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The Honorable Arlen Specter
United States Senate
Washington, DC 20510

Dear Senator Specter:

In her letter to you of October 26, 1985, your constituent, Ms. Maureen Hurley, states that: "Careful research is finding direct correlation between nuclear power plant routine releases and infant deaths and birth defects as well as leukemia and cancer".

To our knowledge, this claim is not supported by existing evidence. Given the existing knowledge regarding the potential hazards from low-level ionizing radiation and the "as low as is reasonably achievable" levels of releases of radioactive materials from NRC-licensed nuclear power reactors, it is highly unlikely that any excess incidence of leukemia or other cancer, birth or genetic effects would occur and even more unlikely that a statistical excess could be detected.

The estimated total annual dose to all persons residing within 1 to 50 miles of all U.S. nuclear power plants is approximately 160 person-rems. This dose is spread over 98 million people which results in an average dose per person of about 0.002 millirems per year. This average dose rate is much less than the normal background dose rate of about 100 millirems per year. This background radiation comes from naturally occurring sources of radiation such as cosmic rays and radioactive trace elements such as potassium, uranium, radium and thorium in soil, rocks and water.

The maximum radiation dose to any individual from nuclear power reactor operations is limited by Environmental Protection Agency Standards to 25 millirems per year, about 25% of the average natural background radiation dose rate. These EPA standards are reflected in the NRC regulations and in the conditions placed by the NRC on the operation of nuclear power reactors. Monitoring conducted by the licensee and verified by the NRC's inspection program and by environmental monitoring conducted by States verifies that nuclear power reactor effluent releases are as "low as is reasonably achievable."

The health implications of these radiation doses cannot directly be measured but have to be inferred from effects observed in populations exposed to high doses of ionizing radiation, such as the Japanese atomic bomb survivors. The risks calculated from these high doses and high dose rates are applied to the lower doses and dose rates from nuclear power plant effluents. If the total.

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annual population dose of 160 person-rem were to continue for forty years (the expected operating lifetime of nuclear power reactors), the projected number of fatal cancers would be about one. Thus the total operation of all U.S. nuclear power reactors over their lifetime might produce one additional fatal cancer in the exposed population of 98 million people.

This potential health impact may be compared to the number of cancer deaths that would be expected to occur from other causes in the same population of 98 million people. The existing (natural) cancer death rate for the U.S. is 188 deaths per year per 100,000 population. This rate, applied to the 98 million people living within 50 miles of a nuclear power reactor, would result in approximately 184,500 cancer deaths per year or about 7 million cancer deaths from natural causes over a 40-year period. The potential increase of 1 additional cancer death over the 7 million expected deaths could not possibly be detected.

The number of potential genetic effects is more difficult to evaluate because no irradiated human population has shown any detectable excess effects in their offspring. Based upon animal studies, the calculated total number of harmful genetic effects which would occur in all of the offspring of the 98 million people living in the vicinity of nuclear power plants would also be about one. This value may be compared to the normal incidence of genetic effects (107,000 cases per million live births) which would be expected to produce approximately 210,000 cases per year in the population of 98 million persons. Expressing this annual incidence over a 40-year period would result in approximately 8 million genetically-caused cases of ill health from natural causes. As was true for the cancer deaths, the increase of one potential genetic effect from the 40-year operation of all existing U.S. nuclear power reactors would be undetectable compared with the expected 8 million genetic effects. As was true for the cancer deaths, the potential increase in genetic effects would not be observable.

We are aware of studies that purport to show increased incidences of cancer or birth defects around U. S. nuclear power plants both from normal operation and from accidental releases from the Three Mile Island nuclear power plant. However, to our knowledge, these studies were not performed by trained epidemiologists. Studies conducted by trained epidemiologists with appropriate consideration of study design, statistical methods and potential interfering factors, have not shown any statistically identifiable increases in health effects due to nuclear power plant radioactive emissions. The enclosed study by the Pennsylvania Department of Health is an illustrative example. It does not support findings of increased cancer rates from the Three Mile Island accident.

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I hope that this letter is responsive to Ms. Hurley's concerns. If you have any further questions or would like additional information, please let us know.

Sincerely,

(Signed) T. A. Rehm

for Victor Stello, Jr.
Acting Executive Director
for Operations

Enclosure:
As stated

*See attached record notes for calculations and data references.

ct 12/30/85 *See previous concurrences

| OFFICE | RES | RES | RES | RES | RES | EDO | OCA |
|---------|------------|-------------|----------|----------|-----------|--------------|--------|
| SURNAME | HPeterson* | RAlexander* | EConti* | KGoller* | RMinogue* | VStello, Jr. | |
| DATE | 12/26/85 | 12/20/85 | 12/20/85 | 12/23/85 | 1/3/86 | 1/7/86 | 1/ /86 |

Prologue and Summary

CANCER MORTALITY AND MORBIDITY (INCIDENCE) AROUND TMI

George K. Tokuhata, Dr.P.H., Ph.D.*

Edward Digon, M.P.H.**

Division of Epidemiology Research
Pennsylvania Department of Health

September, 1985

* Dr. Tokuhata is Director, Division of Epidemiology Research; also Professor of Epidemiology and Biostatistics (adjunct), Graduate School of Public Health, University of Pittsburgh

** Mr. Digon is Chief, Special Studies Section, Division of Epidemiology Research



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

EDO PRINCIPAL CORRESPONDENCE CONTROL

FROM:

SEN. ARLEN SPECTER

DUE: 12/13/85

EDO CONTROL: 001226
DOC DT: 11/19/85
FINAL REPLY:

TO:

OCA

FOR SIGNATURE OF:

** GREEN **

SECY NO: 85-1021

EXECUTIVE DIRECTOR

DESC:

ROUTING:

ENCLOSES LETTER FROM MAUREEN HURLEY RE NUCLEAR
CONTAMINATION

DATE: 12/01/85

ASSIGNED TO: RES

CONTACT: MINOGUE

SPECIAL INSTRUCTIONS OR REMARKS:

RETURN INCOMING WITH REPLY.

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CORRESPONDENCE CONTROL TICKET

SECY NUMBER: 84-1021

LOGGING DATE 11/27/85

OFFICE OF THE SECRETARY

ACTION OFFICE: EDO
AUTHOR: Sen Arlen Specter --Const Ref
AFFILIATION: Maureen Hurley
LETTER DATE: 11/19/85
ADDRESSEE: OCA
SUBJECT: Nuclear contamination

ACTION: Direct Reply...Suspense: Dec 9
DISTRIBUTION: OCA to Ack
SPECIAL HANDLING: None
SIGNATURE DATE:

FILE CODE _____

FOR THE COMMISSION Champ

Rec'd Off. EDO
Date... 11-29-85
Time... 3:00 PM