

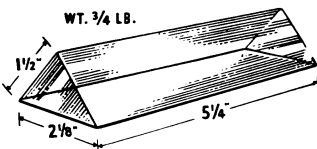
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PUBLIC SAFETY

Reactor Disaster Unlikely

➤ A MAJOR reactor disaster could kill about 50 persons, seriously injure as many as 1,000, and could result in several hundreds of millions of dollars in damages to land.

However, the chances of such an uncontrolled explosion are believed "vanishingly small," Dr. Paul F. Gast of the General Electric Company's Hanford Laboratories, Richland, Wash., reported. The Hanford plant is operated by GE for the Atomic Energy Commission.

He told the First National Conference on Applied Meteorology meeting in Hartford, Conn., that these estimates are based on "theoretical considerations," and could be either under or over by a factor of three. In a major reactor accident, Dr. Gast said, the chief hazard comes from the radioactive fission products accumulated in the reactor core.

In an explosion, these highly radioactive materials would be scattered as tiny particles, sifting slowly to earth as fallout. Most of the fission products, Dr. Gast's calculations show, would not escape from the

reactor building. However, the small fraction that might escape could cause death from overexposure to radiation to anyone within up to 10 to 50 miles downwind from the reactor.

Besides this "non-routine" problem, Dr. Gast also reported on the "outstanding routine" radiation pollution problem: the operation of chemical processing plants. In these plants, the fuel elements that have been irradiated in the nuclear reactor are dissolved, and the uranium and plutonium are separated and purified.

Radioactive iodine-131 has been found to be the most difficult to handle. This could be deposited on vegetation in the surrounding area and there consumed by grazing animals. The allowable limits of atmospheric concentration are therefore set at 1,000 times less than the limit determined by direct breathing of iodine by humans.

Dr. Gast said this extremely low level is typical of the difference in tolerance levels between industrial pollution and radioactive materials.

Science News Letter, December 21, 1957

PUBLIC SAFETY

Exposure Limits Cut

➤ THE PERMISSIBLE LEVELS of radiation for atomic workers and the public has been lowered by two-thirds by the Atomic Energy Commission.

The new standard maximum exposures were recommended by the National Committee on Radiation Protection and Measurement. One basic revision is a new limit on the total radiation dose any individual worker may accumulate beyond the age of 18 to an average of five "rems" per year and not more than 15 rems within any year.

A rem, or roentgen equivalent man, is a dose of any ionizing radiation estimated to produce a biological effect equivalent to that produced by one roentgen of X-rays.

For persons living near atomic installations, the new permissible levels are one-tenth the exposure allowed atomic workers, as in the past.

Another change adopted by the AEC concerns radioactive substances that tend to remain in the human body, either distributed evenly throughout or concentrated near the reproductive organs. The levels have been dropped to one-third those previously specified for occupational exposure to the substances.

The NCRPM had also suggested limiting the radiation exposure to the reproductive organs of the entire population from all sources, including medical and other man-made sources, and background, to not more than 14,000,000 rems per million of population over the period from conception to age 30, and one-third that amount in each decade thereafter. In

accord with this, the AEC requires that its industrial operations must not release any radiation that might be expected to expose the population to an average whole body dosage exceeding one-half a rem per year.

Science News Letter, December 21, 1957

Questions

ASTRONOMY—What three Arizona sites are being studied as possible locations for the projected National Astronomical Observatory? p. 387.

EDUCATION—What percentage of teachers leave their profession within five years? p. 388.

TECHNOLOGY—How great a speed did the Patterson, a free piston gas turbine powered ship, achieve in its trial runs? p. 399.

Photographs: Cover, Chance Vought Aircraft Inc.; p. 387, U. S. Army; p. 389, National Advisory Committee for Aeronautics; p. 394, Merck Sharp & Dohme; p. 400, Bakelite, Inc.

RADIO

Saturday, Dec. 28, 1957 1:30-1:45 p.m. EST
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Wallace Brode, associate director of the National Bureau of Standards, Washington, D.C., and president-elect of the A.A.A.S., will discuss "Science at the Indianapolis meeting of the American Association for the Advancement of Science."

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