Texas Preventable Disease
NEWS

Vol. 47, No. 1
January 10, 1987

contents:

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SUMMARY OF EVENTS AND BUREAU OF RADIATION CONTROL INVOLVEMENT IN THE SOVIET NUCLEAR REACTOR INCIDENT AT CHERNOBYL

On April 26, 1986, a nuclear disaster occurred at the Chernobyl power station in the Soviet Union. The Unit 4 reactor and the building that housed it were destroyed in the incident, and radiation was released into the atmosphere.

At a meeting of the International Atomic Energy Agency held August 25-29, 1986, in Vienna, Austria, Soviet officials presented a 382-page report and attributed the mishap primarily to six violations of safety procedures by plant operators during a test to determine the ability of a turbogenerator to provide in-house emergency power needs after its steam flow had been shut off.

On June 15, Pravda reported that the power plant director and other senior officials were fired for acting irresponsibly during the incident. According to September news reports, at least 31 people died and hundreds were hospitalized with radiation sickness. More than 150,000 people were evacuated from contaminated areas.

On April 29, upon learning of the nuclear disaster, personnel from the TDH Bureau of Radiation Control immediately went on alert. Bureau staff collected air samples daily in Austin, Midland, and Tyler for analysis by the TDH Bureau of Laboratories. Rainwater samples were collected and analyzed as available.

The air samples were collected as part of a nationwide network for the US Environmental Protection Agency -- Environmental Radiation Ambient Monitoring System. These samples were sent to the EPA laboratory in Montgomery, Alabama. Additional samples were collected for the EPA laboratory in Las Vegas, Nevada, as a part of the nationwide network called Standby Air Surveillance Network. Sample results were included in daily reports provided via electronic mail from the US Food and Drug Administration (FDA).

Twice weekly, samples of milk from Fort Worth and Austin were collected by the TDH Milk and Dairy Division and sent to the EPA laboratory in Montgomery for analysis. Results were obtained within 48 hours of sampling. These results were also included in the FDA daily reports. The Bureau collected 124 samples for the EPA monitoring system and analyzed 85 samples in-house. All levels reported were extremely small and far below levels that could pose any threat to public health, even among the most sensitive portions of the population, such as pregnant women.

TDH staff members responded to telephone calls from concerned citizens and the news media and conducted demonstrations or interviews for television and radio programs. Total calls from the press numbered 160. The Bureau also received 179 calls from the public and 121 telephone calls from other agencies.

Three Dallas residents were taken to Comanche Peak Steam Electric Station southwest of Fort Worth for whole-body contamination scans. These individuals had been traveling in the Kiev area of the Soviet Union at the time of the accident. In all, 28 individuals and approximately 150 items of clothing and luggage were checked for contamination at various regional locations around the state. Individual test results are confidential information; however, none of those tested exhibited radioactivity levels that were significant to human health. Clothing and other personal effects could be effectively decontaminated by thorough washing.

Radioactivity resulting from the mishap became evident at various monitoring sites around the country within days of the incident. In Texas, trace quantities of iodine-131 (I-131) were detected on air particulates collected in El Paso on May 10 and in Austin on May 12. Traces continued to be observed on air particulates through May 23. Maximum levels of I-131 observed were 0.4 picocurie per cubic meter of air. A few air samples contained detectable levels of cesium-137 and ruthenium-103. Rainwater samples collected in Austin on May 15 and 18 showed traces of I-131 (15 picocuries per liter or less). The milk sample collected in Fort Worth on May 20 showed traces of I-131 (20 picocuries per liter).

To help put these readings into perspective, they should be compared to the Protection Action Guides (PAGs), the federal levels at which preventive measures would be taken. FDA's PAGs are designed for the most sensitive elements of the population (infants and pregnant women) and are used primarily for relatively short-term radiological incidents. The guides are established well below levels that would trigger any health effects. FDA's guides are more protective than those established by others, such as the European Common Market members and Sweden. The guides become even more protective when they are applied cumulatively across all isotopes covered by the regulation. The PAGs for I-131 are 130,000 pCi/m^2 (picocuries per square meter) for deposition (a measure that combines the concentration of radiation in rainwater and the amount of rainfall) and 15,000 pCi/l (picocuries per liter) for milk.

If the PAG levels are reached, the FDA might advise people to avoid drinking fresh milk or consuming other dairy products, to eat processed foods when possible, and to wash or peel fresh produce. For imports, the FDA might initiate a control program which could include automatic detention, release with comment, or refusal of entry. However, the radiation levels detected in the United States were so low that they were of no public health significance, either on a short- or long-term basis.

Iodine-131 is of special significance because it is one of the most copiously emitted radionuclides. It is the product of fresh fissionable materials (bombs or nuclear power production), and, because of its short half-life (eight days), the normal background level is zero. I-131 is readily taken into the body from food, milk, and water. Once in the body, it tends to concentrate in the thyroid. Large amounts can damage or destroy the thyroid. Since the thyroid plays a key role in the body's metabolism, destruction of the thyroid will cause many of the body's processes to slow to a dangerous rate. However, a person without a thyroid can function almost normally by taking replacement thyroid hormones. At lower levels of exposure, smaller doses of radioiodine may, over a long period of time, produce cancer of the thyroid.

Normal exposure from radiation is called background radiation and measures between 100 and 200 millirems per year in the United States. Background radiation is comprised of three elements: terrestrial, cosmic, and natural radiation.

Terrestrial radiation results from the natural radionuclides present in the soil and varies across the US depending on geology. In the Atlantic and Gulf coastal plains, the measure is 15 to 35 millirems per year; in northeastern, central, and far western areas of the US, 35 to 75 millirems per year; and on the Colorado Plateau, 75 to 140 millirems per year.

Cosmic radiation is received from outer space, and the measure depends on the altitude above sea level -- higher altitudes have higher doses. At sea level, the dose is about 27 millirems per year; at 6,000 feet (Denver), the dose is about 50 millirems per year.

Natural radiation results from the radioactive material naturally present in the body and produces a dose of about 30 millirems per year. To estimate a whole-body dose, the three dose levels from terrestrial, cosmic, and natural radiation must be added together.

People are exposed to radiation in other ways. Women who watch an average amount of color television for a year may receive about 0.3 millirem to their reproductive systems. Since the male reproductive system lies almost entirely outside the body, the dose men receive is about three times greater, or about 1 millirem a year. A coast-to-coast plane flight of about four hours at 30,000 feet will result in a radiation dose of about 1 millirem. A chest roentgenogram requires about 15 to 25 millirems exposure. Other non-natural sources account for less than 10 millirems of exposure per year. These include tiny amounts of radiation from nuclear power lants and even lesser amounts from electron microscopes, airport inspection machines, and minous watch dials.

PA places an emission limit on some radioisotopes present in reactors (eg, five millicuries of dine-129, 0.5 millicurie of transuranic elements per gigawatt-year of operation). EPA also stricts the annual exposure of the population from all parts of the nuclear fuel cycle, cluding nuclear power plants, to 25 millirems to the whole body or any organ, except to the yroid for which the limit is 75 millirems.

UMMARY

he global health impact of the Chernobyl incident can be measured in various ways. The sultant deaths and hospitalizations of reactor workers and the local population clearly monstrate the severe impact on the nearby area. The evacuation of the population in rrounding areas indicates the potential impact to a large number of people. For the people in eas far distant from such an incident, there appears to be little if any health impact at all.

or the residents of Texas and other states in the US, the Chernobyl experience has particular portance. It has demonstrated that a nationwide system of air and water sampling under nergency conditions can provide important information regarding potential hazards. dditionally, public health agencies measure and/or control other man-made or natural diation exposures through education and regulatory programs. Effective coordination of both utine and emergency efforts plays a vital role in the protection of the public's health.

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is report was prepared by Teresa Cage, Bureau of Radiation Control, Texas Department of Health.

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Reported Morbidity and Mortality in Texas 1985 ANNUAL SUMMARY

Reported Morbidity and Mortality in Texas - 1985 Annual Summary is a publication of the Bureau of Epidemiology. This report contains the official data on the reported incidence of notifiable diseases in Texas and provides additional epidemiological descriptions of communicable disease activity throughout the state. Numerous illustrations of disease trends and an overview of special surveillance activities conducted by the Bureau of Epidemiology are also provided. The report is further supplemented by data provided by the Bureau of Communicable Disease Control, the Bureau of Laboratories, and the Bureau of Vital Statistics.

Although copies of the report have been mailed to public health professionals, libraries, and other interested health professionals, a limited number of copies are still available and may be requested in writing from:

Infectious Disease Division
Bureau of Epidemiology
Texas Department of Health
1100 W. 49th Street
Austin, Texas 78756-3180

ATTN: Jan Pelosi

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CALL FOR PAPERS
THIRTY-SEVENTH ANNUAL
SOUTHWEST CONFERENCE ON DISEASES IN NATURE TRANSMISSIBLE TO MAN

Date: Thursday, April 2 and Friday, April 3, 1987
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J.V. Irons Lecturer: Dr. S. S. Kalter, Southwest Foundation for Biomedical Research, San Antonio, Texas

Those wishing to submit papers should send their name, address, telephone number, and subject or title of the paper to Charles Sweet, DrPH, Bureau of Laboratories, Texas Department of Health, 1100 West 49th Street, Austin, Texas, 78756; telephone: (512) 458-7318 or STS 824-9318. Slide and overhead projection will be provided.

TEXAS PREVENTABLE DISEASE NEWS (ISSN 8750-9474) is a free, weekly publication of the Texas Department of Health, 1100 West 49th Street, Austin, TX 78756-3180. Second-class postage paid at Austin, TX. POSTMASTER: Send address changes to TEXAS PREVENTABLE DISEASE NEWS, 1100 West 49th Street, Austin, TX 78756-3180.

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