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Capital Project Evaluation

SYSTEM PERFORMANCE

Project ID: BSPDO17S, BSPD009S, BSPD008S

Prepared:

Power Delivery Research & Consulting Corp. (PDR&C)

North Carolina / New York

Prepared for:

Commonwealth Edison Company

Chicago, Illinois

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Purpose

Power Delivery Research & Consulting, Corp. (PDR&C) evaluated the above referenced project to provide an analysis of capital investment decision-making and project execution for Commonwealth Edison Company's (ComEd) management.

Authors

PDR&C consultants assigned to this project were Robert W. Donohue and Ron Williams. Messrs Donohue and Williams have extensive experience in electric utility decision-making and project execution for the wide range of investments made by utilities including projects similar to that discussed in this report. Additionally, as consultants, they have evaluated decision-making and project execution practices at other utilities across the country.

Robert W. Donohue

Mr. Donohue has over 45 years of experience in the electric utility industry. Since 2003, he has provided consulting services, assessments and operational expertise to a variety of utilities across the Country. These services include evaluations of electric distribution systems, including planning, design, construction, maintenance, operation, investment decision-making and post-event investigations of outage management after significant outage events. Mr. Donohue has served the electric power industry on the Research Advisory Council for the Electric Power Research Institute (EPRI). He was Chair for EPRI's Power Delivery Council, its Distribution Business Council, and is a senior member of the Institute of Electrical and Electronics Engineers. He served as Chairman of EPRI's Power Delivery Reliability Initiative and Vice Chairman of Edison Electric Institute's (EEI) Transmission and Distribution Committee.

Mr. Donohue has held management and senior executive positions for Consolidated Edison Company. Prior to his retirement in early 2003, as Senior Vice President of Electric Operations, Mr. Donohue was responsible for all electric distribution operations, maintenance, engineering, construction, planning, and customer services for Con Edison's territory which serves a population of over 9 million people through nearly 120 thousand miles of underground and overhead line.

Ron Williams

Mr. Williams has over 32 years of experience in the electric utility industry. Since 1998, as Vice President of EXL Consulting, Inc, then as President of PDR&C, Corp., he has consulted throughout the United States in the areas of utility reliability, outage management, asset management, and the use of information technologies for electric distribution reliability and

efficiency improvement. This includes investigations of investments in distribution infrastructure, practices of distribution operations and maintenance organizations, and evaluations of the performance of utilities during large-scale outage events. Mr. Williams has conducted investigative studies and advised numerous utility clients and served a coalition of thirty utilities as consultant for the Electric Power Research Institute's Power Delivery Reliability Initiative.

Previously, Mr. Williams held various leadership positions at Pacific Gas & Electric Company including Plant Manager of fossil fuel and geothermal power plants, Manager of the San Francisco Division, Manager of PG&E's Electric Distribution Information Technology Program, Manager of Materials and Fleet, Manager of Organization Planning and Development, and Executive in Residence at PG&E's corporate Learning Center.

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Method

Based on their experience and knowledge, PDR&C developed criteria for use during this evaluation. An overall research plan was developed and followed to conduct interviews and reviews of documentation relevant to the evaluation criteria for the project. Management and key technical personnel were interviewed. Documents such as ComEd standards, technical presentations, project authorization overviews, project status reports, and key technical reports were reviewed and, in certain cases, site inspections were conducted. PDR&C consultants then recorded their findings as well as opinions into this report.

Use

This report documents work by the authors who were contracted to provide this report to Commonwealth Edison. The authors' opinions, findings, and conclusions are provided solely for the consideration and use of Commonwealth Edison.

Any statements in this report should not be construed as a Commonwealth Edison position, policy, or decision, unless so designated by other documentation.

The report was based on information available to the authors at the time of publication, and therefore, is subject to change. The use of trade names in this report does not constitute an official endorsement or approval of the use of such commercial products.

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Scope of Work

The work described in this report includes three projects specifically designed to address and improve system performance, reliability and customer satisfaction on the underground and overhead distribution system. These projects include work to inject or replace poor performing URD cable and install midpoint circuit reclosers. Two of the three Blanket Projects contained a large number of Work Orders with multiple tasks. The tasks corrected defects in URD cable to prevent in-service failures and reduce service interruptions to customers. The third Blanket Project contained a large number of Work Orders with multiple tasks to install Distribution Sectionalizers and associated equipment. The work was completed and charged to the following blanket projects:

- BSPD008S– System Performance – Cablecure Treatment Distribution
    - Charges to this project were approximately $14.8 million charged to capital during the period July 2008 through end of year 2009.[1] Work charged to this Blanket Project was for cable injection work that was completed based upon the cable condition and assessment and likelihood of success. A successful cable injection will substantially increase the life of the cable by approximately 20 years.[2]
- BSPD009S– System Performance – URD Cable Replacement
    - Charges to this project were approximately $27.0 million charged to capital during the period July 2008 through end of year 2009.[3] Work charged to this Blanket Project included all costs related to

[1] Top Blanket Plant Addition Project ID's Q3 to YE 2009– refer to Tab 1
[2] 2008 and 2009 Blanket Project Accounting Validation forms, Project ID BSPD008S – refer to Tab 2
[3] Top Blanket Plant Addition Project ID's Q3 to YE 2009 – refer to Tab 1

the replacement of URD cables of various spans which had been identified by Reliability Engineering as poor performing cable.[4]

- BSPD017S– System Performance – Install Distribution Sectionalizers
    - Charges to this project were approximately $11.7 million charged to capital during the period July 2008 through end of year 2009.[5] Work charged to this Blanket Project included work performed to install automatic reclosers on 12 kV distribution overhead circuits. Reclosers were installed at the circuit's midpoint based upon the customers supplied by that circuit and at tie points enabling faster customer restoration capability.[6]

The total capital cost of the work that was completed and charged to these three projects was approximately $53.5 million for the period July 2008 through end of year 2009. The blanket projects discussed in this report were all of the blanket projects within the top twenty blanket projects in terms of total capital charges during July 2008 through end of year 2009, concerning emergency replacement of electric underground equipment.

Blanket Projects

Each of the previously described projects is referred to as a "blanket project" by ComEd because each includes hundreds of relatively small and separate jobs or "work order tasks." The costs are "rolled-up" into an appropriate blanket project to aid in budgeting and overall financial management at ComEd. Blanket projects

[4] 2008 and 2009 Blanket Project Accounting Validation forms, Project ID BSPD009S – refer to Tab 3
[5] Top Blanket Plant Addition Project ID's Q3 to YE 2009 – refer to Tab 1
[6] 2009 Blanket Project Accounting Validation forms, Project ID BSPD017S – refer to Tab 4

are universally used throughout the utility industry and explained in detail in the report "Use of Blanket Projects to Manage Core Work" included with this report.[7]

Work Order

An individual work order may include tasks such as; network protector replacements, transformer replacements, manhole installations, sump pump replacements, vault installations, faulted cable replacement as well as other corrective maintenance replacements and installations to meet operational and customer requirements.

The ComEd Work Planners, Engineers, or other trained personnel create work orders within ComEd's enterprise-wide information management system called "PassPort." Work orders are comprised of multiple "tasks" that represent work to be performed. The Work Planner or other trained personnel specifies each task and assigns the account that will be charged when work or material is charged to that task. The assigned account may be a blanket project, unique project or other account as directed by ComEd financial and accounting policies. Tasks that meet certain criteria and are estimated to cost $100,000 or more are generally identified as "unique projects" and not charged to blanket projects.

ComEd technical and field forces as well as contractors physically complete work order tasks as required. Material and labor hours expended are recorded in "PassPort" by engineers, field supervision, and other staff involved in completing the task. Project number, year and month completed, region, work category, work order number, blanket project number, task title, and location are examples of the information in PassPort that ComEd management uses to track work order tasks and ensure proper accounting.

[7] Use of Blanket Projects to Manage Core Work, June 26, 2007 – refer to Tab 5

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Work Order Package Examples

Work Order Packages represent the basic documentation and PassPort screen-shots at the work task level. They are detailed orders to conduct work. They include the basic work assignment information for a job. The type of information depends upon the type of job, but typically the packages include:

- Scope of work
- Accounting
- Sketches
- Timesheets
- Material Codes
- Maps
- Diagrams
- Assignments
- Start and Completion dates

Work Order Package 0670427001[8] is an example of the hundreds of Work Order tasks charged to Blanket Project BSPD008S. This package accounted for work performed to inject multiple sections of URD 3/0 primary cable on REDACTED in the Downers Grove Township, Illinois. The work was completed during January 2009. CONFIDENTIAL & PROPRIETARY

[8] Work Order Package 0670427001-- refer to Tab 6

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Work Order Packages 0638649101[9] and 0652110101[10] are two examples of the hundreds of Work Order tasks charged to Blanket Project BSPD009S. This package accounted for work performed to replace a 521 foot section of primary URD cable with a bare concentric neutral at REDACTED CONFIDENTIAL & PROPRIETARY in Sycamore, Illinois in August of 2008. The second package accounted for work performed to inject a 538 foot URD section of primary cable on segment REDACTED CONFIDENTIAL & PROPRIETARY in the City of Orland Park during August of 2008.

Work Order Package 0662548201[11] is an additional example of the hundreds of Work Orders tasks charged to Blanket Project BSPD009S. This package accounted for work performed to replace a 594 foot section of primary URD cable with a bare concentric neutral at REDACTED CONFIDENTIAL & PROPRIETARY Algonquin, Illinois in November of 2009.

Work Order Package 0626656201[12] is an example of the hundreds of Work Orders tasks charged to Blanket Project BSPD017S. This package accounted for work performed to replace a pole and transfer wire and associated equipment to install a mid-circuit recloser at REDACTED CONFIDENTIAL & PROPRIETARY Lombard, Illinois during July of 2009.

Work Order Package 0626651201[13] is an additional example of the hundreds of Work Orders tasks charged to Blanket Project BSPD017S. This package accounted for work performed to install a mid-circuit recloser and associated equipment on an existing pole at REDACTED CONFIDENTIAL & PROPRIETARY Niles, Illinois during July of 2009.

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[9] Work Order Package 0638649101-- refer to Tab 8
[10] Work Order Package 0652110101-- refer to Tab 7
[11] Work Order Package 0662548201-- refer to Tab 9
[12] Work Order Package 0626656201-- refer to Tab 10
[13] Work Order Package 0626651201-- refer to Tab 11

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Need and Alternatives

Electric utility distribution infrastructure requires ongoing corrective actions to repair and replace infrastructure components to ensure the safety and reliability of the distribution system. Consistent with good utility practice, ComEd minimizes the need for emergency repairs, replacement, and other corrective action by employing maintenance programs intended to optimize the service life of infrastructure components and prevent in-service failures.

Utilities employ performance-centered, preventive and predictive maintenance programs to ensure safe and reliable operation of electric infrastructure components. Those programs are developed using information from manufacturers, industry associations, testing and observations.

In addition ComEd performs an analysis of risk[14] and uses component failure history to identify optimum maintenance intervals and scope. ComEd has moved forward in adopting a more advanced formal asset management program and process that incorporates a standard repeatable model to assess material condition and the application of risk assessment across all asset types and programs in its approach versus the more traditional asset management previously used at ComEd and other utilities. One of the objectives of the material condition improvement program is to understand the material condition of the delivery system assets, future replacement rate and cash flow requirements.[15]

The Material Condition and Risk Assessment Process is a multi-level evaluation that considers the Operational and Financial implications of ComEd's assets. This will result in better asset knowledge, longer term investment planning, targeted and more reachable performance goals and a documented and defendable asset sustainment plan. On the financial side its benefits will be better scenario

[14] Material Condition & Risk, October 10, 2008 – refer to Tab 12
[15] Material Condition & Risk, October 10, 2008 – refer to Tab 12

planning decisions with greater transparency, more planned cost and less reactive costs being spent as well as more defensible rate case submissions.[16]

This methodology is applied across ComEd's engineering groups and in this particular case by Reliability Engineering who in conjunction with the Planning Department[17] developed and recommended to senior management ComEd's System Performance Program. This report discusses three of the components of the company's program, more specifically The URD Cable Injection and Replacement Programs and the Overhead Sectionalizer Installation Program.

A critical part of ComEd's programs is the process for ensuring that results are analyzed and used to drive repair and/or replacement action. That process is discussed in some detail in this report. ComEd has taken proactive and effective steps to reduce customer interruptions and to reduce expenditures caused by in-service failures on the ComEd electric distribution system.

[16] Material Condition & Risk, October 10, 2008 – refer to Tab 12
[17] Interview with Bill Fluhler, March 16,2010

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Reports and Other Documentation:

Definitions

When discussing utility maintenance, certain distinct terms are important to understand: Performance Centered Maintenance, Preventive and Predictive Maintenance, and finally, Proactive Maintenance

The purpose of ComEd's Performance Centered Maintenance Process[18] is to establish a process for the development of recommendations for maintaining equipment that can be used along with maintenance histories and other pertinent equipment-specific information to identify optimum maintenance frequency and work scope for components on the ComEd distribution system.

ComEd defines Preventive Maintenance[19] as "physical maintenance performed at set intervals with the intent of improving equipment material conditions and thus preventing a component or sub-component performance failure." The goal is to prevent in service failures. Examples of preventive maintenance are calibration of transformer gauges, circuit breaker temperature gauges and lubrication of mechanisms.

ComEd defines Predictive Maintenance[20] as "inspections and diagnostic activities." Examples of predictive maintenance include infrared thermography, insulating oil sampling, acoustic monitoring, travel timing tests, system or equipment performance tests, visual inspections and operational data reviews. The data that is collected is analyzed to support timely maintenance decisions such as what corrective maintenance may be called for and if adjustments must be made to the frequency and/or scope of future preventive maintenance.

[18] Procedure AM-ED-P039, Performance Centered Maintenance (PCM) Process – refer to Tab 13
[19] Procedure AM-ED-PO34, Preventive and Predictive Maintenance Program – refer to Tab 14
[20] Procedure AM-ED-PO34, Preventive and Predictive Maintenance Program – refer to Tab 14

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The purpose of the ComEd Proactive Maintenance[21] practice is to ensure that feedback from maintenance personnel are used to improve the effectiveness of the maintenance program. The objective of this practice is ensure that knowledge from employees who work on the equipment is utilized to increase equipment reliability while reducing the overall maintenance costs and to reduce unexpected corrective or high priority emergent work.

URD Program-Cablecure and Replacement

Utilizing the feedback from its maintenance and failure history ComEd has developed a specific program[22] to address the increasing number of URD faults experienced over the last ten years and the resultant customer interruption impacts.

URD faults have grown at an annual growth of 5.5% (from 1998 through 2009) and have cost approximately $20 million per year to address. The problem has been studied and it has been shown that the cause is ComEd's aging population of approximately 8,700 miles of bare concentric neutral cables. These cables were installed from 1966 to around 1985 when ComEd transitioned to EPR jacketed cable.[23]

In 2007 ComEd initiated its multi-year program to Assess, Treat, and Replace (ATR) poor performing URD cable. This effort was a customer satisfaction component of ComEd's system reliability strategy. Its goal was to target approximately 100 miles of cable per year and remediate poor performing cable. Cables are selected based upon the consequences and probability of their failure and are prioritized through ComEd's risk assessment model.

[21] Procedure AM-ED-PO41, Proactive Maintenance – refer to Tab 15
[22] URD Assess, Treat and Replace Program – refer to Tab 16
[23] Com Ed URD Program 2009, ComEd Board Meeting January-refer to Tab 17

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The selected cables are either injected with dielectric fluid which extends the life of the cable by approximately 20 years[24] or if it cannot be injected, it is considered for replacement.[25] Injection is the preferred method of treatment as it offers the least cost-per-foot to address this reliability problem.[26]

The program has evolved since an injection pilot in 2007. In 2008, the program[27] primarily consisted of injection and cable replacement of "half loops" through replacement and injection of poor performing cable. This increased the volume of cable treated and also reduced the cost per unit treated. In 2009, the program[28] was further enhanced to include "full loop" injection and proactive treatment of cables with known problems.[29]

The program reached a significant milestone on September 3, 2009 when the ComEd team reached the two million feet completion mark.

ComEd's Distribution URD Proactive Cable Replacement and Injection Program is given very high visibility in the company and is tracked by senior management as a Focused Initiative which is reported and reviewed monthly.

- In 2008, 2,672 sections [30] were addressed, 827 replaced and 1,845 were injected as part of the program.
- In 2009, 2,445 sections[31] were completed, this surpassed the goal and 196 miles were addressed.
    - 1325 cable sections were injected (80 miles), 5 sections above the goal

[24] 2008 and 2009 Blanket Project Accounting Validation forms, Project ID BSPD008S – refer to Tab 2
[25] Com Ed URD Program 2009, ComEd Board Meeting January-refer to Tab 17
[26] Com Ed URD Program 2009, ComEd Board Meeting January – refer to Tab 17
[27] 2008 Program – refer to Tab 18
[28] 2009 Program – refer to Tab 19
[29] Com Ed URD Program 2009, ComEd Board Meeting January-refer to Tab 17
[30] URD Proactive Cable Replacement & Injection (2008) – refer to Tab 20
[31] URD Proactive Cable Replacement & Injection (2009) – refer to Tab 21

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- 1,120 sections were replaced (116 miles), 290 sections above the goal

Distribution Sectionalizer Installation

ComEd's Distribution Sectionalizing Program is designed to reduce the customer interruption impact of circuit lockouts regardless of the cause of the outage. Programs such as vegetation management, mainline cable testing, and replacement or lightning enhancement are examples of programs that target specific causes of outages.[32]

The Distribution Sectionalizing Program calls for the installation of automatic reclosers at the midpoint, in terms of customers served by that circuit, on the 12 kV distribution system.[33] When the recloser is installed, supervisory control capability is also provided which increases the reliability benefits.[34]

With the addition of the reclosers, the system is basically reconfigured into smaller sections which reduce the number of customers affected by a single event or outage. This directly benefits the customers supplied by that circuit by limiting the extent of the damage to fewer customers. The system also allows for faster restoration and emergency response which is reflected in lower SAIFI.[35] Each year a listing[36] for sectionalizer installations is produced through the collaboration of Reliability Engineering and the Planning Department.[37] The circuits are selected applying ComEd's risk assessment prioritization model based upon probability and consequences.

ComEd's Distribution Sectionalizing Program is given very high visibility in the company and is tracked by senior management as a Focused Initiative[38] which is reported and reviewed monthly. In 2008, 177 mid circuit reclosers were installed

[32] Distribution Automation November 2008 , William Gannon – refer to Tab 22
[33] 3-Phase Site Ready Vacuum Recloser C 8727 dated 2-1-08 & 9-11-09 – refer to Tab 23
[34] 900 MHz Radio and Antenna Installation dated 12-18-09 – refer to Tab 24
[35] Distribution Automation November 2008 , William Gannon – refer to Tab 22
[36] 2008 MCR Program,2009 Circuit Select List – refer to Tab 25
[37] Interview with Bill Fluhler, March 16,2010
[38] 12 kV Distribution Automation (2008) – refer to Tab 26

as part of the program. This was accelerated in 2009 when 267 reclosers,[39] 133 % of the goal, were installed as part of the initiative. Fifty additional devices were installed through other programs.

Material Suppliers

ComEd competitively bids contracts for the materials it uses. Nearly all materials used in projects such as this blanket project are commonly used in ComEd and supplied through ComEd or the Exelon Business Services (a ComEd affiliate) materials supply chain. Most suppliers have been awarded supply contracts through the competitive bid or other process to ensure competitive pricing. For commonly used, lower valued engineered products, contracts are awarded to vendors for multiple years. Upon request, blanket purchase order releases are issued to fill project requirements based on previously negotiated terms. Higher dollar valued engineered products are competitively bid against a number of suppliers (generally three or more).

ComEd's material specifications upon which prospective suppliers bid include detailed descriptions of the types of materials it purchases. For example, the material specification for conventional single and three phase distribution transformers includes specific materials and make-up as well as testing, packaging, and inspection requirements. Additionally, the specification and Exelon's standard terms and conditions includes general provisions such as specifying that the contractor shall be liable for all costs incurred for product that is refused or rejected as a result of its failure to pass certain testing procedures.

Requirements that are unique to the ComEd electrical distribution system such as insulation levels are designated in the design purchase specifications. These details ensure that material purchased conforms to engineering standards for reliability and life-cycle cost. ComEd relies on suppliers who have been selected as a result of the competitive bid process thereby ensuring that the costs of materials used in its projects are reasonable.

[39] 12 kV Distribution Automation (2009) – refer to Tab 27

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Contractors

ComEd relies on contractors to perform work when internal resources are not available or the work scope is not ordinary and customary work performed by ComEd crews (i.e. earthwork, foundations, storm sewers, etc). The majority of all contracts are competitively bid. Exceptions may be approved on a case by case basis such as during an emergency after a storm event when there is insufficient time for the bidding process.

As with the material suppliers described previously, nearly all contractors used in projects such as this project are contractors who have been awarded contracts through the competitive bid process and are referred to as "Contractors of Choice" (COC). The COC contractors have agreed to basic contracting terms and conditions that are competitive in the marketplace as a result of the competitive bid and negotiation process. However, although those contracts are known to be competitive, ComEd still reviews the contracting needs of each major project and may issue some work out to further bidding.

Prior to authorizing a COC to commence work on unique projects, ComEd typically issues a detailed scope of work document to the COC who must provide a detailed cost estimate. The cost estimate is evaluated by ComEd estimators and a process of challenge meetings and negotiations are relied upon prior to ComEd authorizing the COC to start the work. ComEd relies on contractors who have been selected as a result of the competitive bid process, use of detailed estimates that drive a process of challenge and negotiation, and their detailed knowledge of ComEd's system, including its safety requirements, thereby ensuring the costs of engineering and construction services used in its projects are reasonable.

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The COC program is explained in detail in the report "Contractor of Choice Program" included with this report.[40]

The URD Program was completed under the terms of such a contract. The primary contractors for this work were Intern and Utilx [41] whose proposal for the 2008[42] and 2009[43] Program was based on a COC contract. The contract was appropriately modified as the project scope was refined. This allowed ComEd to take advantage of productivity gains as the COC gained more experience with the process. The contract utilized unit pricing for the work accomplished.

The contract was structured to include all phases of the work including, live switching, transformer replacements, landscape and pavement restoration, and treatment by replacement or injection. Installation of replacement cable would be accomplished by boring, trenching or pulling-in existing facilities as required.[44]

The Distribution Sectionalizing Program was also completed under the terms of a COC contracts. The primary contractor for this work was Meade[45] whose proposal for the 2008[46] and 2009[47] Program was based on a COC contract. That contract was also appropriately modified as the project scope was refined to take advantage of productivity gains as more experience with the processes were realized. The material suppliers bid for this work and were appropriately evaluated.[48]

[40] Contractor of Choice Program, November 2005 – refer to Tab 28
[41] Contract Profile Examples Contract 01056580 & 01057512 – refer to Tab 29
[42] 2008 Cable Replacement Program Scope of Work – refer to Tab 30
[43] 2009 Programmatic URD Cable Injection Project Scope of Work – refer to Tab 31
[44] 2008 Cable Replacement Program Scope of Work – refer to Tab 30
[45] Turnkey Installation Of Distribution Reclosers dated November 19, 2007, Meade Electric Response to ComEd Recloser Installation Program 2008-2009 – refer to Tab 32
[46] 2008 Cable Replacement Program Scope of Work – refer to Tab 30
[47] 2009 Cable Replacement Program Scope of Work – refer to Tab 31
[48] ComEd Recloser RFP Phase II and Evaluations – refer to Tab 33

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Documentation

ComEd has established a segregation of duties in the documentation of critical steps in the material supply and contracting processes. These insure that employees do not have conflicting authorizations. An example is that an employee cannot approve a contract and also approve a requisition for the same transaction. Another example is that an employee cannot approve a purchase order against a contract and also be the employee certifying that the item on the purchase order was received and the same employee cannot approve a contract and also approve invoices, vouchers or payments on that contract.

These key safeguards and controls are reinforced through security contained in ComEd's work management system (PassPort). That system will only allow issuance of procurement related documents such as contracts and invoices in accordance with ComEd's segregation of duties and delegation of authority policy.

Bid documents, evaluation matrices, contracts, purchase orders, material requisitions, invoices, work orders and other documents that control and account for the cost of this project were reviewed by PDR&C as appropriate to support our conclusions. Samples may be attached to this report if they were specifically cited in the report.

ComEd material and contracting practices are specifically designed to ensure cost efficiency. The system that ComEd uses to process source documents includes appropriate safeguards which are imbedded and coded into the system. Project Managers and other key personnel we interviewed are trained and knowledgeable about the proper use of the practices and systems. ComEd produces reports used by managers to ensure control of costs and schedule. The source documents such as work orders, invoices, and payment records are retained and available to support detailed analyses if needed.

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Training

Good maintenance procedures are developed consistent with the skill levels of the employees who implement them and are developed to support the execution of long range work plans.

Training of field forces is based upon the assessed skills of the employees, complexity of the task being performed, and the repeatability of the task.

ComEd has a well-defined maintenance program[49] that is executed consistent with the proficiency of the field forces to reduce failures, customer outages, equipment malfunctions, and the need for emergency replacement and repairs.

Restoring customers quickly and safely during emergencies at ComEd is a priority. To ensure field personnel perform their tasks such as testing,[50] switching,[51] installation of emergency generators,[52]or the installation of emergency feed and cables,[53] employees are provided approved methods and strategies to accomplish customer restorations effectively and safely.

Accounting Validation

Two key financial control objectives for ComEd are:[54]

- Capital/O&M accounting treatment for blanket projects are reviewed at inception and annually, authorized and supported.

[49] CM-CE-203001 Cable CURE Injected Cables: Switching, Maintenance And Spill Response – refer to Tab 34
[50] Fuse testing Distribution Cable-Fault Identification OP-ED-211008 – refer to Tab 35
[51] Testing, Switching And Operating Overview, OP-CE-210004 – refer to Tab 36
[52] Portable Generator Installation Procedure, OP-CE-801003, OP-CE-P059 – refer to Tab 37
[53] Emergency Feeds and Cables, CM-ED-213003 – refer to Tab 38
[54] Procedure FI-ED-2005 Rev. 0, EED Sarbanes-Oxley Key Financial Controls (KFC) Self Assessment and Change Control Requirements – refer to Tab 39

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- Each month, actual costs charged to blanket projects are reviewed for appropriateness.

Each month, ComEd managers or analysts review charges to blanket projects to confirm proper charging and correct errors that may be detected.[55] In situations where work order task charges accumulate to greater than $100,000 it is ComEd's policy to treat it as a unique project and authorize it under ComEd's project authorization procedures. [56]

ComEd conducted a validation of the proper accounting of expense and capital costs during 2008 and 2009 for each of the four blanket projects included in this report.[57] ComEd confirmed that the expense and capital charges were appropriate and consistent with proper accounting treatment.

[55] Interview with M. Sharkey on March 10, 2010
[56] Interview with M. Sharkey on March 10, 2010
[57] 2008 and 2009 Blanket Project Accounting Validation forms – refer to Tab 2, 3, 4

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Conclusions:

The total capital cost of the work that was completed and charged to these three projects was approximately $53.5 million for the period July 2008 through end of year 2009.

The blanket projects discussed in this report are all of the blanket projects within the top twenty blanket projects in terms of total capital charges during July 2008 through end of year 2009, concerning replacement and treatment of URD bare concentric neutrals cable and the installation of mid circuit sectionalizing and associated equipment.

Each of the three projects evaluated in this report is referred to as a "blanket project" by ComEd because each includes hundreds of relatively small and separate jobs or "work orders tasks." The costs are "rolled-up" into an appropriate blanket project to aid in budgeting and overall financial management at ComEd. The use of blanket projects in this manner is universal in the utility industry.

Electric utility distribution infrastructure requires ongoing corrective actions to repair and replace infrastructure components to ensure safety and reliability of the distribution system. Consistent with good utility practice, ComEd minimizes the need for corrective action by employing maintenance programs intended to optimize the service life of infrastructure components and prevent in-service failures.

Utilizing the feedback from its maintenance and failure history ComEd has developed a specific program which incorporates risk to address the increasing number of URD faults experienced over the last ten years.

The URD Cable Program has evolved since an injection pilot in 2007. In 2008, the program primarily consisted of injection and cable replacement of "half loops" through replacement and injection of poor performing cable. This

increased the volume of cable treated and also reduced the cost per unit treated. In 2009, the program was further enhanced to include “full loop” injection and proactive treatment of known problem cable.

ComEd’s Distribution URD Proactive Cable Replacement and Injection is given very high visibility in the company and is tracked by senior management as a Focused Initiative which is reported and reviewed monthly.

ComEd’s Distribution Sectionalizing Program is designed to reduce the customer interruption impact of circuit lockouts for any outage cause versus other programs like vegetation management, mainline cable testing and replacement or lightning enhancement which have narrower focus.

Distribution Sectionalizing Program is given very high visibility in the company and is tracked by senior management as a Focused Initiative which is reported and reviewed monthly.

ComEd’s corrective maintenance is necessary to reduce failures on its system. The maintenance program in place at ComEd is comprehensive, and compares favorably with industry practices. It incorporates a thoughtfully planned program as described in the Preventive and Predictive Maintenance Program procedure. The program takes advantage of the PassPort work management system to schedule maintenance work and follow it through to completion.

ComEd’s Preventive Maintenance Program is fully documented. It documents the program tasks and on an annual basis the prioritization is based on real time monitoring, which detects developing problems and the duration for all the equipment in service. These inspection results provide material condition data which is used with risk assessment to initiate and prioritize proactive corrective action projects.

PDR&C

SYSTEM PERFORMANCE

Project ID: BSPDO17S, BSPD009S, BSPD008S

ComEd has a well-defined maintenance program that is executed consistent with the proficiency of the field forces to reduce failures, customer outages, equipment malfunctions, and the need for emergency replacement and repairs.

ComEd utilizes both ComEd's own construction forces and Contractors of Choice (CofC) to complete the work during the construction phase. This allows them to achieve continuous improvement in safety performance, cost effectiveness and reliability. The selection and use of both work forces ensures consistently meeting schedule commitments. Progress is tracked and monitored by region and reviewed by management.

PDR&C conducted an independent evaluation of the blanket project and reviewed samples of contracts, invoices, work orders and other source documents sufficiently to support the following conclusions:

- ComEd minimized the risk of in-service failures and the need for corrective maintenance replacements through the use of a comprehensive maintenance program that compares favorably with industry practice.

- ComEd has taken proactive and effective steps to reduce customer interruptions and to reduce expenditures caused by in-service failures on the ComEd electric distribution system.

- ComEd uses an enterprise-wide asset management technology called "PassPort" to ensure close management of its maintenance planning and implementation.

- The management, engineering, procurement, contracting, and construction for this corrective maintenance work followed the same standards as routine work performed by ComEd.

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SYSTEM PERFORMANCE

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- The attributes of the maintenance programs and procedures described previously compare favorably with industry practice that is specifically designed to reduce in-service failures, ensure the customer need for continuity of service, and ensure the cost effectiveness of corrective maintenance activities.

- Blanket projects are appropriate for use by ComEd field forces to account for work that they perform every day to modify, replace, and extend its distribution system.

- ComEd's use of Blanket Projects provides higher management visibility, improves planning, budgeting and financial controls that helps to maximize the efficiency and management of core work.