

# AVIATION WEEK

## & SPACE TECHNOLOGY

### AERONAUTICAL ENGINEERING

# Lift Off

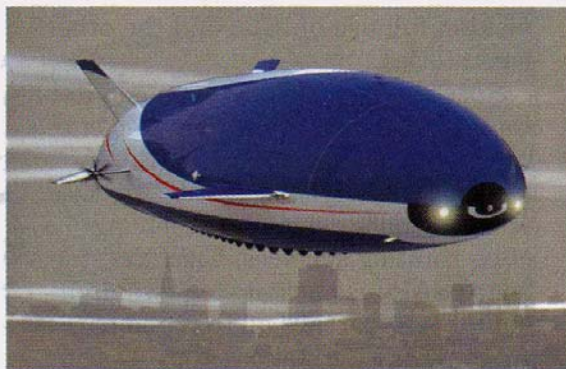
## Airship maker sets out to certificate first in new buoyancy-assisted aircraft class

GRAHAM WARWICK/WASHINGTON

**U**.S. airship manufacturer Worldwide Aeros is working with the FAA to define the type-certification basis for what it calls a new class of aircraft. The Aeroscraft combines aerodynamic lift, gas buoyancy and thrust vectoring to offer better performance and operability than traditional airships and more flexibility than conventional aircraft, the company says.

The FAA has accepted Aeros's application for a type certificate for the first Aeroscraft, the ML866, a 210-ft.-long vehicle aimed principally at the business aviation market. The Montebello, Calif.-based company hopes to fly a prototype within three years and certificate the ML866 in mid-2011. "Development will be funded internally and by customers, including U.S. government agencies, and through deposits from commercial customers," says CEO Igor Pasternak.

The ML866 is described as a "buoyancy-assisted aircraft with adjustable static heaviness," and a key technology is the dynamic buoyancy management system developed by Aeros with funding from the U.S. Defense Advanced Research Projects Agency. The control of



WORLDWIDE AEROS CORP. CONCEPT

**The ML866 is the first in a planned family of Aeroscraft using dynamic buoyancy management.**

static heaviness (COSH) system works by compressing, storing, then decompressing helium within the envelope to adjust the vehicle's buoyancy. Static heaviness is the ratio of buoyancy to gravity; it is increased to land and reduced to take off.

Under a Darpa contract, the company is preparing to test a flight-weight prototype of the COSH system in an Aeros 40D non-rigid airship. "We want to demonstrate we can change the static heaviness enough in a short time to be operationally acceptable," says Pasternak.

Compressing the helium reduces static lift and increases static heaviness. "The technical challenge is to compress and store the helium efficiently," says Paster-

nak. The Aeroscraft ML866 will require several COSH modules, and will also use thrust vectoring for vertical takeoff and landing and aerodynamic lift from the rigid envelope in the cruise. The vehicle is projected to have a 120-kt. cruise speed, 12,000-ft. operating altitude and 3,100-naut.-mi. range.

As the buoyancy-assisted aircraft is a new class of air vehicle, a new certification basis must be agreed with the FAA. Aeros has presented its first version for discussion, the majority drawn from existing FAR Part 25 certification standards for transport aircraft, and "about 15% very specific to the Aeroscraft," Pasternak notes.

Aeros studied an ultra-large cargo-carrying version of the Aeroscraft under Darpa's Walrus program, which was canceled by Congress. The company demonstrated the COSH system on the ground for Walrus, and it is now modifying the Aeros 40D for flight tests under a follow-on contract.

Lockheed Martin was also working on the Walrus program and in January 2006 flew an experimental hybrid airship, the P-791. In February of this year, a senior Skunk Works executive said the company was looking for a partner to commercialize the concept.

Aiming the ML866 at the business aviation market, Aeros emphasizes its huge cabin area—at 5,400 sq. ft., five times that of a large business jet. The aircraft will be certificated to carry up to 28 passengers. "We have received a lot of serious interest from commercial customers, but we have yet to open our order book," says Pasternak. ☐