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AEC'S POSITION ON ADVANCE EMERGENCY PLANNING FOR POTENTIAL ACCIDENTS

Attached hereto is the proposed final draft of our paper on the above subject, intended for use in the Indian Point 2 Hearing, if necessary. This draft contains the suggested revisions from Division Directors and the front office. By copy of this memorandum these people who have made suggested inputs were asked to concur in this final draft of the statement.

Ordered ~~Drawn~~ by C.K. Beck

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Enclosure:

Extent of Advance Emergency Planning
for Coping with Potential Accidents

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EXTENT OF ADVANCE EMERGENCY PLANNING FOR COPING
WITH POTENTIAL ACCIDENTS

1. The concept of defense-in-depth is applied to the design, construction, and operation of every nuclear power facility to reduce the probability of accidents and as a means of assuring reliability in functional performance of plant systems. The primary plant systems are backed up by redundant accident prevention systems, most of which operate automatically, to prevent the loss of important functions in the event of a failure of the primary system. In the unlikely event a serious accident should nevertheless occur, additional systems also are provided to contain and control the potential release of fission products to the environment. All structures, systems, and components important to the safety of the plant must be designed, constructed, and operated in such a way as to achieve superior quality. Hence, this defense-in-depth concept provides assurance that the likelihood of occurrence of an accident having radiological consequences sufficient to affect the health and safety of the public is exceedingly low. In the history of licensed or commercially operating nuclear power plants, beginning in 1957 and encompassing 112 reactor-years of operation, no such accident has occurred.
2. In spite of these provisions, it is not inconceivable that an accident could happen that could cause high radiation levels within the plant and release of fission products to areas outside the plant.
3. As a matter of prudence, each nuclear power plant licensee is required to prepare in advance, and to maintain in readiness, emergency plans

for implementing measures to provide additional protection of persons who might be affected. The licensee's emergency plans include collaborative arrangements for assistance from local and state agencies in the event that the capabilities of these agencies may be needed. State and local agencies also develop their capabilities to respond to emergency situations. In addition, the Atomic Energy Commission maintains Radiological Emergency Assistance Teams in a state of continued readiness. These teams are administered through regional offices located at seven strategic points over the nation, and can respond rapidly to situations where their capabilities may be needed.

4. In recognition that serious accidents could occur that might result in the release of fission products, the Atomic Energy Commission's criteria for the siting of nuclear power plants (10 CFR Part 100) provide that nuclear power plants be located within a low population zone "...which contains residents, the total number and density of which are such that there is a reasonable probability that appropriate protective measures could be taken in their behalf in the event of a serious accident." Thus, it has been, and still is, the clear intent of the AEC that measures for the protection of people in the low population zone can and should be implemented in the unlikely event of a serious accident. It follows that advance planning for providing these protective measures should be undertaken. The measures would be provided primarily by the licensees and by state and local agencies, supplemented

as appropriate by the AEC Radiological Emergency Assistance Teams and other resources of the Federal Government.

5. Highly unlikely design basis accidents (DBAs) are postulated and evaluated for several different purposes in the safety evaluations of nuclear power plants. The evaluation of the DBAs is relevant to the problem of estimating the scope of the emergency planning that should be provided for reasonable protection against the remote possibility of accidents in two respects:
 - (a) In the calculational model used for estimating the potential consequences that might result from a DBA, assumptions are made regarding a number of sequential failures, each of which has a very low probability of occurrence. The use of these assumptions leads to a highly conservative estimate of the fraction of the fission product inventory in the reactor core that might be released into the containment building. A prescribed fraction of this radioactive material is assumed to leak from the containment building and to be transported under the further assumptions of poor meteorological conditions for a 30-day period. The AEC's reactor siting criteria (10 CFR 100) require that for any DBA the low population zone be of such size that the calculated radiation dose to an individual exposed at any point on its outer boundary would not exceed 25 rem to the whole body or 300 rem to the thyroid over the 30-day period. Thus, the calculation of the

potential consequences of design basis accidents, using the highly conservative model prescribed, and the guideline values of 25 rem whole body or 300 rem thyroid, are used to determine the minimum acceptable radius of the low population zone within which protective measures for people are expected to be feasible.

- (b) Realistically, should a design basis accident occur, there is a high probability that the actual consequences would be less severe, probably by a factor of 10 or more, than those that are calculated in the conservative calculational model used for site evaluation, since some of the safety systems conservatively assumed to be degraded in that model would quite likely remain effective to a greater degree than that assumed. Conversely, but also realistically, the level of projected radiation doses at which actual protective measures would be considered for implementation following an accident would be substantially lower than the guideline doses used for site selection because it is prudent to be cautious. This consideration of implementation level also would be a factor of 10 or so lower in most instances than the 25 rem whole body or 300 rem thyroid dose guidelines used for site evaluation. For example, in situations where few people are involved and feasible conditions exist, evacuation or movement of people might be considered for projected dose levels as low as 10 to 20 rem to the

thyroid. The net result of these two realistic considerations is that the geographic area of coverage appropriate for advance emergency planning is approximately the same as the low population zone referred to in the siting criteria of 10 CFR 100.

6. Hence, advance preparations clearly should include provisions for implementing protective measures for residents in the low population zone. One cannot state with absolute certainty that accidents larger than the design basis accident as realistically calculated will not occur. However, such accidents are certainly exceedingly improbable. Coping with accidents that might call for resources beyond those covered by the developed advance emergency preparations might require the additional resources of state agencies, such as disaster use of generalized plans, and the resources of the AEC Radiological Emergency Teams and other Federal agencies. As in other disaster situations, these resources can be mobilized as needed.