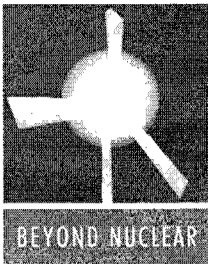


August 22, 2007 (10:49am)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF



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August 21, 2007

Office of the Secretary
United States Nuclear Regulatory Commission
Washington, DC 20555-0111
Attention: Rulemaking and Adjudications
By Email: SECY@nrc.gov

Comments on the TMI Alert Proposed Rulemaking (PRM-50-85)

To whom it may concern:

On Behalf of Beyond Nuclear at the Nuclear Policy Research Institute (NPRI), I am submitting comments in support of the proposed rulemaking as noticed in the Federal Register of July 10, 2007 (Vol. 72 Number 131, pages 37470-37471) to codify relocation requirements for children in nurseries, daycare centers, pre-schools and schools in the event of a radiological emergency arising at anyone of the nation's nuclear power plants. The relocation centers which are also designated to be decontamination centers and reunification locations should be located at least 10 to 20 miles beyond the currently designated 50 mile radius of the Ingestion Pathway Zone. In other words, reception centers for decontamination and reunification should be relocated at least 70 to 100 miles away from the reactor accident site.

Extensive research into the phenomenon of human behavior in response to a radiological emergency principally arising out of the experience of the March 28, 1979 accident at Three Mile Island confirms that current emergency planning is grossly inadequate particularly concerning protective actions for children.

As currently planned and implemented to locate all public shelters and reception centers immediately beyond the ten-mile emergency planning zone is to invite under-utilization and ultimately chaos. With all the reception centers and decontamination centers located within the 10-20 mile zone, anyone arriving from the 1-10 mile emergency planning zone to the anticipated host community expecting shelter, medical attention, decontamination and other emergency services will very likely find that the resident population and a significant number of emergency responders in that zone have already spontaneously evacuated farther away. Focused research confirms that the median evacuation distance

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from the 1979 Three Mile Island accident was between 85 and 100 miles (Zeigler and Johnson 1984).

Furthermore, current emergency planning does not factor in the event of a catastrophic radiological accident or act of sabotage that because the reception centers are sited too close to the reactors that it is likely that significant numbers of as well as emergency responders assigned to the reception centers (as well as police, firemen, bus drivers, hospital personnel, designated guardians such as school teachers, etc.) will abandon or delay responding to their posts in favor of putting more distance between them and the radiological event. Additional numbers will abandon their duty or a significantly delayed their response as a result of role conflicts and attend to family and other personal obligations first because of the potential widespread and unseen danger posed by a radiological release. Substantial social surveys confirm this observed behavior for a potential future event. Emergency planning and exercises therefore need to incorporate the observed human response as well as this attrition factor among first responders, evacuation and sheltering personnel through role abandonment and delayed response to accurately assess the probability of success or failure of the radiological emergency plan. Locating reception and decontamination centers further away from the site of a radiological event is likely to increase use by evacuating populations and reduce attrition of emergency responders due to role conflicts.

In "The Geography of Civil Defence" by Professor Donald Zeigler, in the context of a radiological event from nuclear war, social scientists raise the issue that current evacuation plans assume that there will be no conflicting loyalties among emergency workers at page 157. He goes on to state, "But these workers might well have a conflict and resolve it by choosing to be with their families in host communities beyond high risk zones, rather than at their assigned posts in target areas." More specific to radiological catastrophe from a nuclear power plant, the Zeigler study states "At TMI, role conflict created severe problems for physicians, nurses, and technicians in area hospitals (Smith, Fisher, 1981; Maxwell, 1982) and for nuclear power plant personnel (Kasl, Chishom, and Eskenazi, 1981).

In New York, the Nuclear Regulatory Commission threatened to shut down the Indian Point plants because bus drivers had testified that they would be reluctant to enter a radiation zone (Zuckerman, 1984, p. 110). Research near the Shoreham nuclear power station identified a serious potential for role conflict among volunteer firemen and bus drivers, found to be subject to role conflict pressures (Zeigler, Johnson and Braun, 1983)."

Social surveys show that the Three Mile Island accident in 1979 caused severe organizational problems for surrounding health care facilities. In the attached study "Hospital Organizational Response to the Nuclear Accident at Three Mile Island: Implications for Future-Oriented Disaster Planning," (Maxwell 1982), with regard to adequate hospital staffing "Predictably, the conflicting responsibilities to family and to work resulted in escalating staffing problems as the crisis

continued. Nursing and ancillary support staff who had young children felt considerable pressure as it became evident that the problem at TMI was unlikely to be resolved quickly. Many elected to leave the area to protect their families... The staffing crisis was not restricted to professional and technical staff. Physician staffing reached critical levels at least one institution, with one emergency room physician noting that only six of more than 70 doctors remained available." (p. 276) Such studies confirm that for reception and decontamination centers that are located within 25 miles of the radiological event it is reasonable to believe that they will be under-staffed and under-utilized for populations, particularly children, coming in from the 10 mile radius Emergency Planning Zone.

Concerns arise for public school teachers surveyed for whether or not they would first help evacuate/shelter students from the EPZ around a nuclear power plant in California. In the case study "Role Conflict in a Radiological Emergency: The Case of Public School Teachers," Journal of Environmental Systems, 1985 Volume 15, pp. 77-91, Professor James Johnson's social survey found that nearly one-third of the teachers would not assist in the evacuation effort, "owing largely to a strong sense of obligation to family in crisis situations and concern for public safety. The behavior intentions of the teachers are consistent with actual behavior during the Three Mile Island accident where emergency personnel with close family ties failed to report for duty at local hospitals."

Zeigler points out that he found that less than one-fourth of the teacher would first help evacuate students from the designated danger zone.

To plan and exercise for the initial emergency response actions to be limited to populations within a two-mile radius 360° around the reactor and five-miles downwind is to significantly under-plan for the spontaneous human response to a reactor accident or a successful act of terrorism. Regardless of regulations and plans, evidence indicates that once people are aware of any populations being ordered to evacuate or shelter, they will likely be leaving their homes from all zones within the ten-mile EPZ and well beyond in what has been termed "the evacuation shadow phenomenon." If spontaneous evacuation from within and outside the EPZ is not factored into emergency planning and exercises (if you assume that people will stay in their homes awaiting further instructions) you will be underestimating the volume of traffic on the roads leading away from the nuclear power station site. In a number of emergency planning zones, the population farther out (10 to 25 miles) will likely spontaneously evacuate onto roads and hamper evacuations or trap the population closer in.

"Evacuation Behavior in Response to Nuclear Power Plant Accidents," (Zeigler and Johnson 1984) a social survey of Long Island households was conducted to determine how the public was likely to respond to a potential accident at the Shoreham nuclear power station. A sample of 2,595 households on Long Island was asked to respond to three increasingly serious accident scenarios. Scenario

I asked what they would do if everyone within 5 miles of the plant were advised to stay indoors in response to an accident: Scenario II asked what they would do if the evacuation/sheltering advisory were exactly the same as issued for the Three Mile Island accident in 1979, and: Scenario III asked what they would do if a 10-mile evacuation were ordered. In Scenario I, no one was advised to evacuate, but 25% of the sampled households said they would leave. In Scenario II (the TMI case), 34% of all households said they would leave. In Scenario III, half of the population of the island was projected to attempt to leave.

To further divide the ten-mile emergency planning zone into a bewildering array of twenty emergency response areas indicates that federal and state emergency planners have completely ignored demonstrated human behavior during nuclear emergencies as confirmed by research conducted in the follow-up of the Three Mile Island accident in 1979 and confirmed by research under hypothetical conditions at the Shoreham and Seabrook nuclear power stations. It is unlikely that people in Zone 7 will remain in their homes if they find out that people in Zone 3 are evacuating and others ordered to shelter in place. Residents will manage their own response and likely attempt to evacuate all at the same time. Traffic flow models need to incorporate this factor into their planning and exercises as well as incorporating spontaneous evacuations to reception centers relocated further out.

It is our finding that substantial documentation exists to demonstrate that role conflict and spontaneous evacuation are specifically problematic for emergency planning for nuclear power stations. More of concern, these studies predate the events of September 11, 2001 and were confined to nuclear accidents. As such, studies do not address the human behavioral responses within emergency planning zones and beyond for nuclear catastrophe(s) associated with successful acts of terrorism. It is our concern that calculated malevolent acts would exacerbate the already observed and surveyed behavioral response to a catastrophic radiological release and warrants more independent study.

For all of these reasons, it is prudent to relocate reception / decontamination centers from the current inappropriate locations within 10 to 20 miles from the reactors to sites which are outside of the Ingestion Pathway Zone at least 70 to 100 miles from the reactors because it will 1) provide more appropriate protective distances for children from radiological hazard; 2) better align emergency response plans more appropriately with observed human behavior to put significant distances between a population and a significant radiological event and; 3) significantly increase the number of reception center and decontamination personnel reporting for duty as well as other emergency personnel at centers located further from the event.

Sincerely
Paul Gunter
Director of Reactor Oversight

References:

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SECY - Beyond Nuclear comments PRM-50-85 Emergency Planning

From: <paul@beyondnuclear.org>
To: <SECY@nrc.gov>
Date: 08/21/2007 6:02 PM
Subject: Beyond Nuclear comments PRM-50-85 Emergency Planning

To the Secretary of the US NRC:

Attached please find the comments of Beyond Nuclear in support of Proposed Rulemaking 50-85 on codifying changes to radiological emergency planning to relocate reception and decontamination centers from 10-20 miles from reactors out to new locations that are 70-100 miles from reactors.

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