Zeppelin NT airships

Peter Lobner, 17 August 2019

**Background**

The ZLT Zeppelin Luftschifftechnik GmbH, based in Friedrichshafen, Germany, on Lake Constance, was established in September 1993 for the development, manufacture and sale of airships of the Zeppelin NT (New Technology) brand. Through its owners, Luftschiffbau Zeppelin GmbH and ZF Friedrichshafen AG, today’s firm, ZLT Zeppelin, has a direct lineage back to companies founded more than a century ago by Ferdinand Graf von Zeppelin (1838–1917), prior to the development and manufacture of dirigibles.

In 1991, the Luftfahrtbundesamt (German CAA) issued the Zeppelin NT Type Certificate and approved ZLT Zeppelin Luftschifftechnik GmbH as an aircraft manufacturer. The Zeppelin NT made its first flight on 18 September 1997.

**The Zeppelin NT airship**

Zeppelin NT airships have a rigid internal structure made of composite material and aluminum, an innovative drive concept with swiveling propellers, and a "fly-by-wire" flight control system. These features significantly extend the application limits of previous airships. With the Zeppelin NT’s low-speed maneuverability during takeoff and landing, the typically labor-intensive ground handling tasks are greatly simplified.

Zeppelin NT's rigid internal framework supports the gondola, engines and tail fins. Source: ZLT Zeppelin Luftschifftechnik GmbH
Installing the flexible fabric envelope over the Zeppelin NT’s rigid internal structure. Source: Screenshot from video, ZLT Zeppelin Luftschifftechnik GmbH

Cross-section of the Zeppelin NT showing the locations of the ballonets and the suspension cables securing the gondola to the rigid internal frame. Source: Anatomy of an airship, https://static1.squarespace.com

The Zeppelin NT is longer than a Boeing 747-400 airliner. The airship’s primary structure weighs only about 1,000 kg (2,200 lb) and the empty weight of a complete Zeppelin NT is about 6,622 kg (14,599 lb). In comparison, the empty weight of a Boeing 747-400 is 184,567 kg (406,900 lb).
In normal operation, the Zeppelin NT operates with about 5% negative buoyancy (i.e., the lift gas cells do not create quite enough buoyancy to make the Zeppelin NT lighter-than-air). At takeoff and landing, negative buoyancy is overcome with the application of engine power to three vectored-thrust propellers (two flank, one stern) that generate the needed lift and some forward momentum. As forward speed increases, some aerodynamic lift is generated by the aeroshell and the propellers are rotated to deliver only propulsive thrust during cruise flight.

You’ll find detailed descriptions of the Zeppelin NT here: https://www.airships.net/zeppelin-nt/


In 2011 Goodyear replaced its aging fleet of GZ-20A non-rigid airships (blimps) with Zeppelin NT model LZ N007-101 semi-rigid airships. However, the name “Goodyear blimp” is still being used. You’ll find a good illustrated history of the Goodyear blimp at the following link: http://www.goodyearblimp.com/relive-history/#page/2
Goodyear’s new “blimp” – the semi-rigid Zeppelin LZ N007-101.  
Source: Goodyear

The closest you can come to an airship cruise today is a short commercial flight aboard a 12 – 14 passenger Zeppelin NT 07 airship, which is very similar in design to the new Goodyear airships. My wife and I took a flight on the Zeppelin NT in early June 2017, on a clear blue sky day, one day after a modest wind and rain storm had passed through the Friedrichshafen area and temporarily grounded zeppelin flight operations. Clearly, weather is much more of an issue for flying zeppelins than it is for winged heavier-than-air craft. Nonetheless, in suitable weather conditions, flight in a zeppelin is a remarkable experience. Our short tourist flight in the Zeppelin NT was hardly an adequate basis for a zeppelin commercial business model. However, based on this flight, it’s much easier for me to visualize the utility of a large commercial airship for delivering cargo, passengers and emergency services to remote areas that are harder to reach with other modes of transportation.

You can book your flight on a Zeppelin NT at the following link: http://zeppelin-nt.de/en/homepage.html
One of the Zeppelin NT airships at the airfield in Friedrichshafen. Source: Author’s photo

Preparing to land and exchange passengers. Source: Author’s photo
Takeoff, with flank thrusters in the vertical position for lift.
Source: Author’s photo

View of the German countryside from Zeppelin-NT.
Source: Author’s photo
View of Lindau on Lake Constance (the Bodensee) from Zeppelin-NT. Source: Author’s photo

View of German countryside from Zeppelin-NT. Source: ZLT Zeppelin Luftschiffttechnik GmbH