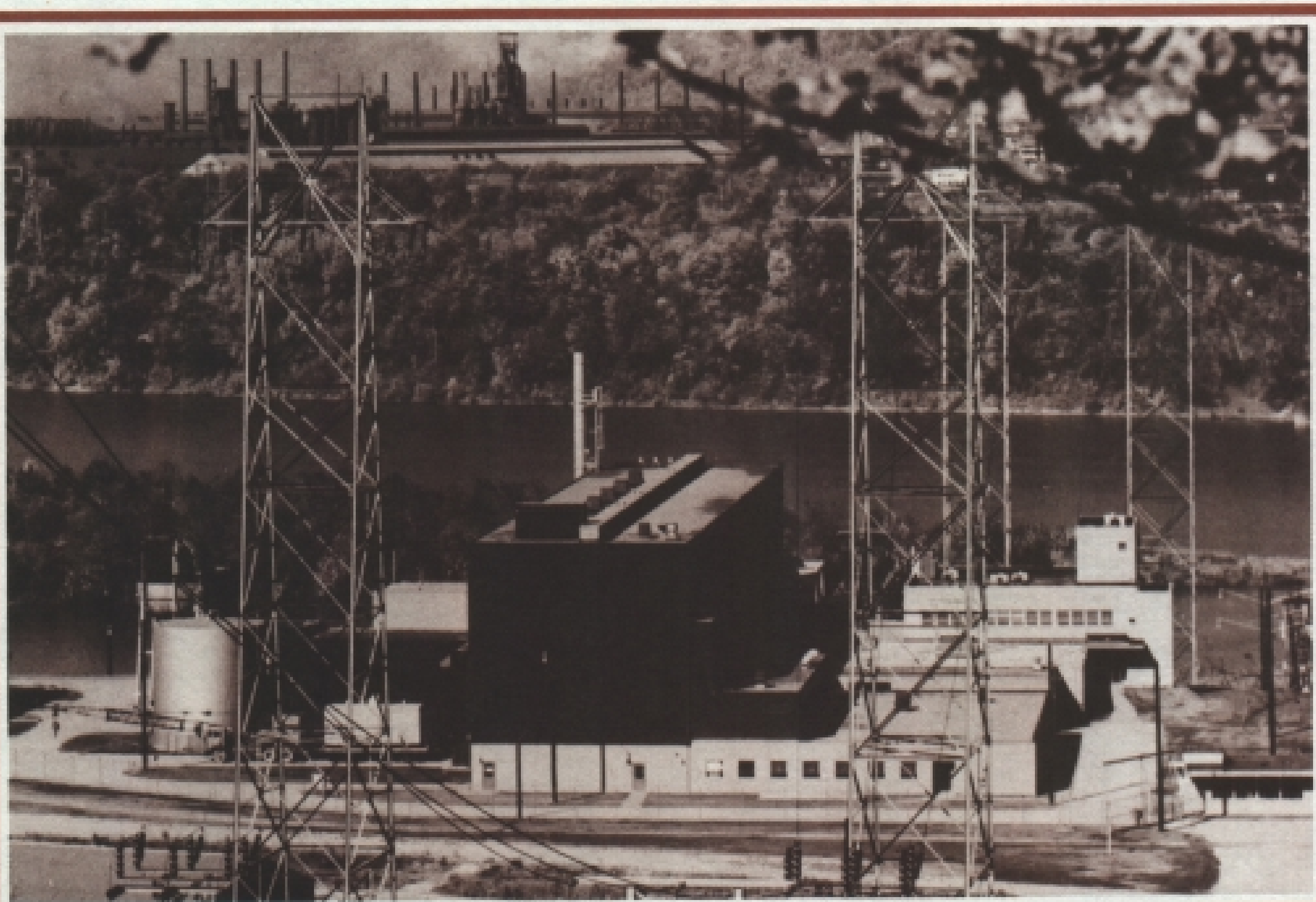
Historic Achievement Recognized



SHIPPINGPORT ATOMIC POWER STATION

A National Historic Mechanical Engineering Landmark

On December 8, 1953 President Dwight D. Eisenhower went before the United National General Assembly to propose an “Atoms For Peace” plan. One of the cornerstones of the plans for the peaceful uses of atomic energy was the building of a nuclear power plant for the commercial generation of electricity to be used as part of a utility system. Thus the congressional Joint Committee on Atomic Energy and the Atomic Energy Commission developed plans for an atomic power station.

A large-scale light water reactor for a proposed aircraft carrier was then being designed at Westinghouse Electric Corporation’s Bettis Atomic Power Laboratory under the technical direction and in cooperation with the Division of Naval Reactors of the Atomic Energy Commission. However, the Federal Government had cancelled the plans for the aircraft carrier. It was decided this design effort could be redirected into a civilian reactor for electric power production. The AEC notified the electric utility industry that they were accepting bids from utilities with the proposal that the utility participate in building and operating a full-scale atomic power station as part of its generating system.

The AEC gave responsibility for supervision of the building and operation of the reactor plant portion of the electric generating station to its experts on light water reactors: The Division of Naval Reactors. With a bid that included supplying the land, the turbine generator and $5 million toward the research and development of the light water reactor, Duquesne Light Company was chosen as the utility for the project. The land was located in the small village of Shippingport, Pennsylvania on the Ohio River about 25 miles from Pittsburgh.

The principal responsibility for carrying the Shippingport project to a successful conclusion was given to then Rear Admiral H. G. Rickover, Director of the AEC Division of Naval Reactors.

SHIPPINGPORT ATOMIC POWER STATION

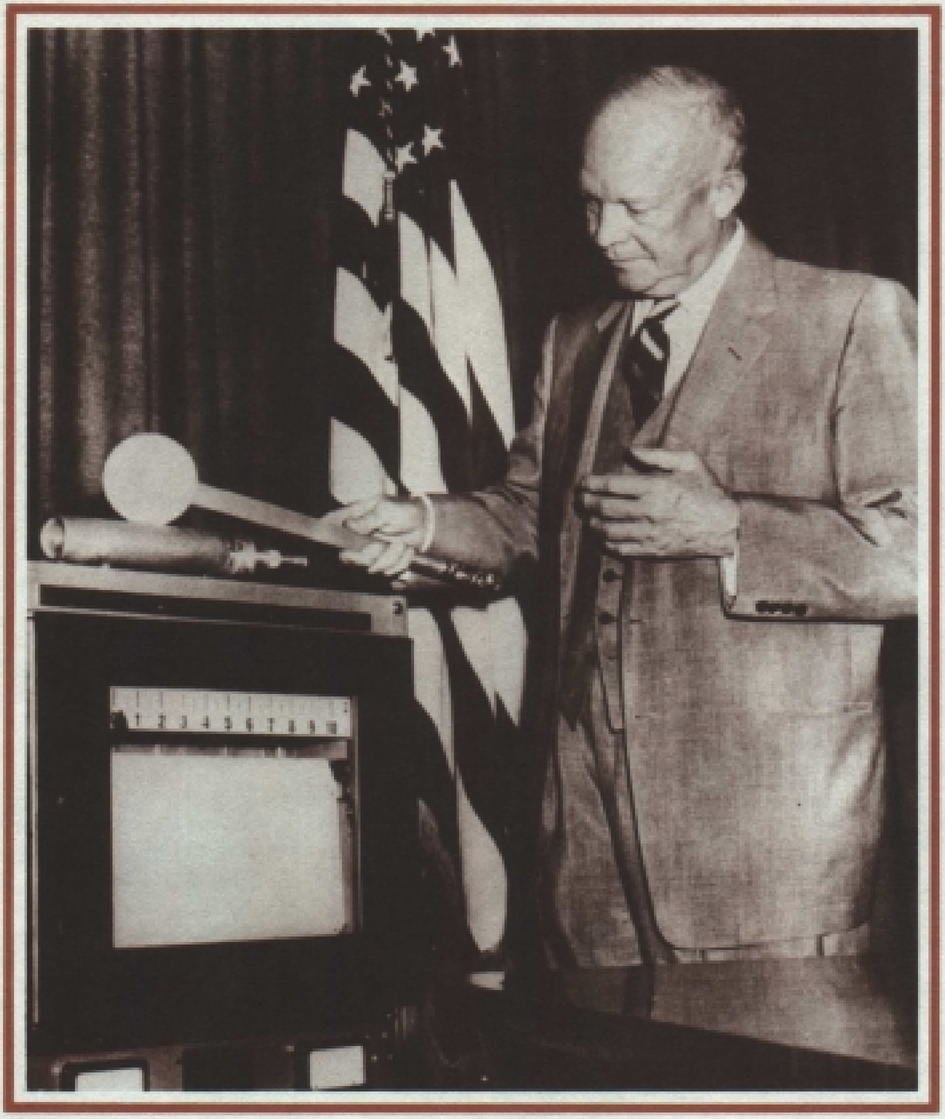
National Historic Mechanical Engineering Landmark

Presentation Ceremony
May 20, 1980

PROGRAM

Welcoming Remarks	JOHN T. POPE Vice President, Region V American Society of Mechanical Engineers
Introduction of Guests	THOMAS R. CURRAN Chairman, Pittsburgh Section American Society of Mechanical Engineers
ASME Landmark Program	PROFESSOR J. J. Ermenc Chairman, National History and Heritage Committee American Society of Mechanical Engineers
History of Shippingport Atomic Power Station	STANLEY G. SCHAFFER President, Duquesne Light Company
Presentation of Plaque	DONALD N. ZWIEP President, American Society of Mechanical Engineers
Acceptance	STANLEY G. SCHAFFER President, Duquesne Light Company
Closing Remarks	THOMAS R. CURRAN Chairman, Pittsburgh Section American Society of Mechanical Engineers
Luncheon Remarks	J. J. TAYLOR Vice President and General Manager, Water Reactors Divisions, Westinghouse Electric Corporation

Informal viewing of exhibits in the Shippingport Visitors' Center and a luncheon at the Willows Motel Restaurant, Industry, Pennsylvania, follow the presentation ceremonies.



ATOMS FOR PEACE - President Dwight D. Eisenhower, participated via electronic communications in both the groundbreaking and dedication of the Shippingport Atomic Power Station. For the groundbreaking, he passed a neutron wand over neutron counter which flashed an electronic signal from Denver, Colorado to Shippingport, activating large highlift which turned the first scoop of ground.

The Shippingport Atomic Power Station project received world wide attention from the very beginning. The ground breaking ceremony on September 6, 1954 (Labor Day) was attended by about 1,400 people, including dignitaries representing nations from around the world. President Dwight D. Eisenhower, the father of the "Atoms For Peace" program, participated in the ceremony via an electric hookup from a summer White House in Denver, Colorado.

In his address, President Eisenhower said: ". . . For today at Shippingport, Pennsylvania, we begin building our first atomic power plant of commercial size—a plant expected to produce electricity for 100,000 people. In thus advancing toward the economic production of electricity by atomic power, mankind comes closer to fulfillment of the ancient dream of a new and better earth.

" . . . through knowledge we are sure to gain from this new plant we begin today, I am confident that the atom will not be devoted exclusively to the destruction of man, but will be his mighty servant and tireless benefactor.

"It is then with profound hope and confidence—and with prayer for future ages of mankind — that I now, by this act begin construction of America's first commercial-size atomic power plant."

The President's address was broadcast to the construction site via television and shown to the guests on 20 strategically located television sets. As he finished, President Eisenhower passed neutron wand over a neutron counter which flashed an electronic signal 1,200 miles to Shippingport, activating a large highlift which moved forward and scooped the first dirt in the ground breaking ceremony. Sensing the historic significance of the moment, the crowd rose to its feet and applauded.

Speaking for Duquesne Light Company at the ceremony, Philip A. Fleger, Chairman of the Board, said, when describing the Shippingport project, "Here private industry invests its capital, its experience, and its productive skill in cooperation with the government to bring the benefit of a great, new natural resource to the American people.

"Here the Atomic Energy Commission, the Westinghouse Electric Corporation, and the Duquesne Light Company embark upon an adventure which should do much to advance the use of atomic energy—through electricity—and thereby promote the well-being of all the people.

"The Duquesne Light Company accepts its share of the responsibility for this epochal undertaking with the greatest humility but with equally great determination."

INDUSTRY AND GOVERNMENT COOPERATION was evident throughout the project. Participants in meetings might have included, from left, Walter J. Lyman, Duquesne's Vice President, Operations, Admiral H.G. Rickover, Director of the AEC Division of Naval Reactors, standing, and Carroll T. Sinclair, Duquesne's Vice President, Engineering and Construction.

Millions of people across the nation were able to see and listen to the proceedings of the groundbreaking via radio and television as Chairman Lewis L. Strauss of the U.S. Atomic Energy Commission addressed the crowd. "Only a little more than a year ago," Mr. Strauss said, "it was believed that production of commercial amounts of electric energy from nuclear power would have to be demonstrated by the government . . . and by the government alone . . . before private industry would or could afford to take part in it.

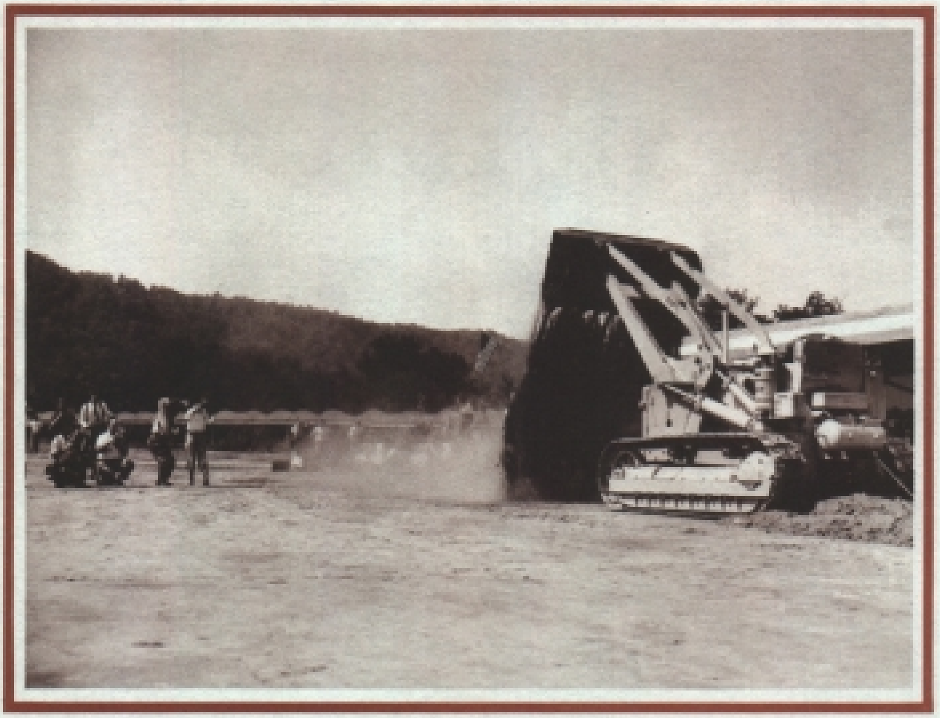
"But so rapid have been the strides in scientific and engineering achievement that here, today the government . . . this is to say, the people . . . begin such an enterprise which is more fundamentally a pioneer adventure than the first railroad to penetrate the West or the first airline to span the continent."

In an effort to put the days proceedings in perspective, the Honorable W. Sterling Cole, Chairman, Joint Congressional Committee on Atomic Energy said, "Now we are at the end of the beginning. Now we translate our hope and dreams of using the atom for the pursuits of peace into the concrete and steel of a plant producing large amounts of electricity. Along the shores of this river a new marvel of science and engineering shall soon testify that the atom has been bent to the way of peace."

Westinghouse Electric Corporation President, Gwilym A. Price, termed the building of the atomic power plant as "Mankind's progress towards a bright horizon."

Mr. Price said, "I am, I believe, excusably proud that only forty miles from here the Westinghouse Atomic Power Division is building the reactor—or atomic furnace—which will energize America's first full-scale atomic power plant. And if we finish well what we begin here today, the atom will bring into existence the truly 'Golden Age of Electricity'.

"The success of this plant eventually will mean great benefits for people everywhere. It forecasts readily available electric power in almost any corner of the earth and the great productivity which alone can bring material well-being to the 'have not' peoples of the world. It may indeed be the first dawning of the new age of plenty which the world has long awaited."



GROUNDBREAKING CEREMONIES featured a large highlift which when electronically activated by President Eisenhower over 1,200 miles away, turned the first scoop of ground for the Shippingport project. When this occurred, the crowd at the ceremonies, sensing the historic significance of the moment, rose to its feet and applauded. Pictures of this occasion were featured worldwide by newspapers, television and movies.

After the ground breaking, the serious business of constructing the new plant began in earnest. Throughout construction the Shippingport Atomic Power Station would continue to receive international attention as a major advancement in technology. During construction, Admiral Rickover would frequently visit the construction site to check progress. He would confer with the project managers: Joseph C. Rengel of Westinghouse, John Gray of Duquesne Light, John Simpson, head of the Westinghouse Bettis Atomic Power Laboratory, and Melvin Oldham who would be the Duquesne Light superintendent of the new generating station.

The new technology and diplomacy mixed together when on May 7, 1956, Admiral Rickover and AEC Chairman, Lewis L. Strauss, conducted a tour of the construction site for the head of Atomic Energy of Great Britain. Visiting the shippingport site as part of a tour of U.S. atomic facilities were Sir Edwin Plowden, Chairman of the United Kingdom Atomic Energy Authority, and John A. V. Willis, Scientific Attache to the British Embassy.

The Shippingport Atomic Power Station would be somewhat different from the nuclear power stations that were to follow. From the outset, the Shippingport project was directed towards advancing the basic technology of light water cooled reactors, through design, development, building and testing and operation of a large power reactor as part of a public utility system. Because of this primary mission, the design of the station is markedly influenced by its dual role of test facility and power producer. The test facility concept results in a duplication and isolation of equipment and in a large amount of instrumentation compared to that required solely for operation as a power producer.

The Shippingport station was constructed for the purpose of advancing nuclear power technology generally. Accordingly, the entire plant was built along very flexible lines. The reactor portion could accommodate cores of different types, and greater power. Multiple components were made by a number of manufacturers using different designs and materials of various kinds were utilized.

Because the technology was new and little understood by the public, some people feared atomic energy. The three principle organizations involved in the Shippingport project, Naval Reactors, Westinghouse Electric Corporation and Duquesne Light Company, patiently explained in both appearances before groups and through the news media, that all safety precautions possible were taken in order to minimize the possibility of the escape of any radiation from

NUCLEAR TECHNOLOGY AND DIPLOMACY mixed together during a tour of the Shippingport construction site by representatives of Great Britain. Participating in the tour were from left, Charles H. Weaver, Vice President, Westinghouse Electric Corporation, Sir Edwin Plowden, Chairman of the United Kingdom Atomic Energy Authority, Lewis L. Strauss, Chairman of the AEC, Philip A. Fleger, Chairman of the Board, Duquesne Light Company, Admiral H. C. Rickover, Chief of the Naval Reactors branch of the AEC, and H. Briggs, Jr., Duquesne's Manager of Advertising and Public Relations.

the plant. They pointed out that the difference between Shippingport and a conventional coal, oil or gas-fired power station was the heat source. The heat was provided by nuclear fission, while in conventional power plants the chemical reaction of the coal, gas or oil with oxygen to produce a fire, provided the heat.

The station, when completed, consisted of a pressurized water reactor and associated systems; four steam generators heated by the reactor; a single turbine generator and associated systems; a radioactive waste disposal system; laboratories; shops; and administrative facilities.

The reactor and other systems carrying high pressure water subject to radioactive contamination were housed in four inter-connected containment vessels in order to prevent the possibility of radioactivity escaping into the environment. These inter-connected containment structures of reinforced concrete and steel were buried beneath the ground. The turbine generator was located outdoors on the turbine deck below which were located the bulk of the steam and electrical systems.

The Shippingport pressurized water reactor plant consisted of two main parts: a primary system containing the nuclear reactor which produced heat and the water which circulates through the reactor to cool it; and a secondary system, containing other water completely isolated from the reactor, which transferred the heat for use in a steam turbine.

At Shippingport, as with all nuclear plants, the nuclear reactor itself is the key element in the primary system. The heart of the nuclear reactor is the core which is housed in the reactor pressure vessel, a large steel container 33 feet high and about 9 feet in diameter.

The first core was an assembly of plates and rods arranged in the general shape of a cylinder, 6 feet high and 7 feet in diameter. The plates in the first core were enriched uranium clad with an alloy of zirconium as protection from the hot water; the rods were hollow zirconium alloy tubes filled with natural uranium oxide pellets. The core was a seed and blanket type with the enriched uranium plates constituting the seed and natural-uranium rods the blanket. The reactor contained enough fissionable fuel to form a critical mass: one capable of sustaining a nuclear chain reaction. The chain reaction could be started, stopped and controlled by 32 neutron absorbing control rods made of the element hafnium. When inserted into the reactor, the control rods slowed the chain reaction and lowered the power level: when withdrawn, they allowed the chain reaction to increase, thus increasing the power level.

THE FIRST CORE, six feet high and seven feet in diameter, weighing 58 tons and containing 14 tons of natural uranium and 165 pounds of high-enriched uranium, was installed in October, 1957. It took more than eight hours to lower the core, the heart of the reactor system, into position with only six-hundredths of an inch clearance between it and the walls of the steel container known as the pressure vessel.

One of the most important features of the Shippingport reactor was that it had a negative temperature coefficient of reactivity. This means the reactor inherently tended to maintain the power level at which it was set. If, for example, the temperature of the water entering the reactor dropped for any reason, the reactor automatically produced more heat, and thus a higher outlet water temperature. If the inlet water increased in temperature, the heat output of the reactor automatically dropped. Thus, the reactor itself automatically maintained the correct power level with no controls being involved. This inherent automatic control feature was true for normal power changes in electric systems so that control-rod movement was necessary only for large changes in power output of the plant.

The Shippingport reactor is a pressurized light water reactor. In this type of reactor water is pumped through the primary system to flow around the nuclear fuel elements in the reactor. As it flows around the reactor core, the water absorbs heat from the fissioning nuclear fuel. The whole primary system is kept under high pressure at about 2,000 pounds per square inch, to prevent the primary water from boiling, thus the name pressurized water reactor. When the water is heated, it flows to the heat exchanging steam generators where it gives up the heat to water in the secondary system.

The secondary system is a relatively low pressure system so that when it absorbs heat in the steam generator, the water in the secondary system is turned to steam. This steam, when sent to the turbine generator, provides the necessary energy to drive the turbine.

The Shippingport reactor has four steam generators where the heat exchange takes place. By using the method of exchanging heat where the primary water is completely isolated, the secondary water does not become contaminated with radioactivity, thus reducing the chance of any escape of radioactivity. The primary system also includes a number of auxilliary systems, such as the pressurizing system, valve operating systems and coolant purification systems.

After more than our years of planning, construction, testing and plenty of plain hard work, the Shippingport reactor was ready for fuel loading. In October, 1957 the reactor core weighing 58 tons and containing 14 tons of natural uranium and 165 pounds of highly-enriched uranium was installed. It took more than 8 hours to lower the core, the heart of the reactor system, into position with only six-hundreds of an inch clearance between it and the walls of the steel container, known as the pressure vessel. A little more than 45 days later the plant was ready for operation. At 4:30 a.m. on December 2, 1957, the control rods were raised just to the point of criticality, where the atomic reaction would maintain itself. This historic milestone for Shippingport also coincided with the 15th Anniversary of the World's first nuclear fission reactor which was built under the football stadium at The University of Chicago by a group of scientists headed by Enrico Fermi.

Testing continued as the reactor was operated below half of its design potential during the next two weeks. Slowly the reactor was brought to the point where the pressurized water was steadily producing steam as it circulated through the heat exchange tubes in the steam generator. On Wednesday, December 18, 1957 at 12:30 a.m. the first power was produced at Shippingport Atomic Power Station as engineers synchronized the plant with the Duquesne Light Company system. Thus the first electricity to be generated at Shippingport was fed into the grid that carried electricity throughout the Pittsburgh area.

THE AGE OF NUCLEAR POWER came to the Pittsburgh area on Wednesday, December 18, 1957 at 12:39 a.m. Duquesne Light engineers synchronized the turbine-generator at Shippingport with the Duquesne Light system as the first commercial electricity produced by nuclear energy was sent out to customers in the Pittsburgh area. By 7:00 a.m. that morning, the turbine-generator fed by steam produced from the heat of the nuclear reaction was generating more than 12,000 kilowatts of electricity.

By 7:00 a.m. that morning the Shippingport plant was producing more than 12,000 kilowatts of electricity. As with many significant historic occasions, the event was accomplished before most people knew what was happening. The people of Pittsburgh did not know they were receiving electric energy generated by the atom as they made their toast, brewed their coffee and read their newspapers. Later the news media would inform the public of the important event.

Within a few days, on December 23, 1957, full power of 68,000 kilowatts was attained by the Shippingport reactor. Although full power was reached, testing continued to determine the operating characteristics and dependability of the station. On the basis of this early "shakedown" operation, it was found that the reactor and station as a whole equalled or bettered the expectations of its designers and operators and they noted that it operated with an ease and responsiveness surpassing conventional coal-fired stations.

After more than four years of planning, construction, testing and plenty of plain hard work, the Shippingport reactor was ready for fuel loading. In October, 1957 the reactor core weighing 58 tons and containing 14 tons of natural uranium and 165 pounds of highly-enriched uranium was installed. It took more than 8 hours to lower the core, the heart of the reactor system, into position with only six-hundreds of an inch clearance between it and the walls of the steel container, known as the pressure vessel. A little more than 45 days later the plant was ready for operation. At 4:30 a.m. on December 2, 1957, the control rods were raised just to the point of criticality, where the atomic reaction would maintain itself. This historic milestone for Shippingport also coincided with the 15th Anniversary of the World's first nuclear fission reactor which was built under the football stadium at The University of Chicago by a group of scientists headed by Enrico Fermi.

Testing continued as the reactor was operated below half of its design potential during the next two weeks. Slowly the reactor was brought to the point where the pressurized water was steadily producing steam as it circulated through the heat exchange tubes in the steam generator. On Wednesday, December 18, 1957 at 12:30 a.m. the first power was produced at Shippingport Atomic Power Station as engineers synchronized the plant with the Duquesne Light Company system. Thus the first electricity to be generated at Shippingport was fed into the grid that carried electricity throughout the Pittsburgh area.

THE AGE OF NUCLEAR POWER came to the Pittsburgh area on Wednesday, December 18, 1957 at 12:39 a.m. Duquesne Light engineers synchronized the turbine-generator at Shippingport with the Duquesne Light system as the first commercial electricity produced by nuclear energy was sent out to customers in the Pittsburgh area. By 7:00 a.m. that morning, the turbine-generator fed by steam produced from the heat of the nuclear reaction was generating more than 12,000 kilowatts of electricity.

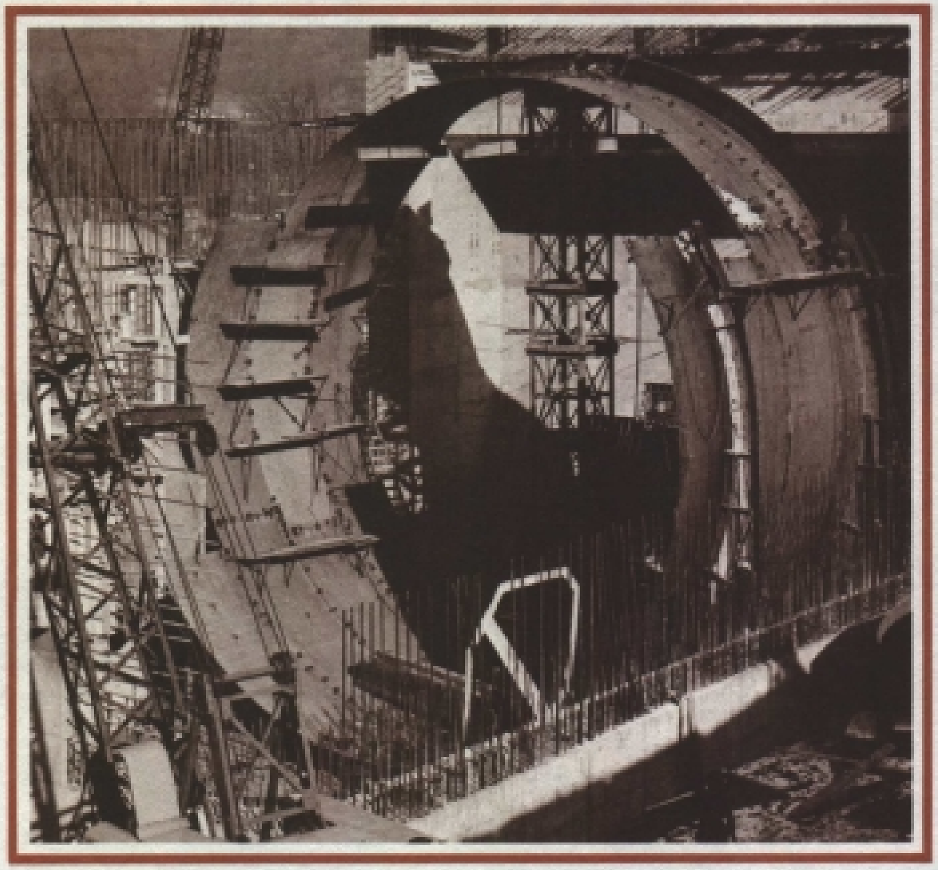
By 7:00 a.m. that morning the Shippingport plant was producing more than 12,000 kilowatts of electricity. As with many significant historic occasions, the event was accomplished before most people knew what was happening. The people of Pittsburgh did not know they were receiving electric energy generated by the atom as they made their toast, brewed their coffee and read their newspapers. Later the news media would inform the public of the important event.

Within a few days, on December 23, 1957, full power of 68,000 kilowatts was attained by the Shippingport reactor. Although full power was reached, testing continued to determine the operating characteristics and dependability of the station. On the basis of this early "shakedown" operation, it was found that the reactor and station as a whole equalled or bettered the expectations of its designers and operators and they noted that it operated with an ease and responsiveness surpassing conventional coal-fired stations.

Speaking for Westinghouse Electric Corporation, Mark W. Cresap, Jr., the Company president said, “The significance of Shippingport is two fold. It is a revolutionary type of station for full-scale electric power generation. It is also a full-scale training and testing facility of historic meaning to the world.

“From what is learned here, as this partnership between the Atomic Energy Commission and the Duquesne Light Company progresses, will represent a priceless contribution to the harnessing of nuclear power for the benefit of humanity. For Westinghouse, participation in designing and developing the nuclear reactor has been a most challenging and inspiring experience.”

Representing the Congressional Joint Committee on Atomic Energy, the Honorable James E. VanZandt, said “. . . we are developing the atom for peaceful purposes and we are doing it by means of ‘partnership’ between government and industry. All of us can be justifiably proud of this, the first all-commercial reactor. Let us consider it as a monument to American genius and to our system of free enterprise which is the envy of the world.”



SPECIAL CONSTRUCTION was usedin order to minimize the possibility of radioactivity escaping into the environment from the reactor and other systems carrying high pressure water subject to radioactive contamination. The reactor and other systems were housed in four interconnected containment vessels, one under construction above, whlch were built of reinforced concrete and steel and were buried beneath the ground.

Lewis L. Strauss, Chairman of the Atomic Energy Commission recalled for the audience the ground breaking ceremony and said, “In the three years and nine months which have elapsed, a period comparing favorably with the time required to build a conventional power plant, the co-operative efforts of government and private industry have brought this plant into being. It is the first large-scale power plant yet built to convert the energy within the atom exclusively to the peaceful service of man’s need for electric power to ease his burden and provide additional comfort for his living. While the creation of this great nuclear power station is of historic significance, we are reminded that this is only one facet of a broad program which the world has come to call Atoms for Peace.”

Speaking for Duquesne Light, Philip A. Fleger, Chairman of the Board said, “It is altogether fitting that this station should be located close to the birthplace of the petroleum industry and almost on top of one of the world’s greatest coal fields. For the history of industry and man’s progress is closely bound up with the history of fuel. Where fuels have been plentiful and man has developed techniques to harness their energy, industry has flourished and people have prospered.

"The lessons already learned in building this pioneer station, the lessons yet to be learned in operating it, Will be applied throughout the free world," he continued. "Atomic power stations now under construction as well as others still to be designed, will be more efficient and more economical because of it.

"In a larger sense progress is the real significance of Shippingport. . . . This is true progress. It comes from the work of free men, with free hands and free minds, in a free society."

The historical significance of Shippingport was well established at its very beginning. Shippingport Atomic Power Station would be more than merely the first full-scale commercial atomic power station. Duquesne's Chairman of the Board, Philip A. Fleger, said it perhaps best when he said in Los Angeles in 1955: "Shippingport will be a university so to speak for the electric power industry of this country."

Shippingport, as it operated through the years, established itself as a source of valuable information on reactor technology for the entire nuclear power industry. Hundreds of articles have been printed in scientific and technical journals about the facility. And many papers about its operation and testing programs have been delivered at scientific meetings throughout the world. It has also served as a training ground for many key personnel in nuclear generating plants throughout the world.

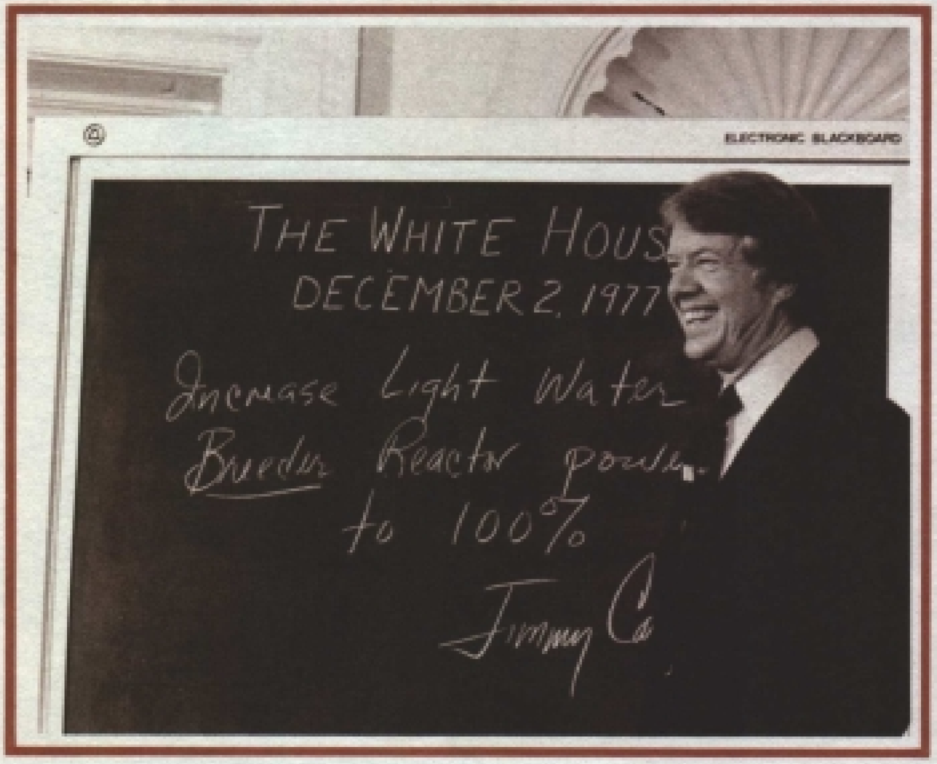
Shippingport also established itself as a source of electricity to help power the Pittsburgh area. During the life of Shippingport's first core, from 1957 to 1964, the atomic power station produced almost 2 billion kilowatt-hours of electricity. In 1964 the plant was removed from service for an extended period of time to permit installation of the second core.

HISTORIC ACHIEVEMENT RECOGNIZED — The Shippingport Atomic Power Station was honored by the American Society of Mechanical Engineers as a National Historic Mechanical Engineering Landmark on May 20, 1980. This plaque was presented to Shippingport in recognition of its historical significance to the development of the engineering profession and of the nation.

The new core increased the plant's electrical generating capacity from 60,000 to 100,000 kilowatts and was capable of producing an additional 50,000 kilowatts (equivalent) of heat. It had more than 5 times the design energy output and over twice the power of the original core. Core #2 was instrumented so that information concerning power distribution in the reactor was available for further improvements and refinements in future nuclear power stations. It is important to know how core performance varies over the life of the core so that more powerful longlasting cores can be built at lower costs.

From February 3, 1965, when the second core went into operation, until February 4, 1974, Shippingport Atomic Power Station had generated almost 3½ billion kilowatt hours of electricity. The plant went out of service on February 4, 1974, because of a mechanical failure in the turbine-generator. Meanwhile, as part of the Federal Government's efforts to expand the nation's sources of energy through the development of technology for new and improved ways to produce energy, a Light Water Breeder Reactor (LWBR) Core was being developed and fabricated as the third reactor core for refueling of the Shippingport Atomic Power Station. A decision was made to begin installation of the LWBR while repairs moved forward on the turbine-generator. A breeder reactor is one that creates more fissionable nuclear fuel than it consumes.

In January 1975, the AEC was reorganized into two different agencies, the Nuclear Regulatory Commission (NRC) and the Energy Research and Development Administration (ERDA) which included the Division of Naval Reactors. In 1977, the U.S. Department of Energy (DOE) was created and ERDA was assimilated into the DOE.



ANOTHER HISTORICAL FIRST - After the light water breeder reactor installed in Shippingport had undergone checkout and initial testing, President jimmy Carter from the Oval Office in the White House, on December 2, 1977, ordered the LWBR to 100% power through the use of closed circuit television.

Again Shippingport Atomic Power Station was the scene of another of the nation's first in nuclear technology. The LWBR was brought to initial criticality on August 26, 1977. After undergoing checkout and initial testing, President Jimmy Carter from the Oval Office in the White House, on December 2, 1977 ordered the LWBR to 100% power. The reactor was then released for routine commercial electric power generation.

The Shippingport Reactor was modified by the Department of Energy to accept the light water breeder core in order to demonstrate that breeding of nuclear fuel can be achieved in a light water reactor system using a thorium-uranium-233 fuel system in a seed blanket core configuration. The LWBR at Shippingport was developed, designed and installed by the Westinghouse Bettis Atomic Power Laboratory under the technical direction of the Department of Energy's Division of Naval Reactors.

The Light Water Breeder Reactor uses a nuclear fuel material, thorium, that is in plentiful supply and for which, to date, there has been no other major energy-related use. The thorium is used in a type of nuclear reactor core that can be operated in pressurized light water nuclear power plants. Most of the power reactors currently in operation or being planned in this country are of the light water type. The operation of the LWBR Core in the Shippingport Atomic Power Station is expected to confirm that breeding can be achieved in a pressurized light water reactor using the thorium/uranium-233 fuel system in a seed-blanket core configuration. This reactor is designed to breed more new uranium-233 from thorium than it consumes while producing electrical energy. This means that once on the breeding cycle, an LWBR replacement core could be produced without requiring further mining or enrichment of our reserves of uranium ore.

Today, Shippingport Atomic Power Station using the LWBR, is still producing electricity for the Pittsburgh area. It has produced over one billion kilowatt hours of electrical energy with the light water breeder core. In another 2 to 3 years, the plant will be shutdown and the core will be removed. It will be analyzed, to verify that more uranium-233 has been produced in the core than has been used to produce energy. The plant will then be decommissioned.

Throughout its more than a quarter of a Century of history, Shippingport Atomic Power Station has been in the forefront of the development of nuclear technology. Today it stands as an operating and living monument to man's search for a better world through the use of his mind, his sciences, and his engineering to produce that which would benefit himself and his fellow man.

National Historic Mechanical Engineering Landmark Program

In September 1971, the ASME Council reactivated the Society's History and Heritage program with the formation of a National History and Heritage Committee. The overall objective of the Committee is to promote a general awareness of our technical heritage among both engineers and the general public. A charge given the Committee is to gather data on all works and artifacts with a mechanical engineering connection which are historically significant to the profession — an ambitious goal, and one achieved largely through the volunteer efforts of the Section and Division History and Heritage Committees and interested ASME members.

Accordingly, two major programs are carried out by the Sections and Divisions under the direction of the National Committee: 1) a listing of industrial operations and related mechanical engineering artifacts in local Historic Engineering Records; and 2) a National Historic Mechanical Engineering Landmark program. The former is a record of detailed studies of sites in each local area; the latter is a demarcation of local sites which are of national significance, people, or events which have contributed to the general development of civilization.

In addition, the Society cooperates with the Smithsonian Institution in a joint project which provides contributions of historical material to the National Museum of History and Technology in Washington, D.C. The Institution's permanent exhibition of mechanical engineering memorabilia is under the direction of a curator, who also serves as an ex officio member of the ASME National History and Heritage Committee.

The Shippingport Atomic Power Station is the forty-fifth landmark to be designated since the program began in 1973.

Other Historic Landmarks

Ferries and Cliff House Cable Railway Power House, San Francisco, California

Leavitt Pumping Engine, Chestnut Hill Pumping Station, Brookline, Massachusetts

A. B. Wood Low-Head High-Volume Screw Pump, New Orleans, Louisiana

Portsmouth-Kittery Naval Shipbuilding Activity, Portsmouth, New Hampshire

102-Inch Boyden Hydraulic Turbines, Cohoes, New York

5000 KW Vertical Curtis Steam Turbine-Generator, Schenectady, New York

Saugus Iron Works, Saugus, Massachusetts
Pioneer Oil Refinery, Newhall, California
Chesapeake & Delaware Canal, Scoop Wheel and Engines, Chesapeake City, Maryland
U.S.S. Texas, Reciprocating Steam Engines, Houston, Texas
Childs-Irving Hydro Plant, Irving, Arizona
Hanford B Nuclear Reactor, Hanford, Washington
First Air Conditioning, Magma Copper Mine, Superior, Arizona
Manitou and Pike's Peak Cog Railway, Colorado Springs, Colorado
Edgar Steam Electric Station, Weymouth, Massachusetts
Mt. Washington Cog Railway, Mt. Washington, New Hampshire
Folsom Power House #1, Folsom, California
Crawler Transporters of Launch Complex 39, J.F.K. Space Center, Florida.
Fairmont Water Works, Philadelphia, Pennsylvania
U.S.S. Olympia, Vertical Reciprocating Steam Engines, Philadelphia, Pennsylvania
5-Ton "Pit-Cast" Jib Crane, Birmingham, Alabama
State Line Generating Unit #1, Hammond, Indiana
Pratt Institute Power Generating Plant, Brooklyn, New York
Monongahela Incline, Pittsburgh, Pennsylvania
Duquesne Incline, Pittsburgh, Pennsylvania
Great Falls Raceway and Power System, Paterson, New Jersey
Vulcan Street Power Plant, Appleton, Wisconsin
Wilkinson Mill, Pawtucket, Rhode Island
New York City Subway System, New York, New York
Baltimore & Ohio Railroad, Baltimore, Maryland
Ringwood Manor Iron Complex, Ringwood, New Jersey
Joshua Hendy Iron Works, Sunnyvale, California
Hacienda La Esperanza Sugar Mill Steam Engine, Manati, Puerto Rico
RL-10 Liquid-Hydrogen Rocket Engine, West Palm Beach, Florida
A.O. Smith Automated Chassis Frame Factory, Milwaukee, Wisconsin
Reaction-Type Hydraulic Turbine, Morris Canal, Stewartsville, New Jersey
Experimental Breeder Reactor 1 (EBR-1), Idaho Falls, Idaho
Drake Oil Well, Titusville, Pennsylvania
The Springfield Armory, Springfield, Massachusetts
East Well's Power Plant (Oneida Street), Milwaukee, Wisconsin
Watkins Woolen Mill, Lawson, Missouri
Fusion-Welded Drum, Chattanooga, Tennessee
Georgetown Steam Plant, Seattle, Washington
Equitable Building, Portland, Oregon

Acknowledgments

The Pittsburgh Section of The American Society of Mechanical Engineers acknowledges the efforts of the Committee that organized the landmark dedication ceremony. Representing the Pittsburgh Section ASME were Eugene W. Starr, (Chairman), S.S. Kapadia, Dewitt Lampman, James R. Shavers, Thomas J. Walcott, Thomas E. Cornelius and Robert G. Orendi. Representing Duquesne Light were Roger Martin, Nelson Tonet and William G. Ott. Representing Westinghouse Electric Corporation were Eugene Curella and W.W. Culbertson. The Pittsburgh Section also recognizes the efforts and cooperation of the officials of Duquesne Light Company, Westinghouse Electric Corporation, PPG Industries and the Division of Naval Reactors of the Department of Energy who helped make the landmark dedication possible.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

THE ASME NATIONAL HISTORY & HERITAGE COMMITTEE

The ASME Pittsburgh Section