



AMEREN ACTION ENERGY RETRO-COMMISSIONING PROGRAM: VERIFICATION AND DUE DILIGENCE

Final

Prepared for:

AMEREN ILLINOIS UTILITIES

Prepared by:

OPINION DYNAMICS CORPORATION

230 Third Avenue

Third Floor

Waltham, MA 02451

(617) 492-1400

www.opiniondynamics.com

Contact: Bill Norton, Vice President

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1. INTRODUCTION

This memo provides the results of Task 3 – Verification and Due Diligence – for the Retro-commissioning Program, which was not included in last year’s QA/QC assessment given its pilot status. Under this task, we explored the quality assurance and verification activities currently carried out by program and implementation staff. We compared these activities to industry best practices¹ for similar C&I programs to determine:

1. If any key quality assurance and verification activities that should take place are currently not being implemented.
2. If any of the current quality assurance and verification activities are biased (i.e., incorrect sampling that may inadvertently skew results, purposeful sampling that is not defensible, etc.).
3. If any of the current quality assurance and verification activities are overly time-consuming and might be simplified or dropped.

This assessment primarily relied on in-depth interviews with program and implementation staff and documentation of current program processes, where available.

The remainder of this memo includes a summary of key quality assurance and verification activities currently conducted by Ameren Illinois Utilities’ C&I Retro-commissioning Program and recommendations for improvement; an overview of data collection activities carried out for this task; and detailed findings on current quality assurance and verification activities.

¹ See the Best Practices Self Benchmarking Tool developed for the Energy Efficiency Best Practices Project: <http://www.eebestpractices.com/benchmarking.asp>.

2. SUMMARY AND RECOMMENDATIONS

C&I Retro-commissioning Program

Overall, Ameren Illinois Utilities' (Ameren or AIU) quality control and verification procedures for the C&I Retro-commissioning Program are sufficient to ensure quality projects. However, in general, compared to other C&I programs in the Act On Energy Business portfolio, the number of quality assurance activities in place is low. We suggest that Ameren first formally document the existing sampling methodology used for post inspections of RSP work, and second, consider expanding the number of these inspections to ensure that projects are completed as expected.

Table 1 summarizes the quality assurance and verification activities currently carried out by the C&I Retro-commissioning Program. It also presents recommended changes to current procedures.

Table 1: Summary of Quality Assurance Activities in Place and Recommendations

QA Activities in Place	Recommended Change
<ul style="list-style-type: none">• Eligibility checks	<ul style="list-style-type: none">• None
<ul style="list-style-type: none">• Engineering review	<ul style="list-style-type: none">• None
<ul style="list-style-type: none">• Verification survey (RSP)	<ul style="list-style-type: none">• None
<ul style="list-style-type: none">• On-site survey/Post inspection (AIU Staff)	<ul style="list-style-type: none">• Document current on-site survey inspection guidelines• Consider expanding the scope of current post inspection activities to cover more than 10% of completed projects
<ul style="list-style-type: none">• Screening of Participating RSPs	<ul style="list-style-type: none">• None

3. DATA COLLECTION

Data for this task was primarily gathered through depth interviews with David Gibson, the deputy program manager from SAIC, on May 19, 2010. The Application Processing Checklist and Custom and Standard Revised Technical Review Process contained within the Technical Review Manual were also reviewed as part of this task given similarities in the administration of the programs.

We used the Self Benchmarking spreadsheet found under the Best Practices in Energy Efficiency Programs (<http://www.eebestpractices.com/benchmarking.asp>) to determine specifically what types of information to collect.

4. DETAILED FINDINGS

C&I Retro-commissioning Program

Eligibility Checks

Upon receipt of the initial application, customer eligibility is checked by entering the account number provided on the application into the AIB database where it is cross-referenced against Ameren's customer information. Ameren customer information is imported into AIB for this purpose. An application cannot be entered into AIB and labeled as a project until the account number is verified. Once the account number is deemed valid and the customer verified as eligible, project information is entered into AIB, and the application review process begins.

Assessment: Ameren's procedures for the verification of customer eligibility are successful in ensuring only eligible customers participate in the program. No changes are needed in this area.

Pre-Approval

Pre-approval is required for all retro-commissioning projects before the survey phase begins. However, given the nature of retro-commissioning, the program carries out a number of steps at the beginning of a project that feed into the pre-approval process. For example, there is typically a kick-off meeting between the Ameren program staff, the designated Retro-commissioning Service Provider (RSP) and the participating customer. Often the meeting occurs at the customer site and allows the group to talk about the project and address any questions the customer may have about their participation. The customer or RSP will then submit an initial application identifying the total survey cost, and the pre-approval process begins.

The pre-approval application review, conducted by program staff, is designed to check that the project is eligible, based on the program criteria, and that the survey scope is reasonable. Typically, Ameren utilizes two, SAIC reviewers for the pre-approval stage. The primary reviewer is responsible for reviewing the project's pre-approval application and making a recommendation to grant or deny the application. A secondary reviewer also examines the application as well as the primary reviewer's recommendation. The approval of this secondary reviewer is required before the project can be pre-approved.

Once an application has gone through the technical review process it is sent to the SAIC program manager and the administrative assistant with a recommendation that they issue the pre-approval letter, which establishes the incentive levels and minimum energy savings requirements determined by the reviewers. The letter is then created and reviewed by the program manager. The program attempts to ensure high data quality by limiting the number of people with responsibility for data entry. The majority of project information and dates in AIB are entered by the program's administrative assistant. This individual also has the responsibility for making all modifications to AIB except when a technical reviewer needs to update project information to aid in the review process. The primary and secondary

reviewers enter data regarding the project, and the secondary reviewer checks the primary reviewer's entries for accuracy.

A formal pre-inspection is not required or necessary for this program given that the first activity conducted is a thorough retro-commissioning survey by the RSP, the results from which are then discussed with the customer and Ameren staff before the scope of the project is finalized. In addition, the RSP and program staff may conduct a walkthrough of the facility before the project starts to identify potential retro-commissioning measures. This walkthrough takes place before the formal retro-commissioning survey.

Assessment: The program has sufficient pre-approval procedures to ensure a thorough review and verification of planned project activities. The program's technical review procedures ensure that the program's requirements are met before work commences, and the review by two staff members also helps to minimize errors in the process.

Final Approval

Upon completion of the project, two surveys are performed: a verification survey conducted by the RSP and an on-site survey conducted by SAIC program staff. The verification survey occurs for all sites and consists of a spot check and instrumented survey to ensure that the appropriate measures have been installed. The instrumented survey involves RSP use of equipment such as leak detectors, where applicable, to verify the changes made as a part of the project. If it is determined that the measures were not installed or if the installation was not consistent with generally accepted engineering practices, the customer may be required to make changes to remedy any discrepancies. Assuming a satisfactory verification survey, the RSP submits the appropriate paperwork to Ameren for review and approval of payment.

As with the pre-approval process, Ameren draws upon two SAIC reviewers for final approval. The primary reviewer is responsible for the main review of the verification survey and additional final documentation. A secondary reviewer examines the application to ensure that all of the requirements have been met. The approval of the secondary reviewer is required before the project can be approved for payment.

Additionally, following the verification survey, program staff performs an on-site survey for 10% of completed projects.² This survey is not an instrumented survey like the verification survey, but a physical observation survey to verify that the proper measures were installed. The presence of installed measures is compared to the invoices and purchase orders kept by the customer per program requirements.

Assessment: The verification survey performed by the RSPs is effective in ensuring a review and verification of agreed-upon project activities, although the process could be enhanced with the addition of mandatory post metering. In addition, while there is theoretically a chance of error or fraud on the part RSPs, who have a responsibility for both conducting the work and ensuring it was done properly, the on-site survey conducted by program staff is a reasonable approach to identifying any such issues and correcting them. However, a higher percentage of projects than the current 10% should be inspected by Ameren staff to ensure that all RSP verification work is done properly and there is a robust independent verification

² At this time, it is unclear how the program determines which projects to inspect.

process. While the screening and training of RSPs is an important and valuable step in reducing the chance of fraud, additional independent verification could help catch any errors in the project work.

The on-site survey exists to verify the RSP's inspection. While a more detailed inspection with instrumentation could be performed by program staff, it is not necessary given the screening and training provided to RSPs. However, in order to enhance this process, Ameren should document the on-site survey process so that it is clear to internal audiences whether projects are randomly selected for the visits or some criteria is used to determine which projects receive an on-site survey. Given that RSPs conduct the initial verification, the evaluation team would suggest that random selection is likely more effective in preventing fraud.

A. APPENDIX: QUALITY CONTROL AND VERIFICATION BEST PRACTICES

Program Design and Structure

1. Base quality control on program's relationship with vendors, number of vendors involved, types of measures, project volume, variability of project size
 - The quality control procedures are based on relationships with a limited number of retro-commissioning service providers (RSPs) involved in the program and the requirement that they receive training from the program.
2. Assure quality of product through independent testing procedures
 - While this issue was not explored through in-depth interviews, it does appear that the program relies on independent sources in establishing product quality. For example, Ameren reserves the right to deny applications for projects utilizing measures that have not been approved by recognized independent public authorities, such as Underwriter's Laboratory (UL).
3. Use measure product specification in program requirements & guidelines
 - The incentive application forms contain tables with facility eligibility requirements and measures to be included in the retro-commissioning audit.
4. Use inspections & the verification function as a training tool for the market, especially for market transformation programs
 - The program has procedures for inspections and verification, but it is unclear whether the program has used these processes to provide training to program participants to reinforce the benefits and optimal use of program measures.
5. Implement a contractor screening/certification/training process
 - RSPs participating in the program were screened by program staff as part of a formal RFP process to ensure that they meet the technical requirements of the program. Once selected, RSPs are also required to participate in quarterly training.
6. Develop inspection and verification procedures during the program design phase
 - The programs' inspection and verification procedures were created during program

development and design.

7. Consider administrative cost in designing the verification strategy

- Given that the program does not inspect all completed projects, administrative cost is an inherent component of the post-inspection strategy. However, the evaluation team is not yet aware of the criteria used to select projects for verification.

Sampling

8. Require pre-inspections for large or uncertain impact projects

- While a formal pre-inspection is not required, to date all participants have had a facility walkthrough and are required to provide an outline of planned measures in their application. In addition, the retro-commissioning study performed as the first step in program participation generally serves the same role as a formal pre-inspection.

9. Conduct/Require in-program measurement/impact evaluation (or post-project inspections and commissioning) for the very largest projects or those with uncertain impacts

- The program uses engineering review, as well as onsite inspections (verification survey) to assess the impact of all projects.
- The program staff also conducts inspections of 10% of completed projects, although it is unclear how these projects are selected.

10. Build in statistical features to the sampling protocol to allow a reduction in the number of required inspections based on observed performance & demonstrated quality of work. Use a “good” random sample.

- It is unclear the extent to which Ameren is using statistical features in the selection of projects for non-RSP post-inspection.

11. Always inspect the first job submitted by a new vendor

- It is not clear whether Ameren has implemented this practice. However, the screening process for admitting RSPs into the program allows another level of quality assurance and control in terms of the services provided.

12. Obtain a good sample of vendor and measure types

- It is unclear the extent to which Ameren has established inspection criteria that provide a good sample of vendor and measure types. It is likely that this happening by default given the small number of active RSPs and relative uniformity of measures implemented.

Inspection Procedures

13. Ensure inspectors have plenty of hands-on-construction practice

- Inspections are performed by both the RSP and utility program staff that have experience in retro-commissioning. While the formal training of these individuals was not assessed as part of this evaluation, technical reviewers have extensive engineering experience and knowledge of the measures incentivized through the program.

14. Conduct an independent audit or pre-installation inspections

- The program often includes a facility walkthrough prior to the formal retro-commissioning study, which serves as an independent audit of facility performance.

15. Conduct on-site post-installation inspections

- Inspections are performed by both the RSP and program staff.

16. Govern post-inspection levels by cost-effectiveness considerations and results from an initial set of inspections early in the implementation process

- Cost-effectiveness is an inherent aspect of the current post-inspection protocols, as described in the Sampling section above.

17. For de-lamping projects, use light level requirements and pre- and post-light level readings to ensure quality

- This topic is not applicable to the retro-commissioning program.

Final Application Review

18. Verify accuracy of rebates, coupons, invoices to ensure the reporting system is recording actual product installations by target market

- Customers are required, as part of the program terms and conditions, to submit

copies of all invoices or other reasonable documentation of the costs associated with implementing the eligible projects.

- As part of the application review process, technical reviewers compare invoices and purchase orders to the application information to confirm that the claimed measures were actually installed at the specified time.

Evaluation

19. Assess customer satisfaction with the product through evaluation

- While the current evaluation effort will not gauge customer satisfaction with the program's processes, this information was indirectly gathered through interviews with RSPs and program staff that have worked closely with participating customers.

20. Tie staff performance to independently verified results

- This topic was not covered in the depth interview.