

WESTINGHOUSE Nuclear Fuel Proof of Quality for Customers

EMNS, Inc.

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Flow of Requirements and Product Traceability In a Multi-Tier Nuclear Supply Chain

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About Westinghouse Nuclear Fuel



Westinghouse Nuclear Fuel (WNF) is the world's leading integrated supplier of nuclear fuel products and services. It manufactures fuel-related products and components for nuclear power plants worldwide through an extensive, multi-tier international supply base, sub-component, and raw material facilities.

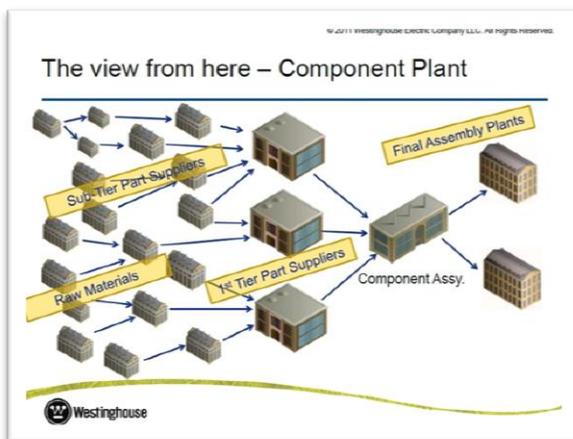
The company employs more than 5,000 people in the United States, Sweden, and the United Kingdom, and participates in joint-venture businesses in Japan and China.

The focus of WNF is on nuclear fuel bundle assembly, which must comply with the same regulatory requirements as a full nuclear plant. Although parts of the supply chain are vertically integrated, other parts are outsourced. As a result, servicing customers around the world means managing an extensive multi-tier, domestic and international supply base.

Qualifying Incoming Materials and Sub-components

Westinghouse Nuclear Fuel (WNF) quality management practices reach far beyond the basic programmatic audits which many companies employ to qualify incoming shipments. The high volume of subcomponents it receives demands a capability for ensuring that repeat orders from suppliers are consistent and uniform. This is critical to the company's success. To that end, WNF confirms process capability by applying Statistical

Process Control analysis to all shipments it receives. In-house quality engineers work with suppliers in order to guarantee that all processes used along the way to a final product are clearly understood and charted. Other tools, such as product-type qualification, and program qualification, ensure uniformity. This activity is supported by a large staff conducting onsite surveillance, which monitors the quality of the inspection activities being performed by suppliers inside their facilities.



Westinghouse tracks lot-by-lot quality. The high volume of data generated by this activity demands the use of a system far beyond what a paper-based system tracked by personnel can accomplish. Although the company attempted to convert paper documents into images such as PDFs, in the end, the retrieval of data still required personnel so it remained burdensome and slow.

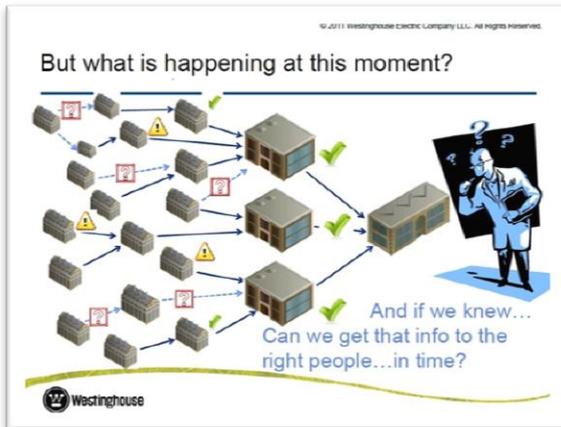
The Critical Nature of Qualifying Information

It's important to understand that the qualifying information is as important to Westinghouse as the parts themselves are to WNF Receiving—the data is a deliverable in itself.

After thoroughly examining the entire process of receiving and reviewing quality data, several limitations were identified.

1. Products from the company's first line of suppliers were confirmed as acceptable by Receiving, as was the data they supplied.

However, there was no clarity about other, more remote tiers – the suppliers to the suppliers. Some of them could very well not be on the Westinghouse Qualified Supplier List. Any sub-par item supplied by a 2nd-tier supplier could affect the products of the first-tier supplier.



2. The data received from a supplier might qualify a specific shipment. However, it supplied no information about the supplier's previous shipments. The ability to easily and quickly compare a shipment with its history could identify a trend. A performance history could enable the suppliers to build a record of quality production over time, and allow Westinghouse to identify performance improvement or deterioration.

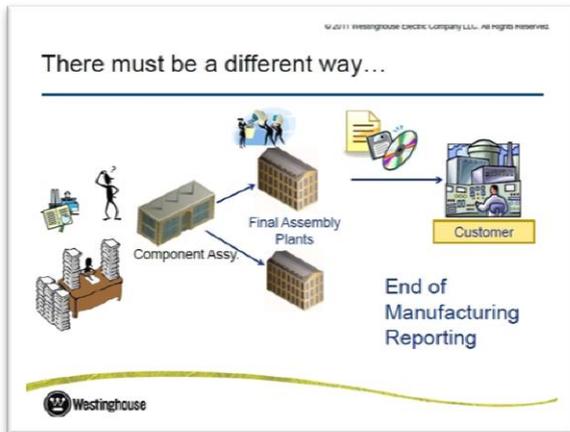
3. The absence of data from second-tier (and beyond) suppliers made real-time tracking and tracing of incoming materials and subcomponents close to impossible.

In summary, the existing system gave the company data about its own production and that of its first-tier, primary suppliers, but obscured the rest of the supply chain in terms of quality. There was also no access to information about quality performance of suppliers over time.

The Challenge of Developing an “End-of-Manufacturing” Deliverable

Westinghouse discovered that it was not alone in facing this challenge. Recently published studies, as

well as informal reports from colleagues in other industries, told a similar story: it is difficult to assemble and then be able to access the essentials required within this mountain of information. That illuminated the difficulty of keeping track of a distributed base of suppliers.



The question was how to get a clear, easy-to-access picture of WNF's complete supply chain, gain performance history, and provide customers with deliverable documentation.

WNF recognized that, looking downstream, it could not provide the full documentation required by its customers, that they in turn were required to provide to regulatory agencies.

Given the challenges upstream, how could the company funnel available data into a useable end-of-manufacturing report deliverable to the end customer, while also satisfying the documentation requirements of the supply chain partners in between?

Partnering with EMNS

WNF realized that incremental changes could not meet this challenge and that a dramatic change was required.

Moving paper and images of paper documentation through the system could not meet the challenge. The company would need to automate the data collection process and produce electronic documentation.

However, there was a concern that demanding more detailed information from suppliers might drive some of them away.

They needed a system that would work with existing manufacturing processes and already-existing electronic data.

It needed to be simple enough so that both WNF as well as its suppliers, and their suppliers (no matter how far downstream) could use it.

The company recognized that it would not be able to develop such a system itself. Since the problem was not unique to WNF operations, the company began evaluating a number of commercial alternatives.

The objective was to find a solution partner who could provide the software product and development practice that met WNF expectations from a quality standpoint, and provided the high level of data security their industry demanded.

- The provider needed to meet Westinghouse supplier requirements, and pass a rigorous audit. To that end, Westinghouse put all candidates through its internal IT security assessments.
- The systems needed to be modular and configurable.
- Since there were many repeatable activities in their extensive supply chain, WNF needed modules to build the data collection system to fit individual links in the supply chain.

The New Approach

After extensive research, Westinghouse selected GSQA[®] software, and WNF is currently using the GSQA[®] system, hosted in Chicago by EMNS, Inc. to deliver this improvement.



With EMNS as a partner, WNF launched the project using a non-typical approach: instead of a limited installation across a wide part of the enterprise (the typical approach) they chose a specific situation, in this case, a European customer who allowed WNF and EMNS to build an end-to-end system that included at least 300

part numbers.

Because the new system would have to incorporate the Westinghouse internal manufacturing sites as well as those of suppliers, modeling the entire system end-to-end appeared to be a useful way of gaining buy-in to the concept.

Initially, when the radical new approach was introduced to suppliers, there was some resistance. Seeing it complete, and in action, helped suppliers understand and accept it.

At this point, Westinghouse had already put much of its internal data into electronic form which facilitated input to the system. As new parts were released, they were simply added.

Contrary to expectations, and in spite of the initial concerns of suppliers, the system was quickly accepted. Suppliers found it extremely easy to use. They found that:

- Data entry is flexible, and not limited to manual entry.
- Suppliers whose data was already available in electronic form appreciated being offered a method of entering data into the system without re-entering it manually.
- Since raw material certificates are entered into the system by the companies supplying them, their clients were no longer burdened with this task.
- There was no time-consuming copying or handling of paper or opportunities for mistakes or omissions.

In short, suppliers realized savings in time and resources by using the new approach.

One of the significant benefits Westinghouse realized was the systematic validation of components' data packages *before shipment* to the final assembly plant. Since Westinghouse customers approve all drawings, specifications, and

revisions, this is a particularly useful feature of the system. It provides a safeguard against the unapproved introduction of inventory, which is a serious violation of guidelines governing production in a fuel assembly plant.

In addition, the electronic validation process allows WNF to summarize any deviations or nonconformances, which its final assembly plant requires before allowing materials to reach their customers, particularly since the system enables the tracking of finished part lots, which contain substantial sub-lots.



How the System Works

After the new Westinghouse system hosted by EMNS was up and running, the company moved away from point-to-point transactions using paper or PDFs. Instead, the new electronic solution now serves as an information hub, connecting WNF to its supply chain partners. Processes between tiers of suppliers are now standardized and common to the entire network.

Westinghouse can quickly and conveniently export its P.O. and specifications to suppliers and receive confirmation of the product certification information in return, in electronic form.

Distributing the Work-load

Westinghouse has replicated the first-tier scenario throughout the chain. As a result, the work-load has been distributed in a more rational way. Data is entered at each site, which means that the work is the same at all levels, in each facility. Westinghouse can reproduce that same process at each link, as the product moves from any one of its plants. At each release point, the data is handed off to the system.

The centralization of all data, including internal data, allows WNF to understand and track the complete path of their product, from suppliers' suppliers, to suppliers, through its own facilities, and on to its final customers. The EMNS system pulls it together and helps Westinghouse organize the final data deliverables.

The system can produce a centralized, searchable graphic of the supply chain as part of its reporting

which is a valuable feature. The same system can be used for country of origin, scorecarding, supply tracking and other critical data. These are areas that Westinghouse can exploit in the future.

The Result

Although Westinghouse faced some resistance at the outset of the project, in the end, people appreciated how easy it was to call up results with a few clicks.

The process requires logging into a secure system, which calls up a web page that summarizes the top level part subassembly they are receiving, with all its ingredients/components, subparts as well as raw materials, together with hyperlinks to the associated certificates.

A user can view the WNF page and review everything that went into the subassembly, view specifications, test results, ship-from location characteristics, ship-to characteristics, any level of certifications, and trace forwards, backwards and sideways for information on “where-used” also.

At the same time, another click provides access to either a single lot, with all the certifications in that lot in a zip file, or accesses all the certifications for that shipment. If Westinghouse ships 500 lots, one click accesses the data about them.

Similarly, the system offers WNF sites the option of downloading a CSV file (for sites that use SAP or other software to control their production), or the ability to view all the data from Westinghouse components on their systems. This reduces the amount of time they spend handling records, and simplifies the task of compiling the final manufacturing report that goes to the customer.

A number of Westinghouse Nuclear Fuel's final sites are now using the new system, and are excited about the benefits they are seeing, with more sites coming on line.

At this point, WNF has no need to install additional software or acquire more licenses, and only needs to assess whatever part numbers and customers should be added to the system.

Westinghouse can also take advantage of other capabilities embedded in the system. This includes Statistical Process Control (SPC) as well as expanded reporting functionality and other growth opportunities. Statistical Process Control provides early warnings of deviations, and is an effective barrier to any attempts at falsification of testing data.

In summary, Westinghouse has identified multiple key benefits since it was introduced to this process.

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Benefit – one button tracing across the entire supply chain

- Significant improvement in

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Benefit – enforcement of certification content

- Reporting content for

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Benefit – simple certification data entry

- External supplier users

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Benefit – validation capabilities

- Validation profiles identify revisions of documents

To view the recording of the presentation on which this whitepaper is based go to the following on GSQA.com:
<http://www.gsqa.com/customers/westinghouse.shtml>

About EMNS

EMNS is the provider of GSQA[®], a leading Software as a Service (SaaS) application for improving productivity through supply chain business intelligence. GSQA[®] has been deployed in the SaaS model since 1996. GSQA[®] is used by a variety of Fortune 200 companies to automate and streamline their existing supplier related activities. The GSQA[®] target markets include complex discrete manufacturing, consumer products, food production, paint manufacturing, chemical processing and a variety of other manufacturers. To learn more, visit www.GSQA.com.

How GSQA[®] Works....

GSQA[®] (Global Supplier Quality Assurance) fills the void left by most enterprise applications. GSQA collects, stores and analyzes material parameters and production settings to improve manufacturing yield. GSQA's knowledgebase of raw material characteristics and process variables allows manufacturers to correlate input cause to output effect. This correlation allows manufacturers to proactively prevent disruptions, resulting in improved yield by reducing waste.

At the same time, GSQA improves the relationship between the licensing company and its supply base. The supply base is managed via easy-to-access web-based portal technology for regulatory and industry certifications. Procurement professionals gain data-driven insights into supplier performance for more effective sourcing. Plant operations management exerts more control over material variability, increasing yields and return on assets. Research and Development personnel gain visibility to supply chain compliance with material specifications (raw, WIP, finished products) and can adjust interactively as internal or market conditions dictate. Instead of focusing on interruptive issues that reduce supply chain effectiveness and profitability, quality professionals using GSQA have a system resource for proactively driving process improvement that supports operational excellence.