

January 25, 2022

L-2022-013 10 CFR 54.17

U.S. Nuclear Regulatory Commission Attention: Document Control Desk 11545 Rockville Pike One White Flint North Rockville, MD 20852-2746

Point Beach Nuclear Plant Units 1 and 2 Dockets 50-266 and 50-301 Renewed License Nos. DPR-24 and DPR-27

SUBSEQUENT LICENSE RENEWAL APPLICATION - ENVIRONMENTAL REPORT REVIEW REQUEST FOR ADDITIONAL INFORMATION (RAI) NO. HCR-1 SUPPLEMENTAL RESPONSE

References:

- NextEra Energy Point Beach, LLC (NEPB) Letter NRC 2020-0032 dated November 16, 2020, Application for Subsequent Renewed Facility Operating Licenses (ADAMS Package Accession No. ML20329A292)
- NEPB Letter L-2021-116 dated June 10, 2021, Subsequent License Renewal Application Environmental Report Review Requests for Confirmation of/Additional Information (RCI/RAI) Set 1 Responses (ADAMS Accession No. ML21161A214)

NEPB, licensee for Point Beach Nuclear Plant (PBN) Units 1 and 2, has submitted a subsequent license renewal application (SLRA) for the Facility Operating Licenses for PBN Units 1 and 2 (Reference 1). In its response to SLRA Environmental Report RAI No. HCR-1 Items A and B (Reference 2 Attachment 25), NEPB was to supplement the response when the final architectural survey report and Cultural Resource Management Plan (CRMP) were available. The attachments to this letter provide the final status narrative for these RAI items and enclose the final architectural survey report.

For ease of reference, the index of attached and enclosed information is provided on page 3 of this letter.

Should you have any questions regarding this submittal, please contact me at (561) 304-6256 or William.Maher@fpl.com.

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I declare under penalty of perjury that the foregoing is true and correct.

Executed on the 25th day of January 2022.

Sincerely, William Maher Maher

William D. Maher Licensing Director - Nuclear Licensing Projects

Cc: Environmental Project Manager, Point Beach SLR, USNRC Administrator, Region III, USNRC Project Manager, Point Beach Nuclear Plant, USNRC Resident Inspector, Point Beach Nuclear Plant, USNRC Public Service Commission Wisconsin Document Control Desk L-2022-013 Page 3

ATTACHMENT'S INDEX			
Attachment No.	Subject		
1	RAI No. HCR-1 Item A		
	Final status narrative regarding the National Register of Historic Places Determination of		
	Eligibility (NHRP DOE) survey of Point Beach Nuclear Plant Units 1 and 2 architectural		
	resources		
2	RAI No. HCR-1 Item B		
	Final status narrative regarding the NEPB Cultural Resource Management Plan (CRMP)		

Enclosure Index			
Attachment	Enclosure	Subject	
140.	140.		
1	-	KAI No. HCR-1 Item A	
		Commonwealth Heritage Group, Inc. Report: National Register of Historic Places	
		Determination of Eligibility, Point Beach Nuclear Plant, 6610 Nuclear Road, Town of Two	
		Creeks, Manitowoc County, Wisconsin (September 2021)	

Point Beach Nuclear Plant Units 1 and 2 Dockets 50-266 and 50-301 NEPB Supplemental Response to NRC RAI No. HCR-1 Item A L-2022-013 Attachment 1 Page 1 of 1

NEPB Supplemental Response:

As part of the NEPB SLR project and as requested by the Wisconsin State Historic Preservation Office (WI SHPO), NEPB conducted a National Register of Historic Places (NRHP) Determination of Eligibility (DOE) survey of Point Beach Nuclear Plant Units 1 and 2 architectural resources. The NRHP DOE report (Enclosure) concluded that NEPB resources were not eligible for inclusion in the NRHP. The principal results of the NRHP DOE survey were also used to inform the modified NEPB Cultural Resources Management Plan (CRMP). The enclosed NRHP DOE report was placed in the PBN SLRA ePortal for NRC review on January 12, 2022.

The WI SHPO reviewed the NRHP DOE report and concurred with the determination that no properties eligible for, or included on, the NRHP were encountered during the architectural survey. On October 5, 2021, the WI SHPO issued the referenced opinion that relicensing will have no effect on historic resources eligible for, or included on, the NRHP.

References:

WI SHPO Email dated October 5, 2021 – Re: SHPO Review 21-1476/MN - Point Beach Nuclear Plant Relicensing (ADAMS Accession No. ML21279A120)

Associated Enclosures:

Commonwealth Heritage Group, Inc. Report: National Register of Historic Places Determination of Eligibility, Point Beach Nuclear Plant, 6610 Nuclear Road, Town of Two Creeks, Manitowoc County, Wisconsin (September 2021)

NATIONAL REGISTER OF HISTORIC PLACES DETERMINATION OF ELIGIBILITY POINT BEACH NUCLEAR PLANT 6610 NUCLEAR ROAD TOWN OF TWO CREEKS, MANITOWOC COUNTY, WISCONSIN

Prepared for

NEXTERA ENERGY RESOURCES, LLC

Prepared By

COMMONWEALTH HERITAGE GROUP, INC.

Shelley Rettig, M.S., Architectural Historian Greg Rainka, M.S., Architectural Historian

September 2021

1.0 INTRODUCTION

Commonwealth Heritage Group, Inc. (Commonwealth) was contracted by NextEra Energy Resources, LLC (NEER) to prepare a National Register of Historic Places (National Register) Determination of Eligibility (DOE) for the Point Beach Nuclear Plant located at 6610 Nuclear Road in the town of Two Creeks, Manitowoc County, Wisconsin (Figure 1). NEER is in the process of renewing the operating license for the plant with the U.S. Nuclear Regulatory Commission. The relicensing of the plant is a federal undertaking that must comply with Section 106 of the National Historic Preservation Act (Section 106) and its implementing regulations 36 CFR 800. Section 106 requires the consideration of effects to properties listed on, or determined eligible for listing on, the National Register of Historic Places (National Register).

The purpose of this DOE is to formally assess the historic and architectural significance of the nuclear plant, which first achieved commercial operation in 1970 and is, therefore, of historic age (50 years or older). The overall plant property is approximately 1,260 acres in size. The nuclear plant and associated built resources are confined within an approximately 350-acre area generally bounded by Tapawingo Road to the north, Nuclear Road to the south, Lake Michigan to the east, and Lakeshore Road to the west (Figure 2). The plant was previously surveyed in 1975 (AHI #65260) but has not yet been evaluated for the National Register.

2.0 METHODOLOGY

Commonwealth conducted contextual and property-specific research at local and state repositories, namely the Wisconsin Historical Society Library and Archives and Manitowoc County Historical Society. Various primary and secondary resources were used to develop a historic context and evaluate the National Register eligibility of the Point Beach Nuclear Plant, including newspaper articles, plant literature (brochures/pamphlets), and historic photographs. Information about the plant also was obtained from current plant personnel. A site visit was completed by Commonwealth in May 2021, at which time digital photographs were taken to document the property's existing physical conditions and historic integrity. In accordance with the plant's safety and security protocols, photographs could only be taken of buildings and structures in certain locations around the exterior of the facility, and access to interior spaces was limited.

This DOE was prepared in accordance with guidance provided by the National Park Service (NPS) on evaluating and documenting the eligibility of historic properties, specifically *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* and *The Components of a Historic Context.* Additional information on evaluating the Point Beach Nuclear Plant was obtained from *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities* (Advisory Council on Historic Preservation 1991). These publications formed the basis for analyzing the applicability of the National Register evaluation criteria to this property and identifying the physical characteristics that are needed to convey historic and/or architectural significance.

3.0 HISTORICAL OVERVIEW

3.1 HISTORIC CONTEXT¹

3.1.1 A Primer on Nuclear Energy

To understand the Point Beach Nuclear Plant, and the various components and equipment that comprise the facility, an understanding of the basic processes of generating electricity with atomic power is necessary. Unlike conventional power plants that use natural gas, coal, or fuel oil to fire boilers that create steam, atomic power plants use the heat generated in the core of an atomic reactor to generate steam power. Energy, in the form of heat, is generated in the reactor's core by a process known as fission. Fission happens when an atom is struck by a free neutron, a subatomic particle. As the nucleus of the target atom absorbs the neutron, it becomes unstable and splits into two different elements. This process of splitting the atom, or fission, generates energy based on Einstein's Theory of Relativity where the energy released is equal to the mass of the object times the speed of light squared. From this theory, even minute particles of mass produce large amounts of energy.²

As research into fission advanced in the early decades of the twentieth century, it became clear that the heaviest atoms, such as those of uranium, provided the most abundant amount of energy. While researchers were able to observe the energy released from small amounts of uranium bombarded by a neutron source, a self-sustaining chain reaction was required to produce sufficient energy for commercial or military applications. All radioactive materials emit neutrons through natural decay; for some materials this is measured in days, for others in thousands of years. The task facing scientists was to have enough mass, and the concomitant release of neutrons, so that with each fission event, surplus neutrons were released to interact with other atoms, thus establishing a self-sustaining reaction.

Another problem was controlling the reaction. For the generation of atomic power, the reactions must take place at a determined rate. In nuclear weapons, for example, the fission process is uncontrolled resulting in the almost instantaneous release of massive amounts of energy. This clearly would not work for other applications of atomic energy. To control the release of energy, rods of material that absorb large quantities of neutrons are used as a "poison" to slow or halt the reaction. These rods are usually made of a boron alloy; those used for regulating the fission process are called control rods. A separate set of rods, or safety rods, can be quickly inserted to stop the reaction.³

Controlled fission was demonstrated first at the University of Chicago. In 1942, under the bleachers of the football stadium, Enrico Fermi constructed a large pile of uranium blocks with graphite blocks as a shield. As the control rods were slowly withdrawn, the fission reaction increased and became self-sustaining, a stage known as reaching a critical state. To avoid any radiation hazard to the assembled team of scientists and spectators, Fermi ordered the insertion of the safety rods after a few minutes. The world's first documented release of atomic power had occurred. Although the possibilities for atomic energy were

¹ Unless otherwise noted, this historic context was derived from the National Register evaluation of the Enrico Fermi Atomic Power Plant in Michigan prepared on behalf of Commonwealth in February 2012 (see Bibliography for full citation).

² J.N. Warnow, et al., Moments of Discovery: The Discovery of Fission (Center for History of Physics, 1984).

³ Warnow, et al.

limitless, there was also concern. Leo Szilard, a contemporary of Fermi who also performed research into atomic power, attended the experiment:

There was a crowd there and when it dispersed, Fermi and I stayed there alone. Enrico Fermi and I remained. I shook hands with Fermi and I said that I thought this day would go down as a black day in the history of mankind. I was quite aware of the dangers. Not because I am so wise, but because I have read a book written by H.G. Wells called The World Set Free. He wrote this before the First World War and described in it the development of atomic bombs, and the war fought by atomic bombs. So I was aware of these things. But I was also aware of the fact that something had to be done if the Germans get the bomb before we have it. They had knowledge. They had the people to do it and would have forced us to surrender if we didn't have the bombs also. We had no choice, or we thought we had no choice.⁴

3.1.2 The Origins of Atomic Energy

Scientists have long examined the seemingly strange properties of elements now known to be radioactive. In 1789, German chemist, Martin Heinrich Klaproth, discovered the element of uranium and named it after the planet Uranus, which had been recently discovered. Uranium metal was first isolated in 1841 by Eugene-Melchior Peligot. Experimentation with radioactive elements continued through the late nineteenth century by many scientists throughout the world.⁵

The beginning of the twentieth century saw many great advances in the understanding and knowledge of nuclear science. In 1903, French physicist Henri Becquerel was awarded the Nobel Prize for his discovery that uranium had natural properties that caused photographic negatives to become cloudy.⁶ Marie and Pierre Curie shared Bequerel's Nobel Prize for continuing Bequerel's observations and discovering thorium, another element that exhibited properties similar to uranium. They coined the term "radioactive" to describe this property.⁷

Two years later, Albert Einstein developed his Theory of Relativity through which he demonstrated that mass theoretically can be converted into energy. His theory explained how a sustained nuclear reaction could produce energy despite no apparent energy source.⁸ He received the Nobel Prize in 1921 for his work in physics. Einstein's theories have been the basis for many experiments with nuclear energy. With the outbreak of World War II, he was forced to flee to the United States because he was Jewish and did not want to provide any kind of support to the Nazis. Einstein provided such an important contribution to modern science that he was named *Time*'s "Man of the Century" in 1999.

Another great leap in understanding radioactivity occurred when Frederick Soddy, an English chemist, discovered that naturally occurring radioactive elements came in a variety of forms that were chemically identical but varied in weight. His discovery in 1911 revealed that atoms had a distinct structure, and that

⁴ Warnow, et al..

⁵ J. Wood, Nuclear Power (London: The Institute of Engineering and Technology, 2007), 1.

⁶ Wood, 2.

⁷ H. Henderson, *Nuclear Power: A Reference Handbook* (Santa Barbara, Calif.: CABC Clio, Inc., 2000), 2-3. 3

⁸ Henderson, 4; U.S. Department of Energy, *The History of Nuclear Energy* (Office of Nuclear Energy, Science, and Technology, 2002), 3.

radioactivity resulted when the structure of the atom changed. He termed these differing structures "isotopes" of the main element from which they were derived. These isotopes would play an important role in the development of both nuclear power and atomic weapons.⁹

The potential for energy derived from atoms became possible during the 1930s. In 1932, British physicist, John Cockcroft along with his Irish partner, Ernest Walton successfully split the atom with high speed protons. By bombarding lithium with high-speed protons, helium along with other byproducts was created. They were also awarded the Nobel Prize for their work in 1951.

In 1939, German physicists, Otto Hahn and Fritz Strassmann, together with Austrian physicist, Lise Meitner and her nephew, Otto Frisch, expanded on Cockcroft's experiments and split uranium atoms through fission. During the fission process, some of the uranium's mass was converted into energy, confirming Einstein's Theory of Relativity. The potential for a self-sustaining uranium fission reaction to generate extraordinary amounts of continuous energy was realized.¹⁰

With the outbreak of World War II, the threat of the Nazis harnessing the power of the atom for military use became a legitimate fear. In response to this possible threat, the United States Army initiated a topsecret project known as the Manhattan Project to develop the United States nuclear abilities. Starting from a small scientific program in 1939, the Manhattan Project developed into a multi-billion-dollar scientific mission to develop atomic weapons as well as nuclear energy.¹¹ J. Robert Oppenheimer led scientists located in Los Alamos, New Mexico, in the development of the first atomic bomb. Two other facilities, Hanford, Washington, and Oak Ridge, Tennessee, operated to produce the uranium-235 and plutonium required for fission in atomic weapons, and later for nuclear power plants. Following World War II, the Manhattan Project continued to control the production of atomic weapons until the formation of the Atomic Energy Commission (AEC) in 1947.

The potential to harness nuclear power required a self-sustaining nuclear reaction continually generating power. In 1942, Enrico Fermi, an Italian-born physicist, oversaw the five first controlled, self-sustaining nuclear chain reaction in a lab located under the University of Chicago's football stadium. He had been actively studying radioactivity and the atom since the 1920s. He was one of the first to realize that Einstein's Theory of Relativity revealed a large amount of potential nuclear energy waiting to be harnessed. He moved to Canada and then to the United States in the 1930s to escape Fascist pressures and to protect his Jewish wife. He was awarded the Nobel Prize in physics in 1938 for his work with induced radioactivity while still in Europe. With the start of the Manhattan Project, Fermi's work took on even more importance. Following his successful self-sustaining nuclear chain reaction experiment in Chicago, he went to work at Los Alamos and helped Oppenheimer develop the atomic bomb. He has been recognized as one of the most important scientists of the twentieth century.

On July 16, 1945, the first nuclear bomb was detonated at the Trinity site located on what is now White Sands Missile Range in New Mexico.¹² The yield of the plutonium implosion bomb was equal to

⁹ Wood, 2.

¹⁰ Henderson, 4.

¹¹ Henderson, 22.

¹² U.S. Department of Energy, *The History of Nuclear Energy*, 12.

approximately twenty kilotons of TNT. The destructive capabilities of atomic bombs were instantly recognized. This event is widely considered the beginning of the nuclear age.

The first atomic bomb utilized against an enemy target was dropped over the Japanese city of Hiroshima on August 6, 1945. The bomb, "Little Boy," was an untested uranium guntype bomb that detonated successfully with a yield of approximately 13 to 18 kilotons of TNT. Three days later, "Fat Man", a plutonium implosion bomb, was dropped over the Japanese city of Nagasaki.¹³

Japan surrendered following the second atomic blast because of the bomb's destructive capabilities; however, no more atomic weapons were ready for deployment. The use of the two atomic bombs against Japan, particularly its destruction to the civilian population, has remained controversial. The energy of the atom was no longer theoretical, and many scientists involved in the Manhattan Project realized that they had unleashed a power capable of destroying humanity into the world.¹⁴

Following the war, many scientists turned their attention to harvesting the power of the atom for peaceful purposes. The first process in this transformation came in August 1946, when President Harry S. Truman signed the Atomic Energy Act of 1946 into law. This act established the Atomic Energy Commission which replaced the Manhattan Project on January 1, 1947. This switched oversight of the United States nuclear programs from the military to civilian control.¹⁵

The Navy played a central role in developing the technology that would form the basis for civilian nuclear power plants. When the Atomic Energy Act was passed in 1946, Captain Hyman G. Rickover was assigned to the Navy Bureau of Ships, which was responsible for ship design. Captain Rickover saw the potential military implications of using nuclear power for submarine propulsion. He, along with several officers and civilians, spent a year at the AEC laboratory at Oak Ridge, Tennessee to learn the fundamentals of nuclear reactor technology.¹⁶

Captain Rickover strongly advocated the need to establish a Naval Nuclear Propulsion Program to develop the technology needed to create a steam propulsion plant in the confines of a submarine. He recommended two reactor development projects: a pressurized-water cooled reactor and a metal-cooled reactor. The Navy created the Nuclear Power Branch with Rickover as its head within the Bureau's Research Division on August 4, 1948. In 1949, Rickover's division contracted with Westinghouse to develop a facility, the Bettis Atomic Power Laboratory, to work on the pressurized water design. In 1955, the USS Nautilus was launched using the pressurized-water design. In 1950, Rickover contracted with General Electric to develop a liquid-metal cooled reactor. The USS Seawolf was launched in 1957 using the liquid-metal cooled design, but the pressurized-water design was preferable for naval use. In addition to submarines, nuclear was also developed to power aircraft carriers and cruisers. The technology developed by the Naval Nuclear Propulsion Program is the basis for civilian nuclear power.¹⁷

¹³ F. Barnaby, "The Continuing Body Count at Hiroshima and Nagasaki," *Bulletin of the Atomic Scientists* 33, no. 10 (1977): 49; World Nuclear Association, "Outline History of Nuclear Energy," https://world-nuclear.org/information-library/current-and-future-generation/outline-history-of-nuclear-energy.aspx 2005.

¹⁴ Henderson, 33, 180.

¹⁵ World Nuclear Association.

¹⁶ U.S. Department of Energy, *The United States Naval Nuclear Propulsion Program: Over 157 Million Miles Safely Steamed on Nuclear Power* (Office of Nuclear Energy, 2015), 17.

¹⁷ U.S. Department of Energy, The United States Naval Nuclear Propulsion Program, 17.

3.1.3 The Basics of a Nuclear Plant

A pressurized water reactor (PWR) is a light water reactor, meaning it uses ordinary water to cool the reactor core and generate steam. Nuclear fission of uranium atoms produces heat in the reactor core. In the primary system, heat is transferred to the water circulating around the reactor core. The water in this primary system acts as a moderator and coolant but does not flow to the turbine. Instead, it flows through a series of tubes in the steam generator. The heat is transferred to the water in the steam generator, where it boils and steam rushes into the turbine. This causes a shaft to spin inside a generator, producing electricity. The steam is then cooled and condensed back into water and returned to the steam generator to be reused. At Point Beach, cold water from Lake Michigan is pumped through the condenser and back to the lake. As steam passes over the tubes filled with cold lake water, it condenses into water and is pumped back into the steam generator to repeat the cycle. The primary, secondary, and tertiary water systems are closed so that the water from the reactor does not mix with water from other systems.¹⁸

Today, all commercial reactors in the United States are light water reactors, and 65% of them are pressurized water reactors. As of December 31, 2020, there were 94 nuclear reactors operating at 56 nuclear power plants in 28 states. Nuclear power plants have supplied about 20% of the total annual electricity since 1990.¹⁹

3.2 HISTORY OF THE POINT BEACH NUCLEAR PLANT

The production of electricity for consumers by using nuclear power appeared to be a possible solution to the growing demand for energy in the United States in the post-war period.²⁰ On August 30, the Atomic Energy Act of 1954 was signed into law. The primary purpose of the act was to "make our nation's legislative controls better conform with scientific, technical, economic, and political facts as they exist today."²¹ This act was passed to amend the Atomic Energy Act of 1946. It expanded private involvement in the nuclear industry while establishing the strictest Federal Government regulations over any single industry in the United States. The Atomic Energy Commission (AEC) was required to encourage private participation in the nuclear industry but required a structure of regulations to protect the public health and safety as well as to provide defense and security over the nuclear resources.²²

The Atomic Energy Act of 1954 opened the door for the private nuclear industry, and the post-war period saw a growing commercial demand for electricity. Westinghouse and General Electric were the major equipment vendors and most aggressive private sector promoters of nuclear power. Both companies invested heavily in turnkey nuclear plants such as Point Beach in the 1960s, pricing them as loss leaders to be competitive with fossil fuels. The nuclear power industry was booming, and more than 200 nuclear

¹⁸ Duke Energy, "Pressurized Water Reactors (PWR) and Boiling Water Reactors (BWR)," https://nuclear.dukeenergy.com/2012/03/27/pressurized-water-reactors-pwr-and-boiling-water-reactors-bw; Energy Information Center, *Point Beach Nuclear Plant* (1980).

¹⁹ U.S Department of Energy, *Nuclear 101: How Does a Nuclear Reactor Work?* (Office of Nuclear Energy, 2021); U.S. Energy Information Administration, "Nuclear Explained: Nuclear Power Plants," https://www.eia.gov/energyexplained/nuclear/nuclear-power-plants.php#tab2.

²⁰ World Nuclear Association.

²¹ E.P. Alexanderson and H.A. Wagner, *Fermi I: New Age for Nuclear Power* (LaGrange Park, Ill.: American Nuclear Society, 1979), 98.

²² Alexanderson and Wagner, 98.

reactors were ordered between 1965 and 1974. The Atomic Energy Commission predicted as many as 1000 nuclear power plants in operation by the year 2000. However, rising distrust of corporations and the government, along with the partial reactor meltdown incident at Three Mile Island, led to a decline in the nuclear power industry in the 1970s. The last nuclear plant in the United States that was ordered and eventually completed was placed in 1973. In 2002, there were 103 nuclear plants holding operating licenses in the country; about 2/3 of the reactors are pressurized water reactors like the two found at Point Beach.²³

The first nuclear power plant in Wisconsin was located at the La Crosse Boiling Water Reactor (LABWR), south of Genoa in Vernon County. The plant was built by the Dairyland Power Cooperative to serve rural customers in Wisconsin, Minnesota, Iowa, and Illinois. In 1962, Dairyland signed a contract with the Atomic Energy Commission to build a 50,000 kilowatt plant on the Mississippi River. Construction began in 1963. The plant experienced delays and design flaws, and finally went critical on July 11, 1967. It began commercial operation in February 1971, four years after its planned operation date. Dairyland was the smallest nuclear power plant in the country and as such, was more expensive to operate compared to larger plants. New safety regulations following the Three Mile Island incident, changing public opinion on nuclear power, and rising costs of nuclear fuel compelled Dairyland to close the LACBWR on April 30, 1986.²⁴

In the late 1950s and early 1960s, the Wisconsin Michigan Power Company needed to purchase upwards of 75% of its power from its parent company, Wisconsin Electric Power Company (WEPCO). The Point Beach Nuclear Plant was built to meet the demands of both companies and was jointly owned by Wisconsin Michigan and Wisconsin Electric.²⁵ The site in Two Rivers was selected due to its proximity to WEPCO's customers in the Fox Valley. Fenner-Brey Engineering Corporation of Manitowoc conducted the site survey and Bechtel Corporation of San Francisco held the general contract for the plant's construction. The plant was originally designed with a single 454-megawatt reactor but changed to a twin pressurized-water reactor when Westinghouse offered it at a low price. The plant broke ground for Unit 1 on November 28, 1966. Road construction and site grading followed, as well as tests to determine the soil conditions at the site of the reactor. The plant was designed to extend 360 feet from east to west and 340 feet from north to south. The reactor would rise 140 feet (more than 14 stories) and be 120 feet in diameter with a 3'6"-thick concrete wall around it. Project plans also included a deep well which would provide 30,000 gallons of storage water for the batch plant operation and for in-plant water and fire protection. A 2,000-foot-long water intake pipe would extend into Lake Michigan; a shorter discharge pipe would also be built. Work on Unit 2 began in 1967.²⁶

Two ecology groups filed a petition for intervention in mid-August, delaying the operating license. Company representatives and the ecology groups reached an agreement that the plant would maintain radiological discharges "as far below AEC standards 'as the state of the art will allow.'" The petition was withdrawn, and the Atomic Energy Commission issued an operating license for Unit 1 on October 5, 1970,

²³ J. Jurewitz, "The U.S. Nuclear Power Industry: Past, Present, and Possible Futures," *Energy & Environment* 13, no. 2 (2002): 207-237.

²⁴ D. Driscoll, "Slow Boil: The Story of Wisconsin's First Nuclear Reactor," *Wisconsin History* 85, no. 1 (2001): 34-45.

²⁵ "Point Beach Power Plant Featured in Annual Report," Manitowoc Herald-Times, March 16, 1971.

²⁶ "Report Site Preparation Moving Well, *Manitowoc Herald-Times*, December 16, 1966; "Point Beach Power Plant Featured in Annual Report"; J. Gurda, "Our Nuclear Past – and Future: Nuclear Power Was Welcomed in Wisconsin When the First Reactors Went Online," *Milwaukee Journal Sentinel*, April 2, 2011.

and fuel loading began. At 12:17pm on November 2, 1970, Unit 1 reached initial criticality – a self-sustaining nuclear reaction – for the first time.²⁷

Unit 1 began commercial operations on Monday, December 21, 1970, making Point Beach the nineteenth operating nuclear power plant in the United States. Unit 1 was the largest single operating unit in Wisconsin with a total capacity of 497,000 kilowatts. Unit 2 began commercial operation on October 1, 1972.²⁸ See Figure 3 for a photograph of the plant from that period.

By 1973, Point Beach Nuclear Plant provided 35% of the Wisconsin Electric System's total generated power. The facility served areas of Wisconsin and Upper Michigan, and in 1973 it was named the Outstanding Civil Engineering Achievement of the Year by the Wisconsin Section of the American Society of Civil Engineers. The award was based on service to the community, uniqueness, new approaches in design and construction, economy, and exceptional use of materials for balanced utilitarian and aesthetic results.²⁹ Point Beach became an important and reliable source of energy from WEPCO, and plant has operated continuously without serious incident.³⁰

²⁷ "Point Beach Power Plant Featured in Annual Report."

²⁸ "Point Beach Nuclear Plant Now Operating," *The Post-Crescent*, December 22, 1970; Energy Information Center.

²⁹ "Point Beach Nuclear Plant Selected State's Top Engineering Achievement," *The Sheboygan Press*, January 22, 1974.

³⁰ Gurda.

4.0 NARRATIVE DESCRIPTION

4.1 **PROPERTY OVERVIEW**

The Point Beach Nuclear Plant is located in the town of Two Creeks in Manitowoc County, Wisconsin, on the western shore of Lake Michigan (Figure 1). The overall plant property is approximately 1,260 acres in size. The nuclear plant and associated built resources are confined within an approximately 350-acre area generally bounded by Tapawingo Road to the north, Nuclear Road to the south, Lake Michigan to the east, and Lakeshore Road to the west (Figure 2). The plant, which first achieved commercial operation in 1970, consists of two reactor containment buildings, a turbine building, pumphouse, emergency diesel generator building, service buildings, and numerous support buildings and facilities (Figure 4). Bechtel Corporation of San Francisco constructed the plant. The reactors are twin Westinghouse closed-cycle pressurized water nuclear reactors.

4.2 DESCRIPTION OF RESOURCES³¹

4.2.1 Entrance Gatehouse

The Entrance Gatehouse (Figure 5) is a single room, astylistic structure with a rectangular footprint and flat roof. The door is off center on the primary, east-facing side of the structure. The door is flanked by a fixed window and a pair of sliding windows. Two more sliding windows are located on the north and south ends of the structure.

This building appears to have been constructed in the early 1980s.

4.2.2 Turbine Building and Reactor Containment Buildings

The Turbine Building (Figures 6-8) is a large, three-story, astylistic building with a concrete foundation and prefabricated corrugated metal siding. The east façade is punctuated by 16 narrow bays which extend two stories from the top of the foundation to the roofline. A concrete and brick loading dock with a flat roof is located on the east façade.

The two reactor containment buildings (Figures 9 and 10) enclose the concrete reactor containments. They are located on the west side of the turbine building. Each reactor containment building is three stories tall with a rectangular footprint, concrete foundation, corrugated metal siding, and flat roof. The buildings are windowless but do include service entrances on the north and south sides.

Construction was completed in 1970 for Unit 1 and 1972 for Unit 2.

³¹ Exact dates of construction could not be determined for all buildings. Dates were approximated based on appearance, a general understanding of the plant's history, and a review of aerial photographs from the 1980s, 1990s, and 2000s.

4.2.3 Circulating Water Pump House

This building (Figure 11) is a single-story concrete building with a rectangular footprint and flat roof. Two service entrances are located on the west side of the building.

Construction of the pump house was completed c.1970.

4.2.4 Emergency Diesel Generator Building

The Emergency Diesel Generator Building (Figure 12) is a two-story astylistic brick and concrete building with a flat roof and a concrete foundation. A span of concrete delineates the first and second stories. Vertical spans of concrete divide the eastern elevation into three bays, while the southern elevation is divided into two bays. Large metal vents are located in the second story of the southern elevation.

This building appears to have been constructed in the 1990s.

4.2.5 Warehouse 1

This is a single-story structure (Figure 13) with a rectangular footprint and flat roof. It sits on a concrete foundation and has corrugated metal siding. A vehicle entrance, service entrance, and single window are located on the east side.

Warehouse 1 appears to have been constructed in the 1970s.

4.2.6 Warehouse 2

Warehouse 2 is a single story astylistic structure (Figure 14) with a concrete foundation, flat roof, and corrugated metal siding. A vehicle entrance is located on the east side. The north side includes a fenced enclosure with a shed style metal roof.

This building appears to have been constructed in the 1970s.

4.2.7 Warehouse 3

This is a single-story structure (Figure 15) with a rectangular footprint and flat roof. It sits on a concrete foundation and has corrugated metal siding. A vehicle entrance and service door are located on the east side of the structure. An additional service entrance is located on the north side of the structure.

Warehouse 3 appears to have been constructed in the early 1980s.

4.2.8 South Service Building

The South Service Building (Figure 16) is a two-story brick-clad building located adjacent to the turbine hall and reactor buildings. The building has a flat roof and irregular façade. A bank of windows is located on the south and west sides of the building.

This building appears to have been constructed in the early 1980s.

4.2.9 Security Gate House

The Security Gate House (Figure 17) is a two-story astylistic brick building with a flat roof and irregular footprint. The southern elevation is characterized by three glass doors sheltered by an overhanging flat roof. Three metal posts on brick and concrete piers support the roof.

This building appears to have been constructed in the early 1980s.

4.2.10 Sewage Treatment Plant

The Sewage Treatment Plant (Figure 18) is a long, single story brick building with a flat roof and rectangular footprint. A service entrance is located in a small vestibule on the south elevation.

This building appears to have been constructed in the early 1980s.

4.2.11 Training and Engineering Building

The Training and Engineering Building (Figures 19 and 20) consists of two large connected buildings. The northern building is two stories tall with a roughly rectangular footprint. The exterior is clad in white paneling and features large plate glass windows. The southern building is a single story with a roughly rectangular footprint and flat roof. It also features white cladding and banks of windows running the length of each elevation.

This building was constructed c.2000.

4.2.12 Energy Center

The Energy Center (Figure 21) is a single-story building with a rectangular footprint and flat roof. Like the Training and Engineering Building, it features white cladding and banks of windows. The main entrance is located on the northwest corner of the building and is characterized by large glass doors and windows and a large overhanging roof on two piers.

This building was constructed c.2000.

4.2.13 Trailers 9 and 10

Trailers 9 and 10 (Figures 22 and 23) are astylistic mobile trailers on raised foundations with one-over-one vinyl windows. Each trailer is accessed via a wooden staircase and enclosed vestibule.

The two trailers date from c.2010.

4.2.14 Shooting Range

The Shooting Range (Figure 24) is a single-story prefabricated building with metal siding and a gabled metal roof. The entrance is located on the eastern gabled end of the building. Two pairs of sliding vinyl windows are also located on the eastern elevation.

The Shooting Range appears to have been constructed c.2010.

4.2.15 Transporter Building

The Transporter Building (Figure 25) is a two-story prefabricated structure with corrugated metal siding and a flat roof. A large vehicular entrance is located on the northern elevation. A service entrance is adjacent to the vehicular entrance.

This building appears to have been constructed in the 1990s.

4.2.16 Warehouse 5

Warehouse 5 (Figure 26) is a prefabricated metal building with a gabled roof. A vehicular entrance and service entrance are located on the eastern gabled end.

This building appears to have been constructed c.2000.

4.2.17 Warehouse 6

Warehouse 6 (Figure 27) is a large two-story building with metal siding and a shallow-pitched gable roof. The building rests on a concrete foundation. An entrance is located on the southern elevation.

This building appears to have been constructed c.2005.

4.2.18 Warehouse 7

Warehouse 7 (Figure 28) is a two-story building with metal siding and a shallow-pitched gable roof. Small windows are located below the roofline. A vehicular entrance is located on the eastern elevation.

This building appears to have been constructed c.2010.

4.2.19 Flex Building/Warehouse

The Flex Building (Figure 29) is a single-story structure with a rectangular footprint and flat roof. It is clad in brick and concrete. A vehicular entrance is located on the western elevation.

This building appears to have been constructed in the 1980s.

4.2.20 Quonset Huts

There are two Quonset huts (Figure 30) on the plant property. Both are prefabricated metal structures with a single vehicular entrance on the northern elevations. A single service entrance is located adjacent to the vehicular entrances.

The Quonset huts appear to have been constructed in the 1980s.

4.2.21 Fitness Center

The Fitness Center (Figure 31) is a single-story brick building with an L-shaped footprint and a flat roof. The front entrance is located on the western elevation. It features banks of large windows and an overhanging roof supported by brick pillars.

This building appears to have been constructed in the early 1980s.

4.2.22 ISFSI Facility

The Point Beach Nuclear Plant has an Independent Spent Fuel Storage Installation (ISFSI) that was built to accommodate dry storage containers of spent nuclear fuel from the spent fuel pool. The ISFSI was constructed in 1995 and consists of two parallel concrete pads on grade holding vertical storage casks, horizontally stacked storage modules, and other nuclear fuel storage systems.

4.3 HISTORIC BOUNDARY

4.3.1 Verbal Boundary Description

The historic boundary for the Point Beach Nuclear Plant is a polygon generally bounded by Tapawingo Road to the north, Nuclear Road to the south, Lake Michigan to the east, and Lakeshore Road to the west. Beginning at the southwest corner of Manitowoc County Parcel No. 017-024-000-000.00, the historic boundary extends 5,292 feet to the north along the west parcel line on Lakeshore Road. The boundary then turns to the west and extends 1,098 feet along the south side of Tapawingo Road and follows the ISFSI Facility enclosure. The boundary then returns east along Tapawingo Road to the northwest corner of Parcel No. 017-024-000-000.00. It then extends 1,705 feet along the north parcel line on Tapawingo Road before turning southeast and following the Lake Michigan shoreline and east parcel line for 5,829 feet. The boundary then extends to the west along the south parcel line on Nuclear Road for 4,090 feet to the point of origin.

The historic boundary is shown on Figure 2.

4.3.2 Boundary Justification

The historic boundary mostly corresponds to Manitowoc County Parcel No. 017-024-000-000.00, an approximately 350-acre parcel that encompasses the built environment historically associated with the Point Beach Nuclear Plant and provides an appropriate setting. The boundary is extended beyond this parcel slightly to the northwest to include one additional associated built resource, the ISFSI Facility. The

remainder of the overall 1,260-acre plant property is considered extraneous and therefore was excluded from the boundary.

5.0 NATIONAL REGISTER ELIGIBILITY EVALUATION

Four criteria are used to evaluate the eligibility of properties (buildings, structures, objects, sites, and districts) for the National Register. To be eligible, a property must be associated with significant historic events or trends (*Criterion A*) or the lives of significant persons (*Criterion B*), possess significant design or construction value (*Criterion C*), or yield information important in history or prehistory (*Criterion D*). In addition to eligibility under one or more evaluation criteria, a property must also possess integrity, or the ability to convey its significance. There are seven aspects of integrity to consider—*location, design, setting, materials, workmanship, feeling, and association*—and a property must retain at least several, and usually most, of these qualities.

5.1 Criterion A: Event

To be eligible for the National Register under *Criterion A*, a property must be significantly associated with a specific event, pattern of events, or trend important to history. WEPCO broke ground for the plant in 1966 and both Unit 1 and Unit 2 were fully operational by 1972, making it the nineteenth operating nuclear power plant in the United States. Additional service buildings and facilities were constructed within the last 50 years and the plant has undergone regular refueling, maintenance, and upgrades since its initial construction. Point Beach is an important supplier of electricity for the Fox Valley area and is currently the only operating nuclear plant in Wisconsin. However, the plant was not the first nuclear power plant in Wisconsin, nor did it play a significant role in the development of the nuclear power industry in the United States. It also is not associated with a historic scientific achievement or any events or discoveries critical to the science of nuclear power generation. The property is recommended not eligible under *Criterion A*.

5.2 Criterion B: Person

For eligibility under *Criterion B* a property must be closely associated with a significant person and illustrate that person's important achievements and/or his or her productive life better than any other extant property. The Point Beach Nuclear Plant is representative of private enterprise and the work of many people. It does not appear that any individuals achieved historical significance specifically through their associations with this property. As a result, the property is recommended not eligible for the National Register under *Criterion B*.

5.3 Criterion C: Design/Construction

Properties eligible for the National Register under *Criterion C* are notable for their design and/or construction qualities. They may embody distinctive characteristics of a type, period, or method of construction; exemplify the work of a master; or possess high artistic merit. The buildings and structures at the Point Beach plant are largely prefabricated, astylistic buildings with utilitarian functions. No built elements of the facility represent distinct architectural forms or styles or have demonstrable historic value. Regarding the science and engineering of the plant, Westinghouse developed the closed-cycle pressurized water reactor for the U.S. Navy and that technology was then broadly applied to many commercial power plants, including Point Beach. In 2002, roughly two-thirds of the nuclear plants in the country used pressurized water reactors. It appears Point Beach is a typical example of a turnkey nuclear plant with pressurized water reactors from the early 1970s, and, as noted, was the nineteenth operating nuclear power

plant in the United States at the time it became operational. The property is recommended not eligible under *Criterion C*.

5.4 Criterion D: Information Potential

Properties that have yielded, or are likely to yield, important information regarding history may be eligible for the National Register under *Criterion D*. This criterion most often applies to archaeological sites, as they can serve as principal sources of data. Information regarding the history of Point Beach and use of this property for nuclear power generation is generally well documented or obtainable from other sources. The property is recommended not eligible for the National Register under *Criterion D*.

5.5 Integrity

Although the Point Beach Nuclear Plant remains in use, there have been many additions to the plant and overall property outside of the historic period. As a result, it is not a representative example of a nuclear plant from the early 1970s.

6.0 CONCLUSION

The Point Beach Nuclear Plant is recommended not eligible for the National Register. The plant was constructed beginning in 1966 and began commercial operation in 1970, making it the nineteenth operating nuclear plant in the country. It is a typical example of a turnkey nuclear plant utilizing Westinghouse pressurized water reactors, which appear to be the most common type of nuclear reactors used in the United States. While the plant plays an important role in terms of power generation and supply, it does not meet the eligibility requirements for National Register consideration.

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Figure 1. Property Location Map with UTMs

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Determination of Eligibility Point Beach Nuclear Plant Town of Two Creeks, Manitowoc County, Wisconsin



Figure 2. Aerial Overview of Property



Figure 3. Early 1970s Photograph of Property Source: Gurda



Figure 4. December 2019 Drone Photograph of Property from Lake Michigan, View Southwest Source: NextEra Energy



Figure 5. Entrance Gatehouse, View Southwest



Figure 6. December 2019 Drone Photograph of Turbine Building, View West Source: NextEra Energy



Figure 7. Turbine Building (Right), View South



Figure 8. Turbine Building, View North



Figure 9. Unit 1 Reactor Containment Building (Left), View North



Figure 10. Reactor Containment Building, View Northeast



Figure 11. Circulating Water Pump House, View Southeast



Figure 12. Emergency Diesel Generator Building, View Northwest



Figure 13. Warehouse 1, View South



Figure 14. Warehouse 2, View Southwest



Figure 15. Warehouse 3, View Southwest



Figure 16. South Service Building, View East



Figure 17. Security Gate House, View North



Figure 18. Sewage Treatment Plant, View West



Figure 19. Training Building, View South



Figure 20. Engineering Building, View Northwest



Figure 21. Energy Center, View East



Figure 22. Trailer 9, View Northeast



Figure 23. Trailer 10, View Southeast



Figure 24. Shooting Ranger, View West



Figure 25. Transporter Building, View Northwest



Figure 26. Warehouse 5, View West



Figure 27. Warehouse 6, View North



Figure 28. Warehouse 7, View West



Figure 29. Flex Building/Warehouse, View Southeast



Figure 30. Quonset Huts, View Southeast



Figure 31. Fitness Center, View North



Figure 32. ISFSI Facility, View Northeast

Point Beach Nuclear Plant Units 1 and 2 Dockets 50-266 and 50-301 NEPB Supplemental Response to NRC RAI No. HCR-1 Item B L-2022-013 Attachment 2 Page 1 of 1

NEPB Supplemental Response:

As part of the NEPB Subsequent License Renewal (SLR) project, the NEPB Cultural Resources Management Plan (CRMP; NEPB administrative procedure FP-RP-ENV-01_003) was modified on November 5, 2021 to reflect updated guidance for Archaeological, Cultural & Historic Resources to comply with Federal and Wisconsin State Historic Preservation Office (WI SHPO) requirements for historic preservation programs, namely:

- National Historic Preservation Act of 1966, Section 101
- Section 101, 16 U.S.C. 470a(b) State Historic Preservation Programs
- Section 106, U.S.C. 470f Federal Undertakings, Comments of the Advisory Council on Historic Preservation
- WI Statute 44, Subchapter II. HISTORIC PRESERVATION PROGRAM
- WI Statute 44.47, Field Archaeology
- WI Statute 157.70, Burial Sites Preservation

The NEPB CRMP modification also updated the purpose for the procedures, definitions of Archaeological, Cultural and Historic (AC&H) Resources and cultural resources investigations, information for known archaeological sites and architectural resources, and responsibilities of the Environmental Coordinator and Plant Owner Representative. The guidelines for assessment of archaeological resources in the CRMP were clarified for consistency with Section 106 requirements. The map depicting the Point Beach Nuclear Plant Units 1 and 2 site boundary and archaeological sites was changed to improve legibility and account for current layout and features.

The WI SHPO reviewed the modified NEPB CRMP and on October 5, 2021, concurred with the findings and NRHP eligibility determinations for known archaeological and architectural resources, supported avoidance measures and changes to procedures and responsibilities in the NRPB CRMP, and accepted the information for archaeological and architectural resources as fulfillment of the lead federal agency's Section 106 investigatory responsibilities (Reference).

A copy of the CRMP was placed in the PBN SLRA ePortal for NRC review on January 12, 2022 instead of being enclosed with this supplemental response.

References:

WI SHPO Email dated October 5, 2021 – Re: SHPO Review 21-1476/MN - Point Beach Nuclear Plant Relicensing (ADAMS Accession No. ML21279A120)

Associated Enclosures:

None