

COUNCIL OF THE CITY OF NEW ORLEANS

COUNCIL DOCKET NO. UD-17-04

**QUANTA TECHNOLOGY ASSESSMENT OF ENO DISTRIBUTION RELIABILITY IMPROVEMENT
INITIATIVES**

TECHNICAL ADVISORS INITIAL REVIEW

DECEMBER 7, 2018

Introduction

On October 31, 2018, Quanta Technology, LLC (“Quanta”) submitted its final report titled “Assessment of Distribution Reliability Improvement Initiatives” (Report”) to Entergy New Orleans, LLC (“ENO”). In conjunction with the Report, Quanta conducted a review of ENO’s distribution reliability program and comparison of ENO’s distribution reliability practices vs. industry leading practices, and those of a selected group of high performing utility peers. The Report contains numerous recommendations for ENO’s consideration to improve its distribution reliability practices and reliability performance.

Quanta’s Conclusions

Based upon Quanta’s analyses and reviews performed in its engagement, Quanta concludes the following:

1. Some of ENO’s distribution infrastructure dates to the 1920s and ENO’s distribution design follows mid-twentieth century industry standards.
2. ENO’s distribution system is highly populated with aged equipment, which presents an increased risk of failure due to such equipment approaching the end of its normal service life.
3. ENO’s distribution transformer failure rate is within industry norms.
4. ENO’s current reliability program¹ contains adequate components² to continue addressing ENO’s immediate needs to improve its distribution reliability performance.
5. Quanta notes that it is of the opinion that if ENO’s level of effort continues as planned, ENO’s distribution system reliability performance could improve to achieve 2nd quartile performance in the next few years. Quanta notes that such reliability improvement will not be immediate because of ENO’s legacy distribution construction, the design of ENO’s grid, and the existence of aging ENO infrastructure.
6. ENO’s implementation of distribution automation technology, such as smart reclosers, smart sectionalizers and fault location/isolation/restoration systems (“FLISR”) plus ENO’s

¹ Proposed in ENO’s July 5, 2018 Revised Reliability Plan submitted to the Council in Council Docket No. UD-17-04.

² ENO’s FOCUS program, Backbone Program, Pole Program, Sectionalization Program, Internal Program, Equipment Inspection Program, URD/Cable Program, and Vegetation Cycle Trimming Program.

conventional ongoing reliability efforts would offer more immediate improvement in ENO's reliability performance.

7. ENO should consider utilizing additional reliability metrics to identify and prioritize its reliability improvements.
8. ENO presently has a valuable opportunity to coordinate its reliability improvements with grid modernization components by expediting the items recommended in the Report, along with AMI (Advanced Metering Infrastructure) and ADMS (Advanced Distribution Management System).
9. ENO's current asset management information does not allow for in-depth analysis of equipment failures.
10. ENO's current use of a full excavation sound and bore method to inspect the condition of its poles has been more successful than prior methods in identifying poles in need of replacement or reinforcement.
11. ENO's outage cause reporting is somewhat misleading.

Quanta's Recommendations

Based up Quanta's reviews and conclusions, the Report provides numerous recommendations for ENO's consideration to improve its distribution practices and reliability performance, including the following:

Reliability Metrics

1. ENO should continue to use SAIFI³ and SAIDI⁴ metrics as part of its benefit/cost analysis for evaluating and prioritizing its reliability projects.
2. ENO should additionally consider using Customer-Minutes of Interruption ("CMI") and Cost Per Customer-Minute of Interruption ("\$/CMI") metrics to identify and account for SAIDI driven reliability projects.
3. ENO should consider using the Momentary Average Interruption Frequency Index metric ("MAIFE") to evaluate momentary interruptions.
4. ENO should consider using the Customers Experiencing Multiple Interruptions metric ("CEMI_n") to identify its worst performing circuits.

Transition to Model Based Distribution Planning Approaches

1. ENO should consider accelerating adoption of a data analytics program for implementing advanced distribution planning applications for asset replacement, and implementation of FLISR schemes for distribution reliability improvement.
2. ENO should consider estimated customer benefits due to outage cost reduction to better justify reliability projects and programs.

³ SAIFI: System Average Interruption Frequency Index

⁴ SAIDI: System Average Interruption Duration Index

Reliability Programs

1. ENO needs to modify its outage reporting process to better classify outages for subsequent analysis.
2. Before undertaking the design and construction of reliability projects, some level of prioritization should be pursued by ENO to ensure that its identified projects are reasonable to be designed.
3. ENO should install additional sectionalizers to allow partial outage restoration while equipment repairs are being accomplished to reduce average outage durations.
4. ENO should further increase the number of smart reclosers and FSLIR schemes to reduce the number of customers in a switching/protection zone to a maximum of 500 customers to effectively improve distribution reliability.
5. ENO should explore implementation of advanced microprocessor based reclosers to improve distribution reliability.
6. ENO should consider accelerating its grid modernization projects.
7. ENO should pursue a corrective maintenance program based upon the performance of a 100 percent inspection of its distribution system every 5 – 8 years to better identify and repair specific identified problems.
8. ENO should evaluate its current vegetation management program to review current trim cycles, cut-back requirements, and trimming obstacles.
9. ENO should perform a targeted evaluation of its transmission system reliability and develop a plan to improve such reliability.
10. ENO should pursue an internal audit program to ensure current and new distribution planning and reliability processes are effectively pursued and implemented.

Advisors Observations on Quanta Report

Based upon the Technical Advisors initial review of the Report, we are of the opinion that Quanta has performed a comprehensive assessment of ENO's distribution reliability improvement initiatives. The Report appears credible and contains numerous recommendations which, if followed by ENO, should provide significant reliability benefits above those planned and underway following ENO's Revised Reliability Plan that are currently under review in Council Docket No. UD-17-04. Unfortunately, the Report does not estimate the capital and O&M cost required for ENO to fully implement its recommendations and resulting impact upon ENO's ratepayers.

Importantly, the Report confirms the Advisors long-standing opinion that ENO's distribution infrastructure is of advanced age and requires significant remediation and replacement. Further, the Report confirms the Advisors findings that ENO's distribution reliability performance during the past several years has been unacceptable. Additionally, the Report approves the specific components of ENO's Revised Remediation Plan and finds that such efforts if continued to be carried out as planned should return ENO's system to acceptable 2nd quartile reliability performance in several years.

Though Quanta did not specify specific SAIFI and SAIDI reliability performance targets to be achieved by ENO, the Advisors note that its 2nd quartile target provides valuable support for a

range of minimum reliability standards to be imposed for ENO. The Advisors are comfortable with such a finding. However, the Report is replete with statements of uncertainty as to both the overall resulting reliability levels and how long it will actually take to achieve necessary improvements. The Advisors believe that ENO ratepayers may not have the appetite to wait for such reliability improvements. The Advisors believe that each of the additional measures recommended by Quanta, if cost effective, should be implemented as soon as possible to accelerate and make more certain that progress towards achieving a more acceptable level of reliability will be realized in the near term. Each of Quanta's specific recommendations are summarized in the following section of this report.

However, the Report finds that ENO needs to significantly modify its distribution planning and project prioritization processes, which, when accomplished, will provide significantly greater insight to ENO's outages and reliability performance, and would improve ENO's prioritization of projects to accelerate its overall reliability improvement.

The Report's recommendation that ENO accelerate grid modernization efforts and install advanced distribution infrastructure follows the trend seen nationally by other utilities and should provide significant opportunities for ENO to reduce both the duration of outages and number of customers affected by such outages.

The Report's criticism of ENO's current method of reporting outage causes appears warranted, and the recommendation that ENO modify its reporting procedures to better capture the causal factors driving outages makes sense. However, the Advisors note that, changes to ENO's outage reporting approach could potentially eliminate the ability to perform comparative analysis of current reliability performance vs. reported historical reliability performance. The Advisors plan on following up with ENO to ensure that modified outage reporting, if adopted, does not falsely improve ENO's reliability performance, a recalculation of historical reliability performance may be necessary to ensure a proper comparison. The Advisors will report on this concern after coordinating with ENO to gain further information.

Intervenor Comments

Comments on the Quanta Report were filed by the Sewerage & Water Board ("S&WB") and Alliance for Affordable Energy ("Alliance"). The S&WB also commented specifically on ENO's service to SWB facilities.

S&WB Comments: The S&WB notes that ENO's service to most of the S&WB facilities is via residential distribution feeders, as opposed to commercial or dedicated distribution feeders. Further, the S&WB comments though it has approached ENO regarding the installation of dedicated feeders or upgrading ENO's lines servicing S&WB's facilities, and ENO has indicated that this could be accomplished, it would be the ("prohibitive") cost responsibility of the S&WB. S&WB believes that electric service reliability should be ENO's primary responsibility. The S&WB notes that it has experienced multiple trips and outages as a result of voltage sags and swells on the ENO feeders which supply the S&WB. The S&WB recommends that ENO adopt the additional reliability metrics recommended in the Report and agrees that historical outage and

operational data be used in addition to traditional reliability metrics to obtain the clearest picture of ENO's distribution reliability.

The S&WB criticizes that the Report lacks a detailed study of the vintage of various components of its distribution system, and notes that greater information concerning and analysis of the relative age of ENO's equipment would better identify future trouble areas before outages occur. Further, the S&WB also comments that the Report did not examine the topology of ENO's transmission system, and did not study voltage sags, swells, impulses and harmonics, which it claims have resulted in numerous trips of S&WB equipment, and which should be investigated. The S&WB comments that ENO should also conduct a comprehensive inspection of its distribution equipment to ensure that all of it includes BIL ratings (basic insulation level) that support reducing the number of lightning-initiated outages.

The S&WB comments that it should be considered by ENO as a Critical Customer and steps designed to enhance service to the S&WB should be undertaken. Further the S&WB urges the Council to order a study of converting critical portions of ENO's distribution system to underground feeders.

The S&WB is generally in support of the Reports recommendations, in particular those addressing a Corrective Maintenance Program, Vegetation Clearance Requirement, Transmission Reliability Evaluation and Improvement Plan, and Asset Management.

Advisors Observations: Overall, the Advisors agree with the majority of S&WB's comments and recommendations. Regarding S&WB's desiring upgraded or dedicated feeders to serve its facilities, we note that ENO provides S&WB the same level of service provided to all of its customers, under the terms of ENO's applicable rates. ENO is correct in its position that upgrade of its distribution system or provision of dedicated feeders for S&WB would be S&WB's cost responsibility. This policy follows standard utility practice, and follows the provisions set forth in Sections 7 and 23 of ENO's Service Regulations. ENO's provision of such upgrades without the S&WB fully covering the associated costs would penalize ENO's customers by subsidizing the provision of service to a single customer.

The Advisors agree with the S&WB's recommendation that ENO adopt additional reliability metrics. Regarding ENO's use of historical outage and operations, we agree with the S&WB's recommendation, but note that ENO is undertaking such an effort in conjunction with its Distribution Remediation Plan. Likewise, ENO has proposed establishing an asset management program to track the age and condition of its distribution assets in line with the S&WB's recommendation.

Though the S&WB comments that Quanta did not study ENO's transmission topology and did not study voltage saga, swells and harmonics, it is our opinion that a transmission study is not the focus of ENO's distribution remediation plan. Further, the intent and design of the distribution remediation plan centers around improving the overall reliability of ENO's system. An investigation of power quality issues (in particular voltage excursions and harmonics) has not been shown to be a significant system issue for ENO. S&WB's concerns in this regard are centered around its complaints re: ENO's power quality issues specifically affecting the S&WB equipment.

It is the Advisors understanding that this longstanding issue between the S&WB and ENO has been (and we believe still is) in discussion. We do not think this warrants an overall system power quality study, as we are not aware of any other ENO customers claiming similar service problems.

We agree that the S&WB should be considered a Critical Customer for priority notification of both planned and unplanned outage events, and priority service restoration in the event of same. The Advisors do not support ENO's performance of an undergrounding study or undergrounding certain distribution feeders at ratepayer expense. Again, it is the Advisor's opinion that the S&WB should bear the cost responsibility for such upgraded service if it so desires. ENO has noted its willingness to undertake the required work to accomplish this.

Regarding ENO's vegetation management program, based upon the Advisors investigation as part of the Council's Storm hardening docket, we do not believe that vegetation related outages are a significant problem, and accordingly we do not believe an investigation of ENO's vegetation management practices is warranted.

Alliance Comments: The Alliance supports Quanta's recommendation that ENO utilize the MAIFI (momentary average interruption frequency index) as an additional reliability metric upon which ENO's reliability performance can be measured. The Alliance also supports ENO's use of the IBM Maximo software for its asset management program and supports coordination of its use alongside ENO's AMI deployment.

The Alliance suggests that the Council and Entergy consider burying key lines that are considered critical in conjunction with road and drainage projects if practical to accomplish.

Overall, the Alliance acknowledges that that the necessary reliability programs will take time for significant improvements to ENO's system, but the Report provides an encouraging vision of ENO's next steps.

Advisors Observations: The Advisors agree with the Alliance's recommendation that ENO utilize the MAIFI as an additional measure of ENO's reliability performance. Likewise, in line with the Alliance, the Advisors support ENO's use of MAXIMO in developing and operating an asset management program. The Advisors note that ENO has indicated that its deployment of AMI will allow ENO to track momentary outages.

In agreement with the Alliance, the Advisors do not support the piecemeal conversion of portions of certain distribution feeders to an underground configuration, as it is doubtful that such an approach would provide significant changes in ENO's overall reliability performance. The Alliance correctly notes that the cost to totally underground ENO's distribution system would be cost prohibitive. We agree.

Regarding selective undergrounding, ENO notes that it was ordered in the Council's Storm Hardening docket to coordinate with the City to identify undergrounding projects that might be undertaken in conjunction with other road and drainage projects. We note that ENO meets with other City departments periodically for the identification of such projects. To date, we are not aware that any such projects have been identified.

Conclusions

In conclusion, based upon our review, the Advisors are of the opinion that Quanta's recommended changes to ENO's existing distribution processes along with the adoption of each of Quanta's recommended additional advanced processes should be undertaken by ENO.

Next Steps

1. ENO should conduct a complete calculation of each of the reliability metrics identified in the Report for both the current year and previous five years to determine ENO's current reliability performance in comparison to ENO's past performance. The Advisors will report back to the Council after completion of further follow-up with ENO.
2. In conjunction with Council Docket No. UD-17-04, the Council should direct ENO to prepare an analysis of the costs, schedule to implement, and estimated benefits of adopting each of Quanta's ten recommendations identified in this report that are incremental to the measures being undertaken in ENO's ongoing Distribution Remediation Plan.