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**Date:** 01/26/2007 12:51:59 PM  
**Subject:** Backgrounder.pdf

**Mail Envelope Properties** (45BA3FB7.ADB : 11 : 56027)

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**Creation Date** 01/26/2007 12:51:45 PM  
**From:** "Sowdon, Thomas" <[tsowdon@entergy.com](mailto:tsowdon@entergy.com)>

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Mime.822	503017	

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# F.Y.I. For your information

## Pilgrim Nuclear Power Station

Rocky Hill Road, Plymouth, MA 02361



February 1991

### BECo Update on MDPH Case-Control Study of Leukemia

Last fall, the Massachusetts Department of Public Health (MDPH) released a study of leukemia incidence in Southeastern Massachusetts which suggests an association between potential exposure to radioactive effluents from Pilgrim Station and an elevated risk of leukemia. The authors also suggest that relatively high radioactive gaseous effluent release rates from Pilgrim which occurred during the period from 1972 to 1977 may be responsible for the observed excess risk.

First and foremost, there is no excess incidence of leukemia in the 22 town area for the study period from 1978 to 1986 when compared with Massachusetts as a whole or other standard population groups throughout the country. Figure 1 demonstrates this point. The areas identified as SEER areas constitute the Surveillance, Epidemiology and End Result program which provides reliable data on expected incidence rates of all types of cancer to the National Institutes of Health and the National Cancer Institute. You will note that there is no excess of leukemia in the 22 town area when compared to any other group. In fact, leukemia incidence rates for the study area appear to be slightly lower than all the other population groups in the comparison.

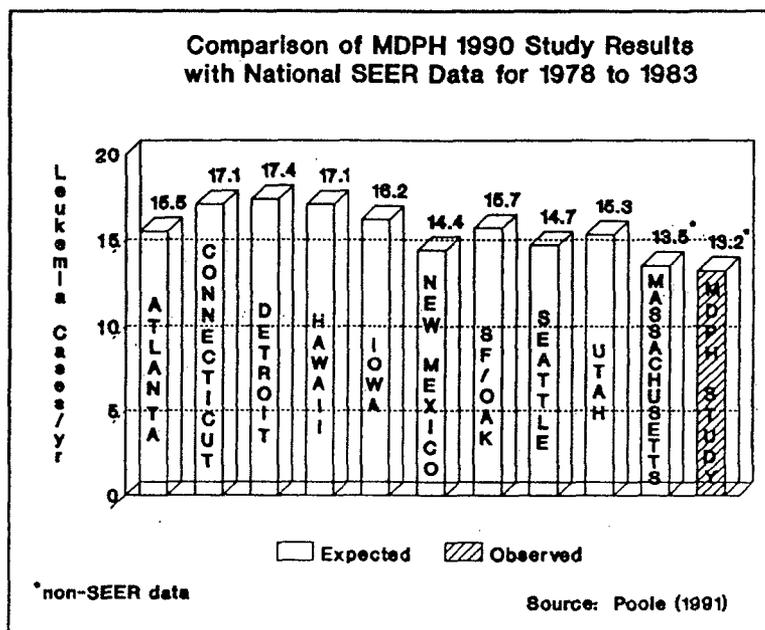


Figure 1

Considering the above information, how could the MDPH reach their reported conclusions? The model used by the MDPH to assess exposure to people in the study is a greatly simplified one which does not adequately represent the dose contribution from Pilgrim and does not consider the relative contribution of natural background to a person's total exposure.

Figures 2 and 3 compare the mathematical "Exposure Scores" used in the MDPH model with conservative calculations of exposure from actual plant emissions including natural background radiation. The scale used in the figures is logarithmic which means that the range of exposure scores is very large. According to the MDPH model, the relative score for exposure at a location near the site boundary could be as much as 6000 times that for a location 20 miles away -- a clearly unrealistic result if all sources of radiation, including background, were considered. None of the actual plant emissions were used to construct the MDPH exposure scores nor was the presence of natural background radiation adequately considered.

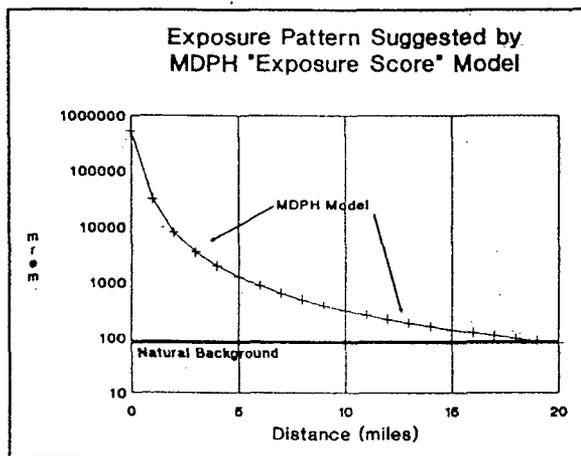


Figure 2

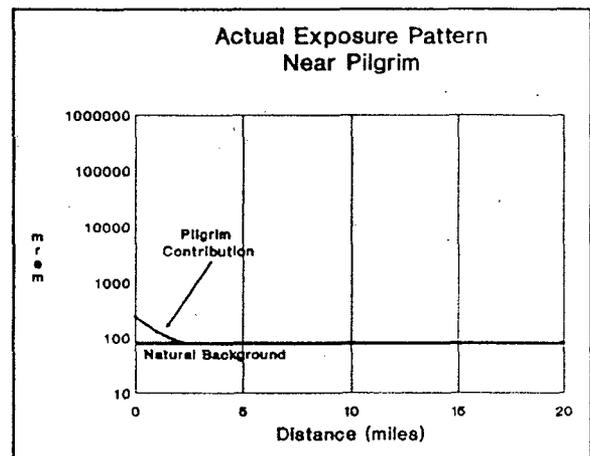


Figure 3

The MDPH interpreted their results to mean that people who had high exposure scores had also received high doses from Pilgrim. This is incorrect. - there is little or no relationship between "Exposure Score" and actual dose. This is a significant flaw in the study methodology.

The MDPH identified no cases of leukemia within a half-mile of the plant and no excess risk of leukemia within 2 miles. In addition, there were no excess cases of any type of radiation related cancer found among employees at Pilgrim Station according to a preliminary survey of data provided by the MDPH on cancer incidence among approximately 18,000 persons who have worked at the plant since 1968.

Emissions from Pilgrim Station, which have been monitored and measured over the time of the plant's operation, are so small as to be undetectable in the presence of natural background levels at distances beyond 2 miles from the plant.

Figure 4 shows the estimated doses resulting from background radiation and from releases of airborne radioactive material from Pilgrim for the period of time addressed by the MDPH study. Collectively, these releases have resulted in calculated offsite doses that are small fractions of natural background. Actual environmental measurements support these calculations.

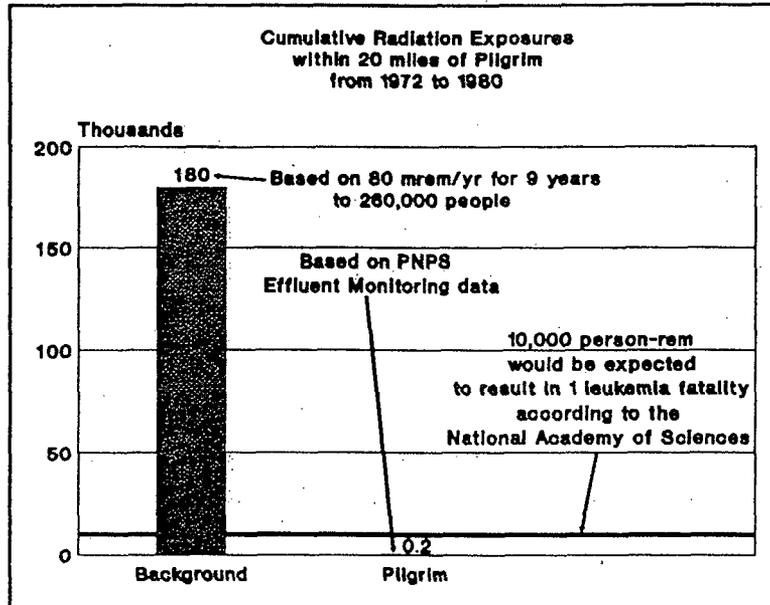


Figure 4

Pilgrim has not contributed enough dose to the nearby population to produce even one leukemia based on the latest risk estimates published by the National Academy of Sciences. These risk estimates were reported in the most recent report on the Biological Effects of Ionizing Radiation (BEIR V). If the results of the MDPH study were correct, the latest BEIR risk estimates would be in error by a factor of at least 1,000.

Furthermore, the MDPH study indicates that the excess leukemia risk practically disappeared after 1983. That result is not consistent with the last 40 years of information on health effects observed in populations exposed to ionizing radiation which demonstrate that the excess risk in those populations does not abruptly disappear after a short period of time.

Without explanation, the MDPH decided not to include 4 towns within the geographical bounds of the study area which have a history of higher-than-normal leukemia rates. Since the MDPH formula classifies those communities as having low exposure, their inclusion could have made leukemia incidence rates more balanced throughout the study area.

The MDPH study which alleges that there is an excess risk of leukemia associated with living and working near Pilgrim Station is not consistent with the results of the study of leukemia incidence in counties around nuclear facilities recently published by the National Cancer Institute. That study found no excess leukemia in Plymouth County.

**In summary, the conclusions of the MDPH leukemia study are not credible because THERE IS NO EXCESS INCIDENCE OF LEUKEMIA IN THE STUDY AREA, and because the study:**

- found no excess incidence of leukemia in persons living very close to the plant;
- did not consider actual releases from Pilgrim;
- did not consider natural background radiation exposures;
- found the leukemia risk disappeared too soon to be the result of radiation exposure;
- reported health effects that are entirely inconsistent with risk estimates reported by the National Academy of Sciences (BEIR V);
- reported health effects inconsistent with 40 years worth of government and academic scientific studies of exposed populations;
- reported health effects inconsistent with the National Cancer Institute study; and
- left out data from some towns in the study area which would have affected incidence rates.

If you have additional questions about this subject, please call Tom Sowdon (Pilgrim 747-8834) or Anita Flanagan (Pilgrim 747-8129).

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