



Electromechanical Mobile Industrial Platform

INTRODUCTION TO EMIP PROJECT



**UNDERGROUND HANGAR FOR HELICOPTERS
AND F35 FIGHTER PLANES**

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PRESENTATION EMIP

We are an Italian company specialized in industrial mobile platform.

We have developed an innovative mobile electromechanical platform installed in an underground hangar for helicopters. It is a particular hangar for the storage of helicopters, which also functions as a landing surface and which, using advanced technologies, guarantees maximum comfort reducing to the minimum the environmental impact. Thanks to this new technology, you can manage the stowage of your helicopter fast and easily without having to move it once landed and without the use of means and personnel in addition to the pilot. For this project we registered the patent "Hunderground Hangar for Helicopters" n. AR2013A000018 on the 18th April 2013 and then we extended this license with n.PCT/IB2014/060754 on the 16th April 2014 abroad in European as well as in International Countries. The Hangar Emip for its versatility, its compact size and simplicity of use, is suitable for multiple uses on land and on sea, and is intended to be used not only to give more comfort and security or to save time and money to the persons who use the helicopter for work or just for leisure ; but also to give an important support in the healthcare sector, in the rescue and the military field.

This is because our hangar is designed to be placed in any environment, always keeping its maximum efficiency: gardens, private or public buildings, boats, fixed marine platforms, first aid areas, areas close to hospitals and even in inaccessible territories.

The Emip underground hangar offers many advantages: First of all, a significant reduction of space for the storage of helicopters which, generally, are placed in special structures inside airports or in aviation surfaces, located away from the inhabited centers and with the necessary use of means and personnel for the operations of moving of the helicopter from the landing and take off area, to the stowage area.

Stowage and take-off operations are more easier since the landing area coincides with the positioning platform and, also for this reason, the expected time for helicopter stowage and take-off preparation is considerably reduced from 25 / 30 minutes to 2/3 minutes.

Reduction of management and maintenance costs as the helicopter inside the underground hangar, remains in an optimal condition and in absolute safety, protected from damages caused by weathering and incorrect maneuvers ; and this benefit is especially appreciated when the hangar is built on ships or marine platforms where, in addition to the corrosion and the fast wearing of the mechanical and electronic parts caused by the saltiness with the necessity of more frequent and expensive maintenance, the helicopter is also exposed to storms with the risk of sliding from the landing platform and even falling into the sea.

The Emip hangar, being placed underground, has no impact on the environment and can

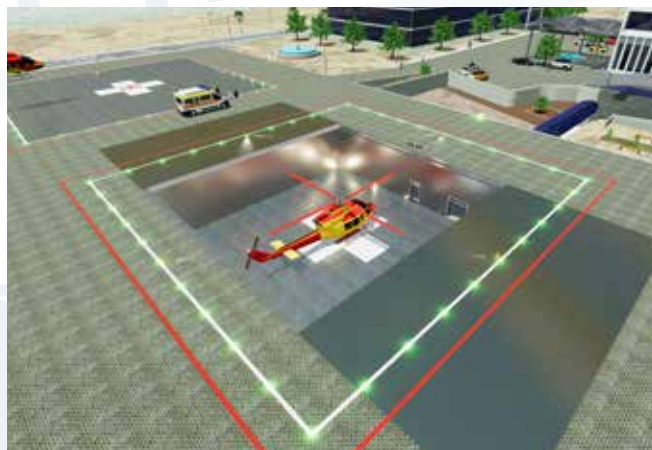


therefore be constructed next to the client's home or within it, if the structure permits it ; and the owner can even reach the hangar from home comfortably through a tunnel, in absolute privacy and manage it without the use of staff besides the pilot, directly through a special encrypted application from his smartphone.

All this in absolute safety and according to all the regulations in force.

UNDERGROUND HANGAR EMIP: SPECIAL MEDICAL RESCUE

The Emip hangar is perfect to give a valid support in rescue operations where, in addition to guaranteeing faster intervention, the patients, once they arrive at the hospital, are introduced directly into the structure in perfect hygienic-sanitary conditions without being exposed to the weather and contamination from outside.





STRUCTURE'S DESCRIPTION

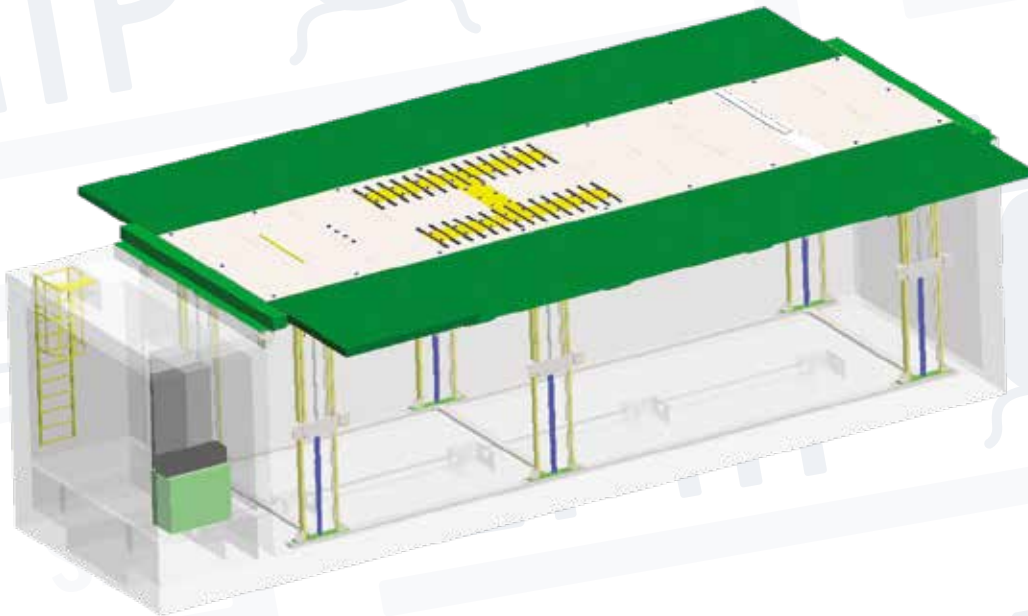
The hangar consists of a mobile platform housed in a basement area realized under the ground, built in reinforced concrete.

It is subdivided in two areas connected to an access door ; the first one is the technical room where is hosted the plc which manages the overall operation of the hangar, and which is accessed through a trap door. The second one is the room where the platform is hosted and is covered with opening and closing doors.

When the hangar is built inside a ship or a fixed marine platform, the structure is made of steel ; in this case, the Emip engineers will provide the shipowner or builder with the parameters needed to set up the compartment where our platform will be located.



MECHANICAL DESCRIPTION OF THE PLATFORM



The platform raises and slides vertically on columns with lanes of low friction. Is provided with rollers of translation or a spinning wheel (depending on the model of hangar) in order to regulate the right positioning of the helicopter and the movements over the platform even also to allow to take off in a different direction from the landing one.

For the ascent and the descent of the platform there is an installation of hydraulic

pistons.

The hydraulic system is powered by a gear pump which enables the pistons to rise thanks to oil pressure and to make a 2-meters run ; a system of chains and sprockets makes expand the run of the pistons up to 4 meters of overall height, necessary for reach the surface, that is the level of the doors.

Upon request, for the ascent and descent of the platform is possible apply a mechanism with screw lead nuts made of steel. But, in this case, we'll have a more electricity consumption and will be required the availability of 15 Kw/h for the overall functioning of the larger hangar model.



COVERING MECHANISM OF THE PLATFORM

The opening and closing of the hangar is composed of two horizontal panels that slide on lanes and that are driven by a gear motor and sprockets, with hydraulic or electrical supply ; but they also can be activated by hydraulic pistons.

The panels are insulated and externally finished with tiles made of shockproof rubber in personalized colours or in 'fake grass' effect, so they can camouflage themselves

perfectly in any environment.

The doors while closed can support the weight of the helicopter during the phase of safety landing, in case they have not been opened due to obstacles detected by the security system in the hangar area.

The doors support the potential weight of snow for up to 300 kilograms for square meters. In countries with heavy snow storms the weight that can be supported will be calculated on basis of the regulations in force.



ELECTRONIC AUTOMATION

Our hangar is powered by electricity of low tension and it has been studied in order to have a low power consumption ; in fact, for example, is only required the availability of 9 Kw/h for the bigger model.

The whole structure generates consumption only when the platform ascends, opening the doors, and descends with the helicopter, closing the doors ; and so it remains on stand by until the next operation.

The electronics applied to the system is composed by a plc that manages overall operation ; inverter to correct eventual anomalies in current flows ; and also by a telephone switch that allows the opening of the Emip platform, employing a sophisticated system of security.

For the landing, the stowage and also for the automatically exit of the helicopter from the hangar, the pilot sends a sms to the system which, in few minutes, controls the whole area, does open or close the doors and it starts the ascent or the descent of the platform without employing means and personnel.



STANDARD INSTALLATIONS

Our hangar is equipped with many devices and installations :

Ventilation device that allows air recycling inside the hangar in order to avoid humidity in the area.

System of abolishing water, in case that it enters during the entrance and the exit of the helicopter, through suction pumps located within a storage tank that allows to accumulate a considerable amount of water under the level which support the helicopter's skids. The basin of water depends on the size of the hangar selected model, and it can have a minimum capacity of 50 cubic meters (in the smallest model) up to the maximum of 500 cubic meters (in the largest model) ; in case of flooding for the occurrence of exceptional floods and if the water exceeds a guard level, a sensor automatically sends a signal to the plc which activates a command of opening of the doors, it raises the platform that brings the helicopter safely on the surface, avoiding in this way damage to the aircraft.

Smoke detector that controls the whole hangar and, in case of presence of smoke, sends a signal to the plc that activates the opening of the doors and the ascent of the platform that brings the helicopter outdoor.

Touch screen for displaying system movements and alarms.

Remote supervisory system of the computer.

Warning lights that indicate to the pilot if the platform is ready for the landing or not.



OPTIONAL INSTALLATIONS

Fire system as determined by the I.C.A.O regulation, with cannons that throw foam in the hangar and in the surrounding area.

Uninterruptible power supply that guarantees the perfect functioning of the system for about 20 minutes in case of lack of energy.

Additional lighting device to facilitate the identification of the platform during night landing.

Near the platform can be installed a fuel tank for refuelling with a minimum capacity of 1000 liters with a distributor electronically activated, hidden under the ground level in order to avoid obstacles.

Weather station for the remote detection of the wind, rain and temperature.

Day or night wind direction indicator (wind cone).

For countries where there are frequent heavy snowfall, we can apply a further heating system of the doors and of the surrounding area to allow the melting of snow and also to prevent the formation of ice.

Required infrared barrier to detect the presence of obstacles at the opening and closing of the platform, covering a surface of up to 1600 square meters ; replaceable with a fence of the same area.

Our hangar can also be equipped with other optional installations and devices to meet every customers requirements.





TYPOLGY OF HANGAR

Until today Emip has designed four models of hangar :

1. Model HI – 1370/355 underground hangar of dimensions 13,70 x 3,55 meters for an estimated height of 3,70 meters for helicopters with two blades till about 12,90 meters of length .
2. Model HI – 1600/1300 underground hangar of dimensions 16,00 x 13,00 meters for an estimated height of 3,85 meters for helicopters with more than two blades till 14 meters of length.
3. Model HI – 1700/1450 underground hangar of dimensions 17,00 x 14,50 meters for an estimated height of about 4,80 meters for helicopters with more than two blades till 15,50 meters of length.
4. Model HI – 2000/2000 underground hangar of dimensions 20,00 x 20,00 meters for an estimated height of about 5,35 meters for helicopters with more than two blades till 18,50 meters of length.
5. Model HI - 2000/2000 Special underground hangar of dimensions 20,00 x 20,00 meters for an estimated height of about 5,75 for helicopters with more than two blades till 18,50 meters of length.

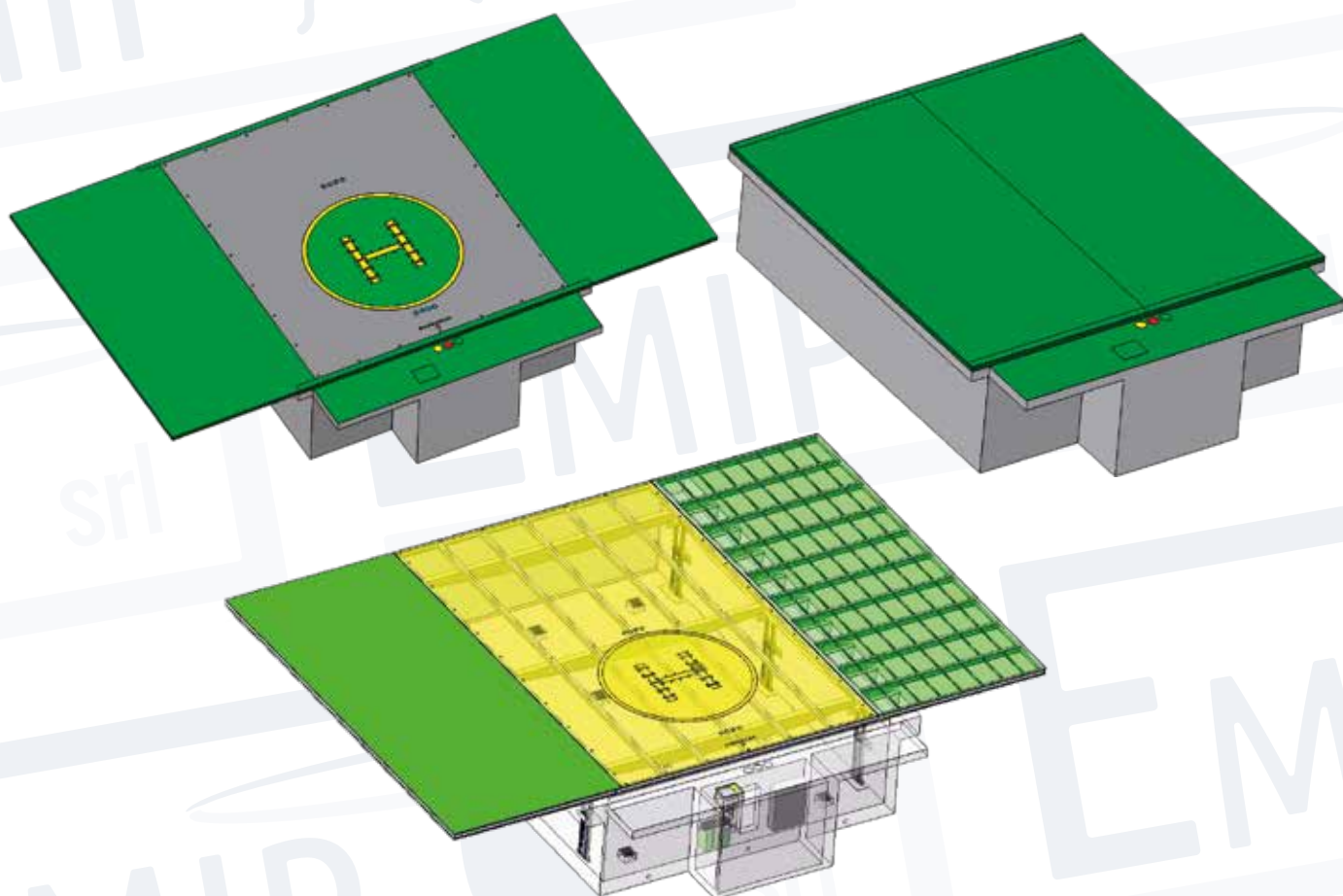


APPLIED REGULATIONS

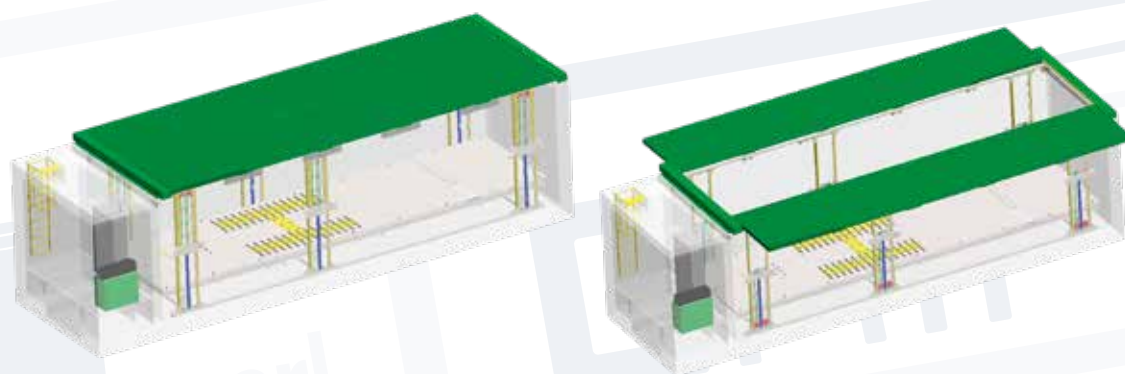
The Emip hangar is built in compliance to the regulations in force :

- Machinery Directive 2006/42/CE
- Directive 1995/16/CE: Approximation of the laws of Member States relating to elevators.
- Regulation UNI EN ISO 4413/2012 Hydraulics: general rules and safety requirements for systems and their components.
- Regulation UNI EN ISO 12100/2010: Safety of machinery.
- Regulation CEI 64 – 8: Low voltage electrical systems.
- Regulation CEI EN 61439 – 1: Low voltage electrical cabinets.
- Regulation I.C.A.O: Fire prevention system (if required)

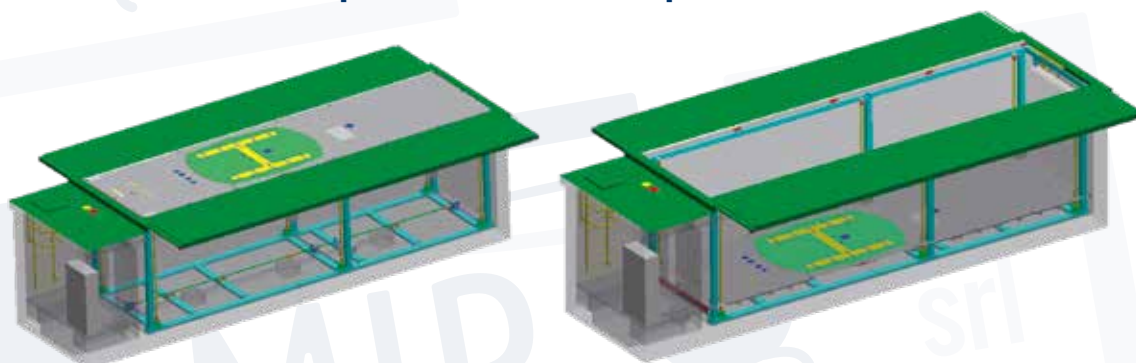
Platform for helicopters with more blades



Oil-pressure platform for helicopters with two blades



Electromechanical platform for helicopters with two blades





Electromechanical Mobile Industrial Platform



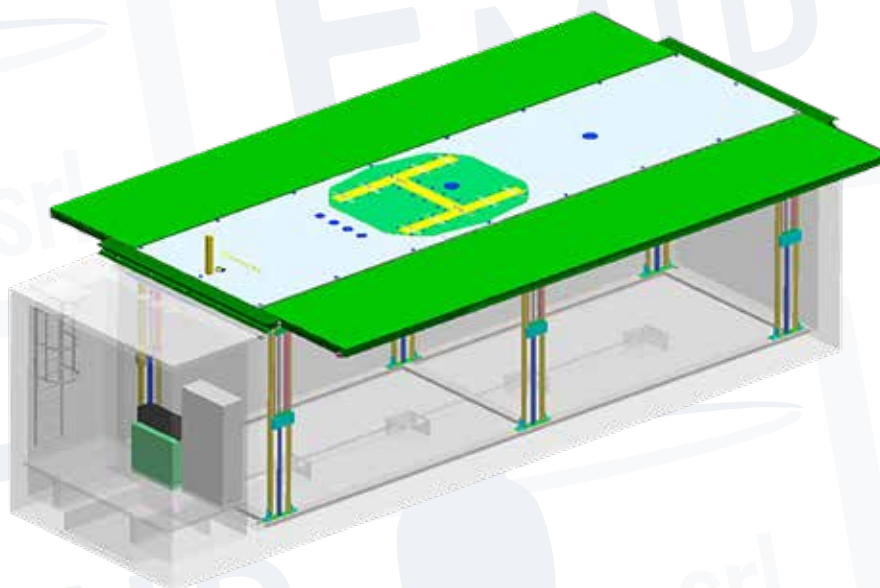
**EMIP UNDERGROUND HANGAR
MODEL HI-F35**

EMIP PRESENTATION

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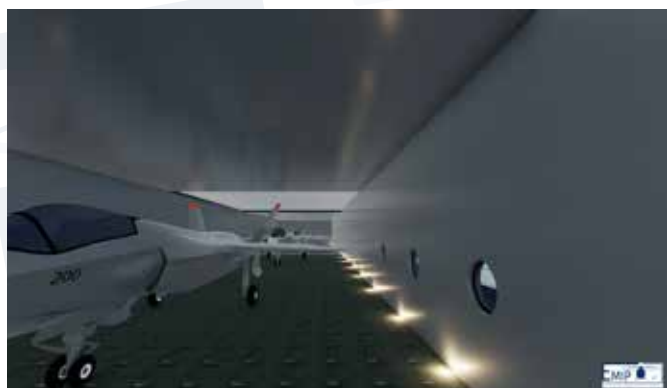
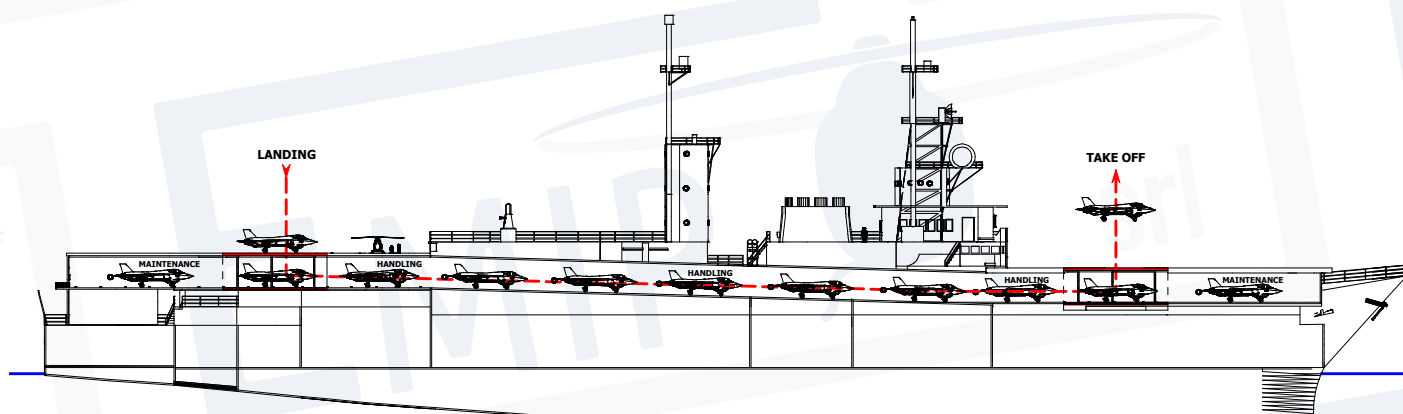
This is because our hangar is designed to be placed in any environment, always keeping its maximum efficiency : gardens , private or public buildings, boats, fixed marine platforms, first aid areas , areas close to hospitals and even in inaccessible territories.



EMIP UNDERGROUND HANGAR MODEL HI-F35

The HI-F35 Model has been specifically designed to be installed on a ship and to make F35 Fighter Jet takeoff, landing and storage operations easier, faster and, above all, safer.

Furthermore, this model of Underground hangar Emip, as designed, allows the jet as soon as it has landed, to be stowed in a short time at the lower level of the ship, where, hidden from the outside, it can be maintained and replenished before being ready to leave again. With this solution more jets can remain in optimal condition and in absolute safety, protected from the fast corrosion of the mechanical and electronic parts caused by weather's conditions and by the saltiness and they are no more exposed to storms with the risk of sliding from the landing platform and even falling into the sea.



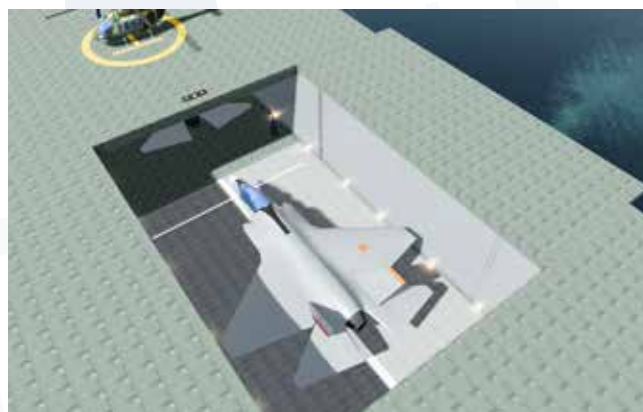
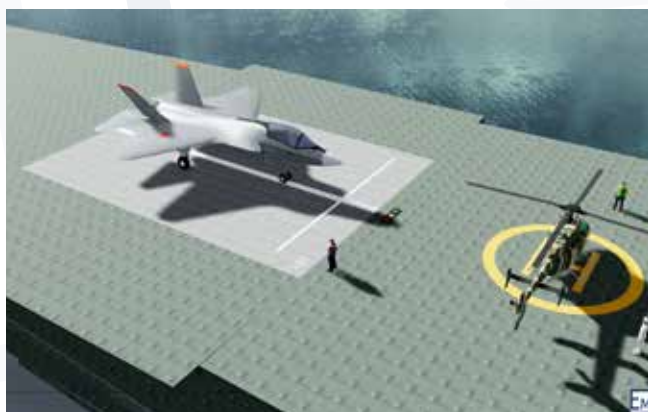


The platform build inside the Underground Hangar Emip is made of hot-galvanized steel with a heat-resistant steel plate that can withstand approximately $700/800^{\circ}\text{C}$, and that can be interchangeable in case of wear.

The platform is moved with an electromechanical system managed by a PLC; a hydraulic system guarantees the rapid sliding of the platform along six columns, the encoders maintain its stabilization during the ascent and descent and the inverters correct any anomalies in the current flow. The platform rises in about 60 seconds with an absorption of about 20 KW and the speed of ascent and descent can be regulated remotely, based on needs. The Emip mobile platform designed for the F35 Fighter jet supports a weight of 30 tons in addition to the weight generated in the impact upon landing by the force and the dynamic thrust for a total of about 60 tons.

The Underground Hangar Emip is covered with two horizontal opening and closing panels that slide on lanes, driven by asynchronous motors and open and close in less than sixty seconds; and the speed can be increased and decreased through gear motors.

The panels are insulated and treated with hot-dip galvanization and painted for camouflage themselves with the ship's surface. The doors while closed can support the same weight of the platform, in the event that they are not opened due to the detection of obstacles in the hangar area by the security system.



At this time two variants of the HI-F35 Model are available :

1. **HI-F35 2000/1500/530** Underground Hangar with a size of 20,00 meters length and 15,00 meters width and an estimated height of 5,30
2. **HI-F35 2000/2000/530** Underground Hangar with a size of 20,00 meters length and 20,00 meters width and an estimated height of 5,30



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Prototype coordinates

📍 43° 30' 01" N - 11° 48' 37" E

