Eight AutoPilot Industrial Project Summaries

GenCorp Automotive Components Manufacturing Plant

A Holmes AutoPilot System was installed in the GenCorp plant in Wabash, Indiana to be used by Jarrod, one of their young engineers, as his Six Sigma training project. The plant made rubber stripping for card doors and windows. Jarrod was young, bright and excited about finding ways to improve his plant. He knew the plant from top to bottom, all of the workers, and understood the equipment and the processes. It didn't take him long. Right away he used the system to find some equipment running during periods when it should have been shut down and he found that the plant was paying a significant penalty every month for one particular line that created a spike in the electrical demand during the middle of the day. He made some changes, used the monitoring system to evaluate the results, made some more changes and so on until he had his systems tuned the way he wanted for both peak production efficiency and energy costs.

Jarrod was spending a few days each month in Ohio attending Six Sigma training with employees from a number of their other plants. He would take his results back to the class where they would each discuss their projects. When he submitted the final report on his project along with the projected and actual savings he won First Prize. Not only that, his project was identified as the Number One Opportunity to Cut Costs Corporate-Wide; the best opportunity to increase efficiency and profitability. After he got back to his office, he called me and said "I have some great news. I won 1st prize. The company is going to install an AutoPilot System in all of their plants world-wide."

Honda-Owned Automotive Components Manufacturing Plant

This eight year old Japanese-owned plant meticulously assigned all costs to individual departments and product lines except for the approximately $2,000,000 in annual utility costs which could not easily be itemized. Departmental energy costs were reported on a per square foot basis which favored some areas and penalized others. The plant managers realized that to be accurate they needed to measure utility consumption at many points within the plant. During the process of installing an energy management system to control lighting and HVAC, the temperature controls company doing the work assured the owner that their system would also provide the desired reporting.

After attempting to use the reports from the EMS for about 18 months, the owner decided that although the EMS was providing the desired control, the reporting was unacceptable. After visits to other sites and discussions with other users, the owner decided to purchase a Holmes AutoPilot System. Immediately upon startup the system provided the reports that the plant had wanted for several years. It broke utility costs down by department, shift, product line and production levels. Within the first 6 months the system was expanded twice, with an increase in the number of monitored points in the existing plant and plans were made to integrate the system into a planned plant expansion. Plant personnel set a target goal to reduce the plant's utility costs by 20% with the data provided by the AutoPilot System.

Kosmos Cement Plant

This facility installed the Holmes AutoPilot System for two reasons: to find opportunities to reduce electrical costs, and to assign electrical costs to different production areas. During the first 6 months following system startup, Holmes Energy engineers assisted the plant's electrical engineer in identifying specific savings opportunities. The owner recovered the initial investment in less than 6 months. The savings included:

- Reducing Peak Demand through a combination of smoothing off short duration peaks and occasionally shifting equipment startup or shutdown by a few hours to take advantage of the utility company's night and weekend off-peak periods. An analysis of 15 minute interval historical data collected from May-Sep showed that the monthly peak demand had been reduced an average of 2,250 KW.

- Reducing KWH Consumption by 200,000 KWH per month by shutting down, for 12 hours per day, 400+ KW of equipment identified as unnecessary in two specific areas. Two hundred (200) KW of other miscellaneous loads throughout the plant were reduced through a combination of operator training, awareness and incentives.

General Electrical Appliance Manufacturing Plant

This large plant had experienced summer peaks exceeding 80 MW. The facility consisted of more than 30 buildings spread out over 1,100 acres and was served through one electric utility meter. In order to distribute costs to buildings and departments, facility engineers spent several days each month reading

consumption totals from existing submeters and entering the data into spreadsheets. Demand, which accounted for 60% of electric costs, was simply being distributed in the same proportion as consumption. A Holmes AutoPilot System was purchased to automate the meter reading and reporting and to identify contributors to the monthly peak. The system produced demand profiles for each feeder, transformer and building in order to understand each contributor. Even though the demand was fairly consistent during weekdays, the data showed that the contributions came from different sources on different days and on any given day could randomly vary and increase the monthly peak 23%, or several hundred KW.

When historical data showed that more than 10% of the one million dollar monthly electric bill was due to the 15,000 Hp compressed air system, the monitoring system was expanded to monitor all compressors plus system pressures and flows throughout the site. Within a few weeks, GE personnel modified system operating sequences and repaired some control and sensor problems which, as documented by actual measured data, resulted in an increase in system efficiency of 20% and a monthly cost savings exceeding $20,000. The owner recovered the initial investment in less than 3 months.

Mariah Meat Packing Plant

This plant manager was convinced that a refrigeration system expansion project was required to support the plant during hot weather. He was prepared to spend $100,000 for additional electrical transformers in the first stage of the expansion. Before the $100,000 expenditure occurred, a Holmes AutoPilot System was installed. Data from the monitoring system showed that the refrigeration load, which accounted for 2/3 of the plant total, remained relatively constant every day of the year even though production involved only one shift M-F. The climate was such that the outside temperature varied from 95 degrees to below zero.

Further investigation uncovered a 400 ton false load in the refrigeration system resulting from faulty valves and controls, relatively minor and inexpensive items to repair. By correcting these problems, the annual electrical cost of the refrigeration system could be reduced 50% or $250,000 per year. In addition, the $100,000 capital expenditure for transformers was avoided as was the cost of the additional refrigeration equipment. Instead of running out of capacity during hot weather, the system had a reserve capacity of more than 100%.

Golden Castings - Foundry

Managers of this foundry believed that their highest costs were for an induction furnace and other equipment associated with melting and pouring metal. Because the operation of that equipment was directly related to production, they assumed they had little opportunity to reduce electric costs.

A Holmes AutoPilot System installed to monitor the main electric meter and transformers determined that 1/3 of the annual electrical cost, or $500,000, was for air compressors, much more than for all of the melting equipment. When the data showed that 50% of the compressed air costs or $250,000 per year was being spent during non-production periods, the plant began to identify and correct air leaks, faulty compressor controls, broken air dryers, and system design restrictions.

In addition to the $250,000 savings potential from reducing air compressor electrical consumption, as corrections were being made the plant was able to shut down two 250 hp compressors during the day. This reduced the peak demand by 400 KW and saved an additional $50,000 a year. The owner recovered the initial investment in less than 3 months.

Rexnord - Heat Treat & Assembly

By monitoring the main electric meters and manually entering weekly production data, a Holmes AutoPilot System produced reports that showed 30% of the annual electrical costs, or $250,000 per year, were being spent during third shift, when less than 5% of production occurred. When the historical reports were shown to the President of the company, he decided to use the data to make each department responsible for their own utility costs.

Procedures were established to automatically print graphs of each department's electrical usage for the previous day and distribute them to the foremen for each department at the morning production meeting. As a result, the electrical consumption was reduced by 35% primarily by just turning off unneeded equipment during the second and third shifts.

Thomson Consumer Electronics (RCA) - Injection Molding & Assembly

This plant's major production cost was operating and supporting more than 50 injection molding presses ranging in size from 200 to 3,000 tons. In a pilot project to include the electrical costs of the presses in the “unit cost" of each molded piece, six presses were selected for initial monitoring with a Holmes AutoPilot System. By accident, when two identical presses were selected at random and real-time graphs brought up on the PC screen for the first time, one press was in operation and the other was not being used during that shift. The press in operation had a base load of 80 KW and as the press proceeded through its 1 minute cycle, the load would jump up over 100 KW, drop down to 88, back up to 100, etc. The press out of service showed a constant load of 80 KW. Its electrical consumption was 85-90% of the active press.

The monitoring showed that only 15% of the load varied with production; 85% was for auxiliary motors associated with hydraulic pumps, cooling and material handling. As a result the owner began to retrofit existing presses with variable speed motors and controls to allow the electrical consumption to more closely match the production output of each press.

After an overloaded transformer exploded and shut down part of the plant, the plant engineer decided to extend the AutoPilot System to include all transformers. Continuous additions and relocations of large pieces of equipment became based on the actual loading under all conditions rather than limited data resulting from the past practice of installing portable recorders for a day or two at a time on each transformer during load studies.