

# Standard in aero engine maintenance raised

February 18 2011, By Regina Yu

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The experts were working in collaboration with Hong Kong Aero Engine Services Limited (HAESL) (a joint venture between Rolls-Royce Group plc, Hong Kong Aircraft Engineering Company Limited (HAECO), a member of the Swire Group and SIA Engineering Company (SIAEC)). This revolutionary breakthrough will greatly reduce the scrap rates seen in existing maintenance processes used in turbine blade repair.

The new mathematics-based software developed by a UK company, Metrology Software Products Limited (MSP), was designed for spatial component location but it has never been used in the multiple axes machining of a turbine blade. After months of exploration, development

and modification, engineering experts of PolyU IC, HAESL and MSP finally declared the novel application a great success. The trial repair of the first batch of [turbine blades](#) using this application was successfully completed at PolyU IC and approved by HAESL for further production development earlier this year. HAESL plans to use this software application in the near future in its turbine blade repair cell.

Ir Professor Alex Wai, PolyU Vice President (Research Development), hailed this success as an important step to facilitate the development of aero engine repair and maintenance. "The application not only meets the high standard of machining precision in aero engine maintenance industry, but also greatly improves the repairability of aero engine turbine blades. It helps to increase the competitive advantage of Hong Kong's aero engine maintenance and [aviation industry](#)."



Turbine blades are subjected to [extreme temperatures](#) in operating conditions, and some deformation and distortion of features can be resulted over time. Components are expensive to replace and maintenance bases are continually researching new repair potential. In view of this, HAESL invited the PolyU IC to jointly explore and develop

turbine blade repair opportunities. A few applications were identified by IC experts and a series of tests were carried out. Finally, the new mathematics-based software developed by MSP was chosen for further study on the possible extension of that application.

"We are very confident that this new application will greatly increase the repair yields of turbine blades when compared to today's practices and in doing so reduce the cost of ownership for our customers," remarked Mr. Mick Brown, General Manager, Operations, HAESL.

PolyU IC and HAESL have been collaborating closely on many engineering projects to enhance and improve business performance since 2002. In 2011 and 2012, HAESL will be recruiting additional staff to meet growing industry maintenance demands. PolyU IC has developed and will deliver essential customized training for new HAESL recruits as well as continue to explore new and improved aero component repair methods.

Located in the thriving aviation hub of Hong Kong, Hong Kong Aero Engine Services Limited (HAESL) provides civil aero engine repair and overhaul services to the city's home carriers, Cathay Pacific and Dragonair, as well as airlines from the Middle East, the Asia Pacific region and around the world.

Since its inception in 1997, HAESL has earned a reputation for operational excellence in RB211 and Trent engine and component overhaul. With over 900 employees, the company operates from an advanced US\$120 million facility, with Phase V, a US\$41 million, 15,000 square metre expansion, scheduled for completion in February 2011.

Provided by The Hong Kong Polytechnic University

Citation: Standard in aero engine maintenance raised (2011, February 18) retrieved 26 April 2024 from <https://phys.org/news/2011-02-standard-aero-maintenance.html>

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