CASE STUDY

Connecting the Digital Thread: How Willis Custom Yachts Increased CNC Productivity with NX & Saratech's Custom ISV Machine Kits

INDUSTRY:
Marine

COMPANY

WILLIS CUSTOM YACHTS

Custom Yacht Manufacturing

> "Saratech has been a key partner in implementing our design-to-manufacturing digital thread. Their team's expert programming, services and guidance significantly shortened our learning curve and accelerated our adoption of new tools. By transitioning from a disconnected toolset—MasterCAM and Rhino—to a fully integrated NX system, **we've achieved substantial efficiency gains**. These improvements have not only expanded our machining capacity and capabilities but also directly contributed to increased sales growth."
>
> **- Bill White**
> Controller - Willis Custom Yachts

CHALLENGE

Willis Custom Yachts builds custom luxury yachts ranging from 18 to 77 feet, with each vessel comprising tens of thousands of components made from exotic woods, aluminum, and carbon fiber. Unlike high-volume production environments, nearly every build is unique. Few parts have square edges or flat surfaces. Instead, most components require precision machining of cambers, chamfers, radii, and complex compound curves to tolerances of approximately 0.008 inches.

As Willis increased the amount of manufacturing performed in-house, its legacy CAD and CAM systems, Mastercam and Rhino, began creating communication gaps between engineering and manufacturing. Translating geometry between separate systems introduced subtle surface inconsistencies, creating challenges with machining tolerances, inspections, and production quality. Frequent engineering revisions also created revision control challenges, while increasingly complex custom parts added to CNC programming demands. Willis needed an integrated digital manufacturing workflow connecting engineering, CNC programming, and production.

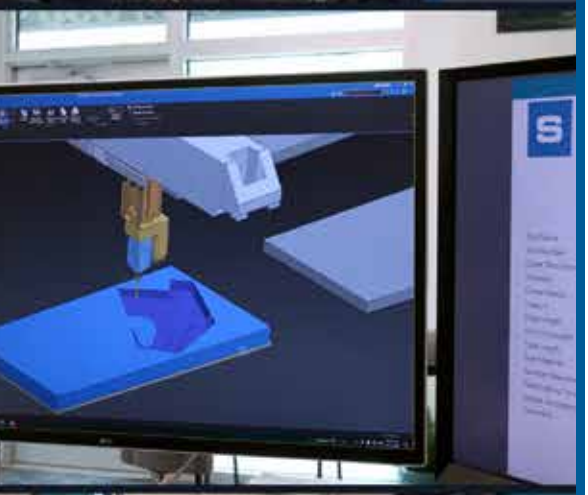
SOLUTIONS

Willis partnered with Saratech to implement Siemens NX CAD/CAM and establish a connected digital manufacturing workflow. By keeping CAD geometry directly associated with machining operations, engineers and programmers could work from the same digital model. Engineering changes automatically flowed into manufacturing, allowing programmers to identify affected operations, regenerate toolpaths when necessary, and ensure machinists were working from the latest approved design.

Saratech also helped Willis optimize CNC programming processes using Siemens NX's advanced five-axis machining strategies and











parametric modeling capabilities. Programmers could generate toolpaths directly from engineering models rather than recreating geometry for manufacturing, reducing programming time by as much as 50% for complex components.

To further improve machining validation, Saratech developed custom ISV (Integrated Simulation and Verification) machine kits tailored to Willis' CNC equipment. These kits accounted for the machines' specific configurations, including kinematics, tool changers, machining envelopes, and cutting tools. Using these machine kits within Siemens NX, Willis could simulate machining operations before production, creating accurate digital representations of the machining environment. Programmers could verify machine movements and toolpaths, identify potential collisions, and generate more accurate cycle-time estimates before programs reached the shop floor.

RESULTS

By transitioning from disconnected CAD and CAM systems to an integrated Siemens NX environment, Willis achieved significant improvements in CNC productivity, programming efficiency, and manufacturing performance. The integrated digital workflow also enabled reliable lights-out machining and helped Willis expand its CNC capabilities into new industries.

- **5X** Increase in Productivity
- **95%** Reduction in Scrap & Rework
- Up to **50%** Reduction in Programming Time
- **2X** Increase in Machine Utilization
- **50%** Faster Part Delivery

ABOUT SARATECH

Saratech provides engineering solutions to help companies realize better products. We supply engineering expertise, services, software, and manufacturing solutions to improve product development experiences. Our dedicated engineering team uses the software and tools that we sell and support while employing industry best practices and methodologies. We serve customers in all major industries, including energy & utilities, aerospace, space, marine, defense, automotive, manufacturing, industrial machinery, medical, electronics, consumer products, and more.

Partner with us to solve challenges and accelerate your development cycle, contact us today to request your free consultation: 949.481.3267 | info@saratech.com

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949.481.3267 | info@saratech.com | saratech.com

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