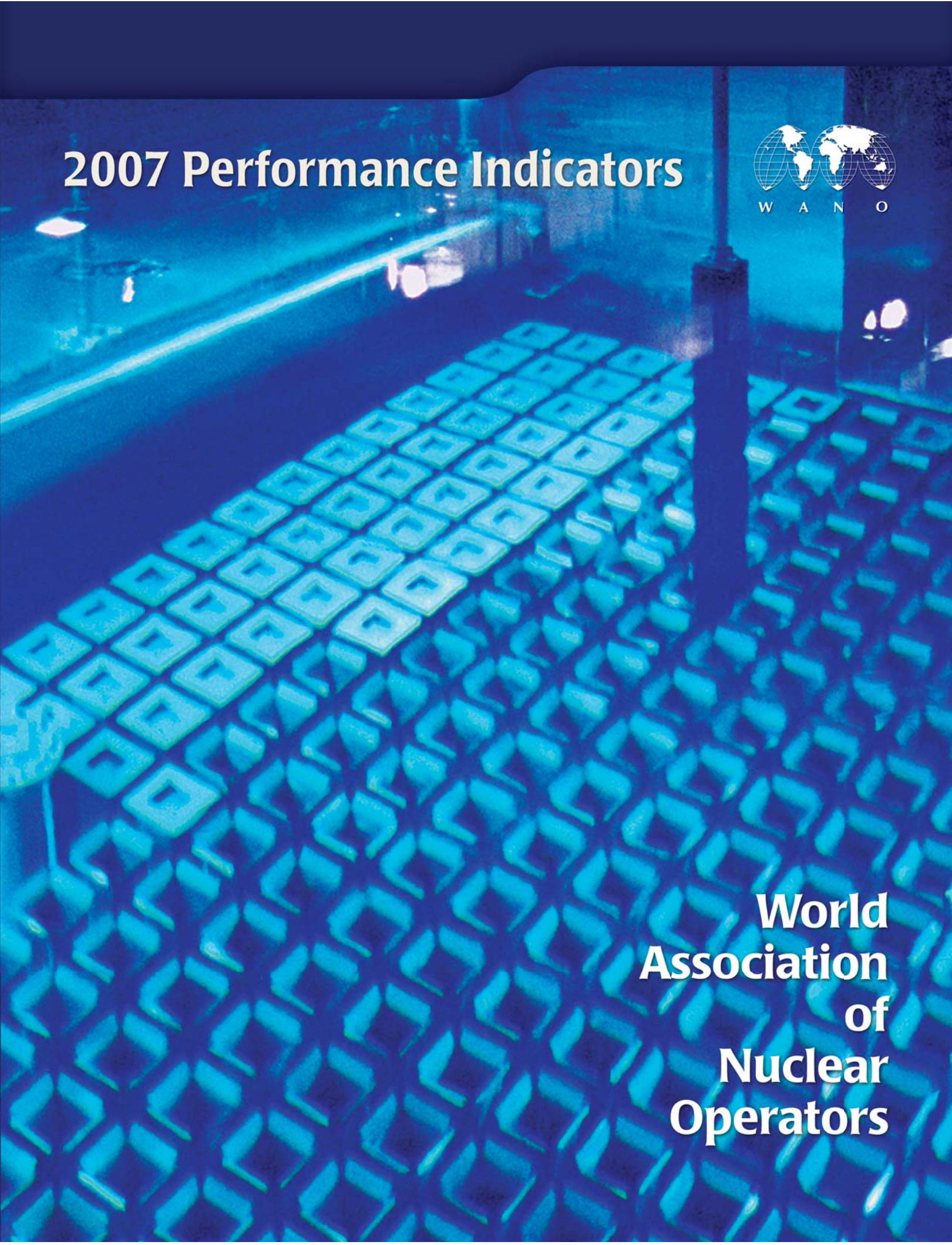
2007 Performance Indicators



WANO

World Association of Nuclear Operators

WANO monitors five additional performance indicators: safety system performance, fuel reliability, chemistry performance, grid-related loss factor and contractor industrial safety accident rate. The first three indicators are defined in a manner that reflects differences in plant-specific designs, configurations, or operational practices. As a result, data can not be summarized across reactor types for inclusion in this report. The last two are new indicators. These indicators are available to WANO members in more detailed reports on the WANO Website.

Safety System Performance

The safety system performance indicator monitors the availability of three important standby safety systems at each plant. Safety systems that are maintained in a high state of readiness have a high probability of being capable of mitigating off-normal events.

Fuel Reliability

The fuel reliability indicator monitors progress in preventing defects in the metal cladding that surrounds fuel. Maintenance of fuel cladding integrity reduces radiological impact on plant operations and maintenance activities.

Chemistry Performance

The chemistry performance indicator provides an indication of progress in controlling chemical parameters to retard deterioration of key plant materials and components. These parameters are already being maintained within strict guidance developed by the industry.

Grid-Related Loss Factor

The grid-related loss factor is the percentage of maximum energy generation that a plant could not supply due to grid issues not under plant management control.

Contractor Industrial Safety Accident Rate

The contractor industrial safety accident rate tracks the number of accidents among contractors that result in lost work time, restricted work, or fatalities per 200,000 work-hours.

The WANO Performance Indicator Programme supports the exchange of operating experience information by collecting, trending and disseminating nuclear plant performance data in 11 key areas. The data is gathered for a set of quantitative indicators of plant performance. These indicators are intended principally for use as a management tool by nuclear operating organisations to monitor their own performance and progress, to set their own challenging goals for improvement, and to gain additional perspective on performance relative to that of other plants.

It is now widely recognised that a good set of overall performance indicators can provide a partial, but important and useful, measure of how well a nuclear plant is managed overall.

WANO published and distributed the first performance indicator report in April 1991. In 1993, reporting of data began for all reactor designs. Currently, 72 percent of the operating nuclear power plants report all eleven indicators.

It is expected that the use of WANO performance indicators will encourage emulation of the best industry performance. It should also further motivate the identification and exchange of good practices in nuclear plant operations.

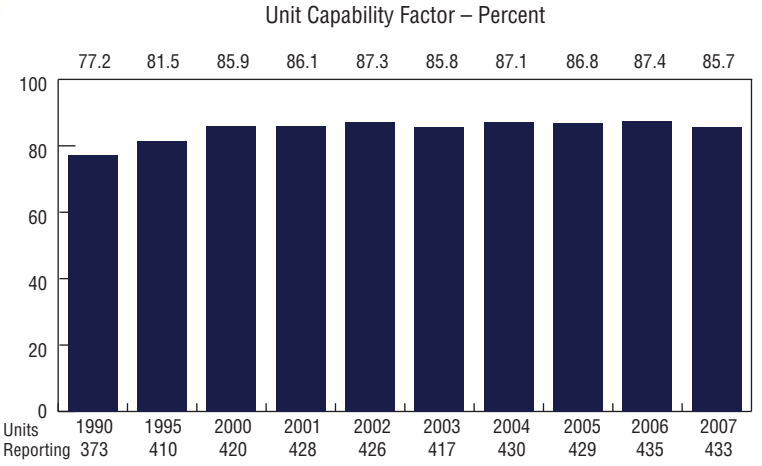
Notes: (1) The median of plant values is displayed for all indicators except unplanned automatic scrams per 7,000 hours critical, where the mean of plant values is shown, and industrial safety accident rate, which is an overall industry value (summation of plant values).

(2) Half of the plant values are above and half are below the displayed median values. The mean is the arithmetical average of the plant values. The median value is normally displayed rather than the mean value because the median value is less susceptible to influence of outliers and is therefore more representative of overall performance.

(3) Worldwide collection of data needed to calculate the forced loss rate indicator did not begin until 2001.

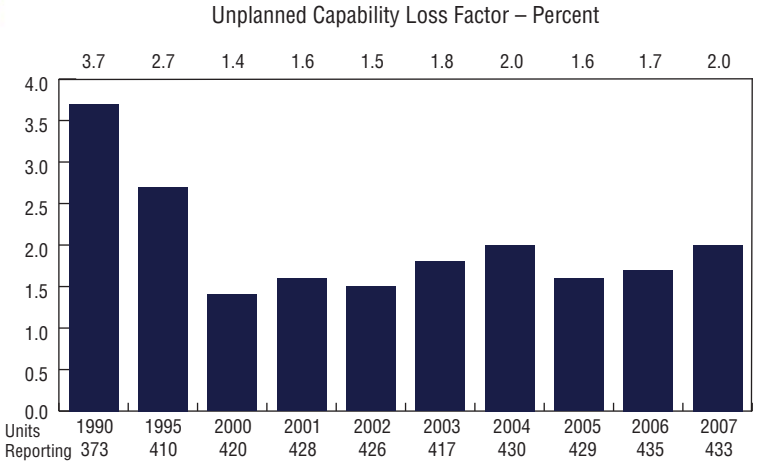
Unit Capability Factor

Unit capability factor is the percentage of maximum energy generation that a plant is capable of supplying to the electrical grid, limited only by factors within control of plant management. A high unit capability factor indicates effective plant programmes and practices to minimise unplanned energy losses and to optimise planned outages.



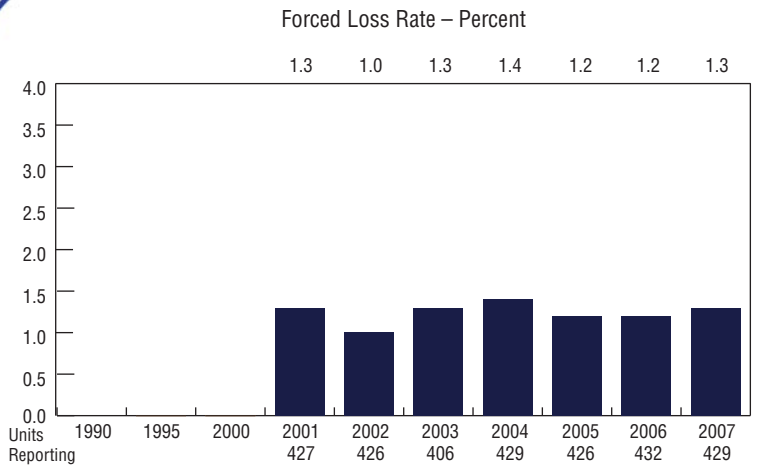
Unplanned Capability Loss Factor

The unplanned capability loss factor is the percentage of maximum energy generation that a plant is not capable of supplying to the electrical grid because of unplanned energy losses, such as unplanned shutdowns or outage extensions. A low value indicates important plant equipment is well maintained and reliably operated and there are few outage extensions.



Forced Loss Rate

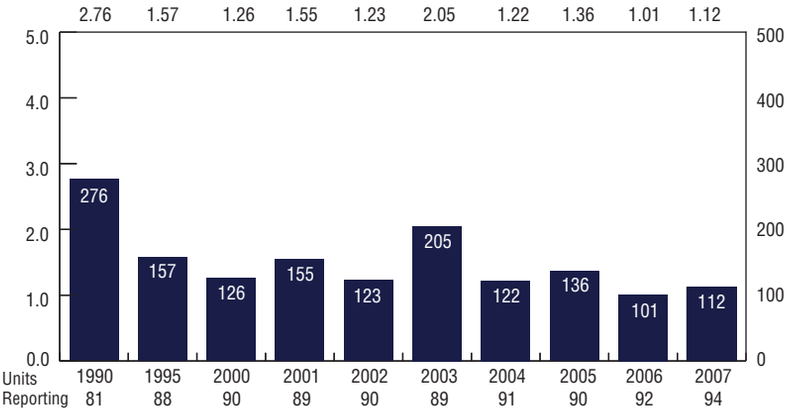
The forced loss rate is the percentage of energy generation during non-outage periods that a plant is not capable of supplying to the electrical grid because of unplanned energy losses, such as unplanned shutdown or load reductions. A low value indicates important plant equipment is well maintained and reliably operated. (See Note 3.)



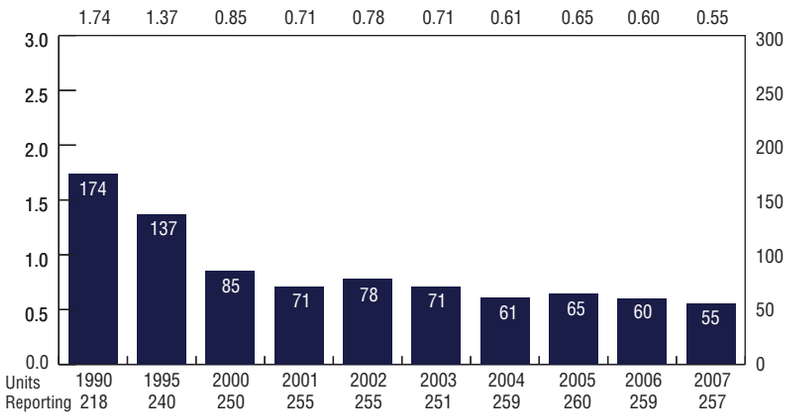
Collective Radiation Exposure

The collective radiation exposure indicator monitors the effectiveness of personnel radiation exposure controls for boiling water reactors (BWRs), pressurised water reactors (PWRs), pressurised heavy water reactors (PHWRs), light-water-cooled graphite reactors (LWCGRs), and gas-cooled reactors (GCRs). Low exposure indicates strong management attention to radiological protection.

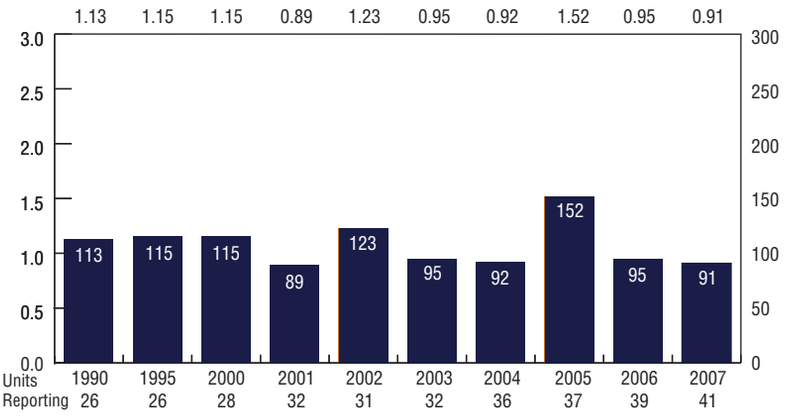
Collective Radiation Exposure (BWRs). Man-Sieverts per unit, Man-rem per unit



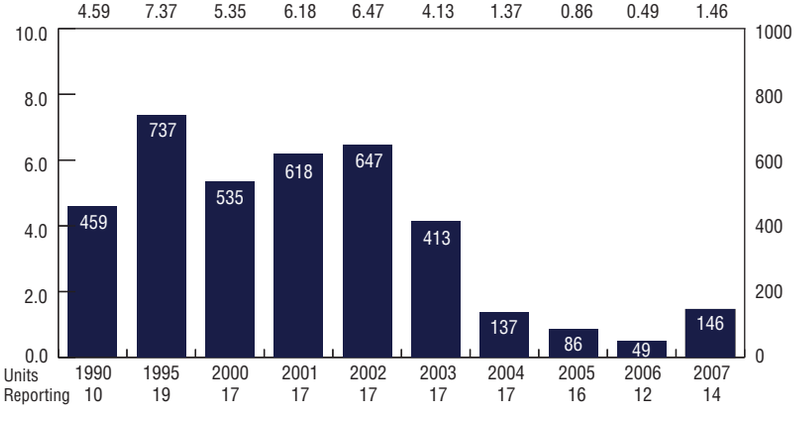
Collective Radiation Exposure (PWRs). Man-Sieverts per unit, Man-rem per unit



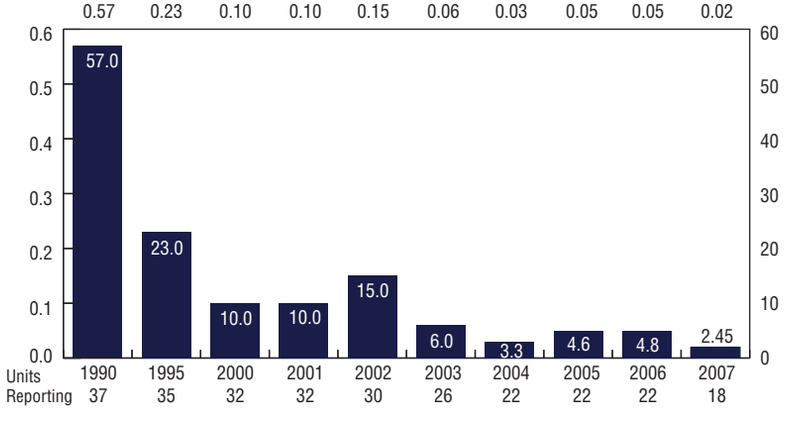
Collective Radiation Exposure (PHWRs). Man-Sieverts per unit, Man-rem per unit



Collective Radiation Exposure (LWCGRs). Man-Sieverts per unit, Man-rem per unit

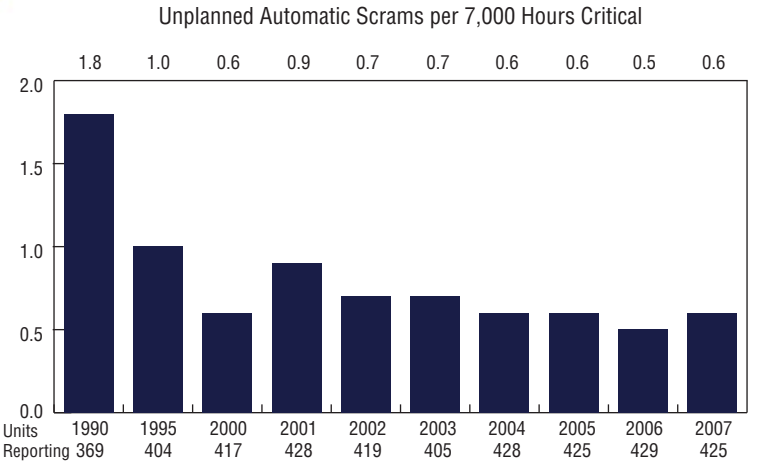


Collective Radiation Exposure (GCRs). Man-Sieverts per unit, Man-rem per unit



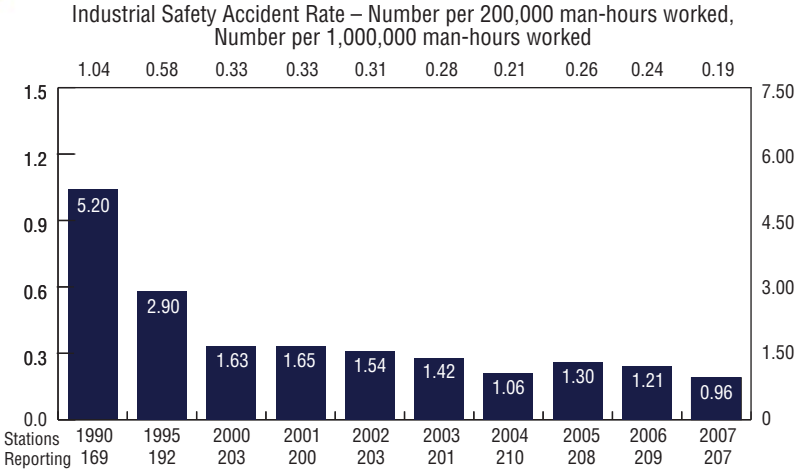
Unplanned Automatic Scrams per 7,000 Hours Critical

The unplanned automatic scrams per 7,000 hours critical indicator tracks the mean scram (automatic shutdown) rate for approximately one year (7,000 hours) of operation. Unplanned automatic scrams result in thermal and hydraulic transients that affect plant systems.



Industrial Safety Accident Rate

The industrial safety accident rate tracks the number of accidents among employees that result in lost work time, restricted work, or fatalities per 200,000 work-hours. The nuclear industry continues to provide one of the safest industrial work environments.



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