LONG RANGE DISTRIBUTION CAPACITY PLANNING

Exelon Utilities Administrative Procedure

AM-EU-09140

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The procedure will only apply to ComEd, PECO and PHI utilities at this time. [redacted]

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1. Purpose

1.1. This procedure describes the process and expectations for a Long-Range forecast of distribution loads, the identification of the general location and timing of new distribution substations supplied at 69 kV or above and the extensions of the transmission system to supply those substations. A long-range plan is intended to provide guidance for the short-term expansion of the distribution system to avoid installation of facilities that may become unnecessary in the long-term. This approach should minimize long-term costs. A long range plan may be made for an entire utility system or for a portion of the system.

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1.2. The long-range distribution plan will provide Transmission Planning with guidance on the magnitude and location of future distribution loads to enhance the Transmission long-range plan and minimize transmission costs.

1.3. One outcome of the long-range plan is to identify potential strategic substation site and right-of-way acquisitions intended to minimize long-term costs.

2. Precautions and limitations

2.1. Precautions

2.1.1 Local land use plans are subject to change based on market trends and the success of land developers to gain approval for projects and obtain buyers and tenants. The long-range plan is primarily intended to provide guidance on the size and general location of future distribution substations and supply lines. Approval to acquire property for future substations and rights-of-way will be requested for specific projects through established procedures. In some cases, state regulatory and regional transmission operator approvals will be required of new substations and transmission system connections.

2.1.2 The long-range plan is intended for internal use and may contain confidential information that could impact company costs or customer satisfaction if improperly used. Distribution of the documentation should be limited to only those areas of the company where it is needed for business purposes.

2.2. Limitations

2.2.1 Changing trends in technology and the emergence of new consumer preferences require that the long-range plan be updated periodically.

3. Prerequisites

3.1. Current land use information on a geographic basis.

3.2. Recent historical, current and forecasted substation peak load information.

3.3. Ten to twenty year municipal, county and regional land use, population and employment forecast or plans on a geographic basis.

4. Procedure

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4.1. LONG-RANGE LOAD FORECAST

4.1.1 Establish current baseline seasonal historical peak load by substation area. Using substation service area connected load or by reviewing each land parcel area, determine the substation use or the current and future land use by class from a land base system, billing system using AMI data, or transformer load management data. If land base calculations are used, calibrate the assumptions on load per unit area of land by comparing the calculated land area customer loads to the substation area loads.

4.1.2 Verify that the vacant land or areas that could be used in reclamation or gentrification in each substation area are realistic for development. This may include procurement of long-range land use and zoning plans from local municipality or county agencies.

4.1.3 Identify the expected sequence of area development over the next 5, 10 and if desired 15 and 20 years from examination of the boundaries of current development, the primary drivers of new development and other system considerations. These drivers of new development and other system considerations may include:

- Access to highway and commuter transportation
- Adequate drinking water and sewage treatment facilities
- Cost of land for development
- Positive local environment for property development
- Prospective New Business Summary (PNB)
- Identify the previously recommended work completed or not completed
- Apply the growth trends where appropriate to compensate for PNB information
- Knowledge of trends of DER and System Efficiency Programs
- Emerging technology
- Changes in electrical system characteristics
- Changes in distribution system requirements, system improvements, etc.

4.1.4 Once all the substation service area or all land suitable for development is exhausted, area load growth should be reduced to a minimum level,in order to account only for changes in electric use by existing customers. Built out areas where existing structures are being replaced with larger or different structures will require case-by-case evaluation to determine the impact on long-range loads.

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4.1.5 A rollup of all load growth across the service territory should result in similar load increases as those forecast by Financial Planning and Analysis and/or PJM website. These predictions may differ because PJM 90/10 load forecast provides the maximum system demand in active power (MW) and substation total load predicts the total of the individual substation undiversified apparent power (MVA). The regional total of the substation loads is forecasted for the third through tenth year using the growth rate of the PJM Load Forecast throughout the ten-year period. A deviation in the growth rate may be included in the five to ten year period at the discretion of the Manager of Capacity Planning. It should be noted that the Financial Planning forecast may include offsetting load reductions in certain customer classes that may not be occurring in areas with land that is being developed.

4.2. NEW DISTRIBUTION SUBSTATION LOCATIONS

4.2.1 Using the 5, 10 and if desired 15 and 20 year forecasted load increases by substation area, an expansion plan for distribution substations can be developed using standard substation ultimate designs. Generally, least cost considerations will result in existing substation sites being built out prior to development of new substations. Substations operating at 12kV and 13kV should generally be placed on 4-6 mile centers, while 34 kV substations should be placed on 10-15 mile centers. The size and ultimate capacity of new substations will be dependent on the anticipated long-range customer density resulting from land development. Transmission extensions should generally utilize the most direct route from the existing transmission system.

4.3. LONG-RANGE TRANSMISSION PLAN

4.3.1 Transmission Planning will develop the transmission long-range plan. Transmission capacity considerations may influence the choice of lines or bulk power substations used to supply future distribution loads.

4.4. UPDATE SCHEDULE

A long-range plan should be updated approximately every 10 years. A more frequent update would be appropriate if significant changes to the drivers to regional development occurred that were not evident in the previous long-range plan.

5. Roles and responsibilities

5.1. CAPACITY PLANNER

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5.1.1 For each update of the Long-Range plan, obtains and reviews information regarding current and future land use plans. Assesses recent historical rate of load increase or decrease in planning areas. Request External Affairs to obtain comprehensive zoning and land use plans prepared by municipalities and counties for those areas where the most significant change in land use is expected to occur. Capacity Planners could also obtain zoning and land use plans from available online municipal websites. The predicted loads for transmission and subtransmission customers, municipal utilities, and cooperatives are provided by customer representatives when growth is anticipated.

5.1.2 Identifies likely future events that would drive a change in land use. These may include a new regional airport, closing of military facilities, major highway expansion plans, municipal water and sewage treatment expansion plans, commuter rail expansion plans, etc.

5.1.3 Forecasts future substation loads. Compiles all information contained in the forecast report in (Section 6).

5.2. CAPACITY PLANNING MANAGER

5.2.1 Assign responsibility and schedule for long-range plan development in each planning area. Provides guidance in the plan development process and review the plan for consistency with previous plans and long-range plans prepared by regional, county and municipal planning commissions.

5.3. CAPACITY PLANNING DIRECTOR OR MANAGER

5.3.1 Determines schedule for completion of the long-range plan.

5.3.2 Approves the Distribution Long-Range plan.

5.4. TRANSMISSION PLANNING

5.4.1 Review proposed connections and extension of the transmission system for consistency with the transmission planning criteria and long-range transmission plan.

5.5. EXTERNAL AFFAIRS

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5.5.1 On request from Capacity Planning, obtain and forward comprehensive zoning and land use plans prepared by municipalities and counties, where available, to the responsible capacity planning manager. Capacity Planning will prioritize the communities where information is needed to permit focus on areas where the most significant change in land use is expected to occur. This is intended to reduce the data collection effort in areas where little change is expected.

6. Documentation

6.1. The report of the plan will include a tabulation of future substation MW loads at 5, 10 and if desired 15 and 20 years from the date of the report. A system map will show the approximate location, time period for initial installation and ultimate capacity of new substations and transmission system extensions. The report will contain a description of significant assumptions about area development including economic development, major transportation corridor or air transportation changes and the basis for those assumptions. The report should be organized with an EU operating region focus. A separate report for each region is an appropriate format for this purpose.

6.2. The long-range plan will be supplied to the Transmission Planning and Real Estate & Facilities. The document should be marked “CONFIDENTIAL” .

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7. Terms and definitions

7.1. LAND BASE: Geographic data base containing current classification of land use. Land uses are utilized to assess categories of existing electric system users including residential, small commercial, large commercial, large industrial. Land used for parks, forest preserves, highways, cemeteries, bodies of water, railroads, etc. is classified as not contributing to area loading. Vacant land, typically with existing agricultural use is typically classified for future residential or commercial development or sites for Distributed Energy Resources.

7.2. LAND USE: Current and expected future utilization of land by residents, businesses and public authorities, including public buildings, environmentally restricted areas, highways, waterways, recreational areas, etc. The use of land by electric customers ultimately drives the loading of distribution system feeders and substations.

7.3. SUBSTATION: Distribution substations supplied by a voltage of 69 kV or greater. The procedure is not intended to identify the location of substations supplied by distribution voltages.

8. References

8.1. AM-BE-P127, Area Planning Process (BGE)

8.2. AM-PE-P132, Area Planning Process (PECO)

8.3. AM-CE-P127, Area Planning Process (ComEd)

8.4. AM-BE-4025, Short-Range Load Forecasting (BGE)

8.5. AM-CE-3032 Short-Range Load Forecasting Procedure (ComEd)

8.6. AM-PE-9058, Short-Range Load Forecasting Procedure (PECO)

8.7. PHI Ten Year Forecast (TYF) Process(No Management Model document at this time.)

9. Attachments

9.1. None

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10. Development history

Revision 0	Date: 12/18/2017
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UFAM Approver(s)	Richard Cornforth(PECO), Donald Hall (PHI), Cory Summerson (BGE), Peter Tyschenko (ComEd)
Reason written	Updated to include PHI processes and new industry trends

Revision 1	Date: 12/8/2020
Writer	Amrit Kaur (ComEd)
Reviewer(s)	Folabi Olujobi (PHI), Jonathan Aguilera Titus (BGE), Daniel Miller (PECO), Laura Lee Whittington (ComEd) & Frank Luedtke(ComEd)
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Reason written	3 Year Review

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