

R E P O R T

Analysis of Emergency Preparedness Issues  
at Pilgrim Nuclear Power Station Raised  
by the Massachusetts Public Interest  
Group (MASSPIRG)

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The Massachusetts Public Interest Research Group (MASSPIRG) has prepared a report entitled Blueprint for Chaos II alleging deficiencies with respect to emergency planning for the area around the Pilgrim Nuclear Power Station in Plymouth, Massachusetts. MASSPIRG has also submitted a petition requesting that the Nuclear Regulatory Commission (NRC) take immediate action to remedy the emergency planning deficiencies. This report has been prepared at the request of the NRC to review the deficiencies alleged by MASSPIRG. The petition and report entitled Blueprint for Chaos II submitted by MASSPIRG to the NRC on July 20, 1983 makes the following five claims:

- (A) Advance public information and education is lacking;
- (B) Notification plans and procedures during an accident are faulty and inadequate;
- (C) Evacuation plans are inadequate;
- (D) Medical facilities are inadequate; and
- (E) The Emergency Planning Zone is too small.

MASSPIRG requests, therefore, that the NRC:

- (1) Issue a finding that emergency preparedness at Pilgrim is not adequate;
- (2) Start a four month time period for correction of all deficiencies in the plan; and
- (3) Determine whether lack of preparedness in conjunction with the "poor safety record" at Pilgrim and high summer population warrants immediate shutdown or operation at reduced power until minimum standards are met.

While MASSPIRG raises a number of good points, after a detailed analysis we continue to make the interim finding that the Commonwealth of Massachusetts has demonstrated that there is reasonable assurance that the public would be adequately protected if there were an accident at

the Pilgrim Nuclear Power Station. This conclusion was reached after a thorough review of state and local plans and an exercise of those plans by FEMA and the Regional Assistance Committee, an interagency group of experts.

The five major issue areas raised in MASSPIRG's petition are addressed below:

(A) Advance Public Information and Education is Lacking.

(1) MASSPIRG: The only method of public education and information used was the mailing of Emergency Planning Information (EPI) pamphlets which were not received by many residents or any tourists and, when received, were not always read and/or kept.

FEMA: Two pamphlets entitled "Emergency Public Information" and "Nuclear Energy Questions and Answers" were mailed to all residents in the EPZ in September 1981 and September 1982. In addition, the pamphlets were distributed to commercial establishments and public buildings in the EPZ, including hotels. Over 120,000 of both brochures have been distributed in an area of approximately 55,000 population and 20,000 households. Posters depicting emergency information have been displayed in the EPZ since October 1982.

MASSPIRG's information was derived from a poll that they conducted of some of the residents in the area. When asked if they had received EPI brochures, a substantial 70% responded that they remembered receiving them.

MASSPIRG also reports that 9% of those polled said they would tune to an EBS radio station as a first reaction to hearing the sirens, and an additional 19% would tune to radio or TV,

both of which are reasonable and appropriate responses. MASSPIRG did not ask what people would do upon some reflection as the sirens continued to sound.

Each siren has a public address capability and can be used to broadcast specific instructions to the public, including transients, in an emergency and this should be considered to be part of the public education effort. Local and state public safety vehicles also are equipped with PA capability. Messages will be broadcast over these public address systems to tune to the EBS station for information. This should be sufficient to aid residents and transients in an emergency.

- (2) MASSPIRG: The Emergency Public Information (EPI) pamphlets are inadequate, providing no information on public shelters, transportation, or temporary breathing filters. There also are inaccuracies in the emergency telephone number listings which should include the numbers of the Civil Defense Directors.

FEMA: NUREG 0654 ("Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants") requires annual dissemination of information to the public including:

- A. educational information on radiation;
- B. contact for additional information;
- C. protective measures, e.g., evacuation routes and relocation centers, sheltering, respiratory protection, radioprotective drugs; and
- D. special needs of the handicapped.

The Commonwealth is committed to updating the brochures at least annually in accordance with NUREG-0654. MASSPIRG has relied on outdated information for their remarks on public information. The "Joint State and Local Radiological Emergency Response Exercise for the Pilgrim Nuclear Power Station, March 3, 1982" has been superseded by results from the exercise held June 29, 1983. Therefore, we disagree with MASSPIRG's conclusions with regard to public shelters, transportation, and temporary breathing filters - specifically we note that:

Public Shelters - Any building, public or private, can be used as a shelter if sheltering is recommended during an incident. Instructions for this are included in the 1982 Questions and Answers brochure.

Public Transportation: The lack of provisions in the plans for transportation of those who may not have access to cars was previously noted as a deficiency and the state is revising the plans accordingly. No requests for special transportation have, to date, been registered with Plymouth Civil Defense, although such information has been solicited in the EPI brochures and at public meetings.

"Ad hoc Respiratory Protection" - The 1981 version of the pamphlet had this information which was inadvertently left out of the 1982 version. It will be included in the next printing. In any case, it is the intention of the state to broadcast specific instructions on ad hoc respiratory protection at the time of any accident. There are too many variables



and possible adverse consequences for this public information to be completely covered in an understandable public information brochure. Therefore, while general information may be provided, information specific to the incident will be included in EBS messages and releases.

Emergency Phone Numbers - The numbers given in the brochure are town office numbers which are more appropriate for dissemination and reception of information than numbers of civil defense directors who will be otherwise involved during an emergency. The numbers recently have been reviewed for accuracy, are updated annually, and include numbers to call in advance of an incident to register special needs.

(B) Notification plans and procedures during an accident are faulty and inadequate.

(1) MASSPIRG: The Pilgrim warning siren system is inadequate to alert the public within the EPZ in 15 minutes as observed by FEMA at the last test.

FEMA: MASSPIRG seems to have misunderstood the report on the "Pilgrim Nuclear Power Station Siren Response Exercise for the Pilgrim Nuclear Power Station, March 3, 1982." The fixed siren system was designed to be used in conjunction with other methods of notification such as mobile notifying teams, tone alert radios, and the EBS. FEMA is currently developing standards for measuring the effectiveness of fixed sirens. However, the 1982 siren test demonstrated an impressive ability to notify the public using sirens alone. In our opinion, the test also demonstrated a continuing need for the other forms of public notification that are presently included in the plans.

- (2) MASSPIRG: Boston Edison and the Commonwealth of Massachusetts have not adequately attempted to respond to the special notification needs of the deaf or severely hearing impaired individuals.

FEMA: The Commonwealth of Massachusetts and Boston Edison have worked with the Massachusetts Office of the Deaf, the Council of Elder Affairs and the Deaf Community Center in Framingham in an attempt to identify deaf residents within the EPZ. They have also attempted to notify deaf people within the EPZ through newsletters about efforts to provide deaf residents of the EPZ with teletypewriter (TTY) devices. No such households have been identified by these efforts. This may be because most individuals with special needs live with someone and can rely on other members of the household in times of emergency. Also, deaf people and other individuals with special needs tend to congregate in urbanized areas where they can receive services readily and the Pilgrim EPZ is not urbanized.

Confidential lists identifying the deaf are believed to exist. In a meeting on August 19, 1983 with MASSPIRG, the Massachusetts Secretary of Public Safety agreed to do research on existing laws to see if this information could legally be made available to the MCDA for planning purposes. The Commonwealth and Utility have assured FEMA that they will continue their outreach and will provide TTY devices to any profoundly deaf person in the EPZ who requests one.

(C) EVACUATION PLANS ARE INADEQUATE

- (1) MASSPIRG: Given the difficulty in predicting the time when radioactivity

may be released during an accident, reactor operators and NRC inspectors should be trained to make accurate estimates under various accident scenarios in order to aid in the decision to order sheltering or evacuation.

FEMA: We believe that the prime responsibility for response to this rests with the NRC. However, we note that the State does not depend upon the Utility entirely for information; the advice of health physicists and radiation scientists of the Massachusetts Department of Public Health (MDPH) Radiation Control Unit will also be taken into consideration.

- (2) MASSPIRG: Time estimates for evacuation of the Pilgrim EPZ are too low, and do not take various weather scenarios or other variables into account.

FEMA: The evacuation and traffic management plans for the 10-Mile EPZ are clearly set forth in the Massachusetts Civil Defense Agency Area II Operations Plan. The time estimates are based upon the Evacuation Time Estimate Study, Pilgrim 1990 with Appendices A, B, C, and D, produced by HMM Associates, Waltham, Massachusetts. Their draft document, submitted August 19, 1981 to BECO, was accepted by the NRC and is included as part of the BECO plan as required by NUREG-0654, II,J.8. In response to statements made at the June 3, 1982 public meeting on off-site Radiological Emergency Response Plans for Pilgrim and by the Massachusetts Attorney General contesting the validity of the study, this document currently is being reviewed by FEMA for consistency with NUREG-0654, II, J.10.1 and Appendix 4 and the results of this review



will be included in the 44 CFR 350 finding. Meanwhile, the MCDA can revise the time estimates in the plan according to conditions prevailing during an incident.

- (3) MASSPIRG: There are no workable plans for evacuating special groups such as the physically disabled, nursing home residents, hospital patients, schoolchildren, campers, prison inmates, etc.

FEMA: Although this is a weak area in the plan, it is made clear that all of the resources of Area II as well as state resources will be brought to bear should it become necessary to evacuate special population groups. Transportation resources and special equipment have been inventoried and are considered adequate. The Plan provides that, if there is time, schoolchildren will return home to evacuate with their families, or, if decided at the State or local level, be evacuated in buses. MCDA has been seeking assistance from BECO in improving these elements of preparedness. More attention is also being given to providing means other than evacuation for protecting those who have impaired mobility.

- (4) MASSPIRG: There are no written agreements with bus companies or bus drivers to provide transportation of those who do not have a car or do not drive.

FEMA: There are no written agreements with private bus companies and drivers to provide emergency transportation, as yet. Such agreements will be actively sought. Appropriate arrangements also will be made with the Massachusetts Bay Transportation Authority (MBTA), a state agency that, in an emergency, may be directed by the governor to respond. According to the MCDA, a study of the availability of public transportation has been completed and is on computer.

(D) Medical Facilities Inadequate:

- (1) MASSPIRG: Hospital space and personnel trained in treatment of radioactivity-contaminated injured persons is almost non-existent.

FEMA: This concern has been addressed in accordance with NRC's requirements as follows:

- 1) The NRC through NUREG-0396 made it clear that medical requirements resulting from power plant accidents need involve only limited facilities for treatment of exposed or contaminated individuals. This position is in accord with NRC decision 30.776 which states that: "No additional medical facilities or capabilities are required for the general public since arrangements that currently are required for onsite personnel and emergency workers provide emergency capabilities that should be adequate for treatment of members of the general public. No contractual agreements are necessary, and no additional hospitals or other facilities need be constructed to handle individuals who may be exposed to dangerous levels of radiation since treatment requires a lesser degree of advance planning and can be arranged for on an as-needed basis during an emergency".
- 2) We note that all accredited Massachusetts hospitals are required by the Commonwealth to maintain a capability to treat exposed or contaminated individuals and emergency personnel are advised in the handling of radiation victims. In addition, as required by NRC regulations, the Utility has made arrangements with Jordan hospital in Plymouth to provide acute treatment for

exposed or contaminated personnel. This ability was reviewed by the May 1982 Exercise of the Emergency Plan and found acceptable.

These arrangements are documented on page 133 and Annex A of the Emergency Plan for the Pilgrim Nuclear Power Station.

- (2) MASSPIRG: There are no plans for distribution of radioprotective drugs to institutionalized persons or anyone else within the Pilgrim EPZ.

FEMA: The Commonwealth of Massachusetts has carefully reviewed this issue and formulated a policy for the distribution of potassium iodide which is that it will only be given to emergency workers under extraordinary circumstances. If there were a possibility of radioactive iodines being released, the Commonwealth would evacuate the area or shelter the population rather than have them take radioprotective drugs. This policy is based upon the Commonwealth's perception of the drug's potential adverse side effects if distributed to the general population, and is consistent with current federal policy.

(E) Size of the EPZ is Inadequate:

- (1) MASSPIRG: Jurisdictional boundaries, not demographic, topographic, or other natural/physical factors, were used in establishing the EPZ. Therefore, Cape Cod was not included in the emergency planning and it should have been.

FEMA: An analysis of the MASSPIRG report "Blueprint for Chaos II: Pilgrim Disaster Plans Still A Disaster" shows that many of the conclusions in that report upon which the petition is based are, in turn, based on a document that FEMA understands

is not generally accepted by the scientific community, "Calculation of Reactor Accident Consequences (CRAC 2) Results and Liquid Pathways (NUREG-1596) Study: Implications for Emergency Planning in the Vicinity of the Pilgrim Nuclear Power Station." The size of the Emergency Planning Zone for Pilgrim is based upon NUREG-0654 criteria and approved by the Regional Assistance Committee. The size of the EPZ to be used for radiological emergency response was determined by a joint NRC/EPA task force study. The conclusions reached by the task force are documented in NUREG-0396, EPA 520/1-78-016.

The NRC has been investigating accident source terms, probabilities and consequences of nuclear reactor accidents for several years. The result of these studies when complete are expected to be used in revising NUREG-0654. The revision of NUREG-0654 may include reconsideration of the size of the Emergency Planning Zone.

#### SUMMARY

MASSPIRG: FEMA's Interim Finding indicated 73 deficiencies in the emergency plans and preparedness for Pilgrim Nuclear Power Station.

FEMA: Of the 73 deficiencies mentioned in FEMA's 1982 Interim Findings, 13 were considered significant. Of these 13, only 1 remains outstanding today and is in the process of being corrected. The significant deficiency is in the



area of evacuation transportation of the special needs population. However, we were able to conclude that the public would be protected because of overall state ability, including being able to organize resources on an ad hoc basis.

Minor deficiencies are those which, even collectively, would not jeopardize the public health and safety, but could improve the plans and/or preparedness if corrected. Most of the minor deficiencies in our 1982 Interim Findings also have been corrected.