

TABLES
2005 Liquid Effluent Releases of Tritium
From Pressurized Water Reactors Operating in the United States

- 2005 Liquid Effluent Releases of Tritium, in Curies, from Pressurized Water Reactors Operating in the U.S. pages 1-8
- Frequency (in days) of planned batch liquid radioactive releases from operating U.S. pressurized water reactors, for the year 2005 page 9

2005 Liquid Effluent Releases of Tritium, in Curies,
From Pressurized Water Reactors Operating in the U.S.

Arkansas Nuclear One 1 & 2	Arkansas 1	Arkansas 2
Location	Arkansas	
Electrical output	836 MWe	858 MWe
License	1974-2034	1978-2018
Reactor vendor/type	Babcock & Wilcox/ Lowered Loop	Combustion Engineering
Operator	Entergy	
Total release	711	461
Beaver Valley 1 & 2	Beaver Valley 1	Beaver Valley 2
Location	Pennsylvania	
Electrical output	821 MWe	831 MWe
License	1976-2016	1987-2027
Reactor vendor/type	Westinghouse Three-Loop	
Operator	FirstEnergy	
Total release 1 & 2	2449	
Braidwood 1 & 2	Braidwood 1	Braidwood 2
Location	Illinois	
Electrical output	1161 MWe	1154 MWe
License	1987-2026	1988-2027
Reactor vendor/type	Westinghouse Four-Loop	
Operator	Exelon	
Total release	881	881
Byron Station 1 & 2	Byron Station 1	Byron Station 2
Location	Illinois	
Electrical output	1163 MWe	1131 MWe
License	1985-2024	1987-2026
Reactor vendor/type	Westinghouse Four-Loop	
Operator	Exelon	
Total release 1 & 2	2520	

Callaway 1		
Location	Missouri	
Electrical output	1125 MWe	
License	1984-2024	
Reactor vendor/type	Westinghouse Four-Loop	
Operator	Union Electric Co.	
Total release	1292	
Calvert Cliffs 1 & 2		
	Calvert Cliffs 1	Calvert Cliffs 2
Location	Maryland	
Electrical output	825 MWe	835 MWe
License	1974-2034	1976-2036
Reactor vendor/type	Combustion Engineering	
Operator	CCNPPI - subsidiary of Constellation Energy Group	
Total release 1 & 2	991	
Catawba 1 & 2		
	Catawaba 1	Catawaba 2
Location	South Carolina	
Electrical output	1129 MWe	1129 MWe
License	1985-2024	1986-2026
Reactor vendor/type	Westinghouse Four-Loop	
Operator	Duke Energy	
Total release 1 & 2	1528	
Comanche Peak 1 & 2		
	Comanche Peak 1	Comanche Peak 2
Location	Texas	
Electrical output	1150 MWe	1150 MWe
License	1990-2030	1993-2033
Reactor vendor/type	Westinghouse Four-Loop	
Operator	TXU Generation Company LP	
Total release 1 & 2	1475	
Crystal River 3		
Location	Florida	
Electrical output	834 MWe	
License	1977-2016	
Reactor vendor/type	Babcock & Wilcox Lowered Loop	
Operator	Florida Power Corp.	
Total release	694	
Davis-Besse 1		
Location	Ohio	
Electrical output	882 MWe	
License	1977-2017	
Reactor vendor/type	Babcock & Wilcox Lowered Loop	
Operator	FirstEnergy Nuclear Operating Co.	
Total release	407	

D. C. Cook 1 & 2			DC Cook 1	DC Cook 2
Location	Michigan			
Electrical output	1000 MWe	1060 MWe		
License	1974-2014	1977-2017		
Reactor vendor/type	Westinghouse Four-Loop			
Operator	Indiana Michigan Power Co.			
Total release 1 & 2	525			
Diablo Canyon 1 & 2			Diablo Canyon 1	Diablo Canyon 2
Location	California			
Electrical output	1087 MWe	1087 MWe		
License	1984-2021	1985-2025		
Reactor vendor/type	Westinghouse Four-Loop			
Operator	Pacific Gas & Electric Co.			
Total release 1 & 2	2951			
Fort Calhoun 1				
Location	Nebraska			
Electrical output	478 MWe			
License	1973-2013			
Reactor vendor/type	Combustion Engineering			
Operator	Omaha Public Power District			
Total release	142			
Ginna 1				
Location	New York			
Electrical output	480 MWe			
License	1969-2009			
Reactor vendor/type	Westinghouse Two-Loop			
Operator	Rochester Gas & Electric Corp.			
Total release	260			
H B Robinson 2				
Location	South Carolina			
Electrical output	710 MWe			
License	1970-2010			
Reactor vendor/type	Westinghouse Three-Loop			
Operator	Carolina Power & Light Co.			
Total release	554			
Indian Point 1, 2, & 3			Indian Point 1 & 2	Indian Point 3
Location	New York			
Electrical output	951 MWe	979 MWe		
License	1973-2013	1976-2015		
Reactor vendor/Type	Westinghouse Four-Loop			
Operator	Entergy Nuclear IP2 LLC		Entergy Nuclear Operations, Inc.	
Total release 1, 2, & 3	321	951		

Joseph M. Farley 1&2			
	Farley 1	Farley 2	
Location	Alabama		
Electrical output	830 MWe	839 MWe	
License	1977-2017	1981-2021	
Reactor vendor/Type	Westinghouse Three-Loop		
Operator	Southern Nuclear Operating Co., Inc		
Total release	595	720	
Kewaunee 1			
Location	Wisconsin		
Electrical output	511 MWe		
License	1973-2013		
Reactor vendor/Type	Westinghouse Two-Loop		
Operator	Dominion Energy Nuclear Management Corp.		
Total release	226		
McGuire 1 & 2			
	McGuire 1	McGuire 2	
Location	North Carolina		
Electrical output	1100 MWe	1100 MWe	
License	1981-2021	1983-2023	
Reactor vendor/Type	Westinghouse Four-Loop		
Operator	Duke Energy Corp.		
Total release 1 & 2	1435		
Millstone 2 & 3			
	Millstone 2	Millstone 3	
Location	Connecticut		
Electrical output	871 MWe	1130 MWe	
License	1975-2015	1986-2025	
Reactor vendor/Type	Combustion Engineering	Westinghouse Four-Loop	
Operator	Dominion Nuclear Connecticut, Inc.		
Total release	496	1715	
North Anna 1 & 2			
	North Anna 1	North Anna 2	
Location	Virginia		
Electrical output	925 MWe	917 MWe	
License	1978-2018	1980-2020	
Reactor Vendor/Type	Westinghouse Three-Loop		
Operator	Virginia Electric & Power Co.		
Total release 1 & 2	1053		
Oconee 1, 2, & 3			
	Oconee 1	Oconee 2	Oconee 3
Location	South Carolina		
Electrical output	846 MWe	846 MWe	846 MWe
License	1973-2033	1973-2033	1974-2034
Reactor Vendor/Type	Babcock and Wilcox Lowered Loop		
Operator	Duke Energy Corp.		
Total release 1, 2, & 3	893		

Palisades 1			
Location	Michigan		
Electrical output	730 MWe		
License	1971-2011		
Reactor Vendor/Type	Combustion Engineering Nuclear Management Co., LLC		
Operator	Co., LLC		
Total release	305		
Palo Verde 1, 2, & 3			
	Palo Verde 1	Palo Verde 2	Palo Verde 3
Location	Arizona		
Electrical output	1243 MWe	1243 MWe	1247 Mwe
License	1985-2024	1986-2025	1987-2027
Reactor Vendor/Type	Combustion Engineering Standard Design		
Operator	Arizona Public Service Co.		
Total release	"There were no liquid effluent releases beyond the Site Boundary from PVNGS" page 11		
Point Beach 1 & 2			
	Point Beach 1	Point Beach 2	
Location	Wisconsin		
Electrical output	510 MWe	512 MWe	
License	1970-2010	1973-2013	
Reactor Vendor/Type	Westinghouse Two-Loop		
Operator	Nuclear Management Co., LLC		
Total release 1 & 2	553		
Prairie Island 1 & 2			
	Prairie Island 1	Prairie Island 2	
Location	Minnesota		
Electrical output	522 MWe	522 MWe	
License	1974-2013	1974-2014	
Reactor Vendor/Type	Westinghouse Two-Loop		
Operator	Nuclear Management Co.		
Total release 1 & 2	516		
Salem 1 & 2			
	Salem 1	Salem 2	
Location	Delaware		
Electrical output	1096 MWe	1092 MWe	
License	1976-2016	1981-2020	
Reactor Vendor/Type	Westinghouse Four-Loop		
Operator	PSEG Nuclear, LLC		
Total release	336	200	
San Onofre 2 & 3			
	San Onofre 2	San Onofre 3	
Location	California		
Electrical output	1070 MWe	1080 MWe	
License	1982-2022	1983-2022	
Reactor Vendor/Type	Combustion Engineering		
Operator	Southern California Edison Co.		
Total release 2 & 3	1132		

Seabrook 1		
Location	New Hampshire	
Electrical output	1155 MWe	
License	1990-2026	
Reactor Vendor/Type	Westinghouse Four-Loop	
Operator	North Atlantic Energy Service Corp.	
Total release	1300	
Sequoyah 1 & 2		
	Sequoyah 1	Sequoyah 2
Location	Tennessee	
Electrical output	1125 MWe	1126 MWe
License	1980-2020	1981-2021
Reactor Vendor/Type	Westinghouse Four-Loop	
Operator	TVA	
Total release 1 & 2	1481	
Shearon Harris		
Location	North Carolina	
Electrical output	900 MWe	
License	1987-2026	
Reactor Vendor/Type	Westinghouse Three-Loop	
Operator	Carolina Power and Light Co.	
Total release	330	
South Texas 1 & 2		
	South Texas 1	South Texas 2
Location	Texas	
Electrical output	1251 MWe	1251 MWe
License	1988-2027	1989-2028
Reactor Vendor/Type	Westinghouse Four-Loop	
Operator	STP Nuclear Operating Co.	
Total release	408	1519
St Lucie 1 & 2		
	St Lucie 1	St Lucie 2
Location	Florida	
Electrical output	839 MWe	839 MWe
License	1976-2016	1983-2023
Reactor Vendor/Type	Combustion Engineering	
Operator	Florida Power and Light Co.	
Total release	168	168
Summer		
Location	South Carolina	
Electrical output	966 MWe	
License	1982-2042	
Reactor Vendor/Type	Westinghouse Three-Loop	
Operator	South Carolina Electric and Gas Co.	
Total release	466	

Surry 1 & 2			Surry 1		Surry 2	
Location	Virginia					
Electrical output	810 MWe		815 MWe			
License	1972-2012		1973-2013			
Reactor Vendor/Type	Westinghouse Three-Loop					
Operator	Virginia Electric and Power Co.					
Total release 1 & 2	842					
TMI 1						
Location	Pennsylvania					
Electrical output	802 MWe					
License	1974-2014					
Reactor Vendor/Type	Babcock & Wilcox Lowered Loop					
Operator	AmerGen Energy Co., LLC					
Total release	765					
Turkey Point 3 & 4		Turkey Point 3		Turkey Point 4		
Location	Florida					
Electrical output	693 MWe		693 MWe			
License	1972-2032		1973-2033			
Reactor Vendor/Type	Westinghouse Three-Loop					
Operator	Florida Power & Light Co.					
Total release	291		291			
Vogtle 1 & 2		Vogtle 1		Vogtle 2		
Location	Georgia					
Electrical output	1152 MWe		1149 MWe			
License	1987-2027		1989-2029			
Reactor Vendor/Type	Westinghouse Four-Loop					
Operator	Southern Nuclear Operating Co. Inc.					
Total release	1175		683			
Waterford 3						
Location	Louisiana					
Electrical output	1075 MWe					
License	1985-2024					
Reactor Vendor/Type	Combustion Engineering					
Operator	Entergy Operations, Inc.					
Total release	700					
Watts Bar 1						
Location	Tennessee					
Electrical output	1125 MWe					
License	1996-2035					
Reactor Vendor/Type	Westinghouse Four-Loop					
Operator	TVA					
Total release	1336					

Wolf Creek 1	
Location	Kansas
Electrical output	1165 MWe
License	1985-2025
Reactor Vendor/Type	Westinghouse Four-Loop
Operator	Wolf Creek Nuclear Operating Corp.
Total release	582

Sources: Individual reactor fact sheets and the 2005 Effluent Reports for each plant. See links at <http://www.nrc.gov/info-finder/reactor> and at <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html>.

Back to related information at http://www.ieer.org/sdfiles/16-1/tritium_releases.html.

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Frequency (in days) of planned batch liquid radioactive releases from operating U.S. pressurized water reactors, for the year 2005

Arkansas Nuclear One 1	1.9	Oconee 1,2,3	2.0
Arkansas Nuclear One 2	3.6	Palisades	40.6
Beaver Valley 1&2	3.5	Palo Verde 1,2,3	None
Braidwood 1&2	2.7	Point Beach 1&2	No data
Byron Station 1&2	3.6	Prairie Island 1&2	2.3
Callaway	2.9	Salem 1	3.8
Calvert Cliffs 1&2	8.5	Salem 2	7.8
Catabwa 1&2	4.8	San Onofre 2&3	3.0
Comanche Peak 1&2	6.9	Seabrook 1	2.2
Crystal River 3	No data	Sequoyah 1&2	2.4
Davis-Besse	8.9	Shearon Harris 1	10.7
DC Cook 1&2	6.6	South Texas 1	5.7
Diablo Canyon 1&2	0.6	South Texas 2	3.6
Fort Calhoun	2.2	St Lucie 1	10.1
Ginna	3.7	St Lucie 2	10.4
H.B. Robinson 2	3.9	Summer	1.5
Indian Point 1&2	7.8	Surry 1&2	No data
Indian Point 3	2.9	Three Mile Island 1	8.1
Joseph M. Farley 1	1.4	Turkey Point 3	4.9
Joseph M. Farley 2	1.0	Turkey Point 4	4.9
Kewaunee	10.1	Vogtle 1	2.8
McGuire 1&2	1.8	Vogtle 2	7.9
Millstone 2	5.1	Waterford 3	4.0
Millstone 3	0.8	Watts Bar 1	3.2
North Anna 1&2	No data	Wolf Creek 1	5.9

Sources: Primarily, the 2005 *Annual Radioactive Effluent Release Report* (sometimes called the *Radiological Effluent Release Report*) for each plant. Links to these reports are at: <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html>. Also useful is the list at <http://www.nrc.gov/info-finder/reactor/#AlphabeticalList>.

Notes:

1. Reading the table, examples: Arkansas Unit 1 released contaminated liquid effluents 191 times in 2005, which is, on average, a release about every 2 days. Arkansas Unit 2 had 102 releases, which is, on average, a release every 3.6 days.
2. Operating plants with unplanned releases in 2005 are: Beaver Valley 1&2, Callaway, Davis-Besse, Joseph M. Farley 2, North Anna, Three Mile Island 1, and Watts Bar 1. These unplanned releases are not reflected in the data in the table above.
3. Indian Point 1, though not operating, is included in the table because the reported data for Unit 2 was combined with Unit 1 in 2005.
4. The Turkey Point Units 3 and 4 data raise questions. Both units are reported to have had 75.5 batch releases (we have used 75). There is no such thing as a "half" release; it is either no release or one release. We also think that all of the liquid release data are odd, because they are identical for each reactor; not just the number of batches, but the length of time the releases took, the curie content, every datum point.

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