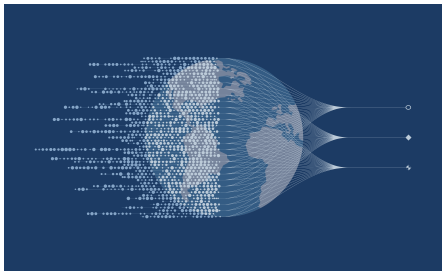

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analysis of nuclear power reactor outages as sources of elevated radioxenon releases

Radioxenon discharges from nuclear power reactors (NPPs) are frequently detected by the noble gas monitoring systems of the International Monitoring System. However, the standard assumption of continuous releases is not realistic. It has been demonstrated that ramping power down and up during operations are occasions of elevated discharges, which are most likely to be observed. Despite this, only limited information is available about these relevant NPP operations.
This study utilizes comprehensive outage data from the International Atomic Energy Agency's Power Reactor Information System (PRIS) to statistically analyze the frequency and duration of outages. The analysis focuses on planned full outages, during which reactor units are disconnected from the grid for purposes such as inspection, maintenance, repair, refueling, or a combination of these activities. The statistics are presented by reactor type, including Boiling Water Reactors (BWRs), Gas-Cooled Reactors (GCRs), Pressurized Water Reactors (PWRs), Pressurized Heavy Water Reactors (PHWRs), and Light Water Graphite Reactors (LWGRs). The results of this study support event screening and expert technical analysis of radiological events of interest, helping to distinguish reactor emissions from nuclear explosion signals and enhancing the understanding of the operational sources of elevated radioxenon releases.

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