

Case Study

Transforming maintenance
using virtual assembly



Rotating Machinery Services (RMS) revolutionized the aftermarket turbomachinery industry. With a focus on solid engineering, technical expertise, and established relationships, RMS provides unparalleled service to turbomachinery operators worldwide. They specialize in engineering, repair, and maintenance services for critical infrastructure equipment, ensuring the safe and continuous operation of large industrial rotating equipment in energy, petrochemical, food and beverage, and steel industries.

Prevu3D ROI: unlocking value and multiplying returns for RMS



75%

Reduction in downtime duration



50%

Reduction in execution labor costs



50%

Of scope executed prior to downtime



95%

Discoverable elimination during downtime

7-day downtime duration reduction

by virtually identifying issues prior to project field execution

100% of discoverables eliminated

by mitigating installation issues prior to project field execution

Pushing engineering boundaries

The seamless integration of rotating equipment replacements is a critical undertaking. One recent project, focused on the drop-in replacement of the AC D54 Centrifugal Compressor, has not only tested engineering limits but also established a new benchmark for efficiency. This ambitious initiative entailed close collaboration between RMS's engineering and metrology teams to guarantee a flawless transition with reduced customer downtime durations.



The foundational visual layer: 3D scanning

The project's scope was to facilitate a drop-in replacement for the AC D54 Centrifugal Compressor, which posed several challenges and opportunities for innovation.

The project began with real-time scanning of the existing blower while it was in operation. The captured data was then uploaded to [RealityPlatform™](#), Prevu3D's hosting and processing platform, for [advanced 3D visualization](#). This method enabled engineers to capture essential geometries, including suction and discharge nozzles as well as baseplate feet, without interrupting the customer's production schedule. The precise measurements of these elements served as the foundational layer for the subsequent steps of the project.

A crucial aspect of the project involved scanning the drop-in replacement blower at RMS's Pearland shop. This high-accuracy scan played a pivotal role in guaranteeing the seamless integration of the replacement blower into the customer's existing system. The precision of the scan laid the groundwork for the subsequent virtual assembly process in the Prevu3D platform.

RMS's virtual assembly process for heavy machinery repairs and replacements

Step 1 - Capture the existing unit in operation

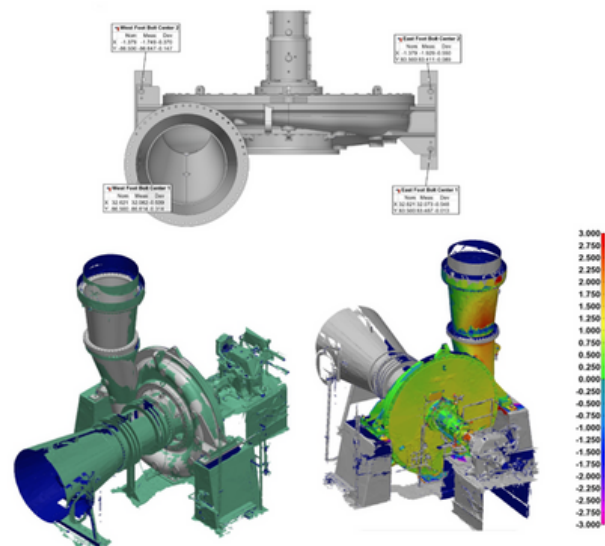
Digitally map the spare rotor prior to the maintenance outage or turnaround.



Step 2 - Digitally map the compressor casing

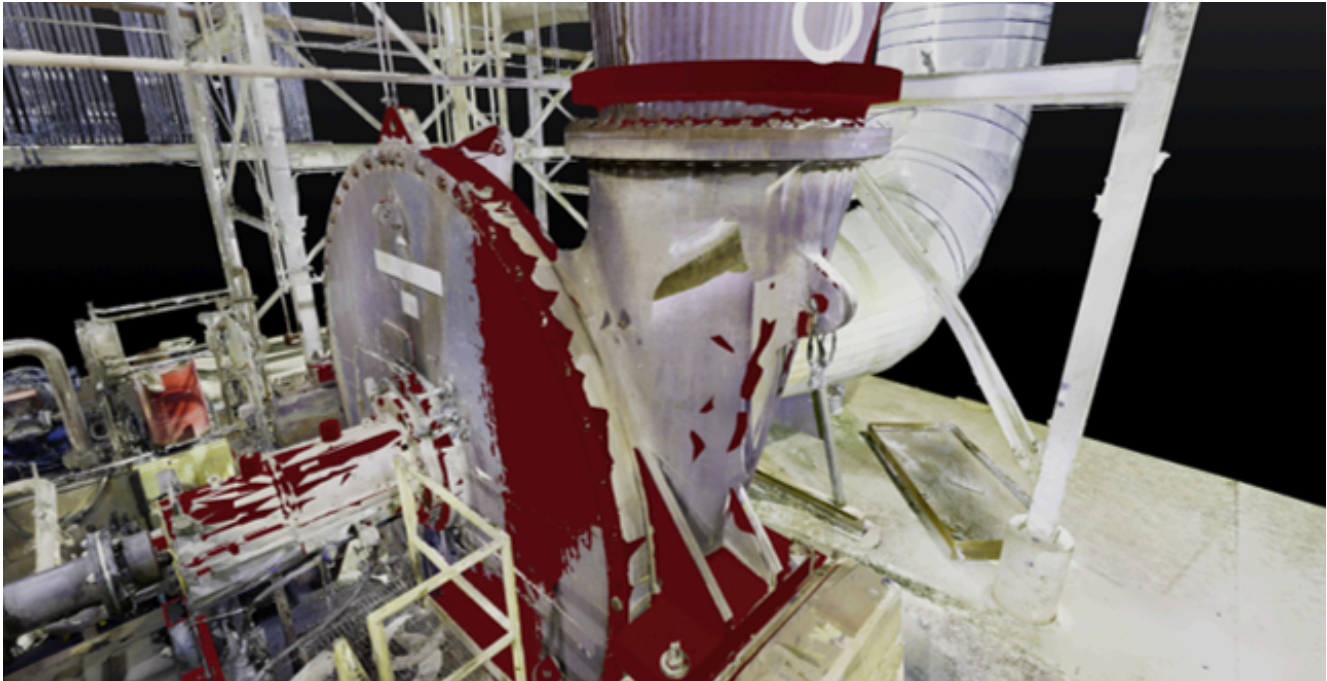
During the virtual overlay process, the engineers discovered that machining the baseplate was necessary to ensure a seamless fit for the new blower. Collaborating with a field machining company, they optimized the baseplate geometry to achieve optimal shaft end alignment.

This proactive approach prevented delays and complications during the actual replacement.



Step 3 – Virtual assembly

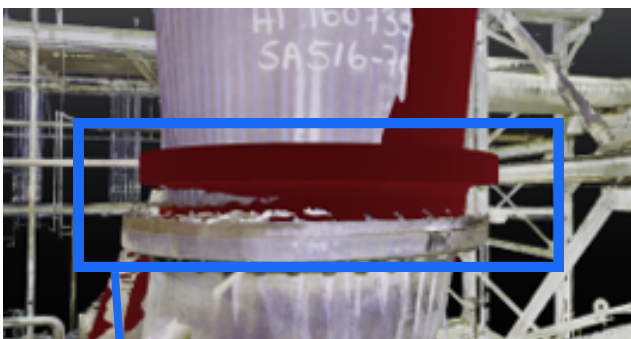
Evaluate and optimize internal clearances in real-time before physically installing the spare rotor—an overlay scan of the new blower with the existing one in operation.



Step 4 – Mitigation

Address all findings prior to downtime

Comparing the existing and replacement blowers revealed variations in discharge nozzle heights. The engineers quickly leveraged the metrology data to fabricate a transition spool, addressing the discrepancy. This agile response demonstrated the project team's commitment to efficiency and highlighted the power of data-driven decision-making using Prevu3D [engineering tools](#).



Discharge flange position deviation required new pipe spool



Baseplate fit-up issues required field and shop machining

Virtual overlay prepares RMS for the drop-in replacement process

The virtual overlay of the replacement blower onto the existing machine's scan data enabled RMS to efficiently prepare for the drop-in replacement process. By identifying differences between the two blowers in [RealityPlan™](#), RMS engineers proactively addressed potential challenges, ensuring a comprehensive understanding of how the replacement blower would integrate with the existing system. This approach minimized unexpected issues during installation.

The results

The success of this project hinged on effective collaboration, both internally and externally. Working closely with the site team was crucial to ensure that the project aligned with site requirements and expectations. Ongoing communication and feedback loops were pivotal in adapting to any unexpected challenges and ensuring a successful outcome.

The drop-in replacement of the AC D54 blower is a testament to the ingenuity and adaptability of RMS's engineering practices. This project has redefined equipment replacement processes by seamlessly integrating Prevu3D software solutions, real-time scanning, and virtual assembly and set a new standard for efficiency and precision.

"With Prevu3D, we can overlay CAD models onto 3D scans, identifying critical misalignments before they escalate. This proactive approach has saved us and our clients significant time and resources."

Matt Walker

Manager of Data Analysis and Training at Rotating Machinery Services

Discover Prevu3D's engineering software



Prevu3D empowers engineers and EPCs by transforming reality capture data into actionable insights. [RealityPlatform™](#) converts point clouds into high-fidelity 3D meshes, while [RealityAssets™](#) links components to spatial locations for precise analysis, back modeling, and design integration.

With [RealityPlan™](#), teams can overlay CAD and BIM models, refine layouts, and assess clashes before execution. Native plugins for Autodesk ([Revit](#), [Plant 3D](#), [Inventor](#)), [SolidWorks](#), and [NVIDIA Omniverse](#) accelerate modeling for retrofits, expansions, and maintenance planning. Integration with NVIDIA Omniverse enables simulation, allowing [engineers](#) to test design modifications in a virtual environment before implementation.

By connecting asset intelligence with real-world conditions, Prevu3D [streamlines collaboration](#), reducing project risks, downtime, and optimizing execution from design to operation.

Join industry-leading manufacturers like RMS, maximizing the potential of 3D engineering design workflows.

Talk to a Prevu3D expert >>>

