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Capital Project Evaluation

EMERGENCY REPLACEMENT OF ELECTRIC OVERHEAD EQUIPMENT

Project ID: EB6022, FLTR60, RPLOHOC

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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 work to replace electric overhead equipment that was completed and charged to the following projects. These Blanket Projects contained a large number of Work Orders with multiple tasks to correct defects or failures of items such as poles, overhead wires, joints, gang switches, cable terminations, re-closers, pole-top capacitors, pole-top regulators, and pole-top transformers. The Blanket Projects include:

- EB6022 – Corrective Maintenance – Emergency Pole Replacement – Outside Chicago
    - Charges to this project were approximately $8.7 million charged to capital during the period July 2008 through end of year 2009.[1] Work charged to this Blanket Project was pole replacement work that needed to be completed immediately because the pole condition presented an imminent risk to the health and safety of the public, employees, or contractors.[2]
- FLTR60 – Corrective Maintenance – Emergent Distribution Transformer Failures – Suburbs
    - Charges to this project were approximately $11.5 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 EB6022 – refer to Tab 2
[3] Top Blanket Plant Addition Project ID's Q3 to YE 2009 – refer to Tab 1

replacement or repair of failed or damaged distribution transformers found during service restoration or other field activities.[4]

- RPLOHOC – Corrective Maintenance – Emergent Distribution – Replace Overhead Equipment – Outside Chicago

    - Charges to this project were approximately $23.4 million charged to capital during the period July 2008 through end of year 2009.[5] Work charged to this Blanket Project included work to replace overhead property units. Examples include; Anchors, Cross Arms, Guy Wire, Poles (other than emergency pole replacements), and Transformer Racks.[6]

The total capital cost of the work that was completed and charged to those projects was approximately $43.6 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 emergency replacement of electric overhead equipment.

Blanket Projects

Each of the previously described projects is referred to as a "blanket project" by ComEd because each includes hundreds of relatively

[4] 2008 and 2009 Blanket Project Accounting Validation forms, Project ID FLTR60 – refer to Tab 3
[5] Top Blanket Plant Addition Project ID's Q3 to YE 2009 – refer to Tab 1
[6] 2008 and 2009 Blanket Project Accounting Validation forms, Project ID RPLOHOC – refer to Tab 4

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 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; pole replacements, fuse replacements, wire and cable replacements, anchor guy installations, and insulators and transformer installations as well as other 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,

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

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.

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

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Work Order Packages 06777162-01 and 06634280-01[8] are two examples of the hundreds of Work Order tasks charged to Blanket Project EB6022. Those packages accounted for work performed to replace a 45 foot pole, 14 foot arm and 400 watt street light in Skokie, Illinois in September 2009 and work to replace a 40 foot pole and a 25 kVA transformer in Rockford Illinois in February 2009.

Work Order Packages 06731460-01 and 06732234-01[9] are two examples of the hundreds of Work Order tasks charged to Blanket Project FLTR60. Those packages accounted for work performed to replace a 75 kVA transformer in River Forest Illinois in August 2009 and work to replace a 25 kVA transformer in Lemont Illinois in July 2009.

Work Order Packages 06697994-01 and 06763955-01[10] are two examples of the hundreds of Work Order tasks charged to Blanket Project RPLOHOC. Those packages accounted for work performed to replace a 219 amp-167 kVA regulator in Riverside Illinois in July 2009 and work to replace a radio signal repeater in Park Forest Illinois in August 2009.

[8] Work Order Packages 06777162-01 and 06634280-01 -- refer to Tab 6
[9] Work Order Packages 06731460-01 and 06732234-01 -- refer to Tab 7
[10] Work Order Packages 06697994-01 and 06763955-01 -- refer to Tab 8

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Need and Alternatives

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 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, and analysis of risk[11] and component failure history to identify optimum maintenance intervals and scope. Even with an effective performance-centered maintenance program, components wear out, failures will occur, and corrective actions including emergency repairs will be required.

In order to evaluate ComEd's corrective maintenance and emergency replacements, it is necessary first to examine what the utility has done to reduce failures on its system. ComEd inspects its facilities on a regular basis driven by risk, elapsed time between inspections, or by other proxies of component condition, such as hours of operation or operating cycles for example.

A critical part of a good maintenance program is a process for ensuring that results from the program are analyzed and used to drive repair and/or replacement action. Such a program exists at ComEd and is discussed in some detail in this report to document

[11] Material Condition & Risk, October 10, 2008 – refer to Tab 9

that the company has taken direct and effective efforts to reduce expenditures caused by in-service failures on the ComEd electric distribution system.

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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[12] is to establish a process for the development of generic 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[13] 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[14] as "inspections and diagnostic activities." Examples of predictive maintenance include infrared thermography, insulating oil sampling, acoustic monitoring,

[12] Procedure AM-ED-P039, Performance Centered Maintenance (PCM) Process – refer to Tab 10
[13] Procedure AM-ED-PO34, Preventive and Predictive Maintenance Program – refer to Tab 11
[14] Procedure AM-ED-PO34, Preventive and Predictive Maintenance Program – refer to Tab 11

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.

The purpose of the ComEd Proactive Maintenance[15] 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.

Maintenance Program

One of the key drivers to ensuring a safe, reliable electric distribution system is a system where maintenance is directed not only at the system level but down to the component level as well. Attention to detail at the component level is a sign of a mature, sophisticated inspection and maintenance program.

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. A PassPort document collects all the tasks that are required to be completed. It provides requirements, references or directly provides information

[15] Procedure AM-ED-PO41, Proactive Maintenance – refer to Tab 12

such as instructions for construction or maintenance work, technical standards, analysis, training, execution, work management, planning, scheduling, regulatory requirements and documentation.[16]

Detailed component inspection classifications have been established for the overhead and underground distribution systems.[17] Some of the various components that are covered for the overhead system include:

- Aerial Conductor, AM-CE-PO34 – R3002[18]
- Cutouts and Disconnects, AM-CE-PO34-R3003[19]
- Aerial Gang Operated Switches, AM-CE-PO34-R3004[20]
- Reclosers, AM-CE-PO34-3005[21]
- Distribution Wood Poles, AM-CE-P034-R3029, AM-CE-PO34-R3007[22]
- Pole Top Capacitors, Regulators, and Transformers AM-CE-P034-R3009[23] AM-CE-PO34-R3010,[24] and AM-CE-PO34-R3016[25]

[16] Procedure AM-ED-PO34, Preventive and Predictive Maintenance Program – refer to Tab 11
[17] Procedure AM-ED-P034_R001, PCM Template Index – refer to Tab 13
[18] Procedure AM-CE-PO34-R3002 – refer to Tab 14
[19] Procedure AM-CE-PO34-R3003 – refer to Tab 15
[20] Procedure AM-CE-PO34-R3004 – refer to Tab 16
[21] Procedure AM-CE-PO34-R3005 – refer to Tab 17
[22] Procedure AM-CE-PO34-R3007 – refer to Tab 18
[23] Procedure AM-CE-PO34-R3009 – refer to Tab 19

These procedures include the reason and basis of why the maintenance is to be performed. Each component includes a rating that indicates its criticality, duty cycle, either heavy load or normal load, and its service condition, either in service or spare.

Each equipment component is also assigned special "Condition Monitoring Tasks," "Task Frequencies," "Failure Codes," and "Comments" unique to the specific equipment component to be inspected. It is worthwhile to review several examples to get a clearer understanding as to the thoroughness and detailed planning that went into preparing each of these procedures.

Wood Pole Example

Reviewing distribution wood poles and the three component classification categories clearly shows the delineation regarding criticality; above 34 kV is Class I and below 34 kV is Class II. This clarification is regardless of duty cycle or service condition since the poles would be subject to the same duty cycle and only poles in service are inspected. The critical nature experienced is due to the feeder voltage and number of the customers that could be impacted if pole failures were to occur. Based on the criticality, the task frequencies vary, Class I being a 2-year frequency and Class II a four-year frequency.

To ensure that each inspection task is understood, a task definition sheet is included as part of each and every procedure. The definitions are written specific for that particular component. For the case of wood poles they are:

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[24] Procedure AM-CE-PO34-R3010 – refer to Tab 20
[25] Procedure AM-CE-PO34-R3016 – refer to Tab 21

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- Task – "Ground Line/Detailed Visual Inspection"
    - Inspection includes partial excavation of wood poles at ground line. Those reject-poles which are candidates for steel reinforcement are identified".
- Task – "Pole Treatment"
    - "Performed on poles that have decayed wood that does not require replacement. Included in the scope are: External Treatment – A wood preservative is applied to the external surface of the pole from 18" below the ground-line to 3" above the ground-line. Internal Treatment – Poles with internal voids or insect infestations are treated with an approved liquid and/or fumigant
- Task - "Visual Inspection"
    - "Visual inspection of the pole to identify significant/obvious external damage"
- Task - "Sound and Bore Test"
    - "Sound with a hammer from either ground-line or above ground-lines as applicable, to as high as the inspector can reach in order to locate exterior decay or interior packets of decay. Poles shall be bored at a 45-degree angle past the center of the pole to identify and quantify if internal decay exists."

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Establishing the task and definition for each component promotes a clear understanding so that the inspector can assign the proper failure modes. In the case of wood poles, these include: Failure to Provide Adequate Conductor Support, Failure to Provide Adequate Grounding and Failure to Provide Adequate Insulation Level. A failure cause is associated with each mode; for example, failure to provide adequate conductor support could be a failure mode of:

- Wood Decay/Damages
- Mechanical Fastening Failure (weld, bolt, etc.)
- Wood Cracks (weather)
- Woodpecker Damage
- Guy Wire Failure
- Cross Arm
- Broken Pole/Pole Top Extension

Each failure mode and failure cause is directly associated with a maintenance task.[26] The importance of this detail is that the Preventive Maintenance Program is fully documented via Performance Centered Maintenance templates. Each template documents the program tasks and on an annual basis the prioritization is based on the real time monitoring, which detects developing problems and the duration for all the equipment in

[26] Procedure AM-CE-PO34 – refer to Tab 13

service. These inspection results provide condition data used to initiate and prioritize corrective action.

As described above, this same level of detail is provided for critical equipment and their components that make up the overhead electric distribution equipment. As a result of these inspections, equipment that is found in a state of disrepair, inoperable, or that has failed in service must be replaced in order to maintain a safe reliable system. These failed components are then scheduled for replacement, and when replaced are charged to one of the four overhead blanket projects that are the subject of this report.

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.

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.

The COC program is explained in detail in the report "Contractor of Choice Program" included with this report.[27]

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.

[27] Contractor of Choice Program, November 2005 – refer to Tab 22

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.

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.

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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.

Additional Work Practice Procedures

ComEd has well-defined procedures to reduce failures, customer outages, equipment malfunctions, and the need for emergency replacement and repairs. Several examples that are important to the conduct of emergent work are:

DSO Equipment Overload Guidelines provide guidance and expectation for field operations and dispatch personnel in providing timely response to equipment overloads to protect operating equipment.[28]

Overhead Distribution Circuit Inspection and Maintenance is a procedure to provide a detailed programmatic inspection of 4 kV, 12 kV, and 34 kV overhead circuits.[29]

Work Coding Procedure to provide detail instructions of the proper use of PassPort codes to ensure the right priority is given to the work, that the work is assigned properly, accounted for properly, and bundled efficiently with other work.[30]

[28] Procedure OP-CE-040015 – refer to Tab 23
[29] Procedure CM-CE-P321 – refer to Tab 24
[30] Procedure WM-ED-2001 – refer to Tab 25

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Work Screening and Prioritization procedure is used to ensure that work is legitimate, not duplicative, properly coded and scheduled.[31]

Emergent and Emergency Documentation Process procedure ensures that required documentation for Emergent and Emergency work is completed properly and timely.[32]

DSO Trouble Response Process is a procedure that provides guidelines to ensure that work is dispatched responsively to customer outages, feeder lockouts and emergency trouble.[33]

Load Verification of Failed Distribution Transformer procedure provides guidelines to personnel to verify transformer load when responding to transformer failure or blown transformer fuses. The objective of this procedure is to avoid repeat interruptions due to transformer overload.[34]

Fix it Now (FIN) Team procedure which outlines the FIN team missions to protect the schedule by addressing the bulk of the priority 10 and 20 maintenance work items and to improve system material condition by reducing the corrective maintenance backlog.[35]

Restoring customers quickly and safely during emergencies at ComEd is a priority. To ensure field personnel perform their tasks like testing[36], switching[37], installation of emergency generators[38]or

[31] Procedure WM-ED-P014 – refer to Tab 26
[32] Procedure CM-CE-P056 – refer to Tab 27
[33] Procedure OP-ED-P063 – refer to Tab 28
[34] Procedure OP-ED-142026 – refer to Tab 29
[35] Procedure WM-ED-21 – refer to Tab 30
[36] Fuse testing Distribution Cable-Fault Identification OP-ED-211008 – refer to Tab 31

the installation of emergency feed and cables[39] they are provided in advance approved methods and strategies to accomplish customer restorations effectively and safely.

Accounting Validation

Two key financial control objectives for ComEd are:[40]

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

- 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.[41] In situations where work order task charges accumulate to greater than $100,000 the task it is ComEd's policy to treat it as a unique project and authorize it under ComEd's project authorization procedures.[42]

ComEd conducted a validation of the proper accounting of expense and capital costs during 2008 and 2009 for each of the three blanket projects included in this report.[43] ComEd confirmed that the

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[37] Testing, Switching And Operating Overview, OP-CE-210004 – refer to Tab 32
[38] Portable Generator Installation Procedure, OP-CE-801003 – refer to Tab 33
[39] Emergency Feeds and Cables, CM-ED-213003 – refer to Tab 34
[40] Procedure FI-ED-2005 Rev. 0, EED Sarbanes-Oxley Key Financial Controls (KFC) Self Assessment and Change Control Requirements – refer to Tab 35
[41] Interview with M. Sharkey on March 10, 2010
[42] Interview with M. Sharkey on March 10, 2010
[43] 2008 and 2009 Blanket Project Accounting Validation forms, Project ID EB6022 – 2008 and 2009 Blanket Project Accounting Validation forms, Project

expense and capital charges were appropriate and consistent with proper accounting treatment.

ID FLTR60 -- 2008 and 2009 Blanket Project Accounting Validation forms, Project ID RPLOHOC – refer to Tab 2, 3, and 4

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Conclusions:

The total capital cost of the work that was completed and charged to those projects was approximately $43.6 million for the period July 2008 through end of year 2009.

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.

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 via Performance Centered Maintenance templates. Each template documents the program tasks and on an annual basis the

prioritization is based on the real time monitoring, which detects developing problem and the duration for all the equipment in service. These inspection results provide condition data used to initiate and prioritize corrective action.

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.

Equipment that is found in a state of disrepair, inoperable, or that has failed in service must be replaced in order to maintain a safe, reliable system. These failed components are then scheduled for replacement and when replaced are charged to one of the three blanket projects that are the subject of this report.

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.

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- 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.

- 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.

- ComEd's material and contracting standards were used in this blanket project and the source documents are available through ComEd's PassPort work management system.

- ComEd reports are available that provide detailed listings of all material costs including catalog identification number,

description, location of installation, when installed, and the quantity and cost of each item.

- ComEd reports are available that provide listing of all contracts used in the project, material requisitions issued, amounts charged and other pertinent information.

- ComEd electronically stores information such as work orders, material requisitions and other documents it uses in its accounting for the cost of this project.

- Our review of documents representing steps in ComEd's materials and contracting processes indicates those processes were followed and the costs were reasonable.