

## *Early Reactors in the United States and Russia*

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The first nuclear reactors for commercial civilian applications were developed in the early 1950's. In 1951, Experimental Breeder Reactor (EBR-1), located at the National Reactor Testing Station in Idaho, was completed and was operated by Argonne National Laboratory. In the first demonstration of nuclear-generated electricity in the United States, 4 light bulbs were supplied (Right hand photo) . EBR-1 was a prototype of the metal cooled reactors. The BORAX III reactor, a BWR prototype, actually lit the town of Arco in a 1955 demonstration. ([More on Argonne history](#)). Argonne-West is a division of the national laboratory operated by the University of Chicago.

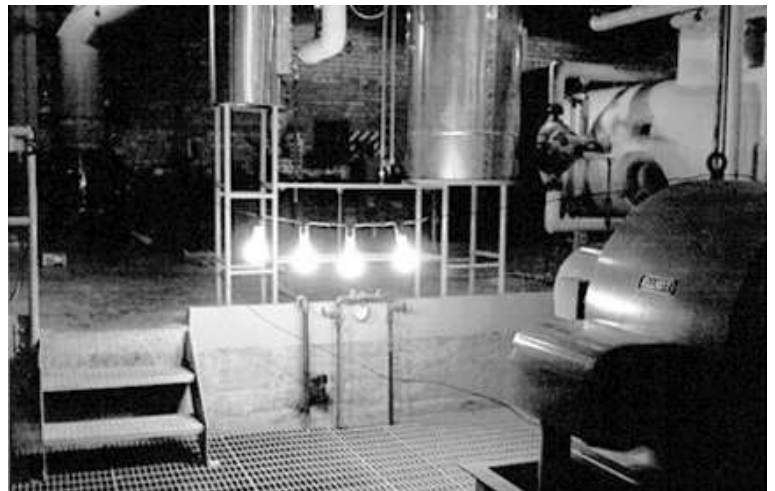
[Stagg Field](#) at the university was home of the world's first nuclear reactor, which was completed in December [1942](#) by a team of scientists headed by Enrico Fermi. Subsequently, the [Graphite Reactor](#) was built at Oak Ridge to demonstrate that plutonium could be produced from uranium. This pilot scale reactor was a predecessor to the production reactors built at Hanford, Washington and is attributed to be the first to generate electricity.

In the 1950's and 1960's, a number of smaller reactors of different designs ([PWR](#), [BWR](#), [metal cooled](#), organic coolant, [gas cooled](#)) were built and operated. Eventually, in the US, the PWR and BWR designs were the only survivors of the pilot plant stage. The table below shows the history of the early reactors.

### **EBR-1 Reactor - first US Reactor to supply electricity**

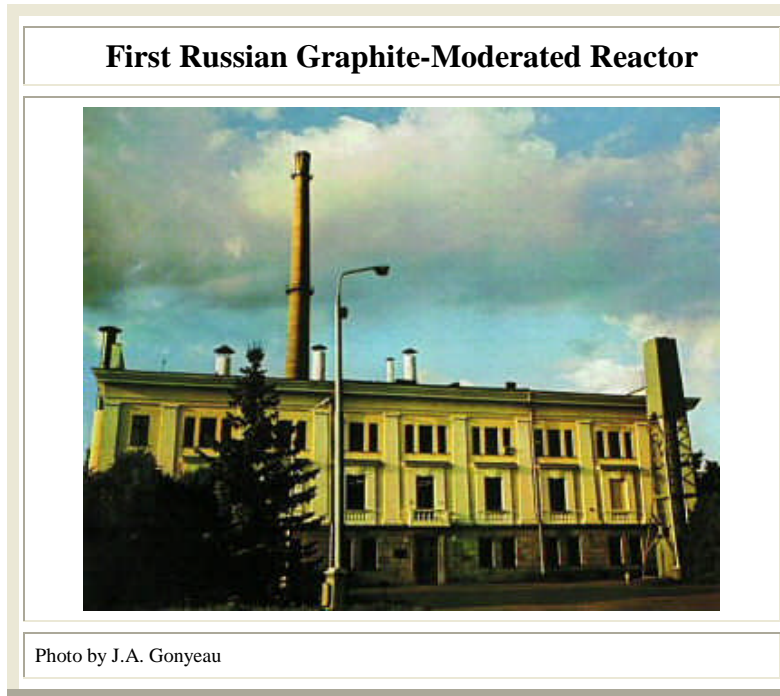


Photo by J.A. Gonyeau



Courtesy [Argonne National Laboratory - West](#)

In Russia at about the same time, the Institute of Physics and Power Engineering developed a 10 MW graphite moderated reactor at [Obninsk](#). This reactor commenced operation in 1954 and was the precursor of the RBMK design. The reactor was used to provide district heating for many years. The reactor is now shutdown.



During the 1960's, a number of smaller prototype reactors were designed and operated by utilities and/or government agencies. These included:

<i>Year</i>	<i>Unit</i>	<i>MWe</i>	<i>Location</i>	<i>Utility</i>	<i>Reactor Type</i>	<i>Shutdown</i>
1957	<a href="#">Shippingport</a>	60	Shippingport, PA	Duquesne Light	PWR / LWBR	1982
1960	<a href="#">Dresden 1</a>	200	Morris, IL	Commonwealth Edison	BWR	1978
1961	<a href="#">Yankee Rowe</a>	160	Rowe, MA	Yankee Atomic	PWR	1991
1962	<a href="#">Big Rock Point</a>	60	Charlevoix, MI	Consumers Power	BWR	1997
1963	<a href="#">Indian Point 1</a>	250	Buchanan, NY	Consolidated Edison	PWR	1974
1963	<a href="#">Humboldt Bay 3</a>	60	Eureka, CA	PG&E	BWR	1976
1963	<a href="#">Hallam</a>	75	Hallam, NB		LMGMR	1964
1964	<a href="#">BONUS</a>	70	Rincon, PR		BWR	1968
1966	<a href="#">Fermi 1</a>	60	Monroe, MI	Detroit Edison	LMFBR	1978
1966	<a href="#">Hanford-N</a>	860	Richland, WA	AEC/WPPSS	LGR	1988
1966	<a href="#">Pathfinder</a>	60	Sioux Falls, SD	Northern States Power	BWR	1967
1967	<a href="#">Peach</a>	40	Peach Bottom, PA	Philadelphia Electric	HTGR	1974

	<a href="#">Bottom 1</a>					
1969	<a href="#">LaCrosse</a>	50	Genoa, WI	Dairyland Power	BWR	1987

### Legend

<i>Abbreviation</i>	<i>Meaning</i>
BWR	Boiling Water Reactor
LGR	Light Water Cooled - Graphite Moderated Reactor
LMFBR	Liquid Metal Fast Breeder Reactor
LMGMR	Liquid Metal (Cooled) -Graphite Moderated Reactor
LWBR	Light Water Breeder Reactor
PWR	Pressurized Water Reactor

Subsequently, larger reactors were designed and operated starting with the San Onofre 1 and Connecticut Yankee PWRs in 1967 and Oyster Creek and Nine Mile Point 1 BWRs in 1969. These newer reactors were rated at 400 to 600 MWe. [Argonne](#) and [Oak Ridge](#) National Labs, [DOE](#) and [NRC](#) have each provided short histories of nuclear power.