



STATE OF NEW JERSEY
Board of Public Utilities
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ENERGY

IN THE MATTER OF THE PETITION OF JERSEY CENTRAL)
POWER & LIGHT COMPANY PURSUANT TO N.J.S.A.)
40:55D-19 FOR A DETERMINATION THAT THE)
OCEANVIEW 230 KV TRANSMISSION PROJECT IS)
REASONABLY NECESSARY FOR THE SERVICE,)
CONVENIENCE OR WELFARE OF THE PUBLIC)

ORDER

DOCKET NO. EO14030281

Parties of Record:

Gregory Eisenstark, Esq., for Jersey Central Power & Light Company
Stefanie A. Brand, Esq., Director, for New Jersey Division of Rate Counsel

BY THE BOARD¹:

BACKGROUND

The New Jersey Board of Public Utilities ("Board") is empowered to ensure that regulated public utilities provide safe, adequate and proper service to the citizens of New Jersey. N.J.S.A. 48:2-23. Pursuant to N.J.S.A. 48:2-13, the Board has been vested by the Legislature with the general supervision and regulation of and jurisdiction and control over all public utilities, "so far as may be necessary for the purpose of carrying out the provisions of [Title 48]." The courts of this State have held that the grant of power by the Legislature to the Board is to be read broadly, and that the provisions of the statute governing public utilities are to be construed liberally. See e.g., In re Public Service Electric and Gas Company, 35 N.J. 358, 371 (1961), Twp. of Deptford v. Woodbury Terrace Sewerage Corp., 54 N.J. 418, 424 (1969), Bergen County v. Dep't. of Public Utilities, 117 N.J. Super. 304 (App. Div. 1971).

Procedural History

On March 25, 2014, Jersey Central Power & Light Company ("JCP&L" or "Company"), a New Jersey public utility engaged in the business of purchasing, transmitting, and distributing electric energy for light, heat and power to more than 1,000,000 residential, commercial and industrial customers in 13 counties and 236 municipalities in New Jersey, filed a petition with the Board

¹ Commissioner Upendra J. Chivukula recused himself due to a potential conflict of interest and as such took no part in the discussion or deliberation of this matter.

pursuant to N.J.S.A. 40:55D-19 of the New Jersey Municipal Land Use Law ("MLUL"). JCP&L seeks a decision by the Board that a proposed 230 kV transmission line between JCP&L's Larabee substation in Howell, New Jersey, and its Oceanview substation in Neptune, New Jersey, along with associated upgrades to these substations (the "Project") is reasonably necessary for the service, convenience or welfare of the public and that, accordingly, the zoning and land use ordinances of municipalities along the proposed route of the Project shall not apply.

According to the petition, PJM Interconnection, LLC ("PJM"), the Federal Energy Regulatory Commission ("FERC") - approved Regional Transmission Organization, identified a planning criteria violation in regard to the JCP&L Atlantic - Oceanview 230kV lines as part of its Regional Transmission Expansion Planning ("RTEP") process, specifically a reliability criteria violation for a potential voltage collapse on the system. PJM approved the Project, as part of the 2012 PJM Baseline Reliability Assessment issued January 4, 2013. JCP&L and PJM established an in-service date of June 1, 2017 which JCP&L believes will allow for sufficient time to receive all necessary approvals for the Project and to complete construction.

The proposed 16.1 mile long route for the Project begins in Howell New Jersey, continues within the existing transmission Right of Way ("ROW")² through the municipalities of Colts Neck Township, Howell Township, Neptune Township, the Borough of Tinton Falls, and Wall Township in Monmouth County. The Project is divided into three segments; two of the segments will require replacement of the existing H-frame structures with steel monopoles ranging from 80 to 160 feet high. For the third segment, the steel monopoles will range between 80 and 115 feet high.

The proposed substation upgrades will include a reconfiguration of the Oceanview 230kV substation to a six breaker ring bus with five breakers initially and a reconfiguration of the Larabee 230kV substation from a ring bus configuration with 8 breakers to a breaker-and-a-half configuration with 11 breakers.

N.J.S.A. 40:55D-19 provides that the MLUL, and any ordinance or regulations made under the authority thereof, shall not apply to a development proposed by a public utility for installation in more than one municipality for the furnishing of service if, upon petition by the public utility to the Board with notice to all affected municipalities, the Board thereafter conducts a hearing to determine whether the proposed installation of the development in question is "reasonably necessary for the service, convenience or welfare of the public."

The Board determined that the petition should be retained by the Board for hearing to decide whether the system upgrades proposed by JCP&L are reasonably necessary for the service, convenience or welfare of the public, consistent with N.J.S.A. 40:55-D-19. By Order dated May 21, 2014, Commissioner Mary-Anna Holden was designated the presiding officer with authority to establish and modify schedules, decide all motions, and otherwise control the conduct of this case. Additionally, the Order set June 20, 2014, as the last day for motions to intervene in this matter.

Commissioner Holden issued a Pre-Hearing Order, dated August 13, 2014, setting a procedural schedule, designating early October 2014 for public hearings, and November 3, 6 and 7, 2014

² According to the petition, this proposed route was selected because it can be constructed entirely within JCP&L's existing transmission ROW, and therefore complies with N.J.A.C. 14:5-7.1(a)(1) which requires an EDC to make use of available railroad or other RsOW whenever practicable, feasible and safe, subject to agreement with the owners.

as the evidentiary hearing dates. The Pre-Hearing Order was posted on the Board's website and was served on representatives of the affected municipalities. No motions to intervene or participate were filed.

After publication of notice in newspapers of general circulation in JCP&L's service territory, a public hearing was held on October 8, 2014 in Wall, New Jersey, a town affected by the proposed system improvement. The hearing record reflects that no members of the public wished to make a statement at that time.

At the November 2014 evidentiary hearings, held at the Office of Administrative Law in Newark, New Jersey, with Commissioner Holden presiding, JCP&L submitted the pre-filed testimony of its witnesses. At the outset of the hearing, Commissioner Holden acknowledged the parties' stipulation to mark and to move into evidence all discovery exchanged between the parties (JC-11 and 12) as well as the pre-filed witness testimony marked as JC-2 through JC-10. JCP&L's witnesses attended the hearing in person and were available for cross-examination. After being introduced by the Company's attorney, the Company's witnesses noted on the record any subsequent changes to their pre-filed testimony before being presented for cross-examination.

Testimony Presented

Overview of the Project

John T. Toth, a Supervisor in the Transmission Engineering Department of JCP&L's parent company, First Energy, provided an overview of the Project. (JC-2) Toth testified that the Oceanview substation, located in Neptune, New Jersey, is currently supplied by two 230 kV circuits (T-2020/S-1033) from the Atlantic substation, which is located approximately four miles northwest of the Oceanview substation in Colts Neck, New Jersey. Both circuits are located on a single set of double-circuit wooden H-frame structures between the Atlantic and Oceanview substations.

During its RTEP, PJM identified the need for a third 230 kV circuit into the Oceanview substation. The third 230 kV circuit is needed to mitigate the potential for: (i) a simultaneous outage of the existing, double-circuit 230 kV transmission line supply to the Oceanview substation; and (ii) outages to the lower voltage circuits and substations supplied through the Oceanview substation.

Toth referred to the testimony provided by Timothy B. Gaul, Associate Vice-President of Energy Services for The Louis Berger Group ("Louis Berger") which performed a routing study for the Project ("Routing Study"). As discussed in detail in Gaul's testimony, the proposed route for the Project begins in a northerly direction from JCP&L's Larrabee substation, which is located in Howell, New Jersey, within the existing Larrabee Atlantic 230 kV and Smithburg-Atlantic 230 kV transmission ROW for approximately 11.6 miles. The route traverses approximately 2.5 miles through Allaire State Park (which is part of the 11.6 miles within the same ROW, before reaching a point just east of the Atlantic substation). From the Atlantic substation, the proposed route heads southeast within the existing Oceanview-Atlantic 230 kV transmission corridor for approximately 4.5 miles into the Oceanview Substation. The Project will pass through sections of the municipalities of Colts Neck, Howell, Neptune, Tinton Falls, and Wall in Monmouth County.

Toth testified that the entire 16.1-mile-long route would be constructed within existing transmission ROW. Some limited tree clearing may be conducted within the existing ROW and

JCP&L may seek additional priority tree rights where necessary, but no significant tree clearing is anticipated, as the ROW is currently maintained in accordance with JCP&L's vegetation management program. Between the Larrabee and Atlantic substations, the route will be constructed adjacent to existing transmission lines, on new steel monopoles within the existing ROW. The new steel monopoles in this section are expected to be between 80 feet and 160 feet in height. Between the Atlantic and Oceanview substations, the route will be constructed by rebuilding an existing transmission line, currently on H-frame structures, on steel monopoles and constructing the Oceanview 230 kV Transmission Line on an adjacent set of steel monopole structures. The new steel monopoles for this section are expected to be between 80 feet and 115 feet in height.

Associated substation work that is to take place within the existing Larrabee substation includes constructing a new 230 kV transmission line terminal and adding 3 breakers. The addition of 3 breakers allows for reconfiguring the existing 8 breaker ring bus into an 11 breaker, breaker-and-a half protection scheme.

Associated substation work that will take place at the existing Oceanview substation includes an additional five 230 kV breakers in a ring bus arrangement. This will allow for the new 230 kV transmission line terminal and the relocation of the connection of two existing 230/34.5 kV transformer banks to the new ring bus.

Toth estimated the total project cost at approximately \$81.7 million, which includes construction work at two (2) existing substations - Oceanview and Larrabee substations. The \$81.72 million project cost does not include overhead costs.

The required in-service date established by PJM is June 1, 2017. The testimony notes that JCP&L expects to begin submitting applications for permits in the second quarter of 2014 and continue until approximately the third quarter of 2015. Many of the permits for the Project require that final detailed engineering be complete. Detailed engineering started in February, 2014 and will be completed in August, 2015. JCP&L anticipates that construction will begin in 2016 and is estimated to take 12 to 16 months.

The Need for the Project

Jeffrey A. Goldberg, an Advanced Engineer in the Energy Delivery Planning and Protection ("EDPP") Department of First Energy Service Company, provided testimony as to the electrical need for the Project. (JC-4) Because Mr. Goldenberg was no longer employed by the Company at the time of the hearing, Lawrence A. Hozempa, Supervisor in Transmission Planning for the Company, adopted Mr. Goldenberg's prefiled testimony and was available for cross examination. (JC-4A) Hozempa testified that the Project is a PJM baseline RTEP project needed to resolve planning criteria violations for electrical reliability purposes. Specifically, these facilities are needed to address identified criteria violations that can occur from the simultaneous loss of the existing two Atlantic – Oceanview 230 kV lines which are routed on common double-circuit towers. The loss of both 230 kV sources into the Oceanview substation would result in significant customer load loss.

Hozempa testified that the Project is needed to avoid the identified voltage drop violations at the Atlantic substation and potential local voltage collapse for the identified NERC C (N-1-1) contingency. Failure to construct the line by the proposed June 1, 2017 in-service date could result in extended interruption of electric service to a large block of customers due to the loss of the Atlantic – Oceanview (X2024 and Y2025) 230 kV transmission lines.

Goldberg's prefiled testimony described two past events that affected Oceanview and other substations in the area. On December 9, 2008, there was an event at Oceanview substation and on August 30, 2010, there was an event at Atlantic substation. In the 2008 incident, the Oceanview 230-34.5 kV transformer Bank 1 failed which created a fault on the Atlantic – Oceanview Y2025 230 kV line causing it to trip. In addition, the Atlantic 230 kV ring 1 bus breaker "XY" failed to open, so the Atlantic – Oceanview X2024 230kV line also tripped. The resulting outage created an area voltage collapse affecting more than 173,000 customers with over 560 MW of load loss. According to Goldberg, if the Project was in-service when this event occurred, there would not have been a voltage collapse and no customers would have been affected. In the 2010 incident, a Coupling Capacitor Voltage Transformer ("CCVT") failed catastrophically at the Atlantic substation. The failed CCVT damaged an adjacent wavetrap. A CCVT measures voltage on the 230 kV conductors and transforms it to a lower voltage for use with substation relay instrumentation. A wavetrap is a piece of substation equipment used for substation to substation communication over the 230 kV conductors. Failure of the CCVT on the H1022 line terminal caused a trip of the Freneau – Atlantic (H1022) 230 kV line and the Larrabee – Atlantic (R1032) 230 kV line. The Atlantic 230 kV ring bus was opened in two places, creating two independent 230 kV buses, eliminating all 230 kV sources at Atlantic substation, Red Bank substation, and Oceanview substation. The resulting outage created an area voltage collapse affecting approximately 181,000 customers. According to Goldberg's testimony, if the Project was in service when this event occurred, there would not have been a voltage collapse and no customers would have been affected.

Route Justification

As noted earlier, Timothy B. Gaul, Associate Vice President of Energy Services for Louis Berger, testified about the Routing Study including the route selection methodology, public outreach process, and the preferred route identification process. (JC-5) The overall goal of the Routing Study was to gain an understanding of the opportunities and constraints in the study area, develop feasible alternative routes, evaluate potential impacts and identify a reasonable preferred route for the Project. The specific goal of the Routing Study was to determine a route that minimizes the overall effect of the transmission line on the natural and human environment, complies with the applicable regulatory requirements, avoids unreasonable and circuitous routes and unreasonable costs, and minimizes special design requirements. The study concluded that the route proposed by the petition, the "Preferred Route" is the route that best satisfies these criteria.

The Routing Study considered the cumulative social, environmental, and financial impacts associated with constructing the Preferred Route to be less than any other alternative route. The Routing Study concluded that the Preferred Route can be constructed entirely within JCP&L's existing transmission ROW and that other alternatives would require the acquisition of additional easements and likely the purchase of one or more residences located within the 100-foot wide ROW needed to accommodate the towers.

From an environmental perspective, the Routing Study indicated that the Preferred Route will require fewer acres of forest clearing than any of the other alternative routes. Although all of the alternative routes had engineering challenges, construction of any of the alternative routes examined would be more challenging in areas where the routes would parallel limited access highways or railway ROW, and would likely require the removal of residences. Any route selected would result in changes to the existing viewshed. The Preferred Route would be constructed adjacent to existing transmission lines, while alternative routes involved

constructing a transmission line through a new corridor in some areas. Therefore, the Alternative Routes would have a greater impact on the existing viewshed than the Preferred Route.

Government Affairs and Public Outreach

Notice of this filing, which included a copy of the filing and all pre-filed testimony, was served on the Clerk of the Township of Colts Neck, the Clerk of the Township of Howell, the Clerk of the Township of Neptune, the Clerk of the Borough of Tinton Falls, the Clerk of the Township of Wall, and the Clerk of the Board of Chosen Freeholders of the County of Monmouth, the Department of Law & Public Safety, Division of Law, and on the Director of the Division of Rate Counsel. In addition, a notice of the filing was also served on all property owners within 200 feet of the Preferred Route of the Project.

Two public open house meetings were conducted to present the Preferred Route, provide information about the Project, and solicit input from interested members of the public. The meetings were advertised in local newspapers and property owners located within approximately 250 feet of the transmission centerline received letters notifying them of the upcoming open house meetings. JCP&L representatives informed local and state officials in advance of the open house meetings. At the meeting, attendees received a project factsheet, information on the BPU Process, comment cards and a Project Area map. The public information meetings provided an opportunity for residents and other interested parties to review project information displays and discuss the project with JCP&L and Louis Berger representatives. Sixteen people attended the open house meetings and six comment cards were completed during the meetings. JCP&L reviewed these comments and followed up as appropriate to answer any outstanding questions. No significant opposition to the Preferred Route was expressed during either public meeting. (JC-5, Exh. TBG-2)

Environmental Impacts

Kirsty M. Cronin, a Principal Environmental Scientist in Louis Berger's Energy Services Division of the Planning, Facilities, and Resource Management Business Unit, provided testimony about the environmental impacts and permitting process for the proposed Project route. (JC-6).

Cronin testified that the Project will have impacts on freshwater wetlands, transition areas and riparian areas. However, project-related impacts to regulated areas will be avoided to the maximum extent practicable, and where impacts cannot be avoided, measures will be implemented to minimize impacts. Compensatory mitigation will be proposed for the purpose of mitigating unavoidable Project-related impacts. Cronin testified that JCP&L and the Routing Team selected the Preferred Route as it best minimizes the overall effect of the Oceanview transmission line on the natural and human environment while avoiding unreasonable and circuitous routes, unreasonable costs, and special design requirements.

Cronin asserted that JCP&L has made numerous efforts to first avoid and then minimize potential environmental impacts associated with the Project. Key efforts include:

1. The decisions which led to the selection of the Preferred Route. The entire 16.2-mile-long route would be constructed within existing maintained transmission ROW. This route requires fewer acres of forest clearing than the other alternatives.

2. Once the Preferred Route was selected, field studies including wetland delineation (completed), and threatened and endangered species habitat assessments (ongoing) were conducted to determine the exact location of sensitive natural resources within the Project area.
3. During the preliminary design phase every attempt to restrict disturbance to within the existing maintained ROW will be made, so as to minimize permanent impacts to wetlands, forested areas and other critical areas.

Existing wetland delineation geographic information system ("GIS") data, NJDEP Landscape Data, NJDEP mapped floodplain, and flood hazard area riparian areas will be placed on the base design maps to aid in determining the location of access roads and transmission structures. Critical areas were spanned aerially wherever feasible. For the rebuild portion of the Project, placement of the new structures will be within the vicinity of the existing structures to avoid additional areas of impact.

During construction, a number of vegetative and engineered erosion and sediment control measures will be implemented to avoid sediment migration to regulated areas on- and off-site. Vegetative soil erosion control measures include maintenance of existing vegetation, permanent vegetative cover for soil stabilization, temporary vegetative cover for soil stabilization, and the protection of existing trees and vegetation during construction. Engineered soil erosion control measures include dust control, slope protection matting, and stabilized construction access. Only selected vegetation will be cleared and grubbed. Clearing and grubbing will be limited to what is initially necessary to install access roads or until such time as work is scheduled for that area. Ongoing maintenance of all soil erosion and sediment control measures will ensure their proper function and operation.

Temporarily disturbed areas will be restored to their pre-existing conditions. Depending upon the extent of disturbance, areas requiring re-vegetation will be seeded with grass appropriate for the area. If the disturbed area is located within an erosion hazard area, the area will be restored to pre-existing contours and stabilized by seeding with appropriate seed mix. In all other areas, the disturbed area will be restored to pre-existing contours and will be allowed to naturally re-vegetate to avoid the potential for introducing undesirable species by seeding. If there is likelihood that phragmites or other undesirable species could invade the disturbed area, then the area will be replanted with appropriate native species. Re-vegetation with native species is required only when disturbance within the work area has resulted in the permanent destruction of vegetation and disturbance to the soil which would preclude natural re-vegetation within one growing season.

To minimize potential construction related impacts to state-listed plant and wildlife species, JCP&L will adhere to permit conditions imposing seasonal work restrictions based on sensitive life stages.

Preliminary design indicates that proposed improvements at both the Oceanview and Larrabee substations to accommodate the new equipment and connection to the Project will result in impacts to upland areas. However, any such disturbances will be located on land currently owned by JCP&L.

Cronin concluded that the entire 16.2-mile-long route would be constructed within existing maintained transmission ROW. Although the existing ROW is currently maintained in accordance with JCP&L's vegetation management program, additional clearing within the ROW

will be necessary in certain areas where the ROW is not currently cleared to the full extent necessary for the new 230 kV line, or to remove priority trees. Although JCP&L can construct the entire line within the existing easement, JCP&L may seek additional tree clearing rights in certain areas. If additional tree clearing rights are not granted, JCP&L can still design the line within the existing ROW to meet National Electrical Safety Code ("NESC") clearance requirements.

Rights-of Way and Real Estate Issues

Tracey Janis, First Energy's Manager, Right-of-Way Services, described any necessary property-related rights, including additional rights-of-way, access and vegetation clearing rights, which may be required for the construction, operation and maintenance of the Project. (JC-7) Janis testified that JCP&L acquired the original ROW, in both easement and in fee simple, in the 1930s. In the early to mid-1970's, the easements were amended and revised as needed to accommodate upgrades to the existing 230 kV facilities that are present on a portion of the proposed route. These upgrades consisted of modifications to existing structures, the addition of structures, and a conductor upgrade.

Janis testified that JCP&L does not need to acquire new ROW or property to construct the Project. However, JCP&L may need to acquire additional easement rights for vegetation management. The Company may have to enter into temporary right-of-entry agreements with private and/or public property owners for access points and possibly laydown areas during the construction period of the Project. JCP&L will negotiate with and compensate these property owners for the additional easement rights that may be needed for vegetation management and any temporary right-of-entry agreements that may be needed or construction access and laydown rights.

Janis testified that JCP&L is currently reviewing its existing easements to determine whether any will need to be amended for construction of the Project. Based on the preliminary design, there are approximately thirty-six parcels owned by twenty-eight different landowners which may require additional rights for vegetation management. The rights could require amendments to the existing easements or acquisition of additional rights.

Access road selection has not been finalized and as such, the number of parcels requiring temporary right-of-entry agreements has not been determined. However, existing easement rights grant JCP&L ingress and egress to the property. Therefore, the number of temporary right-of-entry agreements that JCP&L may need are expected to be minimal.

Janis testified that JCP&L will work with the property owners to acquire the necessary rights, including additional easements, access and vegetation management rights, for this Project. JCP&L will also prepare property value opinions utilizing recent sales data for the geographic area and is hopeful that it will be able to successfully negotiate with the affected property owners. If JCP&L is unable to negotiate a settlement with a particular property owner, JCP&L will seek approval to exercise eminent domain rights pursuant to N.J.S.A. 48:3-17.6 and 48:3-17.7.

Jerome J. McHale, a Principal in the firm J. McHale & Associates, Inc, sponsored and explained the real estate property analysis that was completed for the Project. (JC-8)

McHale testified that he relied on the description of the Project as provided by JCP&L, in particular, the detailed description of the Project as found in the Direct Testimony of Dave Kozy,

Jr. (JC-3) McHale provided JCP&L a real estate property analysis that determined the impact on the market value of properties located within 100 feet of the ROW for the proposed Project. McHale concluded that construction of the Project will create no further diminution in value to the properties adjacent to the ROW.

Electric and Magnetic Field (ELF/EMF) Strength

Kyle G. King, President of K&R Consulting, an electric power engineering company prepared an electrical engineering analysis of the existing Larrabee - Oceanview - Atlantic 230 kV transmission lines and how they will be affected by the Project upgrades. His analysis included the effects of electric fields, magnetic fields, audible noise, and radio noise associated with the Project. His testimony described and quantified the expected electrical effects of the Project. (JC-9)

William H. Bailey, PhD, of Exponent, Inc. ("Exponent"), a scientific research and engineering firm engaged in a broad spectrum of activities in science and technology, described the Project with respect to the expected levels of EMF associated with the operation of the existing and proposed transmission line and provide information about the current status of health-related research on EMF. (JC-10)

ELF/EMF

Mr. King described electric and magnetic fields. He testified that the magnetic field levels from existing transmission lines at the edges of the ROW are calculated to be low and will change little under proposed conditions. The largest increase in the magnetic field at the edge of the ROW due to the Project on any section of the route is 11.5 mG and the largest decrease is 71.1 mG. Magnetic field levels under peak loading conditions, however, are higher than under average loading when compared to the existing transmission line configuration in any cross-section. The changes in electric field levels at the edge of the right-of-way between existing and proposed conditions are small; with the highest edge of the right-of-way electric field level calculated to be 1.00 kV/m.

According to Dr. Bailey, there are no standards in New Jersey that apply to any electrical phenomena from transmission lines, nor are there any federal standards for EMF from power lines. The New Jersey Department of Environmental Protection ("NJDEP") has a guideline regarding the edge of ROW electric field levels. The interim guideline limit at the edge of a transmission line's ROW is 3 kV/m, which has not been revised or rescinded. Per Mr. King's analysis the Project will produce a maximum electric field of 1.00 kV/m.

Guidelines for exposure of the general public and occupational exposure to EMF have been recommended by the International Commission on Non-Ionizing Radiation Protection ("ICNIRP") and other agencies. The ICNIRP's 1998 guidelines recommend basic restrictions as limits to protect against acute effects that occur at very high EMF levels, such as perception, annoyance, and the stimulation of nerves and muscles. ICNIRP recommended reference levels of 4.2 kV/m and 833 mG for exposures of the general public to electric and magnetic fields. In 2010, ICNIRP increased the reference level for magnetic field exposure to 2,000 mG at 60 Hz.

The International Committee on Electromagnetic Safety ("ICES") also recommends standards for the safe use of electromagnetic energy in the range of 0 Hz to 300 GHz, including 60 Hz power frequency fields. The ICES defines reference levels for AC magnetic field exposure at 9,040 mG and electric field exposure at 5 kV/m, which are higher than ICNIRP's guidelines at

60 Hz. Exposures above the ICNIRP and ICES reference levels are permitted if it can be shown that the basic restrictions on internal electric fields are not exceeded.

For the Project, Bailey concluded that the highest magnetic field levels at average loading and at peak loading are far below the reference levels for the general public under ICNIRP, ICES, and NJDEP guidelines. The electric field levels are also below the recommended reference levels, even where the maximum electric field is 1.00 kV/m. Because the loading of circuits does not affect electric field levels, they will be the same at average and peak loading. The maximum electric field level at the edge of the ROW under proposed conditions will be 1.00 kV/m, which is below the NJDEP's protection guideline.

None of the panels, reviews, or studies on EMF and health that were reviewed by Exponent concluded long-term exposure to electric or magnetic fields at the strengths normally encountered in our environment is a known or likely cause of any adverse health effect. The World Health Organization's ("WHO") Task Group concluded there was no substantive health issues related to ELF electric fields at levels generally encountered by members of the public. The National Institute of Environmental Health Sciences ("NIEHS") states no regulatory action was recommended by or taken based on the NIEHS report to the U.S. Congress at the conclusion of the EMF Rapid Program, which suggested power companies and utilities continue siting power lines to reduce exposure and explore the ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards. The WHO recommends in the construction of new facilities that low-cost ways of reducing exposures be explored. The WHO stated appropriate exposure reduction measures will vary from country to country but policies based on the adoption of arbitrary law exposure limits are not warranted. The proposed Project is consistent with the recommendations of the WHO and NIEHS because it limits the spread of EMF sources in the area and minimizes the magnetic field level at right-of-way edges.

Dr. Bailey concluded, within a reasonable degree of scientific certainty, that EMF, at the levels described in K&R Consulting's modeling for the Project, are not harmful to human health.

AN

Mr. King testified that New Jersey has published limits for Audible Noise. N.J.A.C. 7:29-1.2 (a) (2) (i) establishes a limit of 50 dBA for "continuous airborne sound" between the hours of 10:00 P.M. and 7:00 A.M. (JC-9) Per Mr. King, 230 kV transmission lines do not typically produce much corona or associated audible noise. Existing noise levels along the edges of the Project ROW range from 30.5 to 37.8 dBA. The calculated audible noise levels after the Project is completed in 2018 range from 34.8 to 38.9 dBA. Therefore, the project noise levels are well below the New Jersey 50 dBA limit. N.J.A.C. 7:29-1.2(a)(2)(i)

RN

Mr. King represented that the IEEE Radio Noise Design Guide identifies an acceptable level of fair weather RN from transmission lines as no more than 40 dB μ V/m at 100 feet from the outside conductors. The Project radio noise values are presented in Table 14 of Mr. King's report to JCP&L (JC-9, Exh. KGK-2). Mr. King concluded that these values are well below the IEEE Radio Noise Design Guideline of 40 dB μ V/m measured at 100 feet from the outside conductor.

DISCUSSION AND FINDINGS

Review Criteria

N.J.S.A. 40:55D-19. Provides that the Board may grant the petition of a public utility for relief from local zoning restrictions on a proposed utility project running through multiple municipalities if, after hearing, on notice to all interested parties, the Board finds that:

the present or proposed use by the public utility ...of the land described in the petition is necessary for the service, convenience or welfare of the public... that the present or proposed use of the land is necessary to maintain reliable electric or natural gas supply service for the general public and that no alternative site or sites are reasonably available to achieve an equivalent public benefit, the public utility...may proceed in accordance with such decision of the Board of Public Utilities, and ordinance or regulation made under the authority of [Municipal Land Use Law] notwithstanding.

The New Jersey Supreme Court, in In Re Public Service Electric & Gas Co., 35 N.J. 368 (1961), explained the applicable legal principles:

- a. The phrase "for the service, convenience and welfare of the public" refers to the whole public served by the utility and not the limited group that benefits from the local zoning ordinance;
- b. The proposed use must be reasonably, not absolutely or indispensably, necessary for the service, convenience, and welfare of the public;
- c. The particular site or location must be found to be "reasonably necessary" and so the Board must consider the community zoning plan, the physical characteristics of the site, and the surrounding neighborhood;
- d. Alternative sites and their comparative advantages and disadvantages, including cost, must be considered in determining reasonable necessity; and
- e. The Board must weigh all interests and factors in light of all the facts, giving the utility preference if the balance is equal. The legislative intent is clear that the broad public interest is greater than local considerations.

Therefore, in making its determination, the Board must weigh all the interests and, in the event the interests are equal, the utility should be entitled to a preference because the legislative intent is clear that the broad public interest to be served is greater than local considerations. See, e.g., In re Monmouth Consolidated Water Co., 47 N.J. 251 (1966); In re Public Service Electric & Gas Company, *supra*, 35 N.J. at 377.

Need for the Project

PJM is responsible for ensuring the reliability of the regional transmission system, and coordinates the movement of wholesale electricity in its 13 plus state venue, including most of New Jersey. The reliability criteria are established by the North American Reliability Corporation ("NERC") per jurisdiction awarded by FERC. A major component of this

responsibility is PJM's planning of the system. As the regional transmission operator, PJM evaluates the projected operation and capacity of the high-voltage electrical transmission system over both a five-year and 15-year planning basis. This evaluation includes assessment of the current transmission infrastructure, existing generation assets, dedicated capacity, updated load forecasts, and planned assets and generation on a multi-year look ahead, and takes the PJM assumed conditions for each study year into account. From this analysis and review, PJM develops the RTEP. Part of the function of this process is to specify anticipated NERC Reliability Standards violations on the transmission system and develop projects designed to fix or mitigate those potential violations.

The Oceanview Project is a PJM baseline RTEP project needed to resolve planning criteria violations for electrical reliability purposes. Specifically, these facilities are needed to address identified criteria violations that can occur for the simultaneous loss of the existing two Atlantic – Oceanview 230 kV lines which are routed on common double-circuit towers, resulting in the possible loss of all 230 kV sources into the Oceanview substation with significant customer load loss.

The Project is needed to avoid the identified voltage drop violations at the Atlantic substation and potential local voltage collapse for the identified NERC C (N-1-1) contingency. Failure to construct the line by the proposed June 1, 2017 in-service date could result in extended interruption of electric service to a large block of JCP&L customers due to the loss of the Atlantic – Oceanview (X2024 and Y2025) 230 kV transmission lines.

Based upon the analyses of PJM and JCP&L, the loss of both the X2024 and Y2025 230 kV lines would result in a potential local voltage collapse in the Oceanview area and could result in a service outage for over 100,000 JCP&L customers. The planning studies have indicated a potential local loss of load that would exceed the planning criteria limit under modeled case conditions. The Project, if implemented as proposed, should resolve the criteria concerns within the area, and is therefore necessary to provide safe and reliable service to customers.

Alternative Routes for the Project

The record demonstrates that the Company examined several routing alternatives after determining that a transmission line had to be constructed between the Oceanview, Atlantic and Larrabee substations. None of the alternative routes were equal to the selected route when compared in terms of cost and possible environmental impact.

The record supports that the selected route is the most reasonable and practicable due to its use of the existing ROW, design with a smaller profile, and adverse least impact upon the environment.

Design, Engineering and Construction

The transmission line will be constructed within JCP&L's existing rights-of-way -- its fee-owned land and secured easements. The record indicates that minimal additional clearing will be required and any impact on wetlands or other environmental impacts that would otherwise result from the construction of the Project, JCP&L represents will be minimized. Aesthetic impacts from the Preferred Route construction are de minimus because the line traverses JCP&L's existing ROW. As JCP&L will be replacing the existing lattice towers with steel monopoles, the footprint of the line will be reduced.

The record provides that JCP&L will meet or exceed the requirements of the National Electric Safety Code ("NESC") in the design of the proposed line. Furthermore, JCP&L represented that it incorporated the concept of "prudent field management" where modifications could be made at little or no cost. For example, JCP&L is using an existing right-of-way, selecting a phasing arrangement to provide cancellation of the magnetic fields wherever practical, and designing the new structures such that visual impact should be minimal.

The record further provides that the Project will be constructed according to well-defined procedures that utilize standard construction practices to perform all work safely and in compliance with OSHA Rules and Regulations, while keeping environmental impacts to a minimum. All work will commence and be conducted in accordance with all applicable state and local permits, property releases and approved special conditions. JCP&L represents that it will, at all times, minimize to the greatest extent practical the impacts of construction activities on local communities.

ELF/EMF

The State of New Jersey has a guideline of 3 kV/m for electric fields at the edge of the ROW. This guideline was established by the NJDEP on June 4, 1981. Upon completion, based upon the information provided in this proceeding, the Project will meet the State of New Jersey's electric field guidelines at the edge of the right of way. The Project, if built as proposed, will produce a maximum electric field of 1.00 kV/m.

The expected EMF levels outside of the ROW will fall below the exposure guidelines published by international organizations.

As previously stated, there are no federal standards for electric fields. New Jersey has adopted a standard of 3 kV/m for electric fields at the edge of a right-of-way. The maximum level of electric fields at the edge of the right-of-way for the Project is projected to be 1.00 kV/m. There are no standards in New Jersey, however, for electric fields within the right-of-way. Thus, the Board reviewed the standards of several other states presented in the record that set maximum levels of permitted electric fields within the right-of-way. The projected maximum level of electric fields associated with the Project at the edge of the right-of-way is 1.00 kV/m. Thus, the Board **HEREBY DETERMINES** that the Project will comply with the New Jersey's standard for electric fields at the edge of the right-of-way, and is well within the guidelines set by other states for electric fields within the right-of-way.

There are no federal standards for magnetic fields at power frequencies. Additionally, New Jersey has not adopted standards for magnetic fields. Therefore, the Board reviewed standards adopted by other states and the international community for guidance on commonly accepted levels of magnetic fields for transmission lines. At the state level, only New York and Florida have guidelines for magnetic fields. Those guidelines establish that magnetic fields for new 500 kV transmission lines at the edge of the right-of-way should not exceed 200 mG. The projected maximum levels of magnetic fields associated with the Project are 39.9 mG at peak loading at the edge of the right-of-way. Thus, the projected levels are lower than the standards set in other states. Therefore, the Board **HEREBY FINDS** that the estimated magnetic field levels are within the guidelines set by other states and the international community.

The methodology used by Mr. King in his calculations is reasonable and was based upon his professional experience as a consultant with respect to EMF issues. However, the Board is

concerned that the estimates calculated by Mr. King should be shown to be accurate once the Project is fully operational. While scientific studies have not been able to provide conclusive evidence linking EMF to adverse impacts on human health at the levels expected from this Project, the Board is continuously monitoring ongoing efforts in this area and should material evidence be established that EMF could subject the population of New Jersey to adverse health effects, this Board will take appropriate action. Accordingly, the Board **HEREBY DIRECTS** JCP&L to conduct a survey of field readings in 2017 similar to that included in the record with the purpose of ensuring that: 1) JCP&L's estimated EMF and noise levels are correct, and 2) that the EMF and noise levels are within the New Jersey guidelines, as well as within all other guidelines and standards considered in this Order. The Board **HEREBY ORDERS** JCP&L to submit to the Board a report describing the results of the survey as soon as practicable after completion of the survey and in no event more than 12 months after the line becomes operational.

JCP&L represents that it employed the principle of "prudent avoidance", a precautionary principle providing that reasonable efforts to minimize potential risks should be taken when the actual magnitude of the risks is unknown, regarding minimizing EMF levels by limiting exposure reasonable investments of money and effort. The Board agrees. The Board **HEREBY DETERMINES** that the design and routing of the Project incorporates reasonable efforts to manage EMF exposure.

Cost Allocation

In determining whether the Project is "reasonably necessary for the service, convenience or welfare of the public," the Board must consider the cost that New Jersey electricity customers will bear in connection with the Project. Construing this standard under the predecessor to N.J.S.A. 40:55D-19, the New Jersey Supreme Court stated: "Alternative sites or methods and their comparative advantages and disadvantages to all interests involved, including cost, must be considered in determining such reasonable necessity." In re Public Service Electric & Gas Co., 35 N.J. 358, 377 (1961). Therefore, the Board must include consideration of the cost of the Project to New Jersey electricity customers.

The estimated cost for the Project, as revised by Mr. Toth in his testimony, is \$81.7 million (excluding overhead costs) which includes the costs of upgrade construction at the Oceanview and Larrabee substations. The Board concludes, based on the testimony and evidence concerning the expected costs of the Project, that the costs are reasonable. As the record amply demonstrates, the project is needed to remedy reliability criteria violations that, if not addressed, could lead to outages for over 100,000 JCP&L customers. The Board concludes that the proposed line is cheaper than the alternatives, in large part because existing rights of way will be utilized, and the testimony in support of the Project was not refuted.

Therefore, the Board **HEREBY DETERMINES** that the cost projections and countervailing economic benefits weigh in favor of approving the Project.

ADDITIONAL FINDINGS AND RECOMMENDATIONS

As a procedural matter, the Board **HEREBY RATIFIES**, in their entirety, all preliminary Orders previously issued by Commissioner Holden during the pendency of this matter for the reasons stated in her Orders.

After a thorough review of the record in this proceeding, the Board **HEREBY FINDS**:

- 1) That the Project is necessary to provide safe, adequate, and reliable electric service in New Jersey and in the PJM region;
- 2) That the Project is reasonably necessary for the service, convenience and welfare of the public;
- 3) That JCP&L considered alternative routes for the Project;
- 4) That JCP&L considered alternative methods to alleviate the projected reliability criteria violations;
- 5) That the planned route, primarily along JCP&L's existing right-of-way, is a reasonable route considering the alternatives;
- 6) That the Project as proposed is to be designed and constructed in accordance with all applicable industry standards in a manner that will minimize adverse impacts upon the environment, to the extent known or predictable;
- 7) That based upon the record in this proceeding, the Project will not be adverse to the public health and welfare;
- 8) That the Project can be constructed, installed, and operated without substantial detriment to the public good and without causing undue economic injury to neighboring property owners;
- 9) That, in light of the reliability issues identified in this proceeding, there is no reasonable, practical, and permanent alternative to the construction and operation of the Project that would have any less adverse impact upon the environment, surrounding community, or local land use ordinances;
- 10) That JCP&L conducted a good faith, reasonable, and extensive analysis of alternative methods for the Project, and the Project represents the most effective and robust solution to the expected reliability criteria violations;
- 11) That JCP&L will take necessary steps to ensure that the Company and local fire and safety officials are adequately prepared in the unlikely event of an emergency;
- 12) That the findings contained within this Order are the result of a thorough and complete review of the record in this proceeding. The Board's findings are limited to the facts and circumstances of this particular Project along this particular route and shall not be construed as a determination by this Board on any other application.

Therefore, in accordance with N.J.S.A. 40:55D-19, the Board **HEREBY DETERMINES**, that the proposed Project is reasonably necessary for the service, convenience, and welfare of the public to enable JCP&L to continue to provide safe, adequate, and reliable service to its customers; that JCP&L should be able to construct and begin local operation of the Project as proposed and modified by the Board in this Order; and that the Local Land Use, Zoning, and any other Ordinances, rules or regulations promulgated under the auspices of the Municipal Land Use Act of the State of New Jersey shall not apply to the construction, installation, and operation of the Project.

Accordingly, the Board **HEREBY ORDERS** that neither N.J.S.A. 40:55D-1 et seq., nor any other governmental ordinances or regulations, permits or license requirements made under the authority of N.J.S.A. 40:55D-1 et seq. shall apply to the siting, installation, construction, or operation of the Project, as proposed in this Order. The Board, however, is cognizant that portions of the Project are located within areas governed by statutes rules of other regulatory agencies. Therefore, this Order shall not be construed as a certificate, license, consent, or permit to construct or disturb any land within the jurisdiction of any other regulatory agency. Should JCP&L need to obtain any approval or authorization to proceed from these entities or any other entity as may be required by law or rules, it is required to do so.

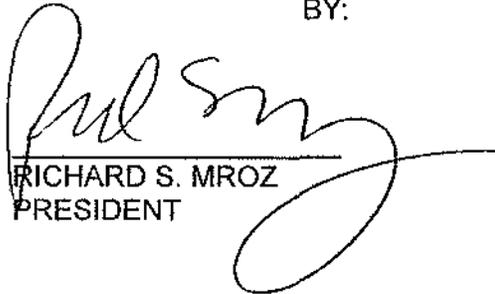
This Order is applicable only to the route as proposed by JCP&L. Should JCP&L determine that additional modifications to the Project route are required because of the actions of another agency or for any other reason, it must request further approval from this Board.

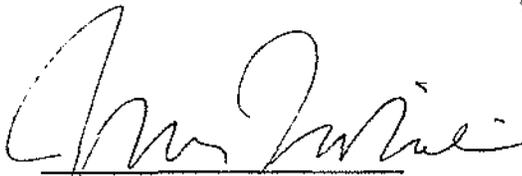
The Board **FURTHER ORDERS** that:

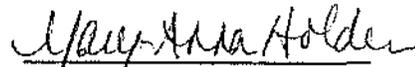
- 1) JCP&L shall minimize the visual impact of all transmission structures to the extent practicable;
- 2) JCP&L shall conduct a survey of EMF field readings during peak demand once the Project is operational, to ensure that the estimated readings are accurate. JCP&L shall report those findings to the Board as soon as practicable after the Project is operational, and in no event more than 12 months after the construction is complete. If the actual readings are substantially greater than the estimated readings testified to in this proceeding, the Board will take appropriate action;
- 3) JCP&L shall comply with the New Jersey audible noise requirements;
- 4) JCP&L shall appropriately compensate property owners for any and all physical property damages that may result from construction of the Project;
- 5) JCP&L shall report to the Board the findings of PJM's next completed RTEP. If that RTEP deems that this Project may no longer appear to be necessary, or can be delayed significantly, the Board's authority to reopen this matter remains.

DATED: 1/21/15

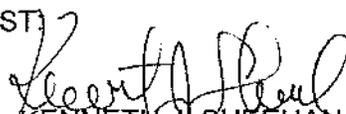
BOARD OF PUBLIC UTILITIES
BY:


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PRESIDENT


JOSEPH L. FIORDALISO
COMMISSIONER


MARY-ANNA HOLDEN
COMMISSIONER


DIANNE SOLOMON
COMMISSIONER

ATTEST:

KENNETH J. SHEEHAN
SECRETARY

I HEREBY CERTIFY that the within document is a true copy of the original in the files of the Board of Public Utilities



IN THE MATTER OF THE PETITION OF JERSEY CENTRAL POWER & LIGHT COMPANY
PURSUANT TO N.J.S.A. 40:55D-19 FOR A DETERMINATION THAT THE OCEANVIEW 230
KV TRANSMISSION PROJECT IS REASONABLY NECESSARY FOR THE SERVICE,
CONVENIENCE OR WELFARE OF THE PUBLIC

BPU DOCKET NO. EO14030281

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