INTERGRAPH®

FACTS AT A GLANCE

Company: Samsung Heavy Industries

Website: www.shi.samsung.co.kr

Description: Since its establishment in 1974, Samsung Heavy Industries has gained recognition for its world-leading shipbuilding technology by winning orders from many of the world's leading shippers. SHI has maintained the world's No. 1 market share in the high-tech and high-value shipbuilding sectors, which include drill ships, ultra-large container ships, LNG carriers, and FPSOs, enabling it to secure an unbeatable level of competitiveness.

Revenue: US$12.3 billion

Employees: 13,000

Industry: Shipbuilding & Offshore

Country: Korea

PRODUCTS USED

• SmartMarine® 3D

KEY BENEFITS

• Material cost savings
• Reduction in design errors by a third
• Simplified maintenance planning
• Faster interference checking
• Easy-to-use solution
• Faster design
• 3D design

SAMSUNG HEAVY INDUSTRIES REACHES NEW LEVELS OF PRODUCTIVITY

Intergraph® SmartMarine® 3D Increases Safety and Quality on an Accelerated Schedule

IDENTIFYING GOALS

Samsung Heavy Industries (SHI) has built the world's largest number of drill ships and successfully delivered the world's largest marine platforms and semi-submersible drilling facilities. The company builds more than 70 vessels every year at a relentless pace. SHI has maintained the world's No. 1 market share in the high-tech and high-value shipbuilding sectors, which include drill ships, ultra-large LNG carriers, container ships, and FPSOs.

OVERCOMING CHALLENGES

• Easily find design mistakes and interferences, reducing errors and enhancing design quality.

• Build automation rules that are based on design standards, preventing human mistakes and saving design man hours.

• Take advantage of core associative technology in combination with geometric constructions and advanced plate systems.

• Use information for material procurement, weight and center of gravity calculations, and various bills of material.

• Employ models for various production tasks such as accuracy control drawings, assembly planning drawings, and fabrication and robotic interfaces.

REALIZING RESULTS

Due to the success of SmartMarine 3D within SHI shipbuilding, SHI began a pilot project for offshore projects using SmartMarine 3D. Based on positive results from the pilot, SHI standardized on SmartMarine 3D for all marine projects, both offshore and shipbuilding. The company accelerated its original schedule to more quickly reach implementation and full production stages for SHI offshore projects.

"The ships we design are so complex that we can't imagine using anything else but SmartMarine 3D. It supports our complex design needs better than other software," said Yeong Soo Bae, executive vice president for SHI.

SHI has designed several field development ships (FDS) that are very compact with a large amount of equipment and machinery on deck. SHI has also designed car ferries with a large quantity of pipes and equipment in machinery spaces.

"Once you install the equipment, you cannot move it out, so you have to make your model or design complete in the design stages. If not, it is very difficult to modify or correct," said Bae. "Without the SmartMarine 3D model, we wouldn't be able to check interference or an installation procedure by simulation. SmartMarine 3D helps us save material and dramatically reduce design errors or modifications."

Five years ago, SHI built a car ferry with a large number of design errors. "We recently completed a new FDS using SmartMarine 3D, and the design errors were reduced by a third," said Bae. "The shipyard is very happy with this result. We like SmartMarine 3D very much."

SHI sees several similarities in using SmartMarine 3D for offshore projects in comparison to shipbuilding projects. The similarities are in outfitting parts, components, disciplines, piping, equipment, and cables. But some design and production processes are different.

The company is evaluating and optimizing the work process of some designs in particular. When SHI used its legacy system for ship design, the design process was according to production schedule. That means if production was late, the design was completed very late.

Now it is different. Most of the design using SmartMarine 3D is front-loaded. SHI can build a special make or model very early,

front-loading it, and then SHI can check with the owner, production department, and several related design departments, such as structure, piping, material, and cable. The groups can then see in the model any interferences and check for operability and the ability for proper maintenance.

In the case of offshore, SHI can optimize the design procedure, sometimes by changing the process or structure. SHI creates two types of offshore products: drillships (similar to hull-type ships) and platforms (same topsides).

The topside structure is composed of many I-beams and H-beams, which are very simple to design. But they are different from members in SmartMarine 3D. SHI is giving feedback to Intergraph to further develop the functionality to design members, connections, and details to create drawings and model data for use by production.

"SmartMarine 3D's main benefit is rules-based functionality," said Bae. "We can create powerful automations, and new users can easily learn the software."

"In the past, we created drawings in 2D. If we needed a 3D model, it would require more man hours than a 2D drawing," said Bae. "But we changed processes and our design standard. Now we are actually reducing design man hours to create a 3D model compared to the time it took in the legacy system to create a 2D drawing."

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>
> Yeong Soo Bae
> Samsung Heavy Industries

ABOUT INTERGRAPH

Intergraph is the leading global provider of engineering and geospatial software that enables customers to visualize complex data. Businesses and governments in more than 60 countries rely on Intergraph's industry-specific software to organize vast amounts of data to make processes and infrastructure better, safer, and smarter. The company's software and services empower customers to build and operate more efficient plants and ships, create intelligent maps, and protect critical infrastructure and millions of people around the world.

Intergraph operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I). Intergraph PP&M provides enterprise engineering software for the design, construction, operation, and data management of plants, ships, and offshore facilities.

Intergraph SG&I provides geospatially powered solutions to the public safety and security, defense and intelligence, government, transportation, photogrammetry, and utilities and communications industries. Intergraph Government Solutions (IGS) is an independent subsidiary for SG&I's U.S. federal and classified business.

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