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THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF THE ATTORNEY GENERAL

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February 23, 1988

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Re: FEMA's Evaluation of the New Hampshire
Response to FEMA Supplemental Testimony

Dear Joe:

I understand that FEMA and the RAC are now in the process of evaluating the New Hampshire Response to FEMA Supplemental Testimony ("New Hampshire Response") and that on March 14, 1988, FEMA will announce its updated position on the so-called beach/sheltering contentions at issue in the NHRERP litigation. Because FEMA's previous position statement on these issues relied, to some extent, on the evacuation time estimates ("ETEs") contained in Volume 6 of Revision 2 of the NHRERP, I am writing now to ensure that FEMA does not rely on those same ETEs as it reviews the New Hampshire Response. The summer weekend ETEs contained in Volume 6 are no longer accurate, if they ever were, and the Applicants make this clear in updated (longer) ETEs submitted as part of their direct

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pre-filed testimony on the ETE issues in the NHRERP litigation. See Applicants' Direct Testimony No. 7 (Evacuation Time Estimate and Human Behavior in Emergencies) ("Applicants No. 7") at 41-44 (attached hereto as Attachment 1).^{1/} Moreover, during the course of the NHRERP litigation, the intervenors submitted substantial evidence that (1) an orderly vehicular evacuation of the Seabrook EPZ beach areas may not be possible when the beaches are crowded and (2) even if an orderly vehicular evacuation were achievable, the realistic summertime ETEs for days when the beach area vehicular population is at capacity (Scenarios 1 and 2) are at least 50-100% longer than the times presented in the Applicants' updated ETEs. See generally the direct testimony of Thomas Adler, Avishai Ceder, and Albert Luloff, and the rebuttal testimony of Edwin Olivera. Thus, while what the current realistic ETEs for Seabrook are is a matter of serious dispute, no one at the hearings has contended that the Volume 6

^{1/} These updated ETEs are presented in four tables, each for an evacuation from "within" a given area (the 2, 5, and 10 mile rings and the EPZ boundary itself). These areas are depicted on the map attached as Attachment 2, a map taken from the NHRERP Rev. 2. For each table, ETEs are listed for Scenarios 1 and 2. These are both summer weekend full-beach ETEs, the first for an evacuation which occurs during good weather, the second for an evacuation during and after a sudden rain. The definition of the various evacuation Scenarios from Volume 6 is attached hereto as Attachment 3. Each of the four tables lists, for Scenarios 1 and 2, the ETEs for Regions 1-9 and 11-13. Regions 1-9 are identified in Table 10-2 in Volume 6, attached hereto as Attachment 4. Regions 11, 12 and 13 are identified on p. 41 of Applicants' No. 7 (contained in Attachment 1). The ERPAs used to identify the various Regions are themselves identified in Table 10-3 in Volume 6, attached hereto as Attachment 5.

ETEs for the summer scenarios were realistic for the 1987-1988 time period.

Given that the state of the ETE record has changed significantly since FEMA last stated its "current position" regarding the beach/sheltering issues, what ETEs if any should FEMA and the RAC use now in assessing the New Hampshire Response? The Intervenor's urge FEMA and the RAC to consider carefully the whole ETE record developed in the NHRERP hearings before drawing conclusions about whether orderly vehicular evacuation is possible and, if so, what ETEs are most realistic and should be applied in reviewing the New Hampshire Response. In our view, the whole record demonstrates that a set of realistic ETEs for the beach areas have yet to be calculated. Our expert, Dr. Adler, presented substantial evidence showing that Applicants' ETEs are much too low, and he testified that the Scenario 1/Region 1 ETE is over 11 hours, but he did not compute a complete set of ETEs. See Testimony of Thomas J. Adler (following Tr. 3847) at 52-53 (attached hereto as Attachment 6). We believe the Applicants should be directed to re-compute the ETEs in the manner which our experts, Dr. Adler and Dr. Ceder, have recommended, and we would encourage FEMA and the RAC to support this effort. In any event, as they review the New Hampshire Response, FEMA and the RAC should not do any of the following at this time:

1. FEMA and the RAC should not assume that an orderly, efficient vehicular evacuation from the Seabrook EPZ beach areas can be achieved when the beaches are crowded. The testimony presented by a number of intervenor witnesses has painted a very chilling portrait of what the traffic situation will be like after the beach areas are ordered evacuated on days when these areas are crowded. At best, the traffic flow will be what the traffic engineers call "Level of Service F," that is, extremely congested flow in which long queues are formed and stop-and-go operations result. Traffic congestion will be so severe, and will last for so long, that many evacuees will likely abandon their cars, finding it faster to walk than to drive. See, e.g., Testimony of Thomas J. Adler (following Tr. 3847) at 15-18 (contained in Attachment 6). See also Testimony of Albert E. Luloff (following Tr. 9203) at 14-15 (attached hereto as Attachment 7). The traffic situation will be far worse than that which exists when the beach areas empty on busy days. Adler Test. at 13-14 (see Attachment 6). Because traffic delays will be so lengthy, driver frustration will result in traffic disorderliness that will further jeopardize an orderly, efficient evacuation. See, e.g., Rebuttal Testimony of Edwin J. Olivera (following Tr. 9483) at 5-8 (attached hereto as Attachment 8). Taken together, this testimony is compelling and cannot be ignored. FEMA and the RAC must at least acknowledge that serious, credible doubt exists about the feasibility of an orderly vehicular evacuation from the beach areas when they are crowded.

2. FEMA and the RAC should not reference the unrealistically short summer weekend ETEs contained in Volume 6 of the NHRERP, ETEs which no witness at the NHRERP proceedings testified were realistic for the beach population in the summer of 1987. As noted above, the Applicants themselves have submitted updated (longer) summer weekend ETEs as part of their prefiled testimony in the NHRERP litigation. (See Attachment 1.) These updated ETEs are longer than the Volume 6 ETEs because a number of the input variables to the IDYNEV computer model were increased. First, as a result of aerial photos taken by the Applicants on one day last summer the number of beach area vehicles used to calculate the summer weekend ETEs was increased by almost 4000 vehicles, from 25,470 in Vol. 6 to 29,293 for the updates. There were many more cars seen parked in the beach area in these photos than in the photos taken in August 1985 which formed the basis for the beach area vehicle estimates used in the Vol. 6 ETE calculations. See generally Applicants' No. 7 at 27-38. Another IDYNEV input variable which the Applicants changed in doing their updated ETE calculations is that which describes the extent of voluntary public evacuation. The Volume 6 ETEs were based on the single assumption "that 25 percent of the population within the EPZ, but outside the Region ordered to evacuate, will spontaneously evacuate, contrary to instructions." Vol. 6 at 10-3. In calculating ETE updates, however, the Applicants also

considered the effects of a "keyhole voluntary evacuation" that would include 50% of the population outside of a wedge-shaped subsegment of the EPZ (e.g., the inner north Region -- ERPAs A and B -- from 2-5 miles) if that subsegment were ordered to evacuate. See generally Applicants' No. 7 at 160.

FEMA and the RAC should keep in mind that Intervenor's submitted substantial evidence that the number of beach area vehicles used to compute these updated ETEs is still much too low, and that concentric voluntary evacuation will be higher than Applicants have now assumed. Nevertheless, the point is that no one considers the Volume 6 summer weekend ETEs to be realistic at this time.

3. FEMA and the RAC should not reference the Region 10 ETEs when discussing the times to "evacuate" or "clear" the beach areas. This should be easy to do since even the Applicants have eliminated Region 10 ETEs from their updated ETE tables. (See Attachment 1.) As was made clear from the cross examination of Applicants' witnesses Callendrello and Lieberman (Tr. 5715-5722), the "beach areas" encompassed by Region 10 include only those portions of the barrier islands immediately adjoining the beaches but not the main exit roads (Rt. 51, Rt. 286, or Rt. 1A west from Salisbury Beach) from these areas. Thus, Mr. Lieberman described a car in Hampton Beach as being outside the Region 10 beach area once it had left Highland Avenue and entered Rt. 51 westbound, a point only

about three or four blocks west of the beach (Rt. 1A), Lieberman, Tr. 5716. This is not a meaningful or relevant point from which to calculate ETEs or "clear" times for the people in the beach areas. The relative safety of the mainland is still some distance away across the marshes, and beach area traffic will move only very slowly along the main evacuation routes (Rt. 51, Rt. 286, Rt. 1A) toward the mainland. New Hampshire has no current plans which contemplate an evacuation of only Region 10. Tr. 5719.

Perhaps most importantly, unlike the outer boundaries for all the other ETE Regions, the "boundary" of Region 10 does not describe any fixed distance from the nuclear plant. For example, after leaving Region 10, the traffic exiting the beach area on Rt. 286 actually moves closer to Seabrook Station, crossing back into the 2 mile ring for a couple of miles. See Fig. 1-3 on p. 1-13, Vol. 6. Thus, Region 10 ETEs have no value for FEMA or the RAC in assessing the adequacy of the NHRERP. As with the ETEs for other portions of the EPZ, the only relevant evacuation times for people in the beach areas are those referenced by their ultimate passage out beyond the 2 mile, 5 mile, and 10 mile rings and through the EPZ boundary itself. For almost all these people, the 5 mile ring is the first relevant ring. Only the closest beach areas on Seabrook Beach and Hampton Beach are less than 2 miles from the plant; most of New Hampshire's beaches are between 2-5 miles from

Seabrook Station. Thus, as the people in these beach areas travel out the evacuation routes to points which are further away from the nuclear plant than when the evacuation began, the first relevant ETE measurement point reached is the 5 mile ring. If Table 2 in the Applicants' ETE updates is referenced (ETEs "from within 5 miles"), the Scenario 1/Region 9 ETE is stated to be 6:20. If larger areas are ordered to evacuate (Regions 5-8), the ETEs for clearing the 5 mile ring are as high as 6:35.

In sum, the Intervenor's believe that the Region 10 ETEs have no relevance. Nevertheless, should FEMA and the RAC still wish to reference the Region 10 ETEs, we encourage you to examine Figures 1 and 2 of the Adler Testimony, at 11a and 16a (Attachment 6). These figures reflect the Region 10 ETEs Dr. Adler has calculated.

4. FEMA and the RAC should not assume that the Applicants' updated ETEs are equivalent to the times needed to "clear the beaches." In fact, all of the Applicants' ETEs (the old and the new) are referenced from an order to evacuate which, pursuant to the planning basis used by Mr. Lieberman in conducting his IDYNEV runs, occurs 25 minutes after a "beach closing" announcement. See Lieberman, Tr. 5665-5674; see also Volume 6 at 4-1, 4-2, 10-12, 10-13. The assumption utilized for the planning basis is that the number of people who will choose to leave the beach areas upon hearing the beach closing

announcement is sufficient to quickly saturate the exit roads. Lieberman, Tr. 5671, 5673. Thus, to determine how long the Applicants contend it will take to "clear" an area (2, 5, or 10 miles ring or the EPZ boundary) after the first notification to beach-goers that generates outbound road saturation from the beach areas, then you must add 25 minutes to all the Applicants' ETEs. For example, in Table 2 of the Applicants' updated ETE tables, Applicants' Direct Testimony No. 7 at 42 (included in Attachment 1), the Scenario 1/Region 9 ETE for an evacuation from within 5 miles is listed to be 6 hours and 20 minutes. This 6:20 is the time that it takes after an order to evacuate (or "OTE") for the last car to pass through the 5 mile ring. However, since the beach closing announcement occurred 25 minutes before the OTE and generated enough outbound traffic to saturate the exit roads, the time to "clear" the 5 mile ring (i.e., time from first notification until the area is cleared of all evacuating vehicles) is really 6 hours and 45 minutes, using Applicants' tables.

5. FEMA and the RAC should not assume that the Applicants' updated ETEs are "conservative," "pessimistic," or "worst case." While KLD Associates has indicated in the past that the ETEs it calculated were based on a number of conservative assumptions about "uncertainties," at the NHRERP hearings Mr. Lieberman of KLD insisted that his estimates were not conservative but were realistic. No party or witness at the hearings has asserted

that KLD's updated ETEs were conservative (unrealistically long). Instead, Intervenor's presented substantial evidence that both the Applicants' 1986 and updated ETEs are overly optimistic, i.e., considerably shorter than can realistically be achieved, because they are based on a number of erroneous critical assumptions. See especially the pre-filed testimony of Dr. Adler and Dr. Ceder. One such assumption, recognized by the NRC's own witness, Dr. Urbanik, is that the Applicants' ETE updates were calculated using an unrealistically small beach area vehicle population because 1500 cars seen moving on the beach roads on the Applicants' 1987 beach photos were ignored. See Urbanik, Tr. 7374. In addition, Intervenor's have pointed out that in counting beach vehicles for the ETE updates, the Applicants have also ignored approximately 2000 additional vehicles hidden from aerial view parked in garages, carports, and in under-building parking areas. See Rebuttal Testimony of Dr. Thomas J. Adler at 14-15 (attached hereto as Attachment 9). If the Applicants had considered these 3500 vehicles (1500 plus 2000) in addition to the 29,293 parked vehicles that were considered in conducting their updated ETE analyses, there is no question that their updated ETEs for the summer scenarios would have been longer.

Another fact, presented by a senior officer for the New Hampshire State Police, also casts serious doubt on the notion that Applicants' ETEs are "conservative" (i.e., likely to be shorter than stated). Captain Sheldon Sullivan stated that the

N.H. State Police, on whom the plans rely for 74 troopers to staff Traffic Control Points ("TCPs") and Access Control Points ("ACPs") throughout the New Hampshire portion of the EP2) (see Table 3.1-1 of the Summary of Personnel Resource Assessment for the NHRERP, Aug. 87, Applicants Exhibit No. 1-A, ff. Tr. 4685), can provide only 4 troopers within the first 15 minutes after notification to them, Tr. 4704, and 3 more within the next 45 minutes, Tr. 4714. Only 6 additional troopers can report to control points within the next hour, for a total of 13 troopers reporting within the first two hours after notification to the State Police. Tr. 4715. Thus, unless notification to the State Police occurs well before an OTE, there will be late-staffing of most of the ACPs and TCPs in New Hampshire. Obviously, some of these ACPs and TCPs are more important than others, and these have been designated "Priority 1" posts. But a total of 46 troopers are needed just to staff the "Priority 1" ACPs and TCPs used to facilitate an evacuation of the entire EP2 on a summer weekend in good weather. See N.H. State Police Manning Sequence, attached as Attachment 10.

Clearly, if a fast-breaking accident occurs at Seabrook Station during the summer, FEMA cannot assume that all Priority 1 posts will be staffed before the beach closing announcement or even the OTE is made. Even the Applicants believe that late staffing could lengthen their updated estimates of evacuation times, depending on how fast the Route 51 overpass of I-95 is

staffed. Applicants' No. 7 at 44-47. Intervenors believe this late staffing will, at best, result in a less efficient and orderly evacuation of the beach areas that will take longer than Applicants' updated ETEs would suggest. Rebuttal Testimony of Dr. Thomas J. Adler at 2-4 (Attachment 9). At worst, this late-staffing creates a situation quite similar to an unplanned evacuation -- traffic control personnel present in the early hours are too few and may be too far apart to ensure orderly traffic flow. Traffic chaos may develop eliminating any reasonable expectation that an orderly vehicular evacuation can occur. But whatever conclusions FEMA and the RAC draw regarding the late-staffing of posts by the N.H. State Police, at least FEMA should agree that Applicants' updated ETEs are quite unlikely to be overly conservative (shorter than realistically can be obtained) for the beach population during relatively fast-breaking accident situations.

Conclusion

FEMA's present assessment of the New Hampshire Response obviously must take into account the extensive evidentiary record regarding ETEs which has been developed to date in the NHRERP litigation. That record contains a number of critical considerations that bear on whether the New Hampshire Response provides adequate protection to the beach population.

Foremost among these considerations is that an orderly, vehicular evacuation from the New Hampshire beaches^{2/} simply may not be possible when the beaches are crowded. To discount the serious, credible doubt which exists about the feasibility of an orderly, vehicular evacuation would be grossly imprudent.

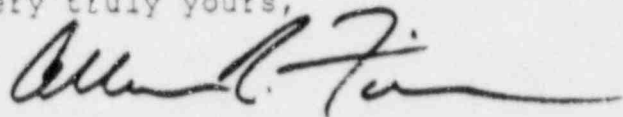
Finally, even were FEMA somehow assured that a vehicular evacuation from the New Hampshire beach areas will always proceed in an orderly fashion, in light of the evidence presented in the ETE portion of the NHRERP hearings FEMA and the RAC must also recognize that, on summer weekends when the beaches are at capacity, if a fast breaking, serious accident were to occur at Seabrook Station, an evacuation of the 5 mile ring could not occur rapidly. In good weather, it will take from 6:45 (Applicants) to over 10 hours (Intervenors) to clear the 5 mile ring from the time the first notification is given to the beach population (assuming that the beach closing announcement occurs within 25 minutes of the OTE). Applicants now contend that it will take 7:30 (7:05 plus 0:25) to clear the full ERZ under such conditions (see Attachment 1); Intervenors' expert Dr. Adler, has testified that this will take over 11 hours. (See Attachment 6, p. 52.) If a sudden rain occurs when the beaches are full, even the Applicants

^{2/} The Attorney General believes that the situation for Salisbury Beach in Massachusetts will be much worse, and that vehicular evacuation from this beach when it is most crowded is in fact not possible, but we have not presented all the evidence on this point because we have been litigating only the NHRERP so far.

believe that it will take a minimum of 8:10 (7:45 plus 0:25) to clear the 5 mile ring and 10:30 (10:05) plus 0:25) to clear the full EPZ. In sum, there is simply no credible way to describe as "relatively short," as Dr. Bores did on p. 8 of his June 1987 revised RAC position paper, the times needed to move all those people in the beach areas of Seabrook and Hampton Beach to points more distant from Seabrook Station (beyond the 5 mile ring) than they were before starting their trips.

The Massachusetts Attorney General strongly urges FEMA and the RAC to take this fresh important information, developed during the hearings on the NHRERP's ETE contentions, into full consideration as they proceed with their review of the New Hampshire Response.

Very truly yours,



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Enclosures

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