

SIEMENS

Ingenuity for life

Marine

Royal IHC

Shipbuilder uses NX and Teamcenter to streamline processes for developing highly complex bespoke vessels

Products

NX, Teamcenter

Business challenges

Integrate and streamline systems and procedures across the organization

Encourage one single way of working in one digital landscape

Integrate specialized solutions into a single digital ecosystem

Keys to success

Provide one digital truth from design and product management to procurement, processing and manufacturing

Use NX to standardize engineering and design

Use Teamcenter to manage status and versioning of product data

Results

Used new data management backbone to streamline the organization's highly complex operations

Developed a single digital ecosystem

Siemens Digital Industries Software solutions help Royal IHC create a single digital ecosystem for its employees, customers and subcontractors

Forging the future of shipbuilding

Teeming with canals and ancient windmills, the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage area around Kinderdijk in The Netherlands can trace its shipbuilding roots back to the Dutch Golden Age in the 1600s. Today, it is home to Royal IHC, a crown jewel in the maritime industry known for its in-depth engineering and

manufacturing expertise of high-performance integrated vessels and equipment for the dredging, offshore and wet mining markets.

Royal IHC has built over 2,500 bespoke vessels, including gigantic dredgers, integrated pipelay vessels for harsh environments, diving support vessels and heavy-lift vessels for wind farm installation. From fleets in the Middle East dredging new islands to the 20 IHC Beavers® and work boats in Bangladesh keeping the country's more than 300 rivers navigable, Royal IHC's impact on the planet and the global marine industry is clear.



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Wim de Ronde
Product Manager, Dredge
Pumps
Royal IHC



Creating bespoke vessels

Not only are most Royal IHC vessels unique, but most of them are massive, measurable in football field lengths and number of stories. Moreover, most vessels and integrated equipment are technologically complex. It takes teams of shipbuilding experts and highly skilled professionals years to build a single vessel, but before the keel laying ceremony (a ceremony marking in effect the ‘birth’ of a ship) occurs, there are months of tough project acquisition work that takes place behind the scenes.

“The acquisition process can take a long time,” explains Ubald Nienhuis, executive director of shipbuilding, Royal IHC. “It is a complicated process when we design bespoke products with the customer, but not just the customer; also, with all the parties who are specialized in various parts of the ship.”

Executing is a complex process that requires seamless integration between the customer, Royal IHC and expert suppliers worldwide.

“We felt that Siemens was the partner that was capable of supporting our growth trajectory.”

Ubald Nienhuis
Executive Director, Shipbuilding
Royal IHC

"The execution stage is a whole different ball game," says Nienhuis. "We are a project-driven company. We handle every ship as a separate project. Of course, we bring in all these people, subcontractors and management procedures into the game to keep control of such a complex project."

Organizing all this isn't as obvious as one might think and the management team at Royal IHC knows their more than 3,000 employees and numerous subcontractors at around 40 locations across the world need to work in sync on a global and integrated basis to maintain operational excellence.

"I think the key in this day and age is information management," says Nienhuis. "You have hundreds of specialists working together to build up the design and eventually build the ship itself. All these people lay a piece of the jigsaw puzzle and it is a management challenge to be able to make the total jigsaw puzzle according to the front on the box."

Integration is the name of the game

Around 2012, the management team realized although the overall company worked well -- the systems and processes at Royal IHC were grown organically. There were different systems, conventions, procedures and habits all over the organization.

"Our products are cutting edge," notes Nienhuis. "Another thing that makes us stand out from the pack is that we provide an integrated product. We are not just the shipbuilder, we are not just the dredging equipment or pipelay equipment or vessel supplier -- we integrate all this into a well-tuned machine."

"What we supply to our customers is an integrated product, and we build it in an integrated, project-oriented way. Integration is really the name of the game at IHC. So how come we can sustain a business model when we have all these



different conventions, procedures and IT systems? We realized we would be able to do much better if we integrated and streamlined all of this."

ONE IHC: A business-driven program

So Royal IHC management team sat down and figured out what the new process should look like. This took some time. After a bit more than a year, the team at Royal IHC had a blueprint for design and development, procurement and project management. It was time the management team put their project out to bid with various suppliers, including Siemens Digital Industries Software.

"It was a very complex evaluation process with many criteria, a multi-faceted problem," states Nienhuis. "I think two things made us go for Siemens Digital Industries Software. The first was the level of integration with product data management and CAD was fairly well handled. The second reason was we felt Siemens could support us during development and in the long term. They had the roadmap to take us to the next level. We felt that Siemens

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This project, called ONE IHC, set out to encourage one single way of working in one digital landscape. In addition to Siemens, another partner in the project was IFS, which supplied the enterprise resource planning (ERP) platform. Together, Siemens Digital Industries Software and IFS integrated their specialized solutions into a single digital ecosystem for Royal IHC.

A bespoke Siemens marine solution

During the implementation phase, Royal IHC brought their in-depth knowledge of shipbuilding processes while Siemens shared their expertise in digitalization and product lifecycle management (PLM). Together, the two teams worked to create a unique solution tailored to the specific requirements of Royal IHC.

“Sometimes you run into problems that are complicated,” says Nienhuis. “Initially, you may not have thought about these problems. We found it very positive that Siemens appointed a high-level mentor that we could contact if we found things blocking our process.”

The Siemens digitalization solution focused on a company-wide implementation of Teamcenter® software and standardization of engineering and design packages in NX™ software. This allowed experts and engineers across the company to benefit from one working environment, data bank and digital truth from design and product management to procurement, processing and manufacturing.

“If it is not in Teamcenter, we cannot sell it, we cannot buy it, we cannot make it, we cannot assemble it,” says Nienhuis. “Any product information really needs to be in

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Ubaldo Nienhuis
Executive Director, Shipbuilding
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Solutions/Services

NX

[siemens.com/nx](https://www.siemens.com/nx)

Teamcenter

[siemens.com/teamcenter](https://www.siemens.com/teamcenter)

Solid Edge

[solidedge.siemens.com](https://www.solidedge.siemens.com)

Simcenter Femap

[siemens.com/femap](https://www.siemens.com/femap)

Customer's primary business

Royal IHC is a leading supplier of innovative and efficient equipment, vessels and services for the offshore, dredging and wet mining markets. Royal IHC has in-depth knowledge and expertise in engineering and manufacturing high-performance integrated vessels and equipment and providing sustainable services.

www.royalihc.com/en

Customer location

Kinderdijk

The Netherlands



Teamcenter in a managed way and then we can do all the transactions. Teamcenter is one of the two core elements in our digital landscape – the other one being the ERP system.”

“We use Teamcenter to manage the status and versioning of the product data so we can keep tabs on where we are in the product development, when we are going to hit the market with the new versions, etc.”

The benefits of a digital twin

With the data management backbone in place and a more streamlined organization up and running, it was time to launch the ONE IHC project across the organization. One of the first teams to go live with the new Teamcenter and NX CAD implementation was the dredge pumps division. Responsible for enormously powerful and mission-critical equipment, engineers like Wim de Ronde could easily see the benefits.

“The exchange of data between the NX CAD and Teamcenter environments and the ERP environment enables all our divisions to open up the same drawings, the same specifications,” says de Ronde, product manager, dredge pumps, Royal IHC. “Anyone with a question can open the system and find everything that is required to get their work done right.”

Using Teamcenter and NX, the engineering teams in the dredge pumps division can easily and seamlessly integrate more advanced engineering software tools from the Siemens Digital Industries Software portfolio, such as Solid Edge® software and Femap™ software, right from within the NX environment.

“NX has become a mainstay of our future blueprint,” says Nienhuis. “We see an enormous drive in development at Siemens to make NX into that general-purpose package that also covers the specialist areas. We look forward to working with Siemens in the future to sustain that development.”

Siemens Digital Industries Software

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