New age for airships calls for new age in repairs

July 30 2016, by Nancy Owano

(Tech Xplore)—Lockheed Martin said that Hybrid Airships offer large cargo capacities with significant reductions in fuel consumption compared to other air vehicles.

Australian Aviation wrote earlier this year that "Long since abandoned as a primary mode of transport, you could be forgiven for thinking that the

airship had been consigned to the history books. However, for the past two decades, Lockheed Martin's Skunk Works has been working on reviving the airship as a modern, efficient and environmentally friendly cargo transport."

Shane McGlaun in *SlashGear* said that this is essentially "a massive blimp," he wrote, for lifting and hauling heavy cargo into areas.

Lockheed Martin's view is that these airships introduce "the next revolution in affordable transportation directly to the 'point of need,' enabling tactical airlift, strategic airlift, humanitarian assistance, disaster relief."

Digital Trends also said the design could be "perfect for specific tasks in the future, like low-cost cargo transport, disaster relief and even military uses." There is a combination of "airship technology for high-efficiency flight, with fixed wing aerodynamics and air cushioned, hover-craft like feet, which let it navigate safely on the ground too."

But wait. Might a new age in transport need a new age of repair? Interesting news from Lockheed Martin, in a recent video posted, talked about that challenge, which is facing the airship industry. Dr. Bob Boyd, program manager, said in the video that the challenge lies in locating the tiny pinholes located on the airship's envelope. Locating them requires a crew of workers, for inside and outside. They carry bright lights to locate any holes needing repair. The process is long, tedious, manual.

Jon Martindale in *Digital Trends* said that "With even the tiniest of holes, much of the craft's efficiency is lost, so keeping the envelope (the big air sack on top of the ship) air-tight is incredibly important."

Now there is SPIDER, an autonomous robot created by the Skunk Works team. SPIDER stands for Self-Propelled Instrument for Airship

Damage Evaluation and Repair.

It adresses the challenge. It scans the envelope and finds the pinholes—-and then patches them. Ben Szpak, mechanical engineer, said SPIDER has two halves, inner and outer, magnetically coupled to allow the robot to scan the entire surface.

Cheryl Limas, software engineer, said SPIDER, once the repair is done, sends a before and after picture to the central processing station for verification. The central station also handles a situation where if a robot were to fail, then search patterns can be changed on the other robots

"As airships are slowly becoming useful again—for tasks including everything from cargo hauling, to meteorological data gathering, to spreading free internet—there will undoubtedly be a demand for Lockheed's Spider bot," said Andrew Liszewski, *Gizmodo*. He said it was "a clever solution for keeping airships airworthy."

More information: lockheedmartin.com/us/products … bridAirship-old.html

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