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NRC OFFICE FOR ANALYSIS AND EVALUATION OF OPERATIONAL DATA  
ISSUES 1991 ANNUAL REPORT

The Nuclear Regulatory Commission's Office for Analysis and Evaluation of Operational Data (AEOD) has issued its 1991 Annual Report.

Volume I presents an overview of the operating experience of the nuclear power industry from the NRC perspective and includes comments about the trends of some key performance measures.

Volume 2 covers non-reactor facilities and activities associated with the use of NRC-licensed radioactive materials and presents information on matters such as personnel overexposures to radiation and medical misadministrations of radioactive materials.

According to the 1991 Annual Report, the overall trends of power reactor safety appear to be leveling off after over six years of steady improvement.

Data used for this conclusion are obtained from:

(1) a set of seven performance indicators--the number of unplanned reactor scrams while the reactor is critical, the number of safety system actuations, safety system failures, the number of significant events, forced outage rates, the number of equipment-forced outages per 1,000 hours that a reactor is critical and the collective radiation exposure per plant. When viewed as a set, these indicators generally show a leveling off in 1990 and 1991.

(2) accident sequence precursors--a quantitative examination of operating experience involving important events or conditions such as one or more safety systems failing on demand or found inoperable, or occurrence of an initiator such as loss of offsite power, or loss-of-coolant accident systematically combined in a complex model to quantify the conditional probability of damage to the reactor fuel.

Data through 1990 indicate that, after improving trends during the early and mid-1980's, the frequency and severity of risk significant events and conditions have not changed significantly. Data for 1991 available since publication of the report show a slight worsening.

Although overall safety performance has plateaued, collective radiation exposure for employees at nuclear power plants continued to improve and violations of NRC limits on personal exposure to radiation are rare.

Approximately 8,000 non-reactor licensees are authorized by the NRC to possess and use radioactive materials--the majority of them for applications such as radiography, gauges and well logging. Approximately 2,200 licensees are authorized to administer radioactive materials or radiation from those materials to individuals for medical diagnosis or therapy.

According to the report, the dominant health concern associated with these uses of NRC-licensed radioactive materials is the possible damage that can occur from overexposure to radiation. In this regard, for 1991, there were:

(1) 21 non-reactor events reported to the NRC in which 26 individuals received exposures that were greater than those permitted by NRC regulations (compared to 24 events and 30 licensee employees in 1990); and

(2) 463 medical misadministrations (444 diagnostic treatments and 19 therapy administrations)--about the same number of diagnostic misadministrations as in 1990 and about two times the average number reported from 1981 to 1989 and about the same number of therapy misadministrations as in 1990 and about 10 percent higher than the number reported in the previous nine years--were reported to the NRC.

However, since the NRC staff estimates that about seven million diagnostic procedures and 30,000 radiopharmaceutical therapy procedures and 50,000 brachytherapy procedures are performed annually in the United States (about 40 percent performed by NRC licensees and the remainder by Agreement State licensees), the error rate for all types of misadministrations remained very low.

Copies of the two-volume report, NUREG-1272, Vol. 6, Nos. 1 and 2, can be purchased from the Government Printing Office, P.O. Box 37082, Washington, D.C. 20013-7982.

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