



## Advanced Manufacturing (Sheffield) Ltd (AML)

### AML Wins Plaudits from Rolls-Royce for Blisk Manufacture

*Introducing Optimised Blisk Programming with Siemens NX™ Turbomachinery*

#### Product

Siemens NX CAM / NX Turbomachinery

#### Industries

Aerospace, Oil and Gas, Nuclear, Power Generation and Industrial

#### Business Challenges

Maintain market leading machining mill/turn technology

Move to strategic partner status among Blue Chip clients

Reduce model preparation time and effort

Machine parts faster to gain competitive edge

#### Keys to Success

Strategic partnership with TTL, Siemens Industry Software's chosen specialist CAM partner

Investment in value-adding technology, such as NX CAM, to reduce cycle times and optimise quality

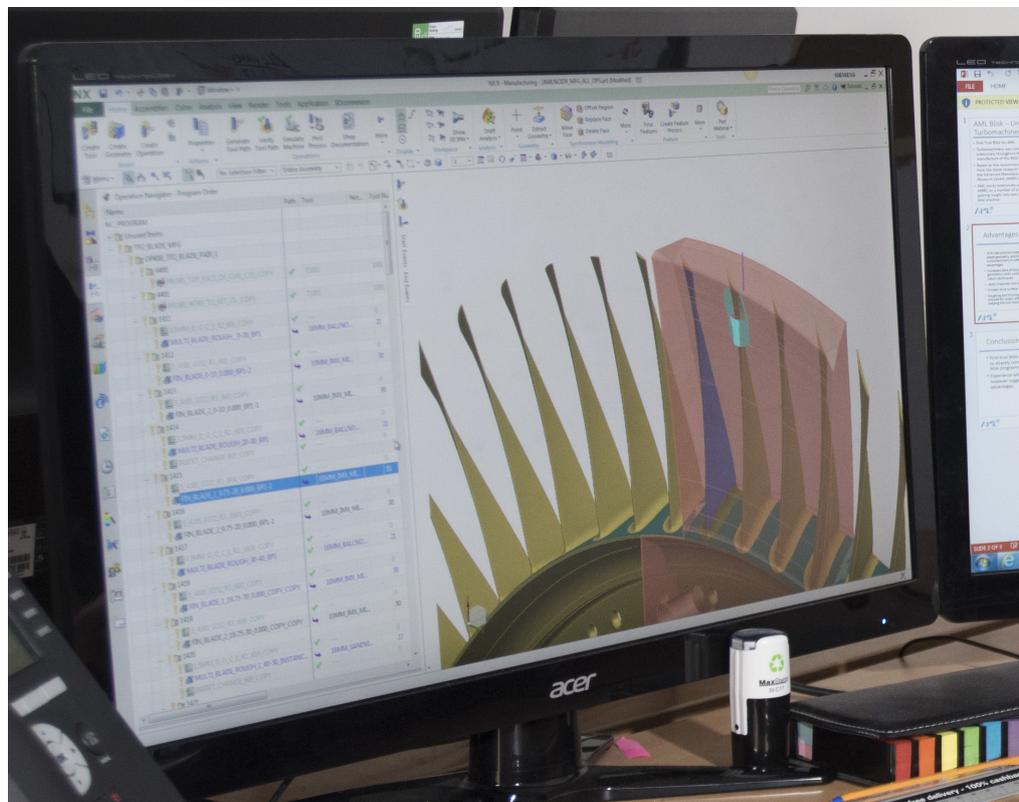
#### Project Results

Automatically generate complex 5-axis toolpaths quickly and easily

Reduced programming times by around 50%

Won plaudits for machining quality from Rolls-Royce

Rapid cost savings over lifetime of contract



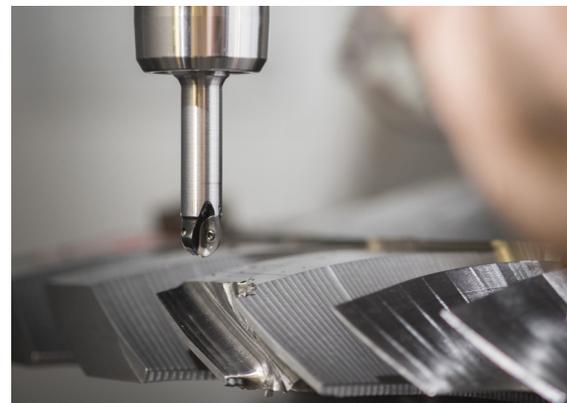
#### Siemens NX Turbomachinery module optimises CNC programming for AML's most complex ever project

AML is a manufacturing solution provider with a portfolio of industry leading customers, among them Rolls-Royce, the Boeing Company, Goodrich, Bombardier and Siemens, along with many of their prime and secondary suppliers. The company, a spin-out from the University of Sheffield's Advanced Manufacturing Research Centre (AMRC), is a sub-contract manufacturer of

complex parts machined from exotic materials such as titanium, super alloys etc and sub-assemblies for the aerospace, oil and gas, nuclear, power generation and industrial sectors.

Strategic relationships with key industry leaders have allowed AML to build a best in class production environment.

The company's development capability is being maintained through ongoing links with the AMRC and with the support of specialist CAD/CAM supplier, TTL, Siemens Industry Software's chosen specialist CAM partner.



This has enabled AML to operate at the forefront of machining mill/turn technology and has boosted its reputation as leader and natural supply chain partner in the machining of complex 5-axis hard metal components, in the most demanding of industries.

In recent years, TTL has provided the company with Siemens NX CAM software, as well as on-going training and support. TTL possesses more than 150 man years of combined experience in CNC programming, multi-axis machining and is uniquely placed to provide the expert services required to maximise the return on AML's NX CAM investment.

**Blisk Project**

As a Tier 2 Member of the AMRC, AML's relationship with the ProcessTechnology Group has provided significant exposure to the benefits of the NX Turbomachinery module. The company had previously invested heavily in NX CAM software suites, so when AML was successful in bidding to supply

Rolls-Royce with two 1.2 metre diameter blisks for the Advance3 aero engine programme, TTL recommended NX Turbomachinery to help optimise part programming and machining.

AML had previously manufactured single blade components but hadn't completed anything of the complexity of this multi bladed component as Bob Leach, Project Engineer, explains.

"We have previously faced some challenges with blisk type items – difficult to generate geometries, difficult to generate toolpaths- a blisk is a complex item."

TTL set up a demonstration of the module's programming capability and ease of use, helping the company assess the major gains that NX Turbomachinery

would deliver to the project – notably a potential 50% reduction in programming lead times and an ability to automatically generate complex 5-axis toolpaths. A cost-benefit analysis identified a rapid payback over the lifetime of the contract through the cost savings associated with quicker, more accurate programming and machining.

Following the demonstration and analysis, TTL introduced the module across the company's design and engineering operations.

"We've been successfully using Siemens NX Turbomachinery on Rolls-Royce blisk components for the past two years," continues Bob. "Working with TTL has been really good and they've been incredibly supportive with all the training they've offered us so far."

**"We simply would not have been able to complete this project without the NX Turbomachinery module and the initial support of TTL. We wouldn't look anywhere elsewhere for this type of support."**



**Benefits to AML**

Had AML not invested in the module, the company’s engineering department would have had to manually generate toolpaths for the blisk, resulting in much higher internal costs and timescales.

“Without the NXTurbo machinery module we’d be using variable contour and other conventional NX strategies to achieve a blade which takes significantly more time and effort to generate the toolpaths. With NXTurbo machinery, you can literally pick the surfaces and go, which has enabled us to deliver the blisk on time and within the parameters specified by Rolls-Royce.” says Leach.

**Key success factors**

The project has been an outstanding success for AML and the NX CAM suite supplied by TTL. The blisk engineered and manufactured by AML won plaudits for its quality from Rolls-Royce.

Gareth Morgan, Managing Director of AML comments, “We simply would not have been able to complete this

project without the NXTurbo machinery module and the initial support of TTL. We wouldn’t look anywhere elsewhere for this type of support.”

With this level of achievement, AML believes the experience will stand it in good stead for projects requiring

**"For multi-blade manufacture, NX Turbo machinery is a very powerful programming tool."**

similar programming and machining capabilities in other sectors such as power generation and marine markets.

“This module extends our capability into the machining of highly complex components and has the potential to open up new markets to us. For multi-blade manufacture, NXTurbo machinery is a very powerful programming tool.” explains Morgan.



**AML Services**

- Development and Pre-Production of Parts
- Production Parts
- CAD/CAM Offload
- TAP Testing
- Global Training Packages

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