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25 YEARS LATER: EMERGENCY PLANNING STILL UNREALISTIC

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There is no disputing that the nuclear accident at Three Mile Island caught federal and State of Pennsylvania officials, alike, without any civilian emergency plan. What had been thought by NRC and industry to be an "incredible" event, in fact occurred. Amid complaints by Pennsylvania Governor Richard Thornberg of conflicting, confusing and misleading information from both NRC and Metropolitan Edison, the operators of TMI, the governor's subsequent "advisory" to evacuate pregnant women and pre-school age children within a 5-mile radius of the seriously damaged reactor was scrambled together and issued three days into the accident. The execution of a plan for an intended population of no more than 3400 "women and children first" prompted the spontaneous evacuation of as many 200,000 people out to 25 miles from the site.

Now twenty-five years later, the picture of emergency planning for a nuclear power accident is much different. But are current plans adequate to protect populations from a catastrophic release of radiation, particularly with the terrorist attacks of September 11, 2001 on the World Trade Center and the Pentagon?

Civil defense plans for a nuclear power plant accident now delineate evacuation routes and establish reception centers for those seeking radiation monitoring, decontamination and medical attention. State and local governments, with support from the Federal government and utilities, develop plans that include a radiation plume emergency planning zone (for sheltering and evacuation) within a radius of 10 miles from the plant, and an ingestion planning zone (sheltering of cows and stored feed) within a radius of 50 miles from the plant.

Residents within the 10-mile emergency planning zone are required to be provided emergency information materials (via brochures, the phone book, calendars, utility bills, etc.). These materials contain educational information on radiation, instructions for evacuation and sheltering, special arrangements for the handicapped, contacts for additional information, etc.

However, current emergency plans for populations living and working around US nuclear power stations remain unrealistic in several important aspects and are as likely to fail. The fundamental flaw is that plans do not take into consideration the natural behavior of people to protect themselves and their families in the event of a nuclear accident.

The lessons learned from the Three Mile Island accident should provide a very important experience for emergency planners to seriously consider the viability of successfully executing nuclear accident emergency plans. A study of human response in the aftermath

of TMI was published in "Evacuation Behavior In Response To Nuclear Power Plant Accidents," by Donald Zeigler and James Johnson, Jr. in the May, 1984 issue of The Professional Geographer.

Here are some of their findings:

1. To plan for only a 10 mile evacuation is to significantly under plan for a nuclear power station accident.

   The 10-mile emergency planning zone is a politically arbitrary distance. It has no bases in meteorology, radiation releases mechanisms and human behavior. In fact studies of human behavior following the Three Mile Island accident in 1979, where a limited evacuation advisory was issued by Governor Thornberg, provides evidence that people will be spontaneously leaving their homes well beyond the current 10-mile planning zones. This human behavior phenomenon has been termed the "evacuation shadow effect." The evacuation shadow is determined by people who believe themselves to be at risk who evacuate even though they have not been ordered or advised to do so by officials. The study of human behavior around the Three Mile Island accident showed that if only the government advised people, specifically pregnant mothers and pre-school children, had left a 5 mile radius, that number would have been about 3400 evacuees. Instead, up to as many as 200,000 people actually evacuated, approximately 39% of the population within 15 miles of the reactor. The "shadow" evacuation phenomenon is not expected to begin to diminish until approximately 25-miles out from the reactor. The study found that in addition to the high rate of voluntary evacuation, those evacuees tended to travel distances much greater than has been observed in previous studies on non-nuclear related evacuation behavior (hurricanes, floods, etc.). The TMI study evidenced that the median distanced traveled by evacuees was 85 miles. The NRC commissioned a study (Flynn 1979) that evidenced an average distance of 100 miles of travel.

2. To locate all of the public shelters and reception centers immediately beyond the 10-mile EPZ is to invite chaos and failure of the plan.

   Currently all shelters and reception centers for evacuees within the current planning zone are located in a 10-20 mile range from reactors. Anyone who takes shelter in them will likely watch the resident population from that area pack into their cars and head farther away. Ionizing radiation is such a dreaded invisible threat people will want to put as much distance as possible between them and the accident site. Because of their close proximity, a significant percentage of shelter and reception center personnel are likely not to report for duty.

3. To depend on buses to evacuate populations without cars (school children, the elderly, and prison and hospital populations) is to ignore role conflicts within the emergency personnel designated as drivers and supervisors vital to successful evacuation. Those people who are depended upon to drive buses are not likely to

be professional emergency workers. They may delay response as a result of role conflict between emergency duty and home. They may not respond at all and tend to their families. Social surveys of personnel with assigned emergency duties indicate the strong potential for role conflict to interfere with the management of a nuclear emergency. Research conducted in the vicinity of the now closed Shoreham nuclear power station on Long Island, NY questioned bus drivers and volunteer fireman "What do you think you would do first if an accident requiring a full scale evacuation of the population within 10 miles of the nuclear reactor were to occur?"

The results found that 68% of 291 fire fighters, 73% of the 246 bus drivers indicated that family obligations would take precedence over emergency duties. The consequence of such choice would be a failed response to the nuclear emergency.

During the TMI accident, role conflict was documented among many of the emergency workers including the exodus of physicians, nurses, and technicians required to staff both the short term and long term medical facilities. At one local hospital, only six of 70 physicians who were scheduled for weekend emergency duty reported for work. None of the hospitals researched in the study were in the 5 mile radius of the evacuation advisory. Other instances of role conflict include Pennsylvania National Guard and even nuclear power plant workers.

Current emergency planning for children in schools located within the emergency planning zone for every nuclear power station rely exclusively upon their teachers and child care providers to supervise students and children through the sheltering-in-place at a facility or an evacuation to a distant “reception center” for the duration of the radiological emergency or until each student or child is released to an authorized adult.

Parents of these children are offered assurance from school administrators, state authorities and nuclear power companies that their children will be cared for should a radiological emergency at the nuclear power station occur. In fact, this is false and misleading assurance. No State has the statutory authority to require non-civil defense employees to participate in an emergency plan for the nuclear power stations. A mandate for non-civil defense employees to participate in the event of a nuclear accident presents the unconstitutional conscription of private citizens. In fact, many affected teachers and care givers are just as likely to be conflicted by family and personal obligations that would likely override any assumed performance in the radiological emergency plan resulting in the failure of the plan for school children. State authorities should be challenged on this unconstitutional practice and required to plan for the provision of the appropriate civil defense personnel.

4. To package information for radiological accident emergency planning as similar to an emergency response to other disasters (i.e. hurricanes) is to ignore that there are major differences in how people respond to these very different events.

Nuclear power plant operators and emergency planners characterize nuclear power plant disaster planning as no different than that for a hurricane or some other disaster. The public clearly perceives a difference of threat and consequences from a nuclear meltdown and that of a hurricane. But nuclear utilities, state emergency planning agencies and the NRC refuse to acknowledge these distinct differences in the actual threat, public perceptions and fears of the harm that can occur as the result of a nuclear power accident on scale of the Chernobyl accident in Ukraine, and other catastrophes. The harm derived from a nuclear accident both short term and long term includes deadly radiation sickness, cancer, birth defects and spontaneous abortions. The magnitude of public response to be greater than an evacuation from a natural disaster should be acknowledged and factored into emergency planning and exercises. Instead, nuclear power regulators, industry officials and state authorities down play the biological impact of exposure to a radiological accident.

5) To expect to "manage" an evacuation is unrealistic.

People will manage their own evacuation response. They will try to rescue their children and families, first. They will head out in their own cars as quickly as possible and try to get on the few available roads and will slow or halt the entire evacuation process. They will end up in traffic jams in bottlenecks beyond the evacuation zones likely trapping the intended evacuees in traffic closer to the nuclear reactor and most immediately under any escaping radiation plume.

With nuclear power becoming increasingly uneconomical, emergency planning is likely to come under increased scrutiny and the budgetary knife of the NRC and the nuclear industry to further reduce "unnecessary regulatory burden" and the associated costs to a deregulated electric industry.

Regulations governing the establishment of the 10 mile radius have already been targeted by industry to be reduced to 5 miles under justification that revised estimates of the "source term," or the amount of radiation likely to be released in a catastrophic accident are much less. One utility, Commonwealth Edison, figured a 75% savings in reduced emergency siren maintenance costs and public information distribution. There is also the ongoing industry effort to minimize the appearance of a threat from nuclear power from the public eye. Just as the word “nuclear” is disappearing from more and more company signs

The fact that questions and concerns regarding realistic human behavior in the face of a nuclear accident are being ignored or whittled away under utility cost savings plans constitutes a dangerous and widening gap in emergency planning around aging reactors.

The industry and regulatory changes do little to build public confidence in the intent and sincerity of efforts to first provide for the health and safety of large populations living in the shadow of an aging and increasingly dangerous nuclear power industry. In fact, profit driven changes or attempts to minimize the impact of a radiological accident further erode public confidence in emergency planning as well as the planning authorities.

Regardless of the federal regulations, local and state authorities have the power to realistically plan for emergency for catastrophic nuclear accidents. The first step in that process is to demand answers to these outstanding questions and many others. Officials must also oppose unrealistic economically-driven changes to already faulted planning.

Ultimately, the only relevant protection is prevention. If you want real civil defense, we must bring a halt to this inherently dangerous and aging industry.