sonitus
engineering solutions

HAYAT S10

AIR VEHICLE SECURING AND TRANSFER SYSTEM

WE TRANSFORM YOUR DREAMS
INTO ENGINEERING

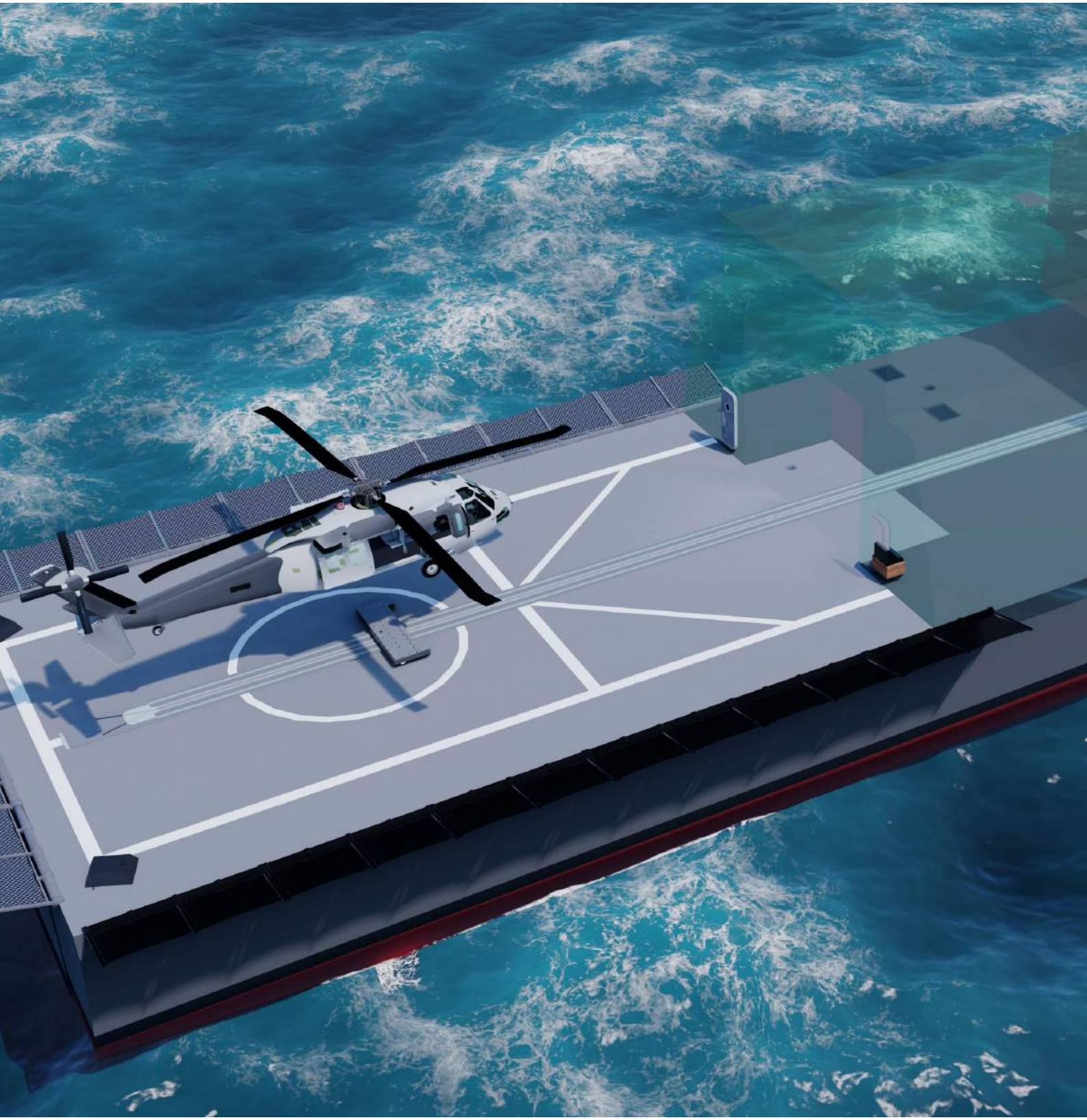
INNOVATIVE TECH COMPANY

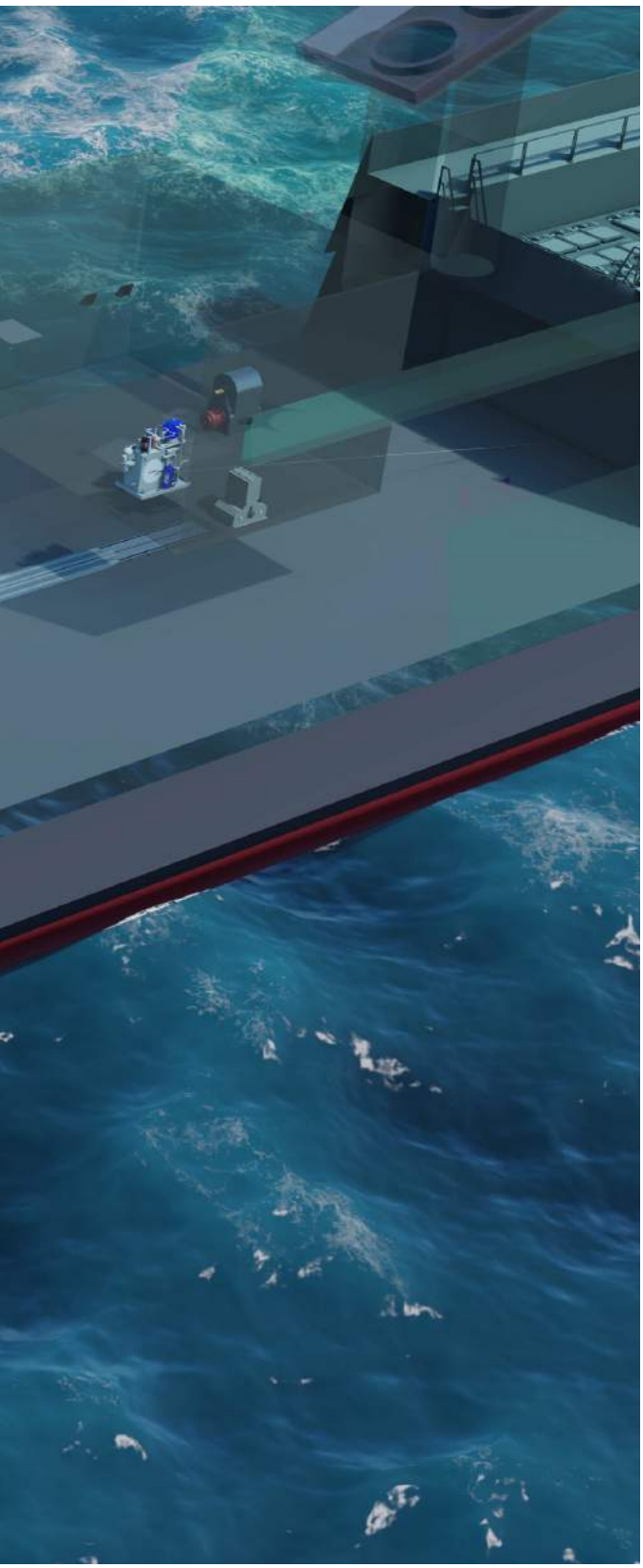
ABOUT US

SONITUS Engineering and Consulting serves with superior technology, high brand quality and a dynamic and experienced staff in many fields, especially in the Defense, Maritime, Automotive and Marine Construction Industries...

Our company carries out all its work with great confidentiality and sensitivity in its office located in Istanbul Technopark, one of the most important technology bases of Turkey.

An important milestone for SONITUS Engineering is its incorporation into ARAS Marine Investment Holding as of 2019. With this partnership, our company has grown rapidly, paving the way for our services to spread over a wide range of industries. Providing services in the national and international arena, SONITUS Engineering has taken part in important export projects, and has reduced our country's dependence on abroad by offering domestic solutions. In this context, it continues its R&D activities intensively and produces new methods and solutions with its innovative structure.





HAYAT S10

AIR VEHICLE SECURING AND TRANSFER SYSTEM

HAYAT S10 is a system that enables the helicopter to be secured, maneuvered and taken to the helicopter hangar or taken from the hangar to the platform, without the need for personnel on the platform during the helicopter operation. All of the equipment mounted on the ship is located on the main deck, and there is no equipment of the system under the main deck or in the engine rooms.

The system consists of a stainless-steel track located on the central line on the helicopter platform and designed to be integrated with the ship's main deck construction, image detection units on the deck to determine the location of the helicopter, the rapid securing car that secures the helicopter, the hydraulic power unit that moves the rapid securing car, and the drum and tension control equipment. Thanks to the image detection units that detect the helicopter's location on the deck, the pilot's relative landing area is reported to the pilot with the pilot visual clue system.

FUNCTION

General	Helicopter is constantly held and kept safe.
Securing Area	Helicopter is secured in an area of approximately 4-6 m2.
Maneuver	With a single operator, the helicopter, which is aligned with the track, can be taken to the hangar by means of a remote-controlled rapid securing car.

PERFORMANCE CHARACTERISTICS

Capture Time	3 seconds
Maneuvering Speed	Variable from 0 and 0.3 m/s
Operation Envelope	Continuous operations in sea state 4, limited operations in sea state 5
Personnel	There is no need for personnel during the capture.

PHYSICAL CHARACTERISTICS

Usable Helicopter	Sea Hawk S70B
Power Requirement	440 V 60Hz, 440 V 400 Hz, 24 VDC

The system works automatically during securing and with remote control during maneuvering, without the need for personnel on the deck during operation. Within 3 seconds after the helicopter lands on the deck, it secures the helicopter by its probe and maneuvers it, ensuring that it is safe until the end of the operation.

EMERGENCY OPERATION

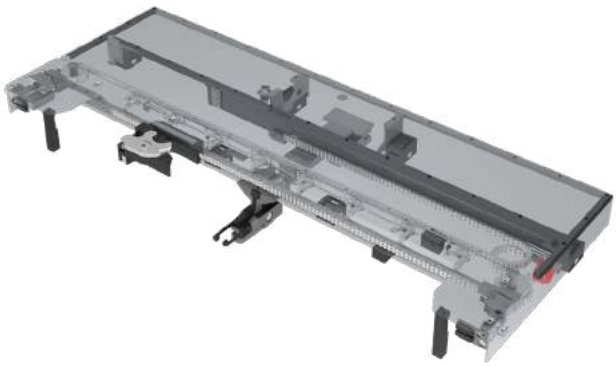
Back Up Systems	Two separate image detection units can detect the helicopter alone.
Power Loss	In case of emergency, the hydraulic unit and the rapid securing car can move with compressed air or with a hand pump.

EQUIPMENT

Rapid Securing Car	The unit that moves along the track and has its own hydraulic system inside to be able to catch the helicopter probe
Hydraulic Power Unit	The unit that provides the hydraulic power required for the system
Traverse Winch	Rope and cable reels that moves the rapid securing car
Tension Control Unit	Spring system with rope and cable reels that keep the system in constant tension.
Track System	High strength, high wear resistance and stainless-steel track profiles that are integrated with deck structure
Isolation Transformer	Transformer used to completely isolate the system from ship electricity
System Processing Unit and Motor Starter Unit	Electronical boxes that house the processors and embedded software
Image Detection Unitst	Camera and filter system that senses the helicopter, calculates the position of the helicopter on the deck and works in all light and weather conditions.
Control Console	Console where the operator controls the system and feedback of the system is received.

RAPID SECURING CAR

Rapid Securing Car captures the helicopter probe and secures it after landing. It secures the helicopter to the deck track in the presence of vertical and lateral loads encountered during helicopter maneuvering and ship motions. It also aligns the helicopter with the tracks and traverses it into or out of the hangar. The rapid securing car has its own hydraulic and electric system inside that launches the self-locking claw mechanism to capture the helicopter probe. The claw mechanism moves laterally on the rapid securing car while the car itself moves along the helicopter deck track to be able to maneuver the helicopter.



TRACK SYSTEM

High strength, high wear resistance and stainless-steel track profiles that are integrated with deck structure. The rapid securing car moves along this track back and forth. The track allows the helicopter loads to be transmitted to the ship structure. Track profiles are made of cast stainless steel material and welded together on a fixture. Casting process is optimized so that end product does not have any casting defects. High strength welding consumables are used to weld the profiles together and to the ship structure. The tracks are machined to the tolerances after welding and heat treatment.

HYDRAULIC POWER UNIT

Hydraulic Power Unit consists of a large reservoir, a hydraulic pump, a manifold, a pneumatic pump, and a hand pump for emergency purposes. For the main power, a variable displacement power regulated pump is used with a bespoke manifold design to be able to automatically adjust the pressure according to the load. Thanks to the pneumatic pump added as a spare, the system can operate in case of emergency or power lots, with the air fed from the compressed air system available on the ship. A titanium plate type cooler is used to increase heat transfer efficiency and to prevent leaks.

TRAVERSE WINCH AND TENSION CONTROL UNIT

High strength stainless-steel rope and the electricity cable that is connected to the rapid securing car are reeled around the wheels of the traverse winch and are kept under constant tension via the tension control unit. Thanks to the radial piston hydraulic motor used in the system, high torque is obtained at low speeds. A reduction gear is not needed, so the system efficiency and life cycle have increased.

ISOLATION TRANSFORMER AND MOTOR STARTER UNIT

Isolation transformer isolates 440 VAC 60 Hz and 400 Hz supply voltages on the ship from the ship supply. Motor starter is the unit that transmits the voltage to the systems. Motor starter has the relays that control the electricity supply, all of which are controlled by the System Processing Unit.

SYSTEM PROCESSING UNIT

This is the main processing center of the system, where all communication controls are made and the operation of the system is monitored. It receives the roll-pitch values from the ship data distribution system, the coordinate information from the image detection units, and the position information of the rapid securing car from the encoder on the traverse winch, and processes them with the algorithms in order for the rapid securing car to follow the helicopter at a safe distance and be ready for the capture. Status information and sensor information form the units are instantly received by the system processing unit and displayed to the operator on control console screens. Additionally, the pilot visual guidance system (PVC), which is the system that assists the pilot in landing the helicopter on the deck, is controlled by the system processing unit. With the coordinate information received from the image detection units, the LEDs on the PVC light up according to the position of the helicopter on the deck and guide the pilot.

CONTROL CONSOLE

It is the unit that allows the operator to control the system with the switches on it and displays the operating status information within the system to the operator. With the touch screens added to the control console, system feedback can be received instantly through the screens. During the maneuvering of the helicopter the operations is controlled via the joystick on the console. Test systems and user manuals and maintenance-operation cards can also be displayed on the screens.

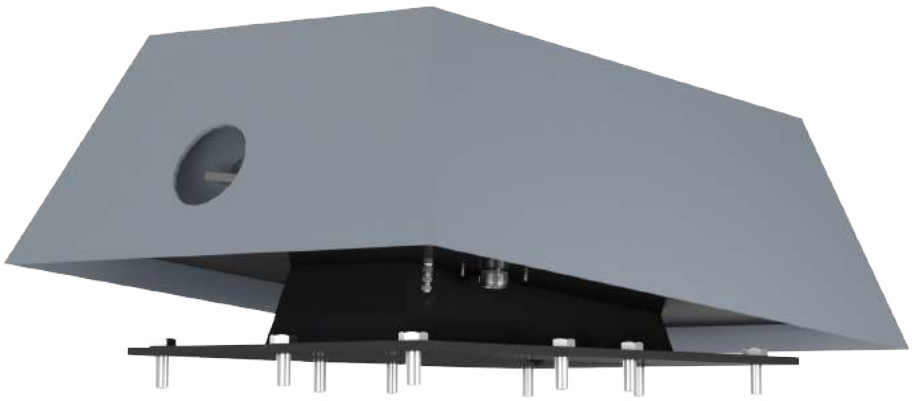


IMAGE DETECTION UNITS

Image processing is performed on the deck with two separate camera systems located at the starboard and port sides on the stern of the ship. Cameras in the image detection units receives the lasers on the helicopter and transfers the helicopter location as coordinate information to the system processing unit using artificial intelligence algorithms and image processing software. The system can analyze the position of the helicopter with software filters and algorithms under harsh environmental conditions such as direct sunlight or under foggy weather.

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HAYAT S10

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