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NRC OFFICE FOR ANALYSIS AND EVALUATION OF OPERATIONAL DATA
ISSUES 1990 ANNUAL REPORT

The Nuclear Regulatory Commission's Office for Analysis and Evaluation of Operational Data (AEOD) has issued its 1990 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.

It also presents the principal findings and issues identified in Office studies conducted during the year, information from such sources as licensee event reports, diagnostic evaluations and reports to the NRC's Operations Center as well as the status of staff actions resulting from previous Incident Investigation Team (IIT) reports.

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 1990 report, the overall safety performance of power reactors shows a continuing overall improving trend.

Data used for this conclusion are obtained from:

(1) a set of eight performance indicators--the number of unplanned automatic reactor scrams while a reactor is critical, the number of selected safety system actuations, the number of significant events, the number of safety system failures, forced outage rates, the number of equipment-forced outages per 1,000 hours that a reactor is critical, the collective radiation exposure per plant and cause-code trends which are obtained by examining the cause of each licensee event report;

(2) abnormal occurrences--an individual incident, recurring event, generic concern or a series of incidents that the Commission determines are significant from the standpoint of public health and/or safety and which are reported to Congress in a quarterly report; and

(3) accident sequence precursors--a quantitative examination of operating experience involving important events (such as one or more safety systems failing on demand or found failed during testing or maintenance, two or more safety systems or subsystems found degraded, or occurrence of an initiator such as loss of offsite power, loss-of-coolant accident or steam line break) systematically combined with hypothesized additional failures in complex analyses to quantify residual probability of damage to the reactor fuel.

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 2,400 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 1990, there were:

(1) 24 non-reactor events reported to the NRC in which 30 licensee individuals received exposures that were greater than those permitted by NRC regulations (compared to 28 events and 40 licensee employees in 1989); and

(2) 467 medical misadministrations (443 diagnostic treatments and 24 therapy administrations)--about three times the average number of therapy misadministrations and an increase of about 10 percent in the average number of diagnostic misadministrations reported in the prior nine years--were reported to the NRC. However, since the NRC staff estimates there are about seven million diagnostic and 180,000 therapy procedures performed per year in this country (about 40 percent by NRC licensees and the remainder by Agreement State licensees), the error rate for all types of misadministrations remained very low--about 0.0001 per diagnostic procedure and between 0.0002 and 0.0003 per therapy procedure.

Copies of the two-volume report, NUREG-1272, Vol. 5, 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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