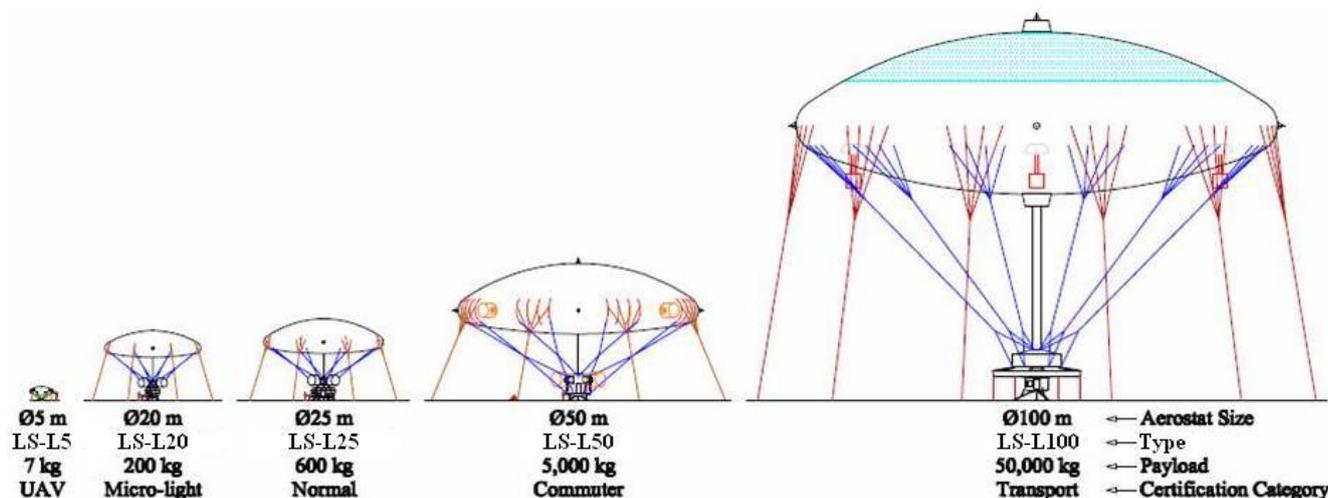


Strategy for Buoyant Aircraft



This document (updated 24 Apr 2022) provides Luffships Limited's (LSL's) strategy for development of primarily omni-directional (O-D) buoyant aircraft (balloons, tethered aerostats and airships) using lighter-than-air (LTA) technology to help the industry mature and fulfil needed air services lacking so far in available affordable, sustainable, reliable ways. It includes provision of both the buoyant aircraft and their operating facilities worldwide, focusing on solving past issues in low risk ways that starts small and grows steadily/naturally.



Today the airship industry in particular, dominated by unidirectional (UD) types, is hardly successful. This is evident from the very low number of manned types in service worldwide (just a handful). However, airships are not stupid and the industry can become successful with new O-D types, needing change from UD methods to overcome past issues, pursued in natural systematic ways evolving from the ground up. As illustrated above, LSL (see website below) has a strategy for such development (making things pay at each stage) only undertaking more difficult projects in doable steps after proving previous arrangements and profiting from them.

LSL's primary goal is for serious aerial-cranes able to port outsized rather heavy loads point to point (pick&put) anywhere; aircraft that many people in mining, agriculture, forestry, construction, humanitarian aid, recovery, etc, and the military want for air transport purposes. However, the people who want such capability are unlikely to get it until the spadework is done and the industry is ready; where it also needs the network of operators and the infrastructure for international flights to be put in place as well as be approved by the aviation authorities before such big aircraft enter service.

LSLs' plan is to enable them through small readily doable projects that scale up in sensible ways to build the industry – only pursuing bigger types when ready and pressed for them with enough money for their development. Such aircraft thus are a goal that may take generations if not supported.

In the meantime, LSL plans to start small preparing the groundwork and the path for people to follow. This includes a number of relatively small (thus cheap & quick to market) low risk projects with earning capability providing useful services in their own way. More importantly though, they are to prove and debug the concepts with low risk to establish confidence in the new ways before embarking big types with greater expense/risk. This starts with LTA-drones and the new O-D methods that overcome the foibles of traditional UD airships and aerostats.

The strategy and fundamental concepts enable LSL to limit technical risk (thus cost) involved from commonality between the different O-D buoyant aircraft intended and their ground arrangements. Technical risk also is reduced further by starting with tethered aerostats, limiting the number of aircraft systems involved, which later are developed as dirigible types using the same ground systems.

These projects are intended as a way for technology development formulated by Luffships as one of the few companies with the data base, experienced people, insight, knowledge and particular cradle to grave airship understanding from many years its core team has in the industry. This allows LSL to guide people eager to establish themselves in the art with older hands who have the knowhow needed.

Strategy for Buoyant Aircraft



1st stage projects include:

- 1) Inflatable fabric structures for cheap easily set up relocatable shelter/storage/working facilities.
- 2) Low captured aerostats (LS-LT15) for displays/shelter (floating projector-screens/roofs) and tethered aerostats as elevators for fixed location area coverage with various systems.
- 3) LTA-drones (LS-L5) for various indoor and outdoor uses – supporting existing drones.
- 4) Perhaps balloon-hoists as large readily deployable naturally shaped tethered aerostats using ground control winches at fixed locations for localised load movement over their ground area, functioning as aerial-cranes.

These projects independently and quickly enable team building/learning for the particular LTA technology and infrastructure aspects needed at low cost before attempting manned aircraft. They also begin the process of establishing new independent international operators (needing training and maintenance services) who then become capable and would organise the necessary worldwide infrastructure arrangements necessary for manned and bigger types.

The 2nd manned flight stage with new low-certification Balloon/Normal category types then may follow, where the LS-L20 and LS-L25 (as air-rovers) provide operators already prepared (or not) with a way to provide aerial services between the network of bases they arrange for such operations. This therefore extends capability and provides a relatively low cost/quick way to affirm the technology and get necessary accreditation with the airworthiness authorities (approvals) plus essential flight/ground data information necessary for passenger and aerial-crane types.

The 3rd stage then follows with the development of initial medium sized free flying aerial-cranes (the LS-L50 for say 5 tonne payloads) and passenger variants under Commuter category rules. These aircraft are intended to enable operators to expand their services and further facilitate the infrastructure needed for bigger types; where the LS-L50 was designed as a general lugger for delivery/extraction of ground installation parts and people for extended services into remote regions otherwise inaccessible (except by foot) as well as providing worldwide services anywhere.

LSL's goal (4th stage) for large aerial-cranes with long-range capability, such as LS-L100 (50 tonne payloads) and LS-L150 (150 tonne payloads), under Transport Category regulations then may follow.

As it happens the arrangements outlined also would facilitate other airship developers with big projects that perhaps will be compatible for long range/endurance purposes when they've found a way to set up the network of operators and infrastructure necessary, and if they survive after starting with a monster and little else to generate revenue/pay the way. Otherwise, Luffships can help with services and projects tailored to their needs.

Well, that's a brief summary, believed to provide a relatively low-cost low-risk way of starting with modest investment, enabling the industry to get underway properly, sustain itself, grow and become a multi-billion \$ international way for everyone's benefit. LSL's website provides further information with numerous downloadable documents throughout to explain everything.

LSL expects stage 1 to take about 2 years after sufficient investment to take what already exists from the effort since starting in 2018 forward into certified service. Stage 2 then will be doable in a further 3 years until revenue earning services begin (based on spadework 2010 to 2018 by forerunners of LSL). Stage 3 another 5 years (based on experience gained by LSL's core team with Airship Industries in the 1980s) when there will be operators in business preparing the network of ground facilities needed for stage 4 – another 10 years to enter service, say 2042.

Maybe its possible with overlapping stages to achieve the primary goal of serious aerial-cranes able to port outsized heavy loads point to point sooner, but this needs investment to flow without delay. What can be said is that CargoLifter started with a huge UD airship project in 1997. 25 years later, serious heavy-lift airships in service remain as a goal to achieve. More of the same is unlikely to succeed!

Further information from contact, as below.