Wing in Ground Effect craft – WSH-500
(50 passengers at cruising speed of 100 knots)

Non-exclusive agents for global market:
The product Identity “WSH - 500” was created by combining the company name & the product type. “WSH” is an acronym for ‘WING SHIP + HOVERWING’. The number at the end represents the capacity & the model number. Because the craft carries “50 passengers” it starts out as a “50”. & Being the first model of the 50 seater craft, it has a number “0” at the end creating the number ‘500’. The numbers will continually change as new models are built. (501, 502, 503 etc.)
Specifications of WSH-500

**Payload** : 4.3 Tons

**Cruising Speed** : 175 km / hr

**Cruising Altitude** : 2.0 m

**Ground Effect Altitude** : 4.9 m

**Fuel Consumption** : 250 kg / hr

**Fuel Type** : Diesel

**Manufacturing Period** : 9 Months

**Material** : Aluminum Alloy etc.
WSH-500

Machineries and equipments of WSH-500 satisfy WIG Craft related requirements of International Maritime Organization (IMO) and LR’s regulations and guidelines.

**Propulsion System:**
- 2 Sets of Turbine Propulsion System
- Reduction Gear
- Propeller

**Power Plants & Auxiliary Devices:**
- Generator
- Batteries
- Fuel Pumps

**Control System & Actuators:**
- Flight Control Computers
- Multi-Functioning Display
- Electro-Mechanic Control Surface Actuator
- Instrument Measuring Control Surface Position

**Instrumentations & Nautical Communications:**
- Alimeter
- Inertial Navigation System
- Direction Indicator
- Air Data System
- Satellite Navigation System (GPS)
- Radar
- Electronic Chart Display & Information System (ECDIS)
- Search Light
- Automatic Identification System (AIS)
- Voyage Data Recorder (VDR)
- High Performance Radar (Optional)

**Safety Appliances:**
- Life Saving Appliances (LSA) Meets Legal Requirements
- Fire Safety System (FSS) Fire Extinguishers & More
WSH-500 is being tested in Gunsan making its way to the final stage. We are looking forward to seeing it start operating in February 2012.
WSH-500

Certifications from Lloyd’s Registers

Working with Lloyd’s Registers, a World’s leading class in passenger craft classifications with experiences in classification of a WIG craft ‘AF-8’, WST is expecting to get WSH-500 classified as Type-A WIG Craft by LR.

Click on the documents below to see the details

Website: http://www.lloydsregister.co.uk
WSH-500

Interior Design

Sketches & Renderings of Interior Design Concepts

Interior Design can be redesigned and changed within certain limitations such as Life Saving & Fire Safety Systems.
## Specifications of WSH-1500

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Payload</strong></td>
<td>16.5 Tons</td>
</tr>
<tr>
<td><strong>Cruising Speed</strong></td>
<td>200 km / hr</td>
</tr>
<tr>
<td><strong>Cruising Altitude</strong></td>
<td>m</td>
</tr>
<tr>
<td><strong>Ground Effect Altitude</strong></td>
<td>m</td>
</tr>
<tr>
<td><strong>Fuel Consumption</strong></td>
<td>900 kg / hr</td>
</tr>
<tr>
<td><strong>Fuel Type</strong></td>
<td>Diesel</td>
</tr>
<tr>
<td><strong>Manufacturing Period</strong></td>
<td>18 Months</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Aluminum Alloy</td>
</tr>
</tbody>
</table>

![Diagram of WSH-1500](image-url)
Machineries and equipments of WSH-1500 satisfy WIG Craft related requirements of International Maritime Organization (IMO) and LR’s regulations and guidelines.

**Propulsion System**:  
- 2 Sets of Turbine Propulsion System  
- Reduction Gear  
- Propeller

**Power Plants & Auxiliary Devices**:  
- Generator  
- Batteries  
- Fuel Pumps

**Control System & Actuators**:  
- Flight Control Computers  
- Multi-Functioning Display  
- Electro-Mechanic Control Surface Actuator  
- Instrument Measuring Control Surface Position

**Instrumentations & Nautical Communications**:  
- Altimeter  
- Inertial Navigation System  
- Direction Indicator  
- Air Data System  
- Satellite Navigation System (GPS)  
- Radar  
- Electronic Chart Display & Information System (ECDIS)  
- Search Light  
- Automatic Identification System (AIS)  
- Voyage Data Recorder (VDR)  
- High Performance Radar (Optional)

**Safety Appliances**:  
- Life Saving Appliances (LSA) — Meets Legal Requirements  
- Fire Safety System (FSS) — Fire Extinguishers & More
Above the Horizon

WSH-1500

Ordering

HELP & SERVICES

Any information about Wing Ship Technology, WSH-500, WSH-1500, related Corporations, is available. Feel free to ask questions, request a consulting, or give us feedbacks. We will get back to you with the information as soon as possible. Thank you for your interest in our product and our company.
Classification by Lloyd's Register (LR)

Everything critical for the safety of craft such as material, manufacturing process, design, test and trial, is examined or inspected by LR.

Inherent static and dynamic stability

For safe operation of WIG craft, the craft should have sufficient inherent stabilities in craft’s motions: roll, pitch, yaw, and heave.
Without need for any artificial stabilization system, WSH-500 has inherent sufficient stabilities.

High-end obstacle detection system

WSH series uses high performance radar system to detect obstacles on its route which can scan 47 times per minute on the speed faster than 140 knots guaranteeing perfect detection of obstacles during daytime, nighttime and foggy weather conditions.
Thermal imaging infrared camera system is installed on WSH-500 to provide clear vision with pilots during night time navigation.

Maneuverability

WSH series avoid collision with other objects using horizontal maneuver (a banked turn).
Horizontal maneuver is much safer than the vertical one (a jump) due to the fact that it is free from risk of the pitch-up instability. (Chapter 4B WIG craft, Ship Design and Construction, 2004, SNAME)
The turning radius of WSH-500 is just around 700 meters.

Always on runway

Whenever necessary for the safety of passengers, WSH-500 can land on sea instantly. Most of failure mode effect of WSH-500 is minor or less.
**Key Features**

**Efficiency**

**Good Lift/Drag ratio**

L/D Ratio Rises as the Flight gets closer to the surface. WSH series flies close to the sea surface (about 2-3 m), and has a good L/D Ratio automatically.

**High Fuel Efficiency**

As WSH series has a good L/D Ratio, Fuel efficiency also get better than other transportations.

**Fuel Consumption Rate (g/p km)**

- WIG: 20
- Airplane: 47
- Ferry: 124
- High Speed Craft: 143

*g/p-km means: fuel usage to transport 1 km for 1 passenger*
**Very Fast Vessel**

Average cruising speed of WSH series is about 200 km/hour (determined by size of craft). WSH series have 2–3 times faster than a conventional high-speed craft such as hydro-foil craft, jet-foil craft, and hovercraft.
Comfortable Boarding

Minimization of rolling by using air cushion: There's no seasickness, and boarding is more comfortable. WSH series also has inherent height stability that supports comfortable operation.
Including Less Greenhouse Effect

WIG crafts can be referred to as “green” transportation system having less impact on our environment compared to the existing transportation systems with comparable operation speed. It also releases exhaust gases near the sea-surface allowing the water to absorb them partially inducing less/low greenhouse effect.

<table>
<thead>
<tr>
<th></th>
<th>CO\textsubscript{2} (g/p km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIG</td>
<td>94</td>
</tr>
<tr>
<td>Airplane</td>
<td>151</td>
</tr>
<tr>
<td>Ferry</td>
<td>396</td>
</tr>
<tr>
<td>High Speed Craft</td>
<td>452</td>
</tr>
</tbody>
</table>

g/p km means: fuel usage to transport 1 km for 1 passenger.
The German inventors and pioneers Alexander Lippisch and Hanno Fischer (Fischer Flugmechanik) developed for the first time a total concept with which a "flying ship" is able to lift off from water and reach ground effect without the use of heavy and extensive electronics. Even bigger aircraft with much weight on board (for example large passenger numbers) can overpower the resistance of the water easily and can make the transition into the comfortable ground effect flight position, without an essentially higher engine performance than necessary for the actual ground effect flight. The lift off aid developed by Fischer Flugmechanik for the second WIG craft generation Hoverwing is an air cushion which is created by a part of the propeller stream under the hull between the two catamaran floats of the vessel, while a front and a stern skirt similar to those used in a hovercraft seals forward and aft. After lift off, the skirts automatically fold back. Through this principle, also the dangerous "pitch movement" can be avoided after the start.
PRINCIPLES

WIG (Wing-In-Ground effect) craft is a very fast marine transportation vehicle. It flies close to the water surface by utilizing a cushion of relatively high-pressure air between its wing and the water surface. Thus it has desirable economic and safety characteristics.
FEASIBILITY

For operating WSH series, new infra-structures doesn’t need to be constructed such as airport. The routes for WSH-500 are already being prepared by Shipping companies. Korean Shipping companies are applied to 'Ministry of Land, Transport and Maritime affairs (MLTM)' for license of WIG craft operation route such as Gunsan-Jaejudo, Yeosu-Jaejudo.

<table>
<thead>
<tr>
<th>Ocean Express Corp.(Operation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Service</td>
</tr>
<tr>
<td>Type of Craft</td>
</tr>
<tr>
<td>Route</td>
</tr>
<tr>
<td>Distance</td>
</tr>
<tr>
<td>Operations per day</td>
</tr>
<tr>
<td>Statement</td>
</tr>
<tr>
<td>2012. 05</td>
</tr>
<tr>
<td>WSH-500, 3crafts</td>
</tr>
<tr>
<td>Yeosu - Jaejudo</td>
</tr>
<tr>
<td>220km</td>
</tr>
<tr>
<td>3round-trip</td>
</tr>
</tbody>
</table>
SYSTEMS

Interim guidelines for wing-in-ground (WIG) craft were approved by the Maritime Safety Committee at its 76th session in December 2002 as MSC/Circ.1054. These guidelines provide the provisions of design, construction and operation, so that member governments can develop their requirements of WIG craft.

Safety Regulations of WIG craft in IMO site
Interim Guidelines for WIG craft

Governments including Korean governments already established the law & other systems related to WIG craft operations
Above the Horizon

GREETINGS

From the CEO: Dr. Chang-Gu Kang
Over the years, our focus remained in the development of Wing-in-Ground (WIG) craft which is an efficient, eco-friendly ship which is faster than 100 knots while showing low fuel consumption rates. We have combined 50 years of German WIG craft technologies and know-hows with our own which has been accumulated since 1994. As its first realization of 4.34 ton payload WIG craft, we introduce to you WSH series presenting a new & innovative travel experience, along with absolute high speed & silky ride. Our sleek, yet powerful ship will provide effectiveness to its global owners and passengers.

From the Technical Advisor: Hanno Fischer
WIG craft allows you to experience 3 comfortable ridings with just 1 craft: feeling of riding on a slow boat in displacement mode, feeling of riding on a race boat during skimming mode, and feeling of riding on a smooth air-cushion during ground effect mode. Furthermore, all these can be experienced without pilot license. I have spent half of my life on developing WIG crafts. Wing Ship Technology(WST) is the successor of my work, Hoverwing. I believe, as technical advisor of WST, they will open a new era in marine transportation. I invite you to this fantastic world of Hoverwing WIG craft.
COMPANY HISTORY

2007. 11   Establishment of Wing Ship Technology Corp.(WST)
2008. 01   Agreement with Jeonrnam-Do for Use of WIG craft in Yeosu-EXPO
2008. 07   Equity investment from Daewoo Shipbuilding & Marine Engineering Cope(DSME)
2009. 04   Establishment of Wingship Heavy Industries Corp. (WHI) : a subsidiary company of WST for production
2009. 12   Completion of construction in Gunsan : Manufacturing facility for WSH-500 / WSH-1500 series
2010. 05   Making an agreement for safety certification with Lloyd's Register(LR) for WSH-500
2010. 11   Aluminum cutting ceremony of WSH-500
2010. 11   Establishment of Ocean Express Corp. : Shipping company that specialized for WSH series
2011. 10   Completion of shipbuilding WSH-500 and begins a sea trial test
Above the Horizon

2009-12-03
Exhibition in Paris
WIG Craft Mock-up Model Displayed during the Exhibition.

PHOTOS

2009-12-03
Exhibition in Paris
Explaining the product during Salon Nautique de Paris Year 2009.

2009-12-03
Exhibition in Paris
Watching a Video Clip on WSH-Series WIG Crafts.
Above the Horizon

2009-12-03
Exhibition in Paris
WIG Craft Mock-up Model
Displayed during the Exhibition

PHOTOS

2011-11-01
Receiving advice from Dr. Fischer

2011-11-08
Minister of Land Transport and Maritime Affairs
Visiting testing sight in Gunsan
Above the Horizon

PHOTOS

2009-12-03
Exhibition in Paris
WIG Craft Mock-up Model
Displayed during the Exhibition.

2011-11-01
Pilots with Dr. Fischer
In Gunsan testing sight.

2011-11-10
Preparing WIG Craft for a test run.
At the testing sight in Gunsan.
Above the Horizon

2010-05-24
International Exhibition
Green Hi-Tech Exhibition:
Explaining about the WIG Crafts

PHOTOS

2009-12-03
Exhibition
Mock-up Design
Mr. Jin H. Park and Mr. DongGyoo Kim (Wingship Technology Corp. www.wingship.com),
Mr. Panagiotis Zagklis (Greece www.wingship.webs.com)
and Mr. Jiyoon Jung and Mr. Young Soo Kim (Samsung C&T).
http://www.samsungcnt.com/EN/index.asp,
at El. Venizelos Airport – Athens GREECE
(February 12, 2012)
FAQs on WSH-500

1. Design life & Certificate statement

WSH-500 is designed to be used for 20 years. The design life would be certified by LR with WSH-500’s final cert. WST expects WSH-500 to receive its final certificate in the first quarter of this year.

2. Estimated schedule of distribution

As far as now, there’s no serious hurdle to distribute WSH series now. The most serious hurdle was its takeoff which has been completed during last tests in Dec 2011. WST expects the certification would be completed by the end of the first quarter of 2012. For commercial distribution, if someone orders a WSH-500 & executes payment today, WST begins to manufacture it from tomorrow. We are ready. WST plans to have official sea trials for LR certification during February and March of 2012.

3. Material (why Aluminum?)

WST aims to distribute bigger WIG craft. For bigger craft, aluminum is better than composite material. Also, it is faster and cheaper to construct the prototype with aluminum than with composite material because there is no need for moulds. Even modification is easy. If there is sufficient number of orders, WST also surely have intention to build it with composite material if necessary.

4. Restriction of sales

When WST buys some parts from US such as gas-turbines and thermal imaging system, there is restriction on distribution. We need to check it before the contract.

5. Restriction of operation

The critical physical condition of WIG craft is wave height. Especially landing & take off. The take-off wave height of WSH-500 is 1.2 meter and landing wave height is 2.5 meter. Buyer could calculate operation ratio by using this data. Bigger model could operate on higher wave height.

6. Global operation of WSH series

South Korea and Singapore have the rules and laws for WIG craft already. International Maritime Organization (IMO) is revising the current interim guidelines for WIG craft currently. Although there is no detailed list of the countries regarding WIG craft legislation limitations, most country can make legislative system for WIG craft easily by referencing the current interim guidelines as S. Korea and Singapore did.

7. Exclusive agency
WST does not have exclusive agency policy except Greece. Currently, DSME and Samsung C&T are non-exclusive agents for global market.

8. The relationship between WST & OEC.

OEC would operate its business merely in Korea or near Korea area. The business goal of WST is production & sale of WSH series instead of operation of WIG craft. OEC is such a model house of business to show the feasibility of WIG craft operation business.

9. Financial program

Usually, a customer gets its financial support by its own credit. The terms & conditions of finance program would be determined by buyer’s credit. So WST is not able to talk about it exactly. Regarding the refund guarantee (RG) insurance, Korean Exim Bank (http://www.koreaexim.go.kr) or same grade of bank will guarantee the refund of buyer’s money in case of unexpected event which is caused by WST.

10. The relationship between DSME & WST

DSME is one of the shareholders of WST. In this stage, WST & DSME discuss about cooperation business model for both. WST is not the subsidiary of DSME. WST & DSME would be a good partner by using their strong point such as WIG technology of WST & Marketing network of DSME.

11. Why Type-A WIG craft?

In the beginning of talk with LR, WST requested approval of Type-B WIG craft at first. LR requested, however, that the craft is to be Type-A. WST is ready for building Type-A 200 passenger class WIG craft already. Regarding Type-B, as far as now, WST considers Type-A is better than Type-B because 200 passenger class WIG craft has 10 meters of cruise altitude in maximum which prevents the craft from being heated by wave of 20 meters. Regarding polymorphic craft, WST needs to have a study to give you a precise answer. It seems, however, a matter of time at a glance to transform a passenger craft to a polymorphic craft although it may require some tradeoffs in payload.

12. Specifications of WSH-500

<table>
<thead>
<tr>
<th>Wing span</th>
<th>Overall (with winglet)</th>
<th>27.2 m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>w/o winglet</td>
<td>21.9 m</td>
</tr>
<tr>
<td>Length Overall</td>
<td></td>
<td>29.0 m</td>
</tr>
<tr>
<td>Height Overall</td>
<td></td>
<td>7.5 m</td>
</tr>
<tr>
<td>Draft (MTOW, even keel)</td>
<td></td>
<td>0.76 m</td>
</tr>
<tr>
<td>Masses</td>
<td>Basic Weight</td>
<td>11561 kg</td>
</tr>
<tr>
<td></td>
<td>Variable Load</td>
<td>356 kg</td>
</tr>
<tr>
<td></td>
<td>Disposable Load</td>
<td>5215 kg</td>
</tr>
<tr>
<td>Fuel</td>
<td>Type</td>
<td>Diesel</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>MTOW</td>
<td>17132 kg</td>
<td></td>
</tr>
<tr>
<td>855 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Passengers, baggage, etc)</td>
<td>4360 kg</td>
<td></td>
</tr>
<tr>
<td>Guarantee</td>
<td>The earlier of 2,500 hours of operation and 12 months after delivery</td>
<td></td>
</tr>
<tr>
<td>Engines</td>
<td>2 X Turbo-prop (Re-manufactured &amp; marinized)</td>
<td>2X 1400 hp</td>
</tr>
<tr>
<td>Engines</td>
<td>2</td>
<td>1400 hp</td>
</tr>
<tr>
<td>Fuel</td>
<td>Type</td>
<td>Diesel</td>
</tr>
<tr>
<td>Specification fuel consumption rate</td>
<td>250kg/hr (2.05m alt.)</td>
<td></td>
</tr>
<tr>
<td>Communication and Navigation system</td>
<td>ECDIS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electric/Air horn (certified)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GMDSS radio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ARPA radar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Night vision (optional provisions)</td>
<td></td>
</tr>
<tr>
<td>Equipments</td>
<td>Indication instruments</td>
<td>Wing incidence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Side slip indicator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Altitude indicator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Airspeed indicator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wind speed and direction indicator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Propeller speed indicator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine speed and health monitor</td>
</tr>
<tr>
<td>Maintenance (Compulsory)</td>
<td>1st year after delivery not exceeding 2,500 hours of operation</td>
<td>Free of charge</td>
</tr>
<tr>
<td></td>
<td>The earlier of 12 months and 2,500 hours of operation</td>
<td>10% of craft price per year</td>
</tr>
</tbody>
</table>

13. WSH-500 cost / production capacity

The price of WSH-500 starts from 7M USD. If the customer wants to install other engines such as 4 sets of PT6, the price would be adjusted accordingly. WST recommends, however, re-manufactured and marinized gas turbines because the turbines would not be guaranteed by the manufacturer if it is marinized while it can not be used without marinization. WST requires 25% of the price as the initial down payment. Another 25% is to be paid at the moment of aluminum cutting. Another 25% is to be paid after launch and the last 25% is after delivery. It is estimated that about 3~4 crafts can be manufactured per year at this moment. If WST gets more orders from customers, the capacity would be increased accordingly.
14. Operator (pilot)

Basically, WST pursues that the pilot would not take too much technical and physical burdens to operate WSH series. Contrary to normal airplane, there is no rotation during takeoff of WSH-500. It is just lifted up in vertical direction like an elevator in a building. The craft inherently maintains its pitch stability, roll stability, and heave stability without aid of pilot nor automatic control system. This is the key feature of WSH series which uses Hoverwing technology. The cost for training is not strictly determined yet. It would be calculated on the basis of actual cost according to customer’s request.

15. Maintenance

WST requires the craft is to be maintained by WST or its alliances with certain amount of maintenance cost, namely 10% of the craft price. According to the contract, the operator is guaranteed to minimize downtime disruption not exceeding 96 hours after its request for repair which is not caused by operator’s error.

16. Safety issues (collision)

- Bird striking

LR requires the wind screen of WIG craft is to be strong enough to resist bird strike during its flight. WST already has prepared bird strike analysis report. The strength of wind shield would be certified by LR at the end.

- Collision with a sea creature such as turtle on sea surface

WIG craft such as WSH-500 is expected to take off and to land around a designated area. After departure of harbor it slowly moves to a certain location for take-off. It takes just several kilo meters for take-off. The rate of collision with such obstacle is remote or less while the effect of collision effect remains “Major” or less which corresponds to a localized structural damage. Thus there is not safety problem due to collision. Regarding operability of the craft, the rate of collision can be sufficiently low with some care when necessary. Additionally, body temperature of turtles is a little bit higher than that of sea water. This leads to easy detection of turtle by thermal imaging system.

- Collision with a jumping sea creature (such as dolphin) above the sea surface

Dolphins and whales are warmer than sea surface. Thermal imaging system makes it easy to detect such obstacles easily. The failure mode effect of detection is “Major” or less which is similar to that of turtle collision.
TO: Son, Haeng-Yun [haeng-yun.son@lr.org]  
COMPANY: LR Ulsan  
OUR REF: LRF/21559  
DATE: 11 May 2010

**IMO RESOLUTION A.600 (15)**

We refer to your request, please be advised that the LR/IMO No for the vessel is

<table>
<thead>
<tr>
<th>Builder (Yard No)</th>
<th>Wingship Heavy Industries Corp-Gunsan</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMO Number</td>
<td>9590436</td>
</tr>
<tr>
<td>Year of Completion</td>
<td>2011</td>
</tr>
<tr>
<td>Ships current name</td>
<td>&quot;WINGSHIP WSH-500&quot;</td>
</tr>
</tbody>
</table>

1) Please note that an IMO Ship Number is assigned for a specific hull number and once issued, will not be subject to any alteration. If the type of ship being built under that hull number is changed or the dimensions changed significantly, then this office should be notified for clarification regarding usage of existing IMO number.

2) If the vessel name given for a hull number is changed during construction then, to avoid any confusion, this office should be notified immediately.

3) If the shipbuilding contract for which an IMO number has been issued for a specific hull number is cancelled by an owner, then that IMO number may become invalid. Please notify this office for clarification and approval regarding the usage of this existing IMO number. The former IMO number is not transferable to another hull at the shipyard.

**Best Regards**

**New Construction Section**  
**Lloyd’s Register – Fairplay Ltd**

The information received to assign an IMO Number has been obtained from sources believed to be reliable, but Lloyd’s Register - Fairplay Ltd. is unable to guarantee the accuracy of all details. Neither Lloyd’s Register - Fairplay Ltd. nor any of its officers, employees or agents shall be responsible or liable in negligence or otherwise however in respect of any inaccuracy contained herein or omission here from. The records of merchant ships registered in some countries are incomplete due to lack of official information. Lloyd’s Register - Fairplay Ltd. does not accept liability for any inaccuracies.
Statement of Construction Stage - Launching

Office: Mokpo
Date: 11 October 2011

This statement is issued to Wing Ship Technology Corp., Ltd.

WST Hull Number WSH-500 - IMO Number: 9590436

This is to state that:

The above craft has been under construction at the Wingship Heavy Industries – Gunsan Factory under survey by Lloyd’s Register.

After construction of hull and installation of equipment, WSH-500 has been launched out at Bieungdo-dong, Gunsan, Chollabuk-Do, Republic of Korea on 11th October 2011.

On successful completion of all trials, testing, approval of required plans, and modifications of hull, machinery and other systems where found necessary, and the craft being registered with a suitable National Authority the vessel may be considered suitable for Classification by Lloyd’s Register as a “Type-A” WIG craft.

***END***

Lloyd’s Register Asia
Mokpo Office

I. F. Forneca
Surveyor to Lloyd’s Register Asia
A member of the Lloyd’s Register Group
STAGE STATEMENT

Office: Mokpo

Date: 12 November 2010

This certificate is issued to Wing Ship Technology Co., Ltd., to confirm the undersigned Surveyor to this Society did attend on the 12 November 2010 for the purpose of witnessing initial Aluminium Cutting for the following vessel:

WST Hull Number WSH 500 (LR Construction Control Number MOK 1000001)
IMO Number: 9590436

Location: WST Gun-San Factory.

Material type: AL 5083-H116 6T
Plate number: Cast No. 8823282, Lot No. ACV 4
Plate size: 1500 x 6000 x 6 mm

J.Y. Lee
Surveyor to Lloyd's Register Asia
A member of the Lloyd's Register Group
STATEMENT OF FACT
FOR VESSEL'S REGISTRATION ONLY

Office: Mokpo
Date: 28 July 2011

This Statement is issued to WINGSHP TECHNOLOGY CO.

WSH- 500      IMO No: 9590436

To State that based on the information received by this office the above vessel will have the following approximate tonnage values, if volumes of all parts are calculated based on LxBxD method and GT & NT are calculated by the guidance formulae given in ITC, 1969 regulations.

GRT - 111     &     NRT - 9

Note:
1. This Statement is not issued on behalf of any National Authority.
2. This Statement is issued only for vessel’s registration may not be used for any other purpose.

L. F. Fonseca
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DSME Signs a MOU with Wing Ship Technology for WIG Craft

DSME has signed a memorandum of understanding with Wing Ship Technology, a world leader in wing-in-ground (WIG) craft. Through this MOU, DSME plans to assist in the commercialization of WIG crafts through mutual cooperation.

DSME agreed to co-market with Wing Ship Technology and jointly develop the WIG craft’s mooring system for use on offshore platforms. Additionally, DSME has plans to cooperate with Wing Ship Technology in the development and co-production of a 200-seat military use WIG.

Wing Ship Technology successfully built the world’s first commercial WIG craft capable of seating 50 people (WSH-500) last December. DSME has supported Wing Ship Technology since the company established itself in 2007 and helped in the successful development of the WSH-500 by providing financing of about 6.3 million dollars.

Through this cooperative agreement, it is possible to maximize both companies’ strengths and provide mutual benefits. For example, if people can use WIG crafts to approach offshore platforms in the ocean, it is safer and more economical than helicopters which are universally used these days. Through this MOU, DSME plans to increase the marketability of offshore platforms and help expand the WIG craft market.

Mr. Y.Y. Koh, the senior executive vice president of DSME, said, “WIG craft is the next generation of transportation and has a ship’s efficiency of operation and an aircraft’s immediacy. The growth potential in the WIG market is very high and we expect that it will be the best form of transportation to places which are hard to reach by vessels and air crafts.”

 Wing-in-ground effect ship: This hybrid works on the same principle as the hovercraft. Most types take off and land on water and while travelling move just above the surface, progressing on a cushion of air. This cushion is created by the aerodynamic interaction between the surface and the wing.

WIG ships could be the next generation of cargo or passenger vessel and they also have military applications. They can be larger than conventional aircraft – the Russians have built one that is 540 tonnes so they can transport more cargo or passengers than a conventional aircraft, can do so more economically, and they travel much faster than any other surface vessel such as a hydrofoil or Seacat. They have been around for decades and come in all shapes and sizes, but so far none have reached commercial production.
Wing-in-Ground (WIG) craft development took a firm step forward with the recent announcement that two Korean companies – Daewoo Shipbuilding & Marine Engineering (DSME) and Wing Ship Technology Corp – are to co-operate to make production of WIG craft a viable operating and commercial proposition. The offshore support vessel market is in their sights, and they also have plans to develop a 200-seat WIG craft for military use.

Wing Ship Technology successfully produced their 50-seat prototype WSH-500 (classed by Lloyd’s Register) late last year with $6.3 million funding assistance from DSME. US-based MTT Corp was contracted to design the special 1,400 hp gas-turbine propulsion systems for the WSH-500 to drive customized 10 ft propellers developing 4,800 lbs thrust.

German naval architect Hanno Fischer, a pioneer in WIG craft development, brought his expertise to bear on the Korean initiative by Wing Ship Technology (founded in 2007) to develop the WSH-500, and the builders say they intend four vessels for delivery in the current year at a price of about US$ 6.7 million each for the basic configuration.

DSME vice president Y.Y. Koh said WIG craft are well suited to meet the needs of the offshore market, considering that they were safer and more economical than widely-used helicopters.