



Summer 2009

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AP1000 design focus: Placement of the CA-20 module keeps Sanmen on schedule



Another major milestone was achieved with the placement of the CA-20 module, as the construction of the first of four AP1000 nuclear power plants in China continues at the Sanmen site. The placement of the CA-20 module in June 2009 keeps the project on schedule, and highlights the benefits of employing a modular approach to nuclear power plant construction.

“The CA-20, which will eventually contain the area used to house spent fuel, is impressive, not necessarily for what it does, but for how it was constructed and what that represents for the future construction of nuclear power plants,” says Ray Aul, Structural Modules lead engineer, who oversaw the engineering of the CA-20. “This module most likely represents the highest level of use for this type of construction in the nuclear industry today,” he adds.

The first-of-a-kind module is comprised of 76 sub-modules, all of which were constructed off-site in a dedicated fabrication shop. The sub-modules were then shipped via road to the construction site and assembled in an area closer to the plant. The CA-20 was then moved into the nuclear island area much the same way that the space shuttle is moved from its storage hanger to the launch pad: via a crawler-transporter. Once that move was accomplished, the module was moved into final position and set into place using one of the largest cranes available. The module is now located directly adjacent to the location of the shield building.

“The significance of modular construction, like we are using at Sanmen, is that work can progress in parallel. For instance, in the case of Sanmen, the nuclear island basemat

preparation and placement was taking place at the same time as the CA-20 module was being built,” says Aul.

Aul adds that this is a much different and more efficient way of construction when compared to the previous generation of nuclear plant construction. “Traditionally, construction of a nuclear plant was very linear. In other words, you would have to wait for one step to be completed before moving on to the next step. This led to very long construction times and often high construction costs.” Modularization, standardization, and parallel activity all contribute to reduced construction time and lower overall costs.

Aul also notes that other industries, such as shipbuilding and aircraft manufacturing, have embraced this method of construction because of the resulting quality, efficiency and accuracy. “The same benefits that made modularization popular in those industries certainly apply when talking about nuclear plant construction.”

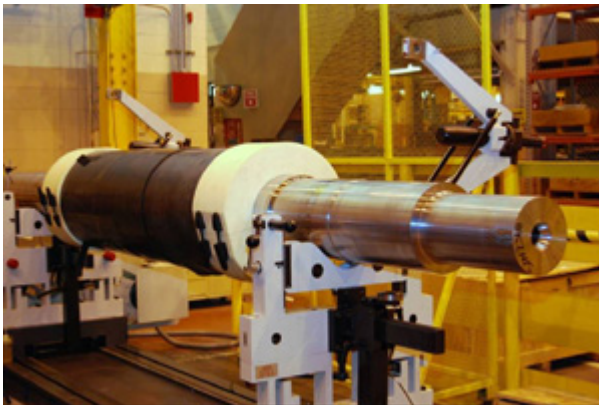
Aul estimates that for every one hour spent assembling a module at a fabrication facility equates to roughly eight hours once on the job site. Ultimately, this reduces construction times from 10 to 12 years, to between three and four years from first concrete pour to fuel load, which is the planned construction schedule of the AP1000.

Click the links to see images of the [CA-20 module placement](#) and [other AP1000 construction](#).

[Back to Top](#)

Supplying the nuclear renaissance: Supply Chain strategy creates links between supply and demand for global deployment of AP1000

There is little question that the nuclear renaissance has ignited a global interest in building new nuclear plants, and the AP1000 is at the front of the pack with four plants currently under construction and eight more planned to begin soon. The interest in adding new nuclear capacity continues to increase; however, those considering new build projects are asking themselves if the supply can meet the planned demand.



Rotor Final Assembly in Work

In the case of the Westinghouse AP1000 supply chain, the answer is a confident “yes.” Westinghouse clearly understands the importance of establishing and maintaining a strong supply chain for equipment, commodities and services in order to keep each AP1000 on time and within budget.

“With the nuclear renaissance fully underway today, Westinghouse conducted a complete review of all critical materials used by the components required to support our most aggressive customer demand. As a result, we have mitigation plans in place, as well as strategic

long-term supply agreements with key suppliers. Of course, we live in a dynamic world, so this capacity analysis is refreshed on a regular basis. Current and new issues are managed in a supply chain risk register. Our goal is to aggressively manage supply to support the expected fleet of AP1000 plants,” says Jack Lanzoni, vice president, Nuclear Power Plants Supply Chain Management.

Lanzoni adds that there were general concerns about the manufacturing capacity available to supply the plants. “Early on, customers wondered if suppliers could support the nuclear renaissance, and suppliers wondered if the nuclear renaissance was real. Westinghouse listened to those concerns and demonstrated, through intelligent risk-taking, our commitment to make the renaissance happen through early strategic supply agreements. This instilled a confidence in both customers and suppliers, who each supported the others’ risk-taking and commitment.”

Having been the basis for 40 percent of the plants in the world during a 50-year span, Westinghouse knows the benefits of having a strong supply chain and how to create one. “There has been a necessary rebuilding of the nuclear supply chain, which we anticipated after a 30-year hiatus in new construction,” says Lanzoni. “However, because Westinghouse has been proactive in seeking out and partnering with major nuclear suppliers around the world, we are now confident in our ability to supply AP1000s wherever the demand may be.”



Heat Exchanger Jacket Shrink

Westinghouse has also undertaken specific initiatives to streamline the supply chain management function based on customer and supplier feedback. “Currently, teams are developing ways of creating a greater level of consistency and anticipation in the supply chain, which results in improved schedules, reduced costs, and identification of gaps proactively, all of which will be of tremendous benefit to our customers,” Lanzoni says.

Additionally, supplier capacity studies are underway to assure that any identified gaps have a contingency plan in place. The risk register process has also been improved to document all elements of risk that could adversely impact the supply chain function. As risks are identified and documented, mitigation plans are developed and results tracked to determine effectiveness. The intent is to move toward problem avoidance rather than problem mitigation.

As the global fleet of AP1000 plants continues to expand, those considering a nuclear new build project can be sure that Westinghouse is well suited to delivering on time and on budget.

To learn more about becoming a Westinghouse supplier, visit <https://supply.westinghousenuclear.com>.

[Back to Top](#)

Customer 1st focus

Westinghouse partners with customers to develop startup resources

With the Commercial Operation Dates (COD) for the first wave of AP1000 plants approaching within the next few years, collaboration has already begun between customers and Westinghouse to set processes and procedures for startup activities.

As the first AP1000 plants were still in the planning stages, Westinghouse realized that it needed to develop a strategy to successfully deliver startup services for AP1000 units under contract, as well as a minimum of four AP1000 units annually by 2015. By working together with our customers in China, and using their feedback, plans are now being developed and implemented to ensure that all necessary resources are in place for the expected COD date of the first AP1000s in 2013.

To tackle the extensive scope of this project, a team was formed as a collaborative effort between a broad cross-section of Westinghouse employees and representatives from the Sanmen and Haiyang site startup organizations in China. Led by Customer 1st leader DH Chung, the team is chartered specifically to examine the matter of startup services for the AP1000.

The team has undertaken several projects that address specific issues related to startup. For example, the team identified early that there was a need from a Westinghouse and a customer standpoint to more clearly define the roles, responsibilities, disciplines, and team composition for the large group of startup employees. As a result, a corresponding project was initiated to develop a Westinghouse staffing plan for acquiring necessary startup resources and the related training requirements.

In developing the overall process plan, the team worked with their counterparts on the China projects to resolve critical startup activities in support of China contract requirements. The team also established key activities such as hiring instructors for startup engineer training, creating a training plan for teaching trainers, and developing a Sanmen wave 1 startup engineer hiring and training plan.

The Customer 1st team also developed and correlated startup test activities, including test plans for construction completion, components, pre-operation, and startup. They also categorized test procedures by test activities, including turnover phases. These documents will be used as a basis to estimate startup resources and training plan needs. Once completed, all variations to startup resource and training projects will be covered by the new process.

For more information on this project, contact Customer 1st Leader Don Hutchings at hutchidf@westinghouse.com.

[Back to Top](#)

Westinghouse AP1000™ construction update

Sanmen, China

- CA20 Module successfully placed for Unit 1 on June 29, 2009, on schedule; Containment Vessel Bottom Head is scheduled for placement by December 2009; excavation and dental concrete are progressing on Unit 2

Haiyang, China

- Unit 1 dental concrete is progressing on Unit 1, with concrete placement on schedule for late August 2009; Unit 2 excavation is also complete; target for Unit 1 CA20 module completion is November 2009

Levy County, Florida , United States

- Progress Energy receives approval from the state of Florida for new nuclear plants. Learn [more](#) ...

VC Summer, South Carolina, United States

- Initiated tabletop clearing, grubbing and grading in June 2009, on schedule; completed construction access road; completed grading of rail spur corridor

Vogle, Georgia, United States

- Site mobilization is continuing, with site clearing, grubbing and grading underway

View images of China projects [here](#).

[Back to Top](#)

To receive this update directly, or to submit comments and article suggestions, please contact Angus Miller at milleram@westinghouse.com

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