

Executive Summary

This report discusses a proposed system to improve upon inventory management issues experienced in the M&TE Tool room for the PG&E Diablo Canyon Power plant. Effective inventory tracking and management is an important characteristic of any organization handling physical assets, and without the proper system in place, companies may lose expensive items and waste time by not having equipment available when needed. The tool room is experiencing inventory shrinkage of M&TE equipment nearing \$100,000 per year largely because of an inefficient checkout system that fails to keep employees accountable for the tools they check out. Even more costly than the shrinkage of inventory is the expense of downtime incurred by not having a tool ready when needed. Two main issues with the current system were identified as the reasons for the shrinkage and lack of accountability: 1 when no tool clerk is on staff, mainly nights and weekends, an unreliable paper-method for checkout is used, and 2, employees are not held responsible for checking their tools back in, resulting in tools being “handed-off” outside of the tool room. To combat these problems, a self-checkout/check-in system was developed, eliminating the need for the paper system, requiring an employee login for returning tools, and reducing the total number of steps in the process by 36%.

PG&E was also interested in using RFID (Radio Frequency Identification) technology to further increase accountability and improve the tracking of tools in and out of the tool room. A working proof-of-concept model was designed, built, and tested at Cal Poly's POLYGAIT Laboratory along with recommendations for a potential implementation at PG&E. The results of the portal testing indicate that the best RFID tags for larger items include the Confidex Ironside Slim or Xerafy Cargo Trak tags while the Confidex Captura G2XM should be used for cabled probes. In addition, a maximum of six tools should be carried through the portal at a single time.

An economic analysis for the proposed RFID system with revised checkout was performed along with two other alternatives: an increase in staffing on nights and weekends with the revised checkout and regular staffing with the revised checkout. All three alternatives were compared to the current state, which includes regular staffing without the revised checkout. The results of the economic analysis suggest that the RFID system paired with the revised checkout provides the lowest total cost solution, with a payback period of 0.046 years and a cumulative four-year return of \$1,442,914.00. The second total lowest cost solution, which is the revised checkout method alone without an RFID system or increase in staffing, provides the fastest payback period of all the alternatives, in 0.019 years, but provides less of a return on an investment than when paired with the RFID system.