRC, however, believes that its response to the Congress on our earlier report on the Price-Anderson Act provides sufficient information for the Congress to use as a basis to determine whether to increase the limit on liability for commercial activities. We recognize that the information provided by NRC would be useful to the Congress since it estimates that the property damage that could occur from an accident serious enough to require an evacuation ranges from a low of $10 million to a high of $100 billion. Further, if personal injuries are included, damages could be substantially higher. Although this information would be useful to the Congress, we believe it is incomplete.

We do not believe the data already provided by NRC gives the Congress a sufficient basis on which to determine a limit on liability that would cover most contingencies that could occur. As we see it, all that this information provides is an upper and lower extreme of the amount of property damage that could occur from a catastrophic nuclear accident at a commercial facility. What it does not provide, however, is information on where the greatest number of possible accidents would fall so that Congress can better understand and determine the limit on liability protection that should be established. Thus, we still see a need for NRC to further assess the potential consequences of catastrophic nuclear accidents to better define for the Congress the financial consequences that could result from most accidents at licensed commercial activities. We believe that this information should be provided the Congress, even if NRC must examine the potential consequences that could occur at all licensed commercial activities.

DEPARTMENT OF ENERGY PRIME CONTRACTORS

COVERED BY THE PRICE-ANDERSON ACT (note a)

Contractor	Number of contracts
Associated Universities, Inc.	1
Babcock & Wilcox Company	3
Battelle Memorial Institute	1
Battelle Pacific Northwest Laboratories	1
Bendix Corporation	1
Boeing Company	2
Burns & Roe	1
Catalytic, Inc.	1
Duquesne Light Company	1
E.I. DuPont De Nemours and Company	1
EG&G Idaho, Inc.	2
Energy Impact Assoc.	1
Exxon Nuclear Idaho Company, Inc.	1
Fenix & Scisson, Inc. (note b)	1
Fluor Engineers and Constructors, Inc.	2
Garrett Corporation	1
General Electric Company	8
Goodyear Aerospace Corporation	2
Goodyear Atomic Corporation	1
Hayes, Seay, Mattern and Mattern	2
Holmes & Harver, Inc. (note b)	1
Mason & Hanger--Silas Mason Company, Inc.	1
Monsanto Research Corporation	1
Morrison--Knudson Company, Inc.	1
NLO, Inc.	1
Norman Engineering Company	1
Reynolds Electrical and Engineering Company, Inc. (note b)	1
RMI Company	1
Rockwell Hanford Operations	1
Rockwell International	10
Ross Aviation	1
Stone and Webster	2
Teledyne	1
The Ralph M. Parsons Company	1
UNC Nuclear Industries, Inc.	1
Union Carbide	2
United Nuclear Corporation	2

a/This information was provided by DOE's Office of Procurement and Assistance Management.

b/These contractors do not have the indemnity clause included in their contracts, but are covered through indemnity clauses of other contractors.

APPENDIX II

Contractor	Number of contracts
University of California	2
University of Chicago	1
University of Puerto Rico	1
Vitro Engineering Company	1
Western Electric Company	1
Westinghouse Electric Corporation	5
Westinghouse Hanford Company	1
Total prime contracts	75

RECOMMENDED LEGISLATIVE LANGUAGE FOR PROVIDING FINANCIAL PROTECTION FROM ACCIDENTS AT DOE-CONTRACTOR OPERATIONS EQUAL TO THAT FOR LICENSED COMMERCIAL ACTIVITIES

If the Congress chooses to require DOE contractors to purchase private insurance, the second sentence of subsection 170 (d) of the Atomic Energy Act, as amended, could be amended to read:

> "In such agreements of indemnification, the Department of Energy shall require its contractors to provide and maintain financial protection from private sources, as defined by subsection (b), in the same amount as required of licensees under subsection (b) to cover public liability arising out of or in connection with the contractual activity * * *."

Should the Congress choose to increase the legal limit on Government indemnity, the second sentence of subsection 170 (d) of the act could be amended to read:

> "* * * and shall indemnify the persons indemnified against such claims above the amount of financial protection required, in the amount of $560,000,000 * * * *provided further that if the amount of financial protection* required of licensees under subsection (b) exceeds $560,000,000, the amount of indemnity, together with any financial protection required of the contractor, shall equal the amount of financial protection required of licensees under subsection (b) * * *."

If the Congress chooses to combine both approaches, it can use both suggested amendments and adjust the amounts.

To assure that the aggregate liability for contractor activities is equal to that for commercial activities, subsection 170 (e)(2) should be amended to read:

> "* * * if the amount of financial protection required of the licensee or contractor exceeds $60,000,000, such aggregate liability shall not exceed the sum of $560,000,000 or the amount of financial protection required of the licensee or contractor, whichever amount is greater * * *."

APPENDIX IV

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

AUG 14 1981

Mr. J. Dexter Peach
Director, Energy and Minerals Division
U.S. General Accounting Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Peach:

We have reviewed the subject draft GAO report entitled "Evaluation of the Price-Anderson Act As It Applies To Department of Energy Contractors." We find that the draft report offers from the NRC perspective, a factual analysis of the Price-Anderson Act as the Act relates to licensed facilities and offer only one specific factual comment. There are presently 73 not 72 operating reactors comprising the secondary retrospective premium layer.

GAO recommends that the legislative committees for DOE and NRC require both agencies to perform studies assessing the financial consequences of nuclear accidents that could occur at commercial facilities and government contract facilities. On this point, we refer to our letter of December 31, 1980, copy enclosed. In this letter the Commission stated that there are probabilistic risk analysis models which can be used to calculate the off-site consequences in the event of a nuclear plant accident. Further, the Commission discussed the various codes being used to calculate reactor accident consequences. We believe that the information contained in our earlier letter as well as any update to this information in the course of the Commission's continued use of probabilistic risk analysis, will provide Congress with a basis on which to determine whether to increase the liability limit.

Sincerely,

E. Kevin Cornell /for

William J. Dircks
Executive Director for
Operations

Enclosure:
NRC letter of December 31, 1980

NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APPENDIX IV

CHAIRMAN

December 31, 1980

The Honorable Jack Brooks, Chairman
Committee on Government Operations
United States House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

The August 18, 1980 GAO report entitled "Analysis of the Price-Anderson Act" (EMD-80-80) recommends that the Nuclear Regulatory Commission undertake technical studies to assist Congress in determining a realistic limitation on liability for nuclear accidents.

There are probabilistic risk analysis models which can be used to calculate the off-site consequences in the event of a nuclear plant accident. The Calculations of Reactor Accident Consequences (CRAC) code, from the 1975 Reactor Safety Study (WASH-1400), is used by the NRC staff to calculate reactor accident consequences, including early fatalities, early illnesses, latent cancers, and property damage. This code has been improved in some respects since 1975 and is continually being revised to incorporate improvements. For example, several computer codes, including CRAC, will be revised to reflect the lessons learned from the Three Mile Island accident and to incorporate recent research results. For a recent study, NUREG-0715, "Task Force Report on Interim Operation of Indian Point" (copy attached), the CRAC code was used to make risk comparisons of various reactor sites, reactor designs, and public protective measures.

In that comparison, off-site risks for six different reactor sites were estimated (see NUREG-0715, p. 17). The sites considered ranged from the Indian Point site, located in the most densely populated area, to the Diablo Canyon site, which is quite remote. The property damage estimates indicate that any accident which is serious enough to require evacuation of members of the general public is likely to cost $10 to $100 million. Accidents of this type have a calculated probability of about one in ten thousand per reactor year.

For lower probability accidents, the numbers are larger. As you know, these probabilistic estimates have wide ranges, depending on protective measures, design, sites, and uncertainties in the estimates (see NUREG-0715, p. 39). Thus for a probability of 10^{-6} per reactor year,

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The estimates for early fatalities range from none to 5,000. For a probability of 10^{-9}, estimates of early fatalities range from 700 to 50,000. Similarly the estimates for early illness range from 10 to 10,000 for a probability of 7×10^{-7} per reactor year and from 6,000 to 300,000 for a probability of 10^{-9}. Latent cancer estimates range from none to 200 for a 10^{-6} probability and from 200 to 2,000 for a 10^{-9} probability. Property damage estimates range from $2 million to $2 billion for a probability of 10^{-6} per reactor year, and from $3 billion to $100 billion for a probability of 10^{-9} (in 1974 dollars). We have not estimated the monetary costs associated with early fatalities, early illnesses or latent cancers.

In addition to the substantial uncertainties inherent in this type of calculation, there is a suspected bias in the model for the property damage analyses which the staff believes tends to underestimate the potential costs. The model uses criteria for interdicting the use of contaminated property and assumptions for cleanup of contaminated property which may be optimistic with respect to costs.

The GAO report recommends that the Commission realistically define a limit of liability for the Price-Anderson Act. As the Acting Executive Director for Operations stated in his letter to GAO commenting on the draft report, since a decision to increase the liability limit must be made by Congress and not the Commission, the Commission believes it may be more appropriate for Congress to determine whether to increase the liability limit based on full consideration of the types of consequences which may occur following an accident (i.e., early fatalities, early illnesses, latent cancer, and property damage). However, the Commission believes that the statutorily prescribed limits of liability should be adjusted to account for inflation.

The GAO report also recommends that the Commission reassess the Federal government indemnity. The Commission believes that there is no objective source of information available to reassess this indemnity and that this is an area for the exercise of Congressional judgment.

Finally, in response to the recommendation that the Commission reassess the financial impact of increasing the present $5 million retrospective premium, I have attached a copy of a financial impact study completed by the staff last year which updates earlier information contained in a 1976 report prepared for the Commission by Dr. Ronald Melicher of the University of Colorado, NR-AIG-003, "Financial Implications of Retrospective Premium Assessments on Electric Utilities" (copy enclosed). This report assessed the financial impact of various retrospective premiums on representative utilities. The staff study provides additional information in this area as well as a sensitivity analysis of the impact of increasing the retrospective premium to $20 million per reactor. This type of

APPENDIX IV

The Honorable Jack Brooks -3-

review should be required for Congress in assessing the tradeoff between the costs of requiring additional protection through increased premiums and the costs of providing power. We do not present this study as definitive, since we are not experts in the financial management of utilities.

Sincerely,

John F. Ahearne

Enclosures:
1. NUREG-0715, "Task Force Report on Interim Operation of Indian Point"
2. NR-AIG-003, "Financial Implications of Retrospective Premium Assessments on Electric Utilities"
3. Financial Impact Study

cc. Rep. Frank Horton

COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
SUITE 2321 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515
(202) 225-6371

May 21, 1981

APPENDIX V

Milton J. Socolar
Acting Comptroller General
of the United States
Washington, D.C. 20548

Dear Mr. Socolar:

I request that the GAO conduct a study on the number of Department of Energy contractors protected by the Price-Anderson Act. I would also ask that GAO render its opinion on the necessity for continuing such protection to government contractors relative to research and development facilities.

As you know, the Price-Anderson Act guarantees a fund of money to pay for damages, and limits liability, in the event of a nuclear accident. The Act, which is codified as Section 170 of the Atomic Energy Act, is most commonly thought of in terms of commercial nuclear power plants. For these plants, the Nuclear Regulatory Commission has authority to extend the protection of the Act to the utilities who own and operate them.

The Price-Anderson Act may also be used to protect the contractors operating DOE's research and development facilities. In this case, the Department of Energy has the authority to extend the protection of the Act.

A number of revisions to the Price-Anderson Act have been proposed for Congressional action. It is, therefore, important that the Committee fully understand the significance of the Price-Anderson Act to the operation of the government's research and development facilities.

It would be most helpful if we could receive your response by early July, 1981. The Subcommittee is planning a hearing on this subject in that time period and we would like to time the release of the report with the hearing.

If there are any questions on this request, please feel free to contact me or Mr. Louis Ventre, the Subcommittee counsel, on 225-2981.

Thank you for your cooperation on this request.

Sincerely,

Marilyn L. Bouquard

MARILYN LLOYD BOUQUARD
Chairman, Subcommittee on Energy
Research and Production

MLB:Vjs


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