



**WARNING:  
UNCONTROLLED  
RADIOACTIVE  
RELEASES**

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**BURIED BELOW IS A TANGLE  
OF CORRODED PIPES  
UNINSPECTED FOR DECADES  
NOW LEAKING  
RADIOACTIVE WATER**

A Beyond Nuclear Report

## **EXECUTIVE SUMMARY**

“Leak First, Fix Later” was first published in April 2010. Now nearly five years later, Beyond Nuclear has taken another look at the problem of aging and deteriorating piping systems carrying radioactive liquids that still run under every nuclear power plant.

Nuclear power plants have an extensive network of buried piping systems and tanks which transport liquids that contain radioactive isotopes including tritium -- a radioactive form of hydrogen -- and long-lived strontium-90. These piping systems -- defined either as “buried” or “underground” --are not adequately inspected or maintained due to their inaccessibility.

The United States Nuclear Regulatory Commission (NRC) is the federal regulator charged by Congress with the oversight and enforcement of regulations and its licensing agreements governing these nuclear power plants.

U.S. reactors continue to experience leaks and spills of radioactive material into groundwater the unmonitored pathways from unknown and unanticipated sources.

To date, the nuclear industry and the federal regulator have failed to focus action plans on how to control and monitor pathways carrying radioactive material to prevent these leaks from occurring. Instead, despite broad uncertainties, the federal regulator and industry are using predictive and probabilistic models to estimate the remaining service life on uninspected and unmaintained pipes before leaks may be expected to occur.

As early as 1979, the NRC publicly identified the need for the nuclear industry to begin a proactive program of inspections and maintenance for the “Prevention of Unplanned Releases of Radioactivity” from reactors. Now, more than three decades later, the call for preventive action remains totally ignored by both the nuclear industry and its regulator.

The only apparent gain is that leaks are being reported. But the nuclear industry is self-reporting these repeated uncontrolled radioactive leaks to groundwater under an industry-led “voluntary initiative” program. In our view, voluntary reporting is not a reliable or acceptable substitute for a comprehensive regulatory program aimed at protecting water resources.

Now, five years after our initial 2010 report, Beyond Nuclear has determined that the NRC has failed to mandate any corrective action programs that focus on inspection and maintenance programs aimed at groundwater protection by preventing ongoing radioactive leaks and contamination of water resources.

## Main Findings

- The licensing agreement between the nuclear power plant operators and the NRC is determined by General Design Criteria including control of radioactivity including "Criterion 60—Control of releases of radioactive materials to the environment. The nuclear power unit design shall include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational occurrences.
- Uninspected, unmaintained and aging buried piping systems at nuclear power plants continue to experience unanticipated and unpredicted radioactive leaks into groundwater. The number of these uncontrolled and unmonitored leaks is increasing.
- The NRC has failed to mandate any enforcement or corrective action programs that focus on inspection and maintenance programs aimed at groundwater protection by preventing ongoing radioactive leaks and contamination of water resources.
- The nuclear industry and the federal regulator have failed to focus action plans on how to prevent these leaks from occurring. Instead, the federal regulator and industry are using predictive and probabilistic models to estimate the remaining service life on uninspected and unmaintained pipes before leaks may be expected to occur.
- The industry “voluntary” actions remain focused on radioactive leak detection, fixing and mopping up after a leak to groundwater as opportunities occur. In fact, the initiative serves more to protect the industry from liability than to protect the water.

## Main Recommendations

- Regulatory oversight, authority and enforcement must be restored and strengthened.
- Standardized NRC regulations should require that underground pipes and tanks be promptly replaced so that systems carrying radioactive effluent can be inspected, monitored, maintained and contained in the event of leaks.
- The nuclear industry must be held accountable for radioactive releases to air, water and soil.
- There must be more public transparency describing the source, cause and extent of radioactive releases from nuclear power plants.
- Radiation protection standards must be strengthened and applied consistently nationwide.



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**A report from Beyond Nuclear**

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