

## Westinghouse Nuclear Fuel: Developing a New Strategic Manufacturing System

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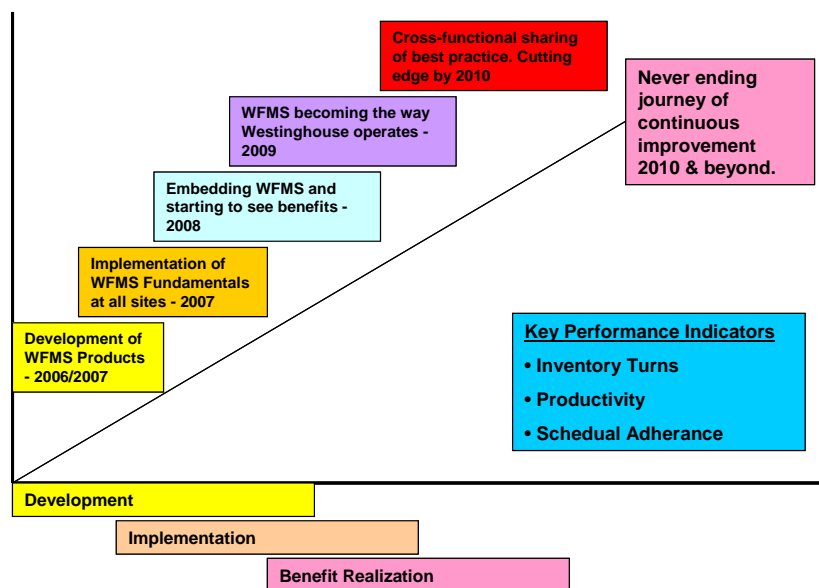
### Client Challenge

Only a small handful of companies worldwide are engaged in the manufacture and sale of fuel for nuclear power plants. It's a highly specialized and competitive industry in which the players routinely strive to win big long-term contracts of five-, ten- or 15-year duration. Participants are under constant pricing pressure.

It was in the context of this environment that Westinghouse Nuclear Fuel took a serious look at its production capabilities—and its prospects for thriving in the nuclear fuel market going forward. Westinghouse came to the conclusion that there was a real need for upgraded processes, as well as needs for a more highly trained workforce and a more motivated middle management.

Specifically, Westinghouse's manufacturing processes were managed with a piecemeal approach—with its six production facilities each more or less determining its own individual direction. The company understood that this failed to meet the need for the kind of systematic approach that could lead to the sustainability it truly required.

For the design of a new strategic manufacturing system framework, Westinghouse Fuel Manufacturing System (WFMS), that would enable achievement of corporate targets over the next five years, Westinghouse turned to a company with which it's worked for several years—RWD. RWD is one of the world's leading providers of process-improvement services, with nearly two decades of transformational experience in many manufacturing and service industries—including the nuclear industry.



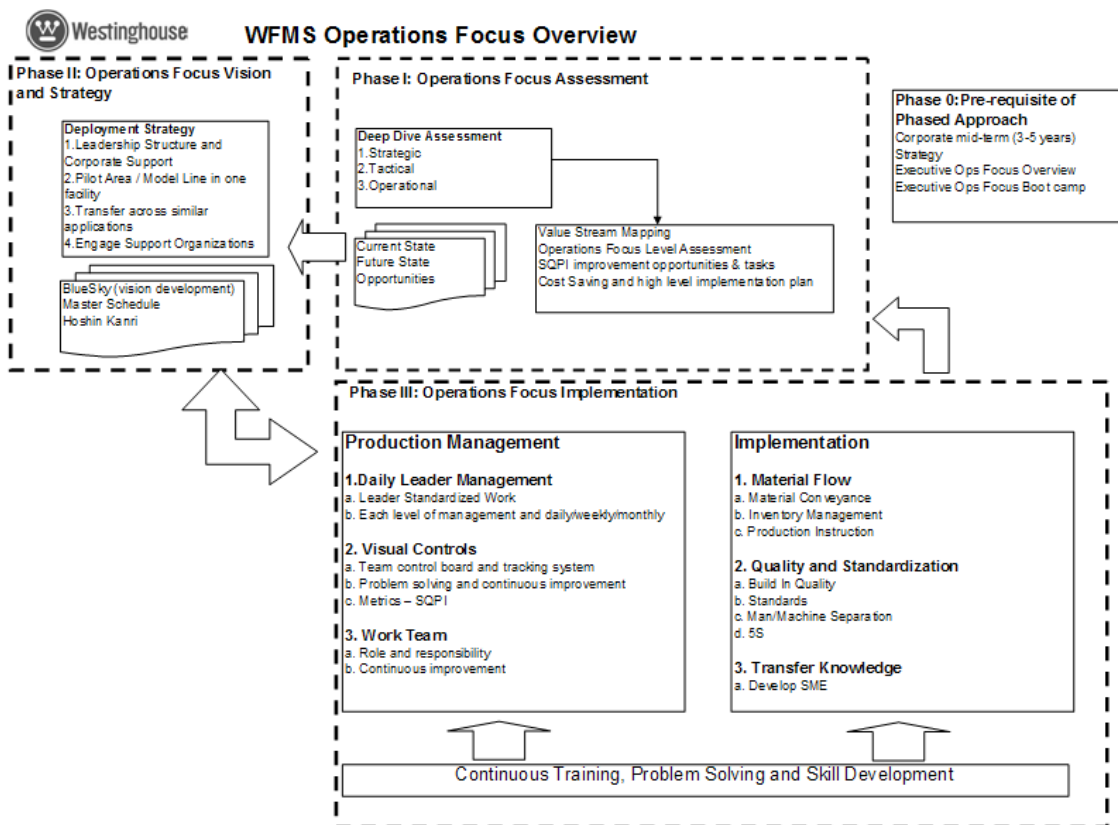
### Westinghouse Fuel Manufacturing System (WFMS) five-year strategy

## Safety, Quality, Delivery

Part of the Westinghouse Electric Company, Westinghouse Nuclear Fuel has been providing the nuclear industry with value-added fuel products and services for over 40 years. It operates facilities in the U.S., the U.K. and Sweden; and hopes to expand to major markets such as China, India, and Brazil.

“Because of the nature of the products they are making,” said RWD Manager Katsumi Shiji, “[Westinghouse is] very sensitive to safety, quality and delivery. These are the major three categories of importance for their customers. If they miss delivery or have defects in the products, they would jeopardize [their customer relationships]. For future growth they need to assure safety, quality and delivery with good cost. That’s why they needed to have a good foundation. They don’t want to bring their U. S. Manufacturing system to China, for example. They want to bring a better, more consistent system.”

As the first step of upgrading Westinghouse Nuclear Fuel’s manufacturing processes, RWD developed the global manufacturing system based on RWD lean manufacturing programs, delivered the work packages to the clients and trained them.



**Westinghouse WFMS System Overview**

Last year RWD performed assessments of the company's six sites with Westinghouse project team—analyzing the “current state” of operations and proposing “future states” for the next year to year and a half. RWD found five key opportunities for improvement for Phase One:

- The production scheduling system had resulted in an overstock of raw material, work in progress and finished product.
- Workers on the floors were not flexible in their skills, and not always able to cover for one another in the events of illnesses or other absences.
- Manpower utilization was very low, creating significant waste. Close to 50 percent of the workers were idle at any given moment.
- Middle managers at the plants lacked the management and leadership skills necessary to carry their processes to a higher level.
- The production floors didn't always meet their targets, producing variable numbers day to day.

“For Phase Two,” said Shiji, “we had what we call ‘Blue Sky’—the ultimate goals and vision. The vision and mission for each site. We developed the master schedule, detailing how to get there step by step, category by category, with a schedule for each site.”

## Addressing Leadership and Processes

RWD supported pilot implementation of all phased approaches and tools at all six sites. Implementation (Phase Three) initially focused on two key areas for improvement upon the assessment (Phase One) and BlueSky/Master Schedule (Phase Two)—leadership and production management.

RWD and Westinghouse personnel first addressed the issue of leadership in the plants' middle management—Operation Managers, Area Managers, Team Managers and Supervisors. “We had to set up leadership standardized work to insure that they do their jobs properly,” Shiji explained, “and do them on time on a daily and weekly and monthly basis, working toward their goals. We taught them how to do it, helped them become capable of doing it and showed them how to monitor what they do.”

To help focus the production processes more tightly, RWD helped Westinghouse create Production Management Center in each production area that show both the metrics—safety, quality, delivery, cost—as well as progress in achieving targets—above, below, right on. If information on the board reveals missed targets, managers and their teams are on notice to devise solutions. At the start of each shift, stand-up meetings at the Production Management Center review progress.

Other important improvements were made, as well:

- RWD determined that work teams were too large to manage all production activities. These have been reduced in size to five to ten people, developing team leader's role.
- Production is being changed from a “push” system to a “pull” system. That is, product will be made as the customer orders it—as in “just-in-time” manufacturing.
- Safety and quality are paramount in the nuclear-fuel industry. To assure that no defects occur, RWD has helped Westinghouse create standardized work processes.
- Procedures and methodologies—and the training material that describes them—were standardized for all sites. “Everybody is using the same approach and objectives, working from the same page,” said Shiji.
- RWD also trained and mentored Westinghouse subject matter experts—in-house consultants who will train workers, help to fix problems and assure continuous improvement.

## Significant Benefits

The initial outcomes of pilot implementation at the South Carolina site point to the potential for significant benefits company-wide. Most notably, the new RWD-designed production management system and rapid-improvement activities led to an immediate savings of \$2 million due to cost avoidance. Moreover, monthly scrap at the site was reduced by \$40,000 and overtime reduced by 3 percent. The cost of retaining RWD in this single instance was only one-tenth of the effective savings.

Columbia (SC) Grids area Pilot:

Cost Avoidance \$2M - Downtime/Production Tracking Boards showed current machinery was not fully utilized and the team has started the project to achieve full efficiency.

Overtime - Overtime has dropped by 3%

Scrap reduction - monthly scrap cost reduced from \$65K to \$25K (\$40K/month cost reduction)



At this early stage in its campaign to upgrade its processes, create a more highly trained workforce and enable a more motivated middle management, Westinghouse Nuclear Fuel is off to a good start—with some help from RWD.