

# Hemeria (formerly CNIM Air Space) - drone airship & tethered aerostat systems

Peter Lobner, 19 June 2023

## 1. Introduction

CNIM Air Space was founded in 2015 and is based in Ayguesvives,



France. On 22 March 2019, Airstar Aerospace was acquired by CNIM Group and rebranded as part of CNIM Air Space, which inherited Airstar's business as a provider of tethered aerostat systems,

stratospheric balloons, small airships and thermal protection for satellites, as well as a continuing role on the Stratobus stratospheric airship project led by Thales Alenia Space. CNIM Air Space developed the small, free-flying, Diridrone blimp for electric power line inspection.

The French firm Hemeria was founded in 2019 and is headquartered in Toulouse, France. In October 2022,



CNIM Air Space was acquired by Hemeria, which continues to offer the tethered aerostat systems, stratospheric balloons and other products and services previously available from CNIM Air Space and Airstar

Aerospace. The Hemeria website is here: <https://www.hemeria-group.com/en/>

The direct link to Hemeria's tethered aerostat surveillance systems is here: [https://www.hemeria-group.com/en/product\\_category/surveillance-tethered-aerostat-systems/](https://www.hemeria-group.com/en/product_category/surveillance-tethered-aerostat-systems/)

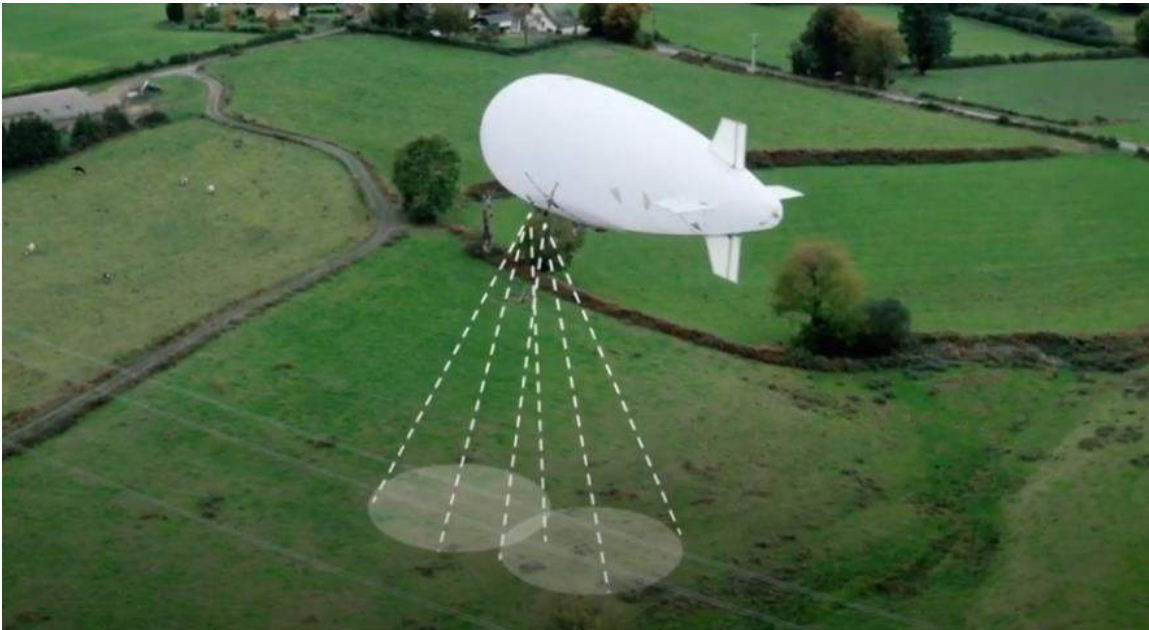
This article provides an overview of the free-flying Diridrone blimp and the range of tethered aerostat systems available from Hemeria.

## 2. Diridrone – free-flying drone blimp

Under a research and development (R&D) partnership initiated in 2017 with the French electricity transmission system operator RTE (Le Réseau de Transport d'Electricité), CNIM Air Space developed a small electrically-powered drone blimp demonstrator, named Diridrone, to perform surveillance and infrastructure inspection tasks, such as:

- Linear inspections: railways, power lines, pipelines, highways, waterways, etc.
- Area inspection: agriculture, forestry, aquaculture, engineered structures, etc.
- Sensitive & industrial site surveillance (patrols)
- Pollution detection in a maritime zone
- Surveillance of large events

RTE planned to use Diridrone for inspecting its network of long-distance, high-voltage electric transmission lines.



*Representation of Diridrone conducting a power line inspection.*



*Diridrone inside a hangar, rear quarter view.*



*The two main electric motor-driven propellers are attached to the non-rigid envelope with straps and cables secured to reinforced areas of the envelope. Source, two images above: Screenshots from RTE video (Dec 2020)*



*The vertical and horizontal tail fins have moving aerodynamic control surfaces. A small propeller attached at the tail with straps and cables provides lateral thrust to improve low-speed handling. Source: CNIM Air Space*

## General characteristics of Diridrone

Parameter	Diridrone
Length	14.5 meters (47.6 ft)
Diameter, max	4.5 meters (15.1 ft)
Airship total mass	150 kg (331 lb)
Payload weight	10 kg (22 lb)
Communications	Radio or cellular
Power source	Hybrid electric power generator
Propulsion	<ul style="list-style-type: none"> <li>• 2 x flank-mounted, electric motor-driven, vectored propellers</li> <li>• 1 x small tail-mounted, electric motor-driven, fixed lateral thrust propeller</li> </ul>
Speed	Hover to 50 kph (31 mph)
Altitude, operating	Sea level up to 1,000 m (3,281 ft), ground level up to 150 m (492 ft)
Range, max	200 km (124 miles)

Diridrone has a low operating cost, a low logistics footprint and is designed for vertical takeoff and landing operations from a small area with a small ground crew. In flight, it can operate over a wide speed range, including stationary flight. The mission programming system enables flights to be conducted autonomously by the autopilot or piloted manually by remote control.



*Ground crew prepares Diridrone in the field for flight.*

Source: CNIM Air Space

In October 2020, the Diridrone successfully completed its first power line inspection missions to monitor the condition of power lines using onboard sensors installed under the gas envelope. This new tool allows RTE to inspect power lines with precision, without de-energizing the lines and causing temporary power outages. The collected information is an input to RTE's maintenance planning process for its entire transmission power line network.



*Diridrone flying over an RTE switchyard.*



*Diridrone in flight.*

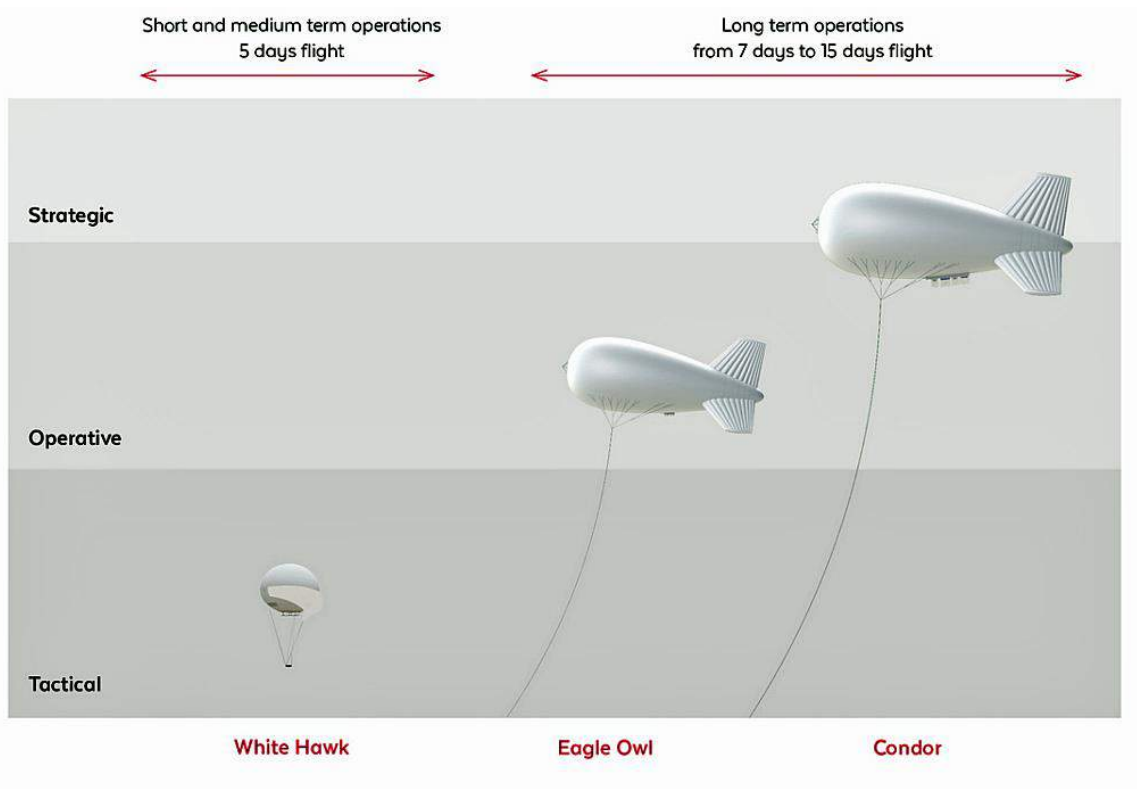
*Source, both graphics: Screenshots from RTE video (Dec 2020)*



*Diridrone in flight. Source. Both photos: Hemeria*

### 3. Hemeria tethered aerostat systems

Hemeria offers a line of tethered aerostat systems derived from aerostats originally developed by Airstar Aerospace before its 2019 acquisition by CNIM Air Space and the subsequent 2022 acquisition by Hemeria.



Source: Hemeria

Hemeria classifies their aerostat systems as “tactical,” “strategic,” and “sovereign,” based on the physical size of the aerostat. The following table shows how they compare to TCOM’s aerostat classifications.

Hemeria aerostat systems		TCOM aerostat systems	
Tactical	White Hawk / 4.4M+	Tactical	12M & 17M
Strategic	Eagle Owl / 19M+	Operational	22M & 28M
Sovereign	Condor / 31M+	Strategic	71M & 74M

Hemeria identifies the potential applications for their tethered aerostat systems as follows.

Application	Tactical, White Hawk	Strategic, Eagle Owl	Sovereign, Condor
Land surveillance	✓	✓	✓
Maritime surveillance		✓	✓
Security	✓	✓	
Intelligence	✓	✓	✓
Communications	✓	✓	✓

### General characteristics of Hemeria tethered aerostats

Parameter	White Hawk	Eagle Owl	Condor
Class	Tactical-class	Strategic-class	Sovereign-class
Length	Spherical balloon	19 m (62.3 ft), larger envelopes available	31 m (101.7 ft)
Diameter, max	4.4 m (14.4 ft), larger envelopes available	7 m (23.0 ft), larger envelopes available	11 m (36.1 ft)
Envelope volume	40 m <sup>3</sup> (1,413 ft <sup>3</sup> ), larger envelopes available	450 m <sup>3</sup> (15,892 ft <sup>3</sup> ), larger envelopes available	1,600 m <sup>3</sup> (56,503 ft <sup>3</sup> )
Payload, max	5 kg (11 lb), up to 20 kg (44 lb) with largest envelope	90 kg (198 lb), up to 120 kg (266 lb) with largest envelope	250 kg (551 lb)
Wind speed, max	75 kph (46.6 mph)	110 kph (68.4 mph)	130 kph (80.8 mph)
Altitude, max (AGL)	300 m (984 ft)	600 m (1,969 ft)	1,200 m (3,937 ft)
Endurance	5 days (for maintenance), 10 days (max)	7 days (for maintenance), 50 days (max)	15 days (for maintenance), 60 days (max)
Deployment time & ground crew	45 minutes, 2 operators	4 hours, 3 operators	4 hours, 6 to 8 operators
Logistics & transport	5 m <sup>3</sup> (177 ft <sup>3</sup> ) van or tactical trailer	20 ft shipping container (aerostat + mooring station)	Semi-trailer or containers (aerostat + mooring station)

Source: Hemeria (2023)



## White Hawk

White Hawk is a family of small, spherical aerostat systems designed to be rapidly deployed with a modest payload to support relatively short-range (tactical) operations. It has been employed by French customs, the French Gendarmerie National and the French Ministry of Defense.

The aerostat is available in several envelope sizes to meet varying payload requirements.

- The smallest envelope has a diameter of 4.4 meters (14.4 ft) and is capable of carrying a 5 kg (11 lb) payload.
- The largest envelope can carry a payload of up to 20 kg (44 lb).
- Payload options include an electro-optical / infrared (EO/IR) camera system, cellular or radio communications relay, wireless & microwave / signal / communications intelligence (WAMI / SIGINT / COMINT) sensors.

From its maximum operating altitude of 300 m (984 ft), White Hawk's horizon is up to 61.9 km (38.5 miles) away.

The White Hawk aerostat system includes a light C2 (command and control) ground station, which controls the payload, processes the data and transmits in real-time to a designated operations center.



*White Hawk  
aerostat in  
flight.  
Source:  
Hemeria*

## Eagle Owl

This is a family of medium-size, multi-mission aerostat systems that are available in several envelope sizes to meet varying payload requirements. All can be configured with one or more payloads.

- The smallest (19 m / 62.3 ft) envelope is capable of carrying a 90 kg (198 lb) payload.
- The largest envelope can carry a payload of up to 120 kg (266 lb).
- Payload options include one or more of the following: EO/IR camera system, radar, cellular or radio communications relay, WAMI / SIGINT / COMINT sensors.

Capable of operating at twice the altitude of the White Hawk, the Eagle Owl's horizon, from its maximum operating altitude of 600 m (1,969 ft), is up to 87.5 km (54.4 miles) away.



*Two Eagle Owl aerostats on their mobile mooring platforms.  
Source: Hemeria*

The Eagle Owl has been in service with the European Border and Coast Guard Agency (Frontex), the French Ministry of the Interior, the French Ministry of Defense and the aerospace lab ONERA.



*Eagle Owl in tethered flight above its mobile mooring platform.  
Source: CNIM Air Space*

Under a program known as “[Operation Poseidon](#),” Frontex, in conjunction with the Greek Coast Guard, conducted an aerostat surveillance pilot program to determine the ability and cost efficiency of aerostats performing maritime surveillance in an operational environment. The first phase was a one-month pilot conducted in 2019 using A-NSE C-T350 aerostats. Following the success of that first phase program, Frontex funded a 4 to 6 month, € 3.01 million second phase program using CNIM Air Space Eagle Owl aerostats. A German firm, in-innovative navigation GmbH, was the program manager for both phases of the program.



*Eagle Owl on its mobile mooring platform.*



*Eagle Owl launching on a maritime surveillance mission.  
Source, both photos: CNIM Air Space*



*(Above left) Eagle Owl on its tether above its mobile mooring platform. Source: Hemeria.*

*(Above right): View of a deployed Eagle Owl from below. Source: Frontex (Oct 2021)*

*(Left) Stern quarter view of Eagle Owl at altitude. Source: CNIM Air Space*

## Condor

This is a large, multi-mission aerostat that is in service with the French Ministry of Defense. It can be configured with a wide variety of payloads weighing up to 250 kg (551 lb). Payload options include EO/OR cameras, radar, cellular or radio communications relay, and WAMI / SIGINT / COMINT sensors. From its maximum operating altitude of 1,200 m (3,937 ft), Condor's horizon is up to 123.7 km (79.4 miles) away.



*Condor on its mobile mooring platform with tractor trailer.*



*Condor on its mobile mooring platform. Source, both photos: Airstar*

#### 4. For more information

- “Tethered Aerostat Condor,” product leaflet, CNIM Air Space, November 2019: <https://pdf.aeroexpo.online/pdf/cnim-air-space/leaflet-condor/184002-18395.html>
- Nathan Gain, “Euronaval: CNIM Soars With New Aerial Coastal Surveillance Solutions,” Naval News, 18 October 2020: <https://www.navalnews.com/event-news/euronaval-2020/2020/10/euronaval-cnim-soars-with-new-aerial-coastal-surveillance-solutions/>
- “Frontex tests aerostat systems in Greece for border surveillance,” Frontex, 14 October 2021: <https://frontex.europa.eu/media-centre/news/news-release/frontex-tests-aerostat-systems-in-greece-for-border-surveillance-b5E918>

#### Videos

- “World premier: a drone airship for the automatic inspection of power lines” (“Première mondiale: un dirigeable drone au service de l’inspection automatique des lignes électriques”) (4:20 minutes), posted by RTE, 17 December 2020: <https://www.youtube.com/watch?v=IKTgDpPefjM&list=PLcnWp7EVKyvERECmNAVigm1CjDQGDC65C&t=78s>
- “Hemeria Airship – presentation,” (2:15 min), posted by Hemeria Airship, 22 December 2022: <https://www.youtube.com/watch?v=o0vbGuHzmdQ>

#### Other *Modern Airships* articles

- *Modern Airships - Part 1*: <https://lynceans.org/all-posts/modern-airships-part-1/>
- *Modern Airships - Part 2*: <https://lynceans.org/all-posts/modern-airships-part-2/>
  - Airstar Aerospace – airships, tethered aerostats & stratospheric balloons
  - Thales Alenia Space - Stratobus
- *Modern Airships - Part 3*: <https://lynceans.org/all-posts/modern-airships-part-3/>