



Automated selective plating takes off for Safran

Safran Landing Systems (formerly Messier-Bugatti-Dowty) is a world leading manufacturer of landing gear systems and has a focus on providing solutions which are not only reliable and robust, but increasingly weight efficient and environmentally responsible, providing overall value across an aircraft program.

Safran's facility in Gloucester has been at the forefront of landing gear technology for over 80 years. Today, the 100,000 m2 site employs around 1,200 people and it's core competencies include design, research, development, and testing, and systems integration together with a comprehensive, state-of-the-art production capability. It is here that they manufacture the landing gear for a number of the world's leading commercial aircraft

THE CHALLENGE

Demanding aerospace operating conditions present continual surface finishing challenges for manufacturers. Components need to be able to withstand friction, extreme temperatures and corrosive environments while continuing to operate at optimum levels. For Safran Landing Systems, one particular challenge came in the form of a landing gear bogie beam design.

Landing gear design includes a stop-pad between the bogie beam and the vertical part of the component to prevent wear as it is retracted into the fuselage. However, this impact results in potential wear at the interface, with a further risk of atmospheric corrosion. A design modification was agreed involving the application of a nickel chrome electrolytic protective treatment.

CUSTOMER

Safran Landing Systems

LOCATION

Gloucester, UK

CHALLENGE

Modify the existing manufacturing process to include an application of nickel chrome for corrosion protection

SOLUTION

Development of a collaborative robot that meets Safran's stringent manufacturing standards.

RESULTS

Fully operational robot processes 30 bogie beams per month.

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THE SOLUTION

SIFCO ASC has partnered Safran on various surface finishing projects for over 20 years including more recent work to increase wear resistance on one of the aircraft's axles. These projects are carried out using the renowned SIFCO Process® - the leading method of electroplating localised areas on components without the use of an immersion electroplating tank.

Neil Kenyon, Process Group Manager, initially approached SIFCO ASC to investigate the potential of the SIFCO Process® as a solution for the nickel plating application. While it was advised that this could be solved by manually plating a layer of nickel underneath a layer of chrome on the section of the bogie beam affected by corrosion, Safran's robust manufacturing quality standards required the process to be highly traceable and repeatable. SIFCO ASC's UK team consulted its French specialist engineering R&D department. Following a full situation analysis, the team recommended the SIFCO Process® should be automated using a collaborative robot in order to adhere to Safran's robust manufacturing standards. However, this had never been done before and would require significant engineering expertise. In order to achieve the results demanded by the aerospace specifications, the two teams embarked upon a collaborative research project.

Initial work began at the end of 2013. Safran tested the nickel material in its specialist facility under simulated take-off and landing conditions. Once it was confirmed that the material was suitable in early 2014, SIFCO began work on designing the robotic system. During this time, to fast-track the benefits of the SIFCO Process®, the plating was carried out manually.

THE RESULTS

The robot, now fully operational at Safran Landing System's Gloucester facility, provides the company with a precise and highly traceable, repeatable and accurate process, well-suited to the hi-tech facility it sits within. The integrated computer logs all of the relevant information including: the parameters plated; the batch numbers for the solution; current densities and solution levels. The fully-automated system also adheres to the company's health and safety policy as it minimises human contact with harmful chemicals. It currently processes 30 bogie beams per month and the team is looking to expand its use into other areas of the company.

Consistent plating uniformity has been achieved using this process, standing up to the robustness of the necessary qualification testing.

The SIFCO Process® has since been specified into the manufacturing process of new landing gear to prolong the corrosion protection. It is also being rolled out into Safran Landing System's Mexico facility where landing gear components are also manufactured.

For more information, visit: www.sifcoasc.com

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