

Whirlpool Amana Operations

Success with 50001 Ready to be Replicated Across the Company

BACKGROUND

Whirlpool Corporation is a manufacturer of major home appliances, with more than 50 manufacturing and technology research centers and 77,000 employees. The company markets Whirlpool, KitchenAid, Maytag, Amana, JennAir, and other major brands worldwide.

Whirlpool North America has a longstanding commitment to reducing water and energy use, designing zero-waste-to-landfill manufacturing plants, and using renewable energy. The company signed the [DOE Better Plants](#) pledge in 2009 and was named ENERGY STAR Partner of the Year in 2014. In 2015 and 2016, it earned the U.S. EPA Smart Way Excellence Award for its sustainable supply chain achievements in energy efficiency.

The 43-acre Whirlpool Amana Operations facility in Amana, IA manufactures French door and column refrigerators, with nearly 3,000 of its employees working out of one building measuring 2.2 million square feet. The plant became interested in 50001 Ready as part of its effort to requalify as a World Class Manufacturing (WCM) facility. The WCM concept is the philosophy of being the highest quality, fastest, and lowest-cost producer of a product or service. It involves continual improvement of products, processes, and services to provide the best choice for all customers. A goal for the Amana facility is to advance to the next WCM level, and achieving ISO 14001 and readiness for ISO 50001 will help to accomplish this goal.

In implementing 50001 Ready, the Amana plant produced tangible savings at low cost, which is particularly valuable to plants with older equipment and in challenging times. As the level of savings per dollar investment was higher than expected, Whirlpool is working to replicate the success of 50001 Ready across the company and the global enterprise. Whirlpool plans to implement 50001 Ready at all nine of its plants in North America.

SOLUTIONS

50001 Ready helped the Amana plant save \$450,000 in its first year of implementation with a 15% reduction in energy consumption as reflected in the plant's last 12 months of energy bills.



Amana Whirlpool team photo. Photo courtesy of Madison Monahan, Whirlpool Corporation

Establishing an energy management system helped the plant identify its plastics processing line as a significant energy use. Consisting of 11 Rotovacs and four inline Thermoformers, the process line creates the plastic interiors and compartments of refrigerator doors.

A spun ceramic thermal insulation material was selected for the Rotovac machines, **resulting in 60% reduction in energy consumption** for these machines.

“Through our 50001 Ready implementation, we discovered these ovens were over 500 degrees on the exterior of their casing and, after investigating, we found the ovens lacked any thermal barrier or insulation between their elements and the machine casing”

- Lance Bohlen, Whirlpool Amana's Energy Pillar Leader

Additional benefits resulting from the plastics processing line improvements included:

- ▶ Annual savings of \$300,000; savings of \$20,000 per year per 12 machines, with some machines yielding savings upwards of \$50,000.
- ▶ Ambient temperature reduced by ~4°F, resulting in increased comfort and safety of nearby workers, as well as shorter machine run-time and warm-up times.
- ▶ Increased and more consistent production quality.

These energy-saving measures have been so successful that plastics processing is no longer the top priority of the energy team and focus has shifted toward improving the performance of the air compressors. Repairing leaky compressed air distribution lines and hoses increased the energy efficiency of the plant's air compression system, lowered noise levels, and prevented blown dust and dirt from getting inside manufacturing equipment—reducing breakdowns and promoting an extended equipment service life. Additional savings resulted from installation of occupancy sensors, LED lighting, and time delay relays placed in air handling equipment to alternate run times for lower peak demands.

“Achieving 50001 Ready is very important to the company. Amana is the first Whirlpool plant to achieve this designation and that is something all of us can be proud of.”

– Humberto Silva, Plant Lead

Implementing a 50001 Ready Energy Management System

- ▶ **Investments.** 50001 Ready helped the Amana plant achieve an annual savings of \$450,000. Most of the projects undertaken had very low capital costs. Even the insulation added to the plastics machinery was low in cost. The most significant investment was for the purchase of devices to measure the energy consumed by various systems and pieces of equipment within the plant. Now that the team has the capabilities to effectively monitor key pieces of equipment, it can use these metrics to inform operations and support greater efficiency throughout the process line.
- ▶ **Reporting.** The 50001 Ready Navigator task activities required regular reporting to corporate managers led the Amana plant to generate monthly energy reports that clearly document the plant's achievements. These reports helped the plant to take top honors for energy savings across Whirlpool North America.
- ▶ **Management support.** Plant executives readily recognized 50001 Ready as an opportunity to complement and leverage the plant's WCM activities to earn additional savings and recognition. From a management perspective, 50001 Ready helped to formalize the plant's internal management review process and enhanced its energy management effectiveness.

- ▶ **Energy Team.** The core energy team consisted of the team leader, a management representative, a process engineer, an autonomous maintenance specialist from the shop floor, a maintenance person, and a controls expert. At any given meeting, group size varied from four to nine people, depending upon production levels and includes additional staff as relevant.
- ▶ **Implementation and effort.** The sequence of the 25 steps in the 50001 Ready Navigator guided the Amana team's daily activities in a logical way and helped the energy team track and measure progress. The entire 50001 Ready preparation and implementation effort took about 18 months.
- ▶ **Professional experience for college students.** To support activities in the Navigator tasks, the Amana plant leveraged the on-site presence of college students participating in intern or co-operative education programs. Involving college students in 50001 Ready expedited progress at the plant and helped build important skills in the future workforce.



Before and after photos of a Rotovac with and without thermal barrier. Photos courtesy of Lance Bohlen, Whirlpool Corporation.

Key Takeaways

A good energy management system provides a logical way to manage energy and reduce costs. A plant that has successfully implemented 50001 Ready can provide an example for other plants and employees around how energy awareness and simple changes can lead to real savings.

WCM and 50001 Ready overlap in some ways, yet each approach delivers unique benefits. The energy component of WCM focuses primarily on identifying and solving energy usage problems, whereas 50001 Ready provides a formal system for managing energy effectively and continually improving energy performance.