LIGHTHOUSES: PAST AND PRESENT



Occasional bursts of light on the horizon

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FOTO: Joan Vicens.

Marine signage continues to make notable technological advances, providing a universal public service to sailors, while some former residential buildings are now being used for cultural and tourist purposes. We provide some glimpses of history to help us understand the past and present of lighthouses.

Lighthouses are the most widespread and well-known type of maritime signal to guarantee the safety of navigation at sea and make it possible, however, they are not the only one. Maritime signals can be visual, acoustic or radioelectric, and each of them fulfills a different function and use. Visual signals are luminous beacons located in lighthouses, buoys, beacons and lines; acoustic signals include bells or sirens, while radioelectric signals, goniometric and hyperbolic Hertzian beacons have emitted or emit signals through the DECCA, OMEGA, and DGPS systems, among others. All these signals fall under the international

supervision of the International Maritime Organization, the International Telecommunication Union and the International Organization for Marine Aids to Navigation.

Lghthouses in the Mediterranean date all the way back to ancient times, but from the 19th century onwards marine aids experienced a boom, coinciding with notable advances in technology and energy resources and, at the same time, the implementation of liberal policies by nation states.

Torches, oil and paraffin

Until the end of the 18th century, lighthouses were lit by bonfires of coal or wood. Davits, torches or candles smeared with grease, oil or tallow were also used. Technical advances in Enlightenment Europe allowed the introduction of oil so that each country had more on hand for combustion in order to operate the lanterns. At the end of the 19th century, vegetable oil was replaced by mineral oil, known as Scottish paraffin because it was a derivative of Glasgow coal. Petroleum was not introduced in an even fashion and, although the first tests were already carried out in 1859, the replacement of one fuel for the other was delayed over time. Then, various types of lanterns that used either petroleum or paraffin started to spread: the Maris, Chance, and Aladino lanterns, among others.

Different types of gas were also used, the most widespread of which —especially for batteries— was acetylene (AGA Dalén system). The use of electricity to operate lamps was gradually introduced at the end of the 19th century, which remains the most commonly used energy source for lighthouses today, although photovoltaic energy is currently used for beacons, buoys and low-power lights.

Lighthouses traditionally had spaces for technical use, others for residential use for lighthouse keepers and their families, and others for storing fuel and various technical equipment, along with terraces, gardens and orchards for leisure and recreation.

The tower, the key point

The lighthouse tower is the most important among the technical spaces. At the top of is the lantern room, where the rotation device, the base of the optic lens and other auxiliary devices are located. Above is the lantern, a metal structure surrounded by glass that protects the lens and the lighting chamber, which allows the rays of light that characterise the lighthouse to emerge. Above this glazed assembly, the lantern is covered with a dual hemispherical dome, finished with a spherical cupola with a ventilation system, a compass rose and a lightning rod with a grounding cable at the top. Aeromaritime lighthouses, such as those at Cap de Creus, Cap de Sant Sebastià, Calella, Llobregat, Cap de Salou, Formentor and Cala Figuera since the 1950s, are strategic installations in which the dome is also glazed, because its characteristic light was visible for air navigation, a function that has declined in the last 25 years.

The most important devices of a visual signal lighthouse are the lenses, traditionally manufactured in England or France. They are formed by glass arranged in such a way that, in suitable spaces around the light source, they allow the light coming from the source to be distributed and grouped, concentrating the light rays in dense projections and in defined directions. The visual flashes that allow each lighthouse to be singled out within a large navigation area are possible by adapting the angles of the lenses. They are essential for lighthouses to be able to carry out their operations effectively, properly and efficiently.

A new conception

Technology advanced significantly throughout the 20th century and recently new technologies have

transformed —if not eliminated— lighthouses and lighthouse keepers. Despite current technological advances, both lighthouses and lighthouse keepers continue to exist, although it is true that in a different fashion and under a different concept.

The work carried out by lighthouse keepers has changed significantly, due to their particular working conditions. As lighthouses are typically isolated, they were forced to live with their families at their workplaces. Today, the widespread use of vehicles and the major improvements in communications compared to two centuries ago explains the change. On the other hand, technically, the manual and mechanical tasks that formed the foundation of the work two centuries have given way to many electrical, electronic and computer programming tasks. Although those same tasks are still necessary in order to operate and oversee lighthouses, computers and remote controls make it possible to resolve many situations that previously required a physical presence at the worksite. However, new technologies are not infallible, and qualified technical personnel are always needed to resolve problems. This is where lighthouse keepers continue to be essential in the 21st century: they can live a hundred kilometres from the lighthouse and be a roving professional who attends to the various incidents arising from the operation of the technical equipment from a control centre. Another issue is that breakdowns may take a greater or lesser amount of time to resolve and that delaying fixing these service issues can cause problems for navigation.

In full force in the 21st century

As public facilities, lighthouses continue to provide their usefulness to navigation and all of them continue to function despite progressive automation. The most important testament to their continued importance is the construction of new lighthouses around the world. In Catalonia, for instance, the Torredembarra lighthouse in Tarragona was inaugurated on 1 January 2000. Modern lighthouses are adapted to the new times, and therefore architecturally they do not require the houses or warehouses that were previously essential. The recent construction of maritime signals gives an idea of the extent to which they continue to be important, despite the introduction of numerous technological advances. The widespread idea that lighthouses have ceased to be useful due to GPS was roundly refuted by the lighthouse keeper and specialist in the history of lighthouses Miguel Ángel Sánchez Terry, in an interview, where he declared: "I tell people who drive around looking at the navigation system that they no longer need to look out the window (laughs). Some sailors say they are guided by GPS. Yes, yes, but don't cover a captain's bridge windows. It's true that ships use GPS, but near the coast you watch for lights, beacons and lighthouses."

The rise of the liberal state in the 19th century was accompanied by a public works policy that provided a public service to citizens. Against this backdrop, Spanish liberalism in the mid-19th century, following the pioneering initiatives of other European countries such as France and England, decided that in order to improve the country's trade and economy, it needed to provide the Spanish coastline with light signals. Thus, on 13 September 1847, the *Plan general para el alumbrado marítimo de España e islas adyacentes* (Gemeral plan for maritime lighting in Spain and the adjacent islands) was approved, which provided for the construction of 126 lighthouses. All the regulations regarding lighthouses for the beacons along the coast were followed by the approval of the *Plan general para el balizamiento de las costas y puertos de España e islas adyacentes* (General plan for beacons along the coasts and ports of Spain and the adjacent islands) on 30 June 1858. This capped off the state planning for maritime signals, which has successfully undergone modifications and expansions over the years adapted to the new times.

One of the oldest lighthouses in the world still in operation is that of Porto Pi in Palma (Mallorca). In Catalonia, if we don't include the signals of the ports of Barcelona and Tarragona —whose origins date back even earlier—, the first new lighthouses were the ones in Cap de Creus (1853), Punta del Llobregat (1854)

and Cap de Salou (1858).

Ministerial affiliation

The lighthouse service in Spain has always been a civil service (never a military one like in Italy, where they have always been linked to the navy), affiliated with the Ministry of Public Works, and its various and changing names over the years.

Within the organisational structure of this ministry, over time, since the creation of the Spanish maritime signal service, lighthouses have depended on various official bodies. In 1992, the State decreed the termination of the Mechanical Maritime Signal Technicians Corps and the transfer of their management to the various port authorities, grouped under the State Ports Authority. Since then, the lighthouses on the Girona and Barcelona coasts have been affiliated with the Barcelona Port Authority; while the ones on the Tarragona coast fall under the Tarragona Port Authority, and those on the Balearic archipelago are part of the Balearic Islands Port Authority.

Following an 1849 law that established the so-called lighthouse tax, lighthouse keepers became affiliated with the civil administration of the State. The creation and regulation of the profession of those in charge of the direct care of lighthouses was decided on 21 May 1851 with the approval of the *Reglamento e Instrucción para el servicio de los faros (Regulation and Instruction for the Service of Lighthouses)*, which created a special corps of civil servants called the Lighthouse Keepers Corps.

To enter the lighthouse technical corps, one needed to follow the civil service examination process like other civil servants. In 1856, the Escuelas Prácticas de Faros (Lighthouse Training Centres) were created and organised in some lighthouses on the coast (Machichaco, Tabarca, etc.), but later the selection process was centralised at the Escuela de Ingenieros de Camins de Madrid (Civil Engineers School of Madrid), where applicants had to go in order to take the exams.

Over the years, regulations governing the profession have changed. The 1930 regulation established, among other things, that in order to join the Corps one had to be between 18 and 28 years old, but a later amendment established the requirement to have completed military service and be between 23 and 38 years old. Depending on the era, internship courses lasting three or five months were held in lighthouses with various types of installations (gas, electric or electronic).

The lighthouse keepers

Some of the first lighthouse keepers were soldiers who made the move to the civil service, as well as former navy telegraph operators and young ship pilots eager to settle down with their families. Later, young candidates came mainly from coastal towns, many of them with a lighthouse through which they came into contact with this world. A large number of lighthouse keepers came from Galicia and the Balearic Islands, territories with rugged coastlines and abundant maritime signage. There were also young people from Madrid and the interior of the peninsula, who, despite not knowing the sea, were attracted by the possibility of becoming civil servants. Over the years, authentic lineages within the profession followed one another. Throughout the 20th century, lighthouse keepers with backgrounds in mechanics and electrical engineering became progressively more common. Until the first half of the 20th century, they had a Corps uniform and in isolated lighthouses there were weapons to defend the facilities and personnel.

Depending on the time period, the Lighthouse Corps staff ranged between 315 and 406 technicians. When joining, newcomers knew that the first years of service would be difficult and that the Ministry would

decide their destination. Veteran lighthouse keepers occupied the best positions and young people were assigned to the most isolated lighthouses. However, this reality was accepted because through rigorous seniority and promotion after promotion, one could end up reaching the desired position depending on one's own geographical origin, the climate, the services nearby a lighthouse, and other factors. Normally a newcomer had to stay two years in the same position, but until Franco's regime a lighthouse keeper could swap the destination with another colleague for a place of a similar category.

Personnel were allocated to each lighthouse based on how the facility was classified. According to the technical characteristics of each lighthouse, they were classified into six different categories. This list of categories was established mainly according to the strategic situation and the light range, elements based on which each lighthouse was equipped with a different optical device (its importance was in relation to its focal distance, that is, the radius from the light source to the centre of the dioptric lens on its horizontal plane). The first-tier lighthouses were located at dominant points along the coast or deep into the sea, on peninsulas or capes, in uniquely strategic places. The second-, third- and fourth-tier facilities served as a reference for coastal navigation and announced the proximity of islands, shoals and reefs. The fifth- and sixth-tier lighthouses marked the entrance to an estuary or indicated to ships the direction to take on a route.

At the same time, within each signal, there was a classification of jobs according to which there were main, first, second and third lighthouse keepers. Each position had an assigned category and this meant that every time a lighthouse keeper received a promotion, they had to choose one of the positions in that category. Lighthouse keepers enjoyed a great deal of geographical mobility throughout Spain at a time when this phenomenon practically did not exist in the labour market, which made this profession highly unique and also made the lives of the respective families unique as they accompanied the lighthouse keeper in his successive transfers. The families traveled to the work site of the head of the household, and they shared the work, the workload and the isolation with him.

One of the main characteristics of lighthouses is their geographical location. Many are located in naturally gorgeous, isolated landscapes, a quality that can arouse a certain envy among visitors. However, we must not forget the harsh living conditions that this entailed, especially in times past when communications were difficult and covering distances that today can easily be covered in a car meant a full day's journey. We're not talking about lighthouses located on small, almost uninhabited islands, or even on small rocky islets. The lighthouses along the Ebro were not desirable destinations either; apart from the loneliness, the conditions were conducive to the spread of malarial fevers.



Cap de Creus Lighthouse. Photo: Joan Vicens.

Inhabited lighthouses

Catalonia and the Balearic Islands had 5 inhabited lighthouses. Tarragona had the Salou and La Ràpita lighthouses, while Ibiza had the Botafoc lighthouse, Mallorca had the Pollença lighthouse, and Menorca had the Ciutadella lighthouse. All the lighthouses are still fully operational. However, in some cases, the old dwellings have been given new uses. Museums or interpretation centres have been opened at Cap de Creus, Tossa, Calella, Vilanova i la Geltrú, in the port of Tarragona (the former lighthouse of La Banya), Porto Pi, Tramuntana, Cavalleria and La Mola de Formentera. Others have also undergone restoration, such as the lighthouses in Sant Sebastià, Formentor and Artrutx.

















A lineage of lighthouse keepers with history

Grandfather: **Alfonso Moral Arnaiz** (Corbera de Toranzo, Santander, 15 May 1901 – Palamós, 10 August 1988)
Mornal Arnaiz joined the Corps on 11 February 1919, and his first assignment was to the Machichaco lighthouse (Biscay), from where he was transferred that same year to the newly electrified Palamós lighthouse. There he married Maria Arpa Castelló from Palamós and remained at the same lighthouse for 51 years until his retirement in 1971, a rather unique feat in his profession.

The son: **Alfonso Moral Arpa** (Palamós, 30 June 1926 – 30 September 2001)
Moral Arpa joined the Corps on 4 March 1946, and was sent to the lighthouse on the island of Alegranza (Lanzarote). In 1948 he was assigned to Cap de Creus, from where he left the following year when he deemed himself redundant to move to a private company and return to Palamós.

The grandson: **Josep Maria Moral Plana** (Palamós, 12 October 1955). Moral Plana is the son of Josep Maria Moral Arpa. He joined on 2 May 1979. He was at the Maó lighthouse (Menorca), at the Decca Sud Chain in Padul (Granada) and at the Sant Carles de la Ràpita lighthouse from June 1983 until his retirement in October 2020.

The great-grandson: **Carlos Moral Vilches** (Granada, 27 January 1982)
Moral Vilches is the first practicing lighthouse keeper on the Tarragona coast who did not take the civil service exam for the Lighthouse Corps given that it had been disbanded. With studies in Naval Engineering and Mechatronics Engineering, on 1 April 2018 he started working at the Tarragona Port Authority as an electrical maintenance technician and shortly after he took on temporary support tasks for lighthouse keepers. When Josep Maria Moral retired in October 2020, his working hours were temporarily increased so that the entire service in the province would not be in charge of a single technician, until he obtained the position through a civil service exam. He is one of the two technicians on the Tarragona coast, and has lived in the Sant Carles de la Ràpita lighthouse since 29 July 2021.







