NEW YORK STATE BOARD

ON ELECTRIC GENERATION

SITING AND THE ENVIRONMENT

In the Matter of	)	
	)	
LONG ISLAND LIGHTING COMPANY	)	
	)	
and	)	Case 80003
	)	
NEW YORK STATE ELECTRIC & GAS CORPORATION	)	
	)	
(Jamesport Nuclear Power Station, Units 1 & 2)	)	

SUPPLEMENTAL TESTIMONY OF
PAUL A. GIARDINA SUBMITTED
FOR THE COUNTY OF SUFFOLK

IRVING LIKE
Special Counsel For The
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Q. Please state your name, title and employer.
A. My name is Paul A. Giardina, and I am the Chief of the Radiation Branch for the Environmental Protection Agency (EPA), Region II Office, located at 26 Federal Plaza, New York, New York 10007.

Q. Have you included a copy of your professional qualifications to this Testimony?
A. Yes. These appear in Appendix "A", attached hereto.

Q. Did you previously testify in these proceedings?
A. Yes. On April 27, 1977, I presented testimony at the request of Suffolk County on the issues of emergency response planning and the comparative health effects of the nuclear and coal fuel cycles.

Q. How does this present testimony relate to that which you previously submitted?
A. In my previous testimony and during cross-examination, I raised concerns similar to those expressed herein regarding the problems associated with radiological emergency planning for Jamesport and made clear my reservations about whether protective actions could be taken in an area susceptible to the levels of radiation above EPA Protective Action Guides (PAG's). At that time I selected a radius of approximately nine miles as an emergency planning area susceptible to those levels. Since that time the field of emergency response planning and protection has been a subject of increased federal agency attention and concern. A joint EPA/U.S. Nuclear Regulatory Commission (NRC) task force report on this subject, EPA studies on sheltering, and other NRC and Federal Preparedness Agency documents - all of which are referenced and discussed later in this testimony - attest to this fact. For example, today we have actual planning zone recommendations from a Federal task force which call for a ten mile inhalation Emergency Planning Zone (EPZ), a development which confirms my earlier nine mile analysis. In 1977 we could only speculate that an acceptable emergency response would be a problem at the Jamesport site; today we are virtually certain that an adequate and effective emergency response is not possible.

I also raised other points in that testimony and in the subsequent cross-examination related to radioactive material transport, radioactive waste management, and decontamination and decommissioning. In the area of urban radionuclide transport I earlier alluded to an NRC contractor, Sandia Laboratories, performing a study on this subject. Sandia has now issued a report on their findings entitled Transport of Radionuclides in Urban Environs: A Working Draft Assessment 1/ in which it is found that a major accident involving

spent fuel or plutonium could result in up to 4000 latent cancer fatalities and well over a billion dollars in property damage if it occurred in New York City. These accident consequences are clearly unacceptable and will probably require at the minimum that alternative modes of transport be considered for such shipments by LILCO. This could, of course, affect plant operating cost projections.

Of greater significance is the uncertainty of costs related to nuclear waste disposal and decontamination and decommissioning as mentioned in my previous testimony. It is true that the Federal government has preemptive authority regarding standard and guidance setting, and regulation of nuclear reactors in the areas of reactor safety, radioactive waste disposal and decontamination and decommissioning. However, the Siting Board must be cognizant that the standards and regulatory programs for radioactive waste disposal and decontamination and decommissioning are just being formulated now as well as much of the technology to implement these standards and regulatory programs. We therefore believe, as was previously expressed, that there is a good deal of speculation in the economic and cost figures presented to the Siting Board in this area. To illustrate this point, the EPA has found that there is a very high degree of uncertainty with regard to estimating risk levels associated with long term high-level waste disposal. Uncertainties could range in these risk estimates up to five orders of magnitude. If the risk estimates associated with standard setting are this variable, certainly cost estimates associated with implementing these standards must be considered variable.

Thus, while the Siting Board must make its decision on this matter using the assumption that the Federal Government will provide adequate standards and regulatory programs, and that it will develop the necessary technologies, the Board is also required to determine whether these costs are capable of quantification such that a rational licensing decision can be made on Jamesport.

Q. What is the purpose of your testimony?
A. The purpose of this testimony is fourfold: (1) to take exception with the recommended decision taken by the Presiding Examiner, Fredric T. Suss, dated May 15, 1979 on Case 80003, Long Island Lighting Company - Jamesport Generating Station, Nuclear Units 1 and 2 in an application of the Long Island Lighting Company for a certificate of environmental compatability and public need to construct two 1150 MWe nuclear fueled generating units at a site in the Towns of Riverhead and Southold, Suffolk County; (2) to support the opinion expressed by the Public Service Commission (PSC) in its

"Order on Appeal Reversing Presiding Examiner's Rulings" issued on January 30, 1976 declaring incorrect the Presiding Examiner's ruling "not to receive evidence concerning any postulated radiological accidents and the consequences thereof because this would be sheer speculation not entitled, in his view, to evidentiary weight."*, and to support the PSC's decision "that the effects on health and safety stemming from plants meeting the NRC standards are germane to the comparative environmental evaluation required by the statute of possible alternative means of supplying the power deemed necessary by the applicant"**; (3) to agree with the opinion of the State of New York Board on Electric Generating Siting and the Environment (Siting Board) in "Order Establishing Decision Procedures" dated May 23, 1979 "that there was a strong showing that consideration of information not available until after the close of the record would materially affect our (Siting Board) ultimate decision, that the record should be updated, and that the parties should be given an opportunity to be heard on the nature and significance of the additional information to be considered"***; and (4) to provide testimony "that these recent developments will have a close and material impact on the evidence accumulated in the record on these issues to date "****, as stated in the Siting Board's "Order Denying Petitions for Rehearing and Deciding Interlocutory Appeals" issued on March 8, 1979.

Q. Do you have any comments on Presiding Examiner Suss' findings regarding federal jurisdiction over radiological hazards?

A. Yes. In the Recommended Decision provided by the Presiding Examiner, Fredric T. Suss, under Section XII, Radiological Hazards, Finding No. 320, the Examiner states, "In the Sterling Case* the Examiners found that Article VIII must be interpreted in the light of Federal jurisdiction and court decisions:

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* "Order on Appeal Reversing Presiding Examiner's Ruling", State of New York Public Service Commission, 1/30/76, p.4.

** Ibid, p. 3.

*** "Order Establishing Decision Proceeding" State of New York Board on Electric Generation Siting and the Environment, May 23, 1979, p. 4.

****"Order Denying Petitions for Rehearing and Deciding Interlocutory Appeals", State of New York Board on Electric Generation, Siting and the Environment", 3/8/79, p. 11.

"Section 141 (4c) of Article VIII states that the article does not apply where the federal government has exclusive jurisdiction. Accordingly, it is concluded that matters concerning radiological health and safety, including such items as the uranium fuel cycle, transportation of radioactive materials, radioactive residue disposal, and security and decommissioning of nuclear plants, cannot be dealt with in this proceeding. The intervenors have argued at great length on these subjects but all that can be done here is to refer them to the NRC with assurances that the agency is fully capable of properly dealing with the matters".

Q. Do you agree with Mr. Suss' findings on this subject?
A. No. It is true that the Federal government has overall jurisdiction regarding radiological health and safety, including such items as the uranium fuel cycle, radioactive waste disposal, nuclear power plant security, and decontamination and decommissioning of nuclear power plants. But it is important that the Federal government's jurisdiction not be misconstrued. The role of the Federal government in these areas is generally to set safety, health, and environmental guides and standards, to develop and enforce a regulatory program, and in some cases, such as with nuclear waste disposal, develop the necessary technology in accordance with standards and regulatory programs. However, in cases where the State becomes involved in the licensing process such as the Article VIII proceedings in New York State, there is a role the State must play in licensing the proposed site. This role involves determining whether the plant, once built and operated in accordance with the various applicable Federal guidance and regulations, is suitable on the site in question from an environmental and economic standpoint. It is also the function of the State to determine which mode of generation (ie., coal, oil, nuclear, cofueling with solid waste, etc.) is the best alternative when environmental and economic considerations are reviewed. For example, a hypothetical nuclear power plant when erected on Site A may involve decontamination and decommissioning costs that are substantially greater than if the same plant were to be erected on Site B just because of site idiosyncrasies. It is the role of the Article VIII procedure to determine which site, in this case A or B,would be most suitable and this judgment is not one that is reserved for Federal jurisdiction. Similarly, it is the role of New York State through Article VIII to determine if a plant fired by coal, or by gas or by uranium is the best for a particular site, and not the role of the Federal government.

Q. Are there other radiological concerns in which the State is not preempted?

A. Yes. There are also areas involving radiation issues that are clearly not reserved for Federal jurisdiction and, in fact, involve State decision making such as the area of radiological emergency response planning around fixed nuclear facilities. Nowhere in the Code of Federal Regulations or in any law promulgated by the U.S. Congress is there any specific reference giving the Federal government preemptive jurisdiction over the State in radiological emergency response planning around fixed nuclear facilities. On March 18, 1976 the U.S. General Accounting Office (GAO) issued a report entitled, Stronger Federal Assistance to States Needed for Radiation Emergency Response Planning 2/ which made the following statements:

> "In regulating the construction and operation of these power plants, the Nuclear Regulatory Commission requires licensees to develop plans for dealing with radiation emergencies on or near power plant sites, including developing agreements with State and local authorities to obtain emergency assistance.
>
> State and local authorities are responsible for coping with radiation emergencies that extend beyond the immediate vicinity of nuclear power plants; however, no Federal agency has authority to require States to develop radiation emergency plans."

Neither NRC nor any other Federal agency has authority to directly require States to develop radiation emergency plans, although a number of agencies have responsibilities for assisting States and local governments to voluntarily develop plans.

As was noted in my previously-filed testimony, a Federal Register Notice 3/ dated December 24, 1975 outlines the responsibilities of various Federal agencies for planning for incidents involving radioactive materials. Two agencies with specific responsibilities in this area are the NRC and the EPA. On December 1978 an NRC and EPA task force prepared a report entitled, Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans In Support of Light Water Nuclear Power Plants NUREG-0396, EPA 520/1-78-016. 4/ This document is a report and while it does not constitute formal Federal Radiation Guidance as of yet, the task force does give recommended plannin information for radiological emergency response. Specifically, the task force that prepared NUREG-0396 recommends that emergency planning should predetermine appropriate emergency responses within an emergency planning zone (EPZ) around each nuclear facility. EPZs should be defined for both

the short term "plume exposure pathway" and for the longer term "ingestion exposure pathways".

Q. Please describe emergency planning requirements which the federal government recommends to predetermine appropriate state and local emergency responses within an EPZ around each nuclear facility.

A. The Emergency Planning Zone concept is illustrated in Figure 1. EPZs are designated as the areas for which planning is recommended to assure that prompt and effective actions can be taken to protect the public in the event of an accident. Responsible government officials should apply the applicable planning items listed in Guide and Check List for the Development and Evaluation of State and local Government Radiological Emergency Response Plans in Support of Fixed Nuclear Facilities NUREG-75/111,5/ in the development of radiological emergency response plans. The following are example planning elements considered appropriate for the EPZs:

1. Identify responsible onsite and offsite emergency response organizations and the mechanisms for activating their services,

2. Establish effective communication networks to promptly notify cognizant authorities and the public,

3. Designate pre-determined actions as appropriate and as contained in NUREG-75/111, EPA 520/1-75-001, and Emergency Planning such as evacuation, sheltering, and thyroid blocking of iodine,

4. Develop procedures for use by emergency workers,

5. Identify applicable radiation measurement equipment,

6. Identify emergency operations centers and alternate locations, assembly points, and radiation monitoring locations,

7. Implement training programs for emergency workers as appropriate, and

8. Develop test procedures for emergency response plans.

Emergency planning should predetermine appropriate emergency responses within the EPZ as a function of population groups, environmental conditions 6/, plant conditions 7/, and time available to respond. For the plume exposure phase, shelter and/or evacuation would likely be the principle immediate

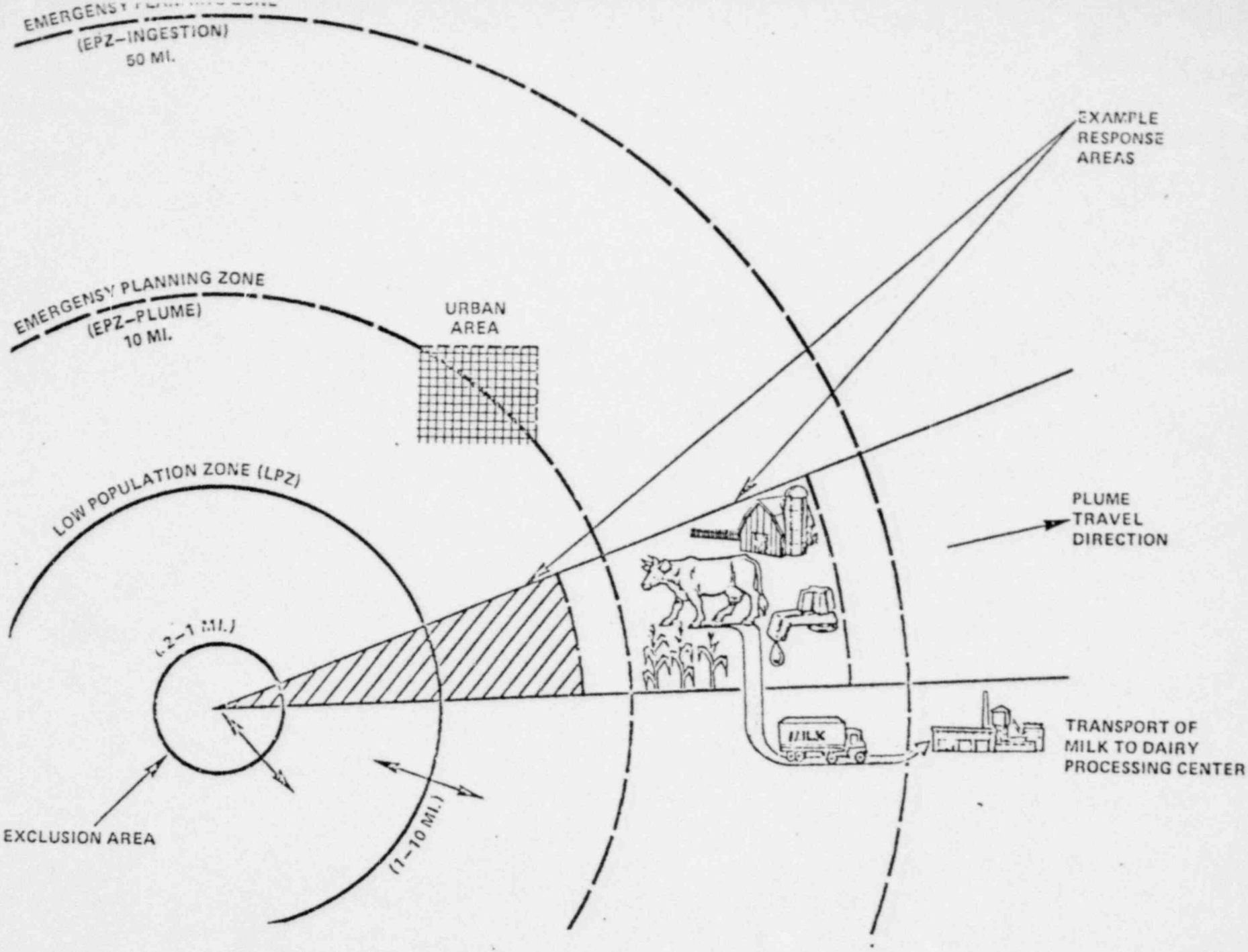

Figure 1 Concept of Emergency Planning Zones

protective actions to be recommended for the general public within the EPZ. The ability to best reduce exposure should determine the appropriate response.

For the ingestion exposure Emergency Planning Zone, the planning effort involves the identification of major exposure pathways from contaminated food and water and the associated control points and mechanisms. The ingestion pathway exposures in general would represent a longer term problem, although some early protective actions to minimize subsequent contamination of milk or other supplies should be initiated (eg., put cows on stored feed).

The EPZ guidance does not change the requirements for emergency planning, it only sets bounds on the planning problem.

Q. How is the size of the EPZ established?
A. Several possible rationales were considered by the task force for establishing the size of the EPZs. These included risk, probability, cost effectiveness and accident consequence spectrum. After reviewing these alternatives, the Task Force chose to base the rationale on a full spectrum of accidents and corresponding consequences tempered by probability considerations. These rationales are discussed more fully in Appendix I to NUREG-0396.

The Task Force that prepared NUREG-0396 agreed that emergency response plans should be useful for responding to any accident that would produce offsite doses in excess of the PAGs. This would include the more severe design basis accidents and the accident spectrum analyzed in the Reactor Safety Study 8/. After reviewing the potential consequences associated with these types of accidents, it was the consensus of the Task Force that emergency plans could be based upon a generic distance out to which predetermined actions would provide dose savings for any such accidents. Beyond this generic distance it was concluded that actions could be taken on an ad hoc basis using the same considerations that went into the initial action determinations.

Q. What is the relationship between the size of the EPZ and possible accidents?
A. The Task Force judgment on the extent of the Emergency Planning Zone is derived from the characteristics of design basis and Class 9 accident consequences. Based on the information provided in Appendix I to NUREG-0396, and the applicable PAGs a radius of about 10 miles was selected for the plume exposure pathway and a radius of about 50 miles was selected for the ingestion exposure pathway, as shown in table 1 Although the radius for the EPZ implies a circular area, the act

shape would depend upon the characteristics of a particular site. The circular or other defined area would be for planning whereas initial response would likely involve only a portion of the total area.

The EPZ recommended is of sufficient size to provide dose savings to the population in areas where the projected dose from design basis accidents could be expected to exceed the applicable PAGs under unfavorable atmospheric conditions. As illustrated in Appendix I to NUREG-0396, consequences of less severe Class 9 accidents would not exceed the PAG levels outside the recommended EPZ distance. In addition, the EPZ is of sufficient size to provide for substantial reduction in early severe health effects (injuries or deaths) in the event of the more severe Class 9 accidents.

Table 1. Guidance on Size of the Emergency Planning Zone

Accident Phase	Critical Organ Exposure Pathway	EPZ Radius
Plume Exposure Pathway	Whole Body (external)	about 10 mile radius*
	Thyroid (inhalation)	
	Other organs (inhalation)	
Ingestion Pathway**	Thyroid, whole body bone marrow (ingestion)	about 50 mile radius***

* Judgment should be used in adopting this distance based upon considerations of local conditions such as demography, topography, land characteristics, access routes, and local jurisdictional boundaries.

** Processing plants for milk produced within the EPZ should be included in the emergency response plans regardless of their location.

*** The recommended size of the ingestion exposure EPZ is based on an expected revision of milk pathway Protective Action Guides based on FDA-Bureau of Radiological Health recommendations. The Task Force understands that measures such as placing dairy cows on stored feed will be recommended for projected exposure levels as low as about 1.5 rem to the infant thyroid. Should the current FRC guidelines, 10 rem 9/ be maintained, an EPZ of about 25 miles would achieve the objectives of the Task Force.

Q. What are the time factors associated with releases?
A. The planning time frames are based on design basis accident considerations and the results of calculations reported in the Reactor Safety Study 8/. The guidance cannot be very specific because of the wide range of time frames associated with the spectrum of accidents considered. Therefore, it will be necessary for planners to consider the possible different time periods between the initiating event and the arrival of the plume and possible time periods of releases in relationship to time needed to implement protective actions. The Reactor Safety Study indicates, for example, that major releases may begin in the range of one-half hour to as much as 30 hours after an initiating event and that the duration of the releases may range from one-half hour to several days with the major portion of the release occurring well within the first day. In addition, significant plume travel times are associated with the most adverse meteorological conditions that might result in large potential exposures far from the site. For example, under poor dispersion conditions associated with low windspeeds, two hours or more might be required for the plume to travel a distance of five miles. Higher windspeeds would result in shorter travel times but would provide more dispersion, making high exposures at long distances much less likely. Therefore, in most cases, significant advance warning of high concentrations should be available since NRC regulations 7/ 10/ require early notification of offsite authorities for major releases of radioactive material. The warning time could be somewhat different for reactors with different containment characteristics than those analyzed in the Reactor Safety Study. The range of times, however, is judged suitably representative for the purpose of developing emergency plans. Shorter release initiation times are typically associated with design basis events of much smaller potential consequences or with the more severe Reactor Safety Study accident sequences.

Q. How do the time factors associated with releases affect emergency planning?
A. The planning basis for the time dependence of a release is expressed as a range of time values in which to implement protective action. This range of values prior to the start of a major release is of the order of one-half hour to several hours. The subsequent time period over which radioactive material may be expected to be released is of the order of one-half hour (short-term release) to a few days (continuous release). Table 2 summarizes the Task Force guidance on the time of the release.

The time available for action is strongly related to the time consumed in notification that conditions exist that could cause

a major release or that a major release is occurring. Development and periodic testing of procedures for rapid notification are encouraged. It is generally recommended that each State plan be fully tested once per year so that assurances can be made that appropriate protective actions such as evacuation, and sheltering can be taken at the PAG levels.

Table 2 - Guidance on Initiation and Duration of Release

Time from the initiating event to start of atmospheric release	0.5 hours to one day
Time period over which radioactive material may be continuously released	0.5 hours to several days
Time at which major portion of release may occur	0.5 hours to 1 day after start of release
Travel time for release to exposure point (time after release)	5 miles - 0.5 to 2 hours 10 miles - 1 to 4 hours

Q. What are the radiological characteristics of releases?
A. To specify the characteristics of monitoring instrumentation*, develop decisional aids to estimate projected doses, and identify critical exposure modes, planners will need information on the characteristics of potential radioactivity releases. For atmospheric releases from nuclear power facilities, three dominant exposure modes have been identified. These are (1) whole body (bone marrow) exposure from external gamma radiation and from ingestion of radioactive material; (2) thyroid exposure from inhalation or ingestion of radioiodines; and (3) exposure of other organs (eg., lung) from inhalation or ingestion of radioactive materials. Any of these exposure modes could dominate (ie., result in the largest exposures) depending upon the relative quantities of various isotopes released.

Radioactive materials produced in the operation of nuclear reactors include fission products and transuranics generated within the fuel material itself and activation products generated by neutron exposure of the structural and other materials within and immediately around the reactor core.

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*An Interagency Task Force on Emergency Instrumentation (offsite) is now preparing guidance 11/ on the type and quantity of instruments needed for the various exposure pathways. Federal agencies represented on the Instrumentation Task Force include NRC, EPA, DCPA, HEW & DOE.

The fission products consist of a very large number of different kinds of isotopes (nuclides), almost all of which are initially radioactive. The amounts of these fission products and their potential for escape from their normal places of confinement represent the dominant potential for escape from their normal places of confinement represent the dominant potential for consequences to the public. Radioactive fission products exist in a variety of physical and chemical forms of varied volatility. Virtually all activation products and transuranics exist as non-volatile solids. The characteristics of these materials shows quite clearly that the potential for releases to the environment decreases dramatically in this order: (1) gaseous materials; (2) volatile solids; and (3) non-volatile solids. For this reason, guidance for source terms representing hypothetical fission product activity within a nuclear power plant containment structure emphasizes the development of plans relating to the release of noble gases and of volatiles such as iodine. However, consideration of particulate materials should not be completely neglected. For example, capability to determine the presence or absence of key particulate radionuclides will be needed to identify requirements for additional resources.

Table 3 provides a list of key radionuclides that might be expected to be dominant for each exposure pathway. More detailed lists of core inventories are presented in Chapter 15 of recent Safety Analysis Reports and in Appendix V of the Reactor Safety Study. Both of these sources give details on the time histories of the release fractions for a spectrum of postulated accidents.

Q. Do you have an opinion as to the radiation exposure that could result from a design base accident at Jamesport?
A. Yes. Based on our review of the Jamesport facility and our analysis of the 10 mile EPZ for the inhalation pathway, EPA believes that a design base accident could result in the release of sufficient radioactivity so as to cause radiation exposures to the general population above EPA protective action guide levels of 1 to 5 rems for whole body exposures to airborne radioactive materials and 5 to 25 rems for thyroid doses due to inhalation from a passing plume in a large portion of the 10 mile EPZ (see Figures 2,3,4). Further we project doses from such an accident could be realized at a level above 5 rems to the adult thyroid 10 miles from the facility within 2 hours, and at a level above 1 rem to the whole body 5 miles out from the facility within 2 hours. Exposures lasting up to 8 hours could result in a 25 rem exposure to the adult thyroid within a 5 mile radius of the plant. These estimates all assume no protective actions are taken.

Table 3

RADIONUCLIDES WITH SIGNIFICANT CONTRIBUTION TO DOMINANT EXPOSURE MODES

Radionuclides with Significant Contribution to Thyroid Exposure

Radionuclide	Half Life (days)
I-131	8.05
I-132	0.0858
I-133	0.875
I-134	0.0366
I-135	.028
Te-132	3.25
Kr-88	0.117

Radionuclides with Significant Contribution to Whole Body Exposure

Radionuclide	Half Life (days)
I-131	8.05
Te-132	3.25
Xe-133	5.28
I-133	0.875
Xe-135	0.384
I-135	.028
Cs-134	750
Kr-88	0.117
Cs-137	11,000

Radionuclides with Significant Contribution to Lung Exposure* (Lung only controlling when thyroid dose is reduced by iodine blocking or there is a long delay prior to releases).

Radionuclide	Half Life (days)
I-131	8.05
I-132	0.0858
I-133	0.875
I-134	0.0366
I-135	.028
Cs-134	750
Kr-88	0.117
Cs-137	11,000
Ru-106	365
Te-132	3.25
Ce-144	284

*Derived from the more probable Reactor Safety Study fuel melt categories and from postulated design basis accident releases.

Figure 3

ADULT THYROID INHALATION DOSE
FROM ALL IODINES VS. DISTANCE

100 % DBA
JAMESPORT.

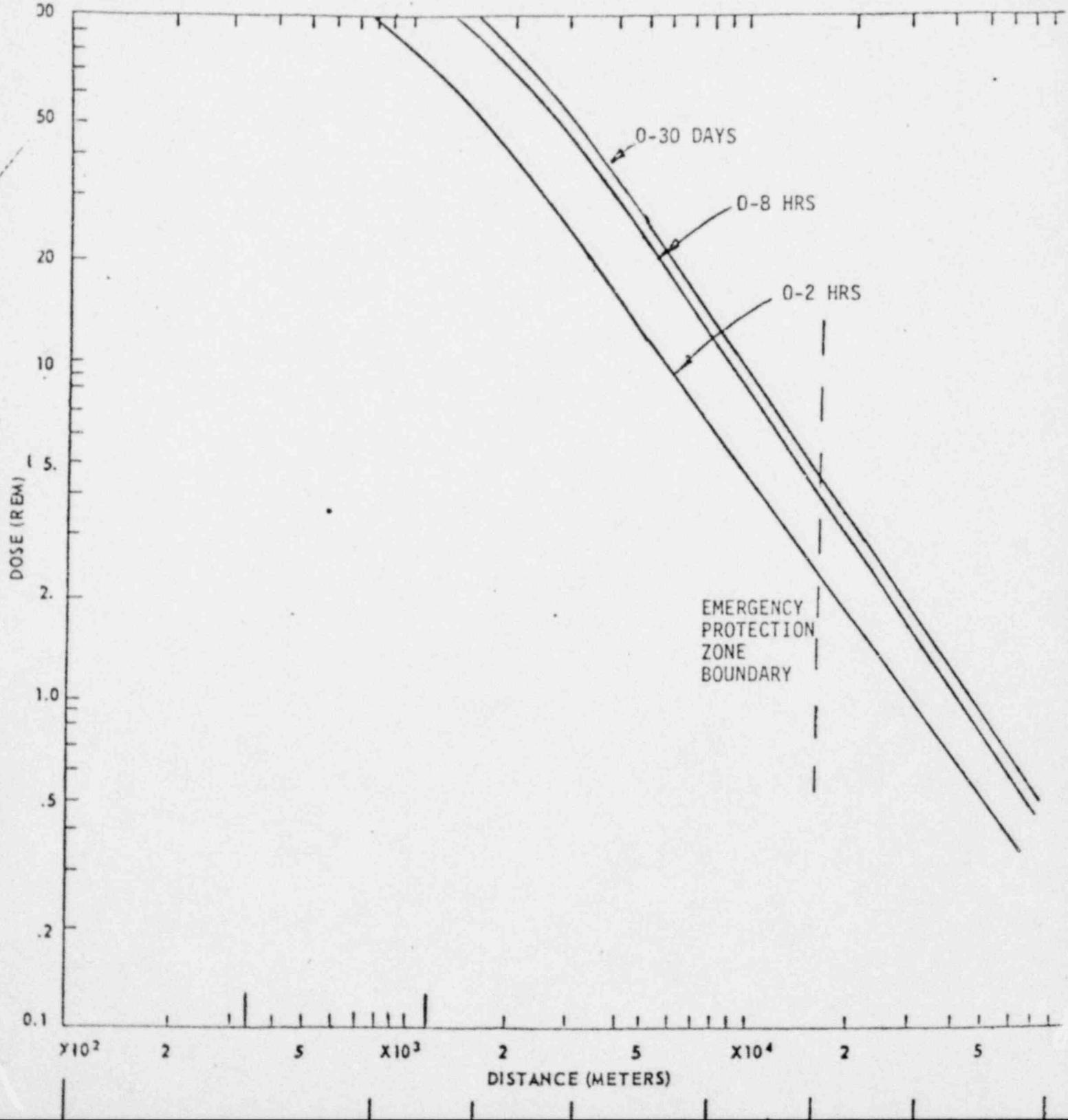


Figure 2

WHOLE BODY DOSE
VS. DISTANCE

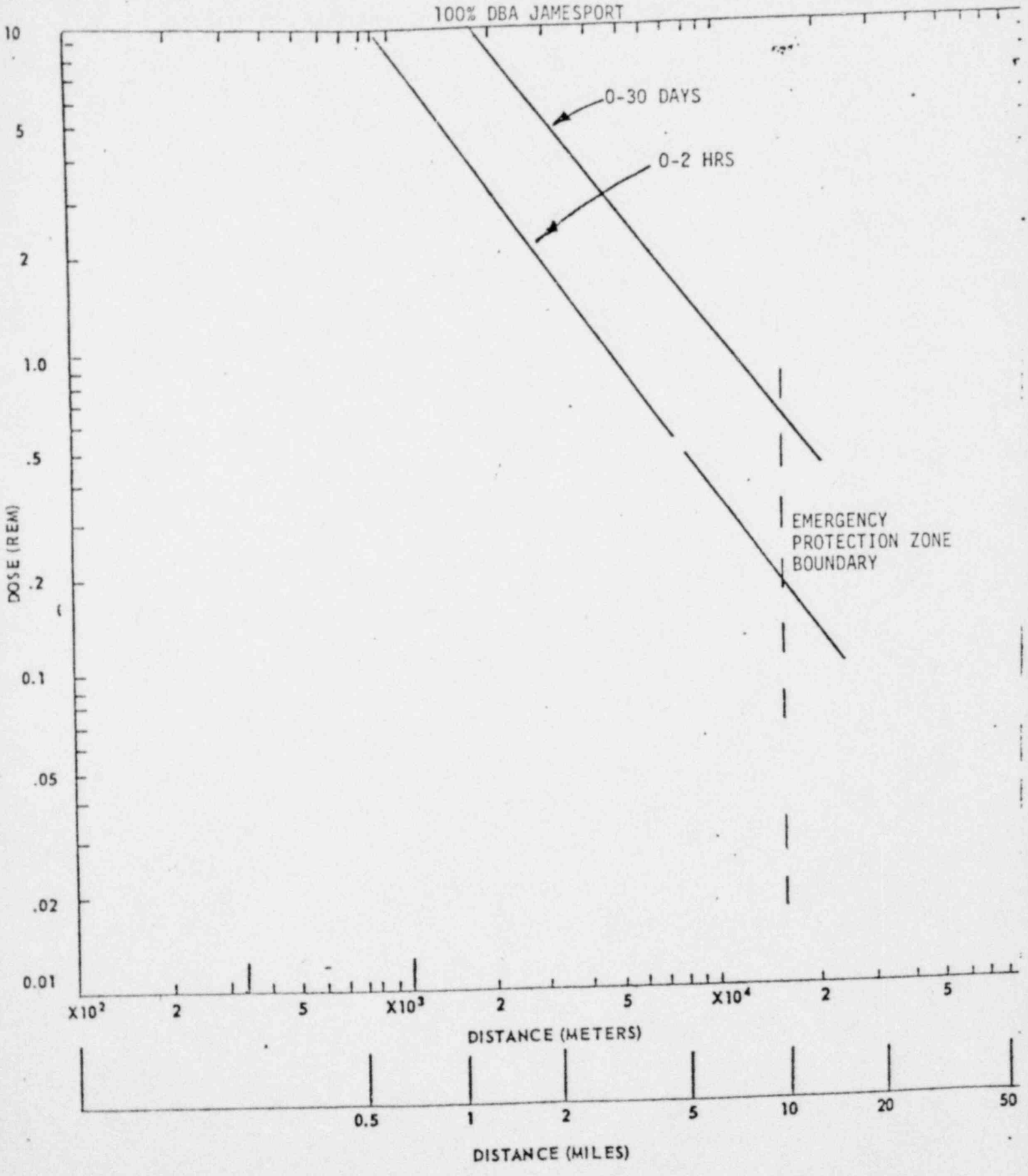
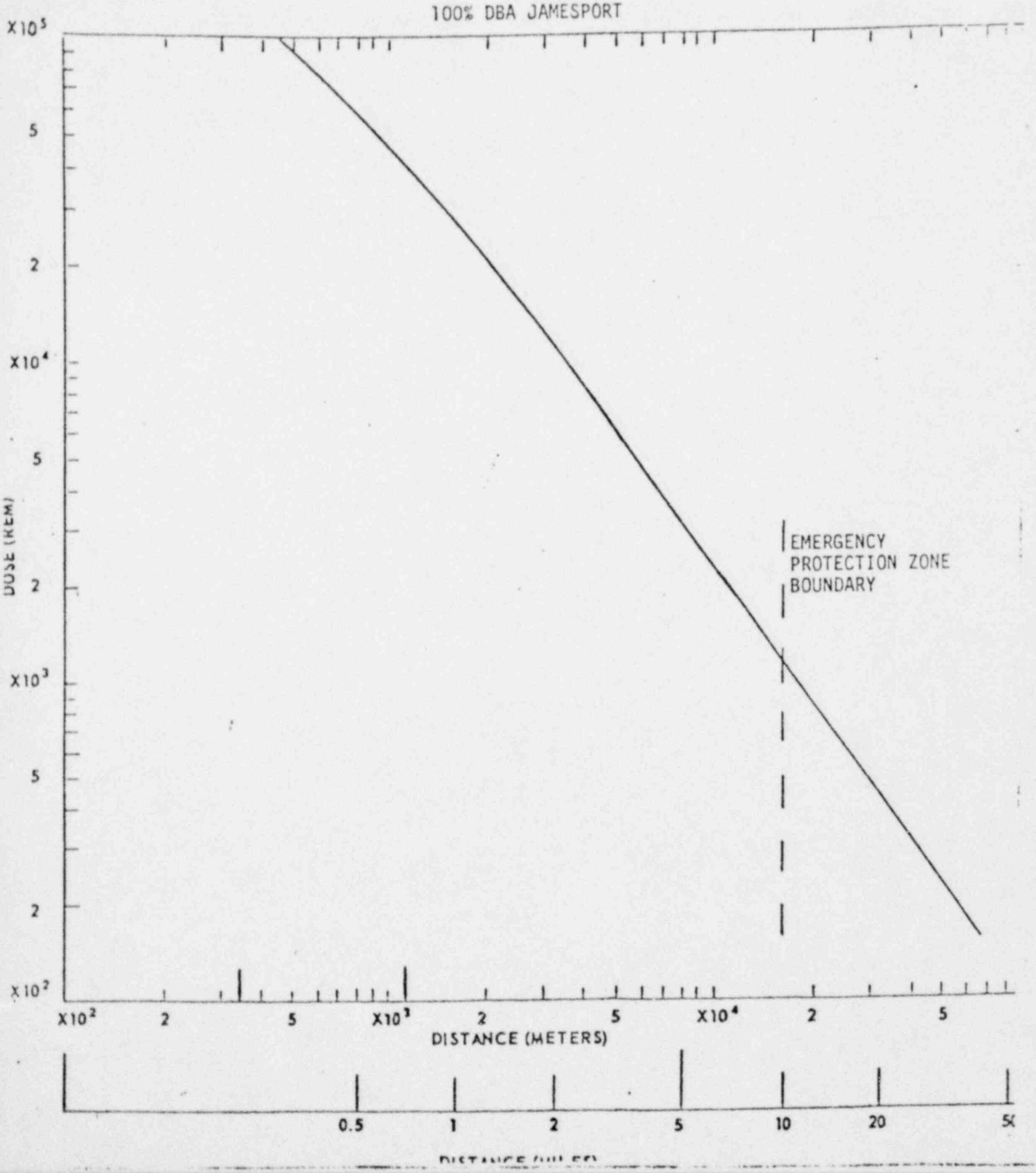


Figure 4

INFANT THYROID DOSE VIA MILK
FROM GRAZING COWS VS. DISTANCE
NO PROTECTIVE ACTIONS



Q. Would the consequences of a DBA be affected by prevailing meteorological conditions?
A. Yes. EPA, in its review of the local geography within the EPZ, notes that should a design base accident occur at a time where the wind was blowing from the east-northeast to the west-northwest, the major routes of land evacuation around the proposed Jamesport facility would be susceptible to the highest exposure levels. This could make evacuation as a protective action impossible. This would leave sheltering as the only available protective action that could be used to mitigate both the whole body and thyroid doses from releases of noble gases and iodine.

Q. How effective would sheltering be as a protective action in the event of a Jamesport DBA?
A. EPA has investigated the relative effectiveness of sheltering as a protective action and has published a report on this subject entitled, The Effectiveness of Sheltering as a Protective Action Against Nuclear Accidents Involving Gaseous Releases Parts I and II, 520/1-78-001 A & B.12/ This report provides information with regard to the relative effectiveness of evacuation and sheltering as protective actions. It turns out that evacuation is the only action, that when executed properly, can achieve 100 percent effectiveness as far as dose reduction is concerned. While sheltering can provide dose reduction EPA 520/1-78-001 A&B states:

> "Sheltering becomes less attractive compared with evacuation for increasing durations of airborne exposure for whole body and thyroid dose considerations - particularly small structure sheltering. For example, for exposure durations of around 3 hours or more, evacuation would be largely recommended in lieu of small structure sheltering. Large structure sheltering, however, may still be somewhat competitive with evacuation as an emergency protective action for cloud exposure periods between 3 and 6 hours. Even at 6 hours, however, the large structure shelter with a low ventilation rate may be only marginally competitive for certain situations of predicted long evacuation transit times away from the radioactive source region".

Q. How effective would evacuation be as a protective action in the event of a Jamesport DBA?
A. Based on these studies and review of the previously mentioned facts, EPA believes that exposures above EPA PAG levels could occur within a 10 mile EPZ in a rapid fashion and that using evacuation as a protective action

to mitigate such exposures may not be possible for over 40% of the time based on wind directions presented in the Jamesport Final Environmental Impact Statement NUREG 75/079. 13/ Utilization of sheltering as an alternate protective action to evacuation does not appear as a suitable alternative for exposure duration in excess of 3 to 6 hours. For this reason it seems reasonable to state based on the latest available information that sheltering may not be adequate and evacuation may not be possible for a large portion of the general population surrounding the proposed Jamesport facility and within the EPZ.

Q. How does your finding relate to N.Y. State's radiological emergency response plan?
A. This finding is in no way a negative commentary on the New York State radiological emergency response plan which was formulated by the New York State Department of Health (DOH). EPA notes that DOH has formulated a plan which required a substantial level of effort. The result of DOH's diligent pursuit of this is a plan that has received the concurrence in February of 1979 of the NRC pending successful field testing. EPA is aware of DOH's efforts as we have participated in the concurrence process. EPA notes that DOH has provided as part of its plan a detailed specific operating procedure (SOP) for the area adjacent to each operating nuclear facility in the State. These SOPs will attempt to utilize EPA PAG and protective action guidance to the best extent possible. EPA's review of these SOPs for existing reactors that have operating licenses in the State of New York leads us to believe that DOH should be able to assure that evacuation of the general population within the 10 mile EPZ surrounding these facilities during accidents such as a design base accident would be possible under all but the most unfavorable conditions (ie., an extremely large snowfall concurrent with an accident). Based on this belief, EPA thinks that DOH has fulfilled their emergency response planning responsibilities.

Q. Does the Jamesport site meet EPA's PAG guidance?
A. Apparently No. EPA believes that if the Jamesport site is licensed DOH will find it virtually impossible to provide the same reasonable assurances of meeting EPA PAG guidance when it must formulate its SOP for Jamesport. This will not occur for reasons of lack of competence or diligence but because of the physical impossibility of the situation. DOH would truly be in an untenable position because the only way adequate protective actions could be carried out would be to prescribe unprecedented planning measures such as air tight long term shelters for everyone in the EPZ and located and spaced so that they could be reached without restricting access to the shelters. Such unpre-

cedented planning measures would be very costly and would run counter to the recommendations made by the joint NRC-EPA task force report in NUREG-0396. In fact, the task force stated in that report several examples of emergency procedures it does not recommend as being justified by the report; that is the task force report should not be used as justification for developing these capabilities for these protective actions. These are: "No special local decontamination provisions for the general public (eg., blankets, changes of clothing, food, special showers). No stockpiles of anti-contamination equipment for the general public. No construction of specially equipped fall-out shelter. No special radiological medical provisions for the general public. No new construction of special public facilities for emergency use. No special stockpiles of emergency animal feed. No special decontamination equipment for property and equipment. No participation by the general public in test exercises of emergency plans."

Q. Is the Siting Board preempted from refusing to certify the Jamesport site based on radiological emergency response grounds?

A. No. Since it is clear that the area surrounding the Jamesport facility will not be susceptible to the same radiation protection recommendations that are achievable at virtually every other operating reactor site in the country a that are recommended by the Federal government, the question then becomes does the State of New York through the Article VIII process or through the Siting Board have any jurisdiction in this area so that it can mitigate this problem. Presiding Examinder Suss in his recommended decision has at several times stated that the State is preempted from this area and it would be inappropriate for the State to base its siting decision on radiological emergency response planning. EPA believes these findings made by Presiding Examiner Suss are incorrect and to the contrary, EPA believes that making a Siting decision on radiological emergency response is not only not preempted by the Federal jurisdiction, but that the State siting process is the most appropriate place for this type of decision-making, considering it is the State and not the Federal government that has the ultimate responsibility for formulating and executing a State radiological emergency response plan for a fixed nuclear facility disaster.

Q. What is the basis for your opinion?

A. 1. The U.S. NRC is the responsible agency for issuing a construction permit (CP) or an operating license (OL) for a nuclear power plant. The NRC has in the past and can today issue a CP or an OL without the affected State having an emergency response plan let alone one that has received NRC's concurrence. Today, over 24 States have commercial nuclear power plants licensed to operate, yet only 12 have concurred in radiological emergency response

plans. However, virtually all of the plants licensed in these 12 states were licensed prior to the State Emergency plan receiving NRC concurrence.

2. There are no NRC rules or regulations preempting States from using emergency response or protective action matters as a decision making tool in determining which proposed site is best for a nuclear reactor.

3. There is no NRC rule or regulation preempting a State from refusing to certify site based on radiological emergency response grounds even after the NRC has issued a construction permit for the facility in question.

4. The only NRC regulations governing emergency response are contained in Appendix E to 10 CFR 50 10/ and these only require that the facility operator and the local governments adjacent to the facility enter into an agreement on the necessary emergency response functions in a limited area, usually extending no further than the EPZ and generally an area much smaller than the LPZ.

5. The NRC has no official jurisdiction over State radiological emergency response plans other than as to provide guidance, advice, and a procedure for which the State may get concurrence in their plan. The NRC does not license State plans.

Q. Please summarize your findings and your Agency's position on the Jamesport site.

A. Based on our findings, EPA recommends that the Siting Board deny the Application of Long Island Lighting Company for a certificate of environmental compatibility and public need to construct two 1150 MWe nuclear fueled generating units at a site in the Towns of Riverhead and Southold, Suffolk County, on the grounds that the State of New York could not provide radiological emergency response protection to citizens residing within a ten-mile radius of the proposed plant that is consistent with protective actions outlined in EPA's Manual of Protective Action Guides and Protective Actions for Nuclear Accidents.

EPA also finds that other issues related to radiation such as the costs associated with decontamination and decommissioning, radioactive waste disposal, and radioactive material shipments, provide sufficient uncertainties to make a positive determination as to whether the Jamesport site is ultimately acceptable highly speculative.

REFERENCES

1. Transport of Radionuclides in Urban Environs: A Working Draft Assessment, SAND 77-1927, May 1978, Sandia Laboratories, Albuquerque, New Mexico.

2. Stronger Federal Assistance ot States Needed for Radiation Emergency Response Planning, March 19, 1976, U.S.General Accounting Office, Washington, D.C.

3. Federal Register, Volume 40, No. 248, December 24, 1975, Pages 59494-59495

4. Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans In Support of Light Water Nuclear Power Plants NUREG-0396, EPA520/1-78-016, December 1978, U.S. Nuclear Regulatory Commission and U.S. Environmental Protection Agency, Washington, D.C.

5. Guide and Check List for the Development and Evaluation of State and Local Government Radiological Emergency Response Plans in Support of Fixed Nuclear Facilities, NUREG-75/111, Dec. 1974, U.S. Nuclear Regulatory Commission.

6. Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, EPA-520/1-75-001, Sept. 1975, U.S. Environmental Protection Agency.

7. Emergency Planning for Nuclear Power Plants, Regulatory Guide 1.101, Mar. 1977. U.S. Nuclear Regulatory Commission, Washington, D.C.

8. Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants, (NUREG-75/014), October 1975, WASH-1400, U.S. Nuclear Regulatory Commission.

9. Federal Radiation Council Staff Report No. 5, July 1964; Staff Report No. 7, May 1965.

10. 10 CFR Part 50, Licensing of Production and Utilization Facility, Appendix E, U.S. Nuclear Regulatory Commission, Washington, D.C.

11. Interim Guidance on Offsite Radiation Measurement Systems, A Report to Developers of State Radiological Emergency Response Plans by the Federal Interagency Task Force on (offsite) Emergency Instrumentation for Nuclear Incidents at Fixed Facilities, August 1977, U.S. Nuclear Regulatory Commission, Washington, D.C.

12. The Effectiveness of Sheltering as a Protective Action Against Nuclear Accidents Involving Gaseous Releases, Parts I and II, EPA 520/1-78-001 A & B, April 1978, U.S. Environmental Protection Agency, Washington, D.C.

13. Final Environmental Statement Related to the Construction of Jamesport Nuclear Power Station, Units 1 and 2, NUREG-75/079, October 1975, U.S. Nuclear Regulatory Commission, Washington, D.C.

14. Federal Response Plan for Peacetime Nuclear Emergencies (Interim Guidance) April 1977, Federal Preparedness Agency, General Services Administration.

Appendix "A"

STATEMENT OF PROFESSIONAL QUALIFICATIONS

QUALIFICATION OF PAUL A. GIARDINA

My name is Paul A. Giardina. My business is the United States Environmental Protection Agency, (EPA) Region II, 26 Federal Plaza, New York, New York. Since July 1975 I have been employed by the EPA as follows:

July 1975-February 1977	Regional Radiation Representative
February 1977-June 1978	Chief, Regional Office of Radiation Programs
June 1978-July 1978	Acting Director, Environmental Programs Div.
July 1978-November 1978	Chief,Regional Office of Radiation Programs
November 1978-Present	Chief, Radiation Branch

for the Region II Office which includes New York, New Jersey, Puerto Rico and the Virgin Islands. I have reported to the Director of the Environmental Programs Division from July 1975 until November 1978 except when I acted as the Director at which time I reported to the Regional Administrator. From November 1978 to the present I have reported to the Director of the Air and Hazardous Materials Division. My responsibilities include the formulation and execution of the Region II Radiation Program. This program includes: the radiological review of light water nuclear power plant environmental impact statements; assistance to States in development, testing, evaluation, modification and maintenance of State radiological emergency response plans; the gathering and reporting of technical information on selected facilities and procedures including nuclear power plants, radioactive waste disposal sites, and radioactive shipment transport methods; and other technical assistance to States pertaining to radiation program activities. In carrying out these responsibilities, personnel under my direction provide technical support for the Agency's Regional radiation program.

I received my Bachelor of Science in Nuclear Engineering from the University of Michigan (Table A-1 contains pertinent course work completed) in 1971 and my Masters of Science in Nuclear Engineering from the New York University Institute of Environmental Medicine and the School of Engineering (Table A-2 contains pertinent course work completed) in 1973. In November 1978 I took part and received a certificate of completion for the Masters Seminar in Environmental Law and Regulations from the Government Institute Incorporated.

From 1974 to 1975, I was employed by Ebasco Services Incorporated in the Consulting Environmental Engineering Department as an Associate Air Quality Engineer. From 1971 to 1974, I was employed by the Consolidated Edison Company of New York Incorporated in the Office of Environmental Affairs and held the title of an Assistant and an Associate Air Quality Control Engineer.

I am a member of the American Association for the Advancement of Seience, the American Nuclear Society, the Health Physics Society and the League of Technical Professionals.

Table A-1

Pertinent Undergraduate Course Work

Principles of Nuclear Engineering I

Principles of Nuclear Engineering II

Nuclear Engineering Materials

Applied Radiation Laboratory

Nuclear Reactor Theory I

Nuclear Reactor Theory II

Nuclear Radiation Measurements

Thermonuclear Fusion

Nuclear Reactor Laboratory

Table A-2

Pertinent Graduate Course Work

Radiological Health

Radiation Protection

Radiation Hygiene Measurements

Reactor Theory I

Reactor Theory II

Environmental Toxicology

Environmental Contamination

Problems in Environmental Health

Dispersion of Pollutants in the Atmosphere

Air Pollution

Air Pollution Engineering

AFFIDAVIT OF PAUL A. GIARDINA

STATE OF NEW YORK)
ss.:
COUNTY OF SUFFOLK)

PAUL A. GIARDINA, being duly sworn, states as follows:

1. I am the Chief of the Radiation Branch for the Environmental Protection Agency, Region II Office, located at 26 Federal Plaza, New York, New York, 10007.

2. I have prepared testimony on behalf of the County of Suffolk for submission in Case 80003 related to emergency response planning and radiation health effects issues. A statement of my professional qualifications is appended thereto. The statements contained in my testimony are true and correct to the best of my knowledge and belief.

Paul A. Giardina

Sworn to before me this
29th day of June, 1979.

Janice M. Olsen

JANICE M. OLSEN
NOTARY PUBLIC, State of New York
No. 52-4527177, Suffolk County
Term Expires March 30, 19 80