



1. FULL MISSION SHIP MANEUVERING SIMULATOR

1.1. BASIC SCOPE OF SUPPLY

INSTRUCTOR SOFTWARE CONSIST OF:
) ARI Ship Maneuvering Simulator Instructor Station
) ARI Ship Maneuvering Simulator Server Application
) ARI GMDSS Module (Instructor)
) ARI Assessment Module
SHIP TRAINEE STATION CONSIST OF:
) Electronic Chart System Module
) Radar/ARPA module Software
) Visualization Software Modules
) Advanced Visual System for Lookout View (Independent Viewing Station)
) GMDSS Module
) Navigational Light/Bridge Alarm module
) Own Ship Conning/Steering console software based including autopilot, hand steering, NFU steering
) Navigation aids simulation software module
) Conning & Maneuvering Station software
) Resource pack of sound databases
) Resource pack for integration of hardware HMI components
) Resources Ship and Exercise Area Package are:
☐ 20 own ship models
☐ 25 target ship models
☐ 10 exercise areas
ARI HARDWARE, HARDWARE INTERFACES CONSIST OF:
) Maneuvering station
) Steering Station
) Radar Keyboard
) ECDIS Keyboard
) PTT Handsets
) Screen Based Gyro
) Azimuth Thruster Controls
INSTALLATION, COMMISSIONING & POWER UP, SYSTEM ACCEPTANCE TESTS
) Project Consultancy
) Site Layout, Design Drawings etc.
) Power, Network Drawings
) Factory Acceptance Test for Hardware Components
) Integration with Engine Simulator
) Site Acceptance
TRAINING AND HANDOVER [FIVE DAYS]
WARRANTY FOR 12 MONTHS
PACKING, FREIGHT AND TRANSIT INSURANCE FOR SHIPMENT

1.2. ADDITIONAL BRIDGE FEATURES

ADDITIONAL FEATURES:
) Anchoring and Mooring Module
) Ship to Ship
) Maneuvering using tugs

-) Maneuvering with mooring lines fixed to jetty
-) Maneuvering with mooring lines fixed to buoy
-) Anti-Piracy Module
-) Fire Control Detection Panel
-) Bow/ Stern Monitoring System
-) Hull Stress Monitoring
-) Ballast Water Control Panel
-) Torque Indicator
-) Fire door/water tight door monitoring panel

1.3. TUG FEATURES

-) Ship Assisting work
-) Escort work
-) High fidelity hydrodynamic modeling of tug behaviour
-) Using custom tug controllers to perform Tug Handling Maneuvering
-) Making fast and adjusting line length
-) Making towage transit
-) Basic rope behaviour under tension
-) Visualisation with facility to 360° around the horizon
-) Effect of wind and weather conditions
-) Push/ Pull action by tug
-) Procedural training in tug operations
-) Conning and Maneuvering Station

2.1. INSTRUCTOR & INDICATIVE TRAINEE STATION

INSTRUCTOR STATION



Indicative Instructor Station



INSTRUCTOR CAPABILITIES

The Instructor Station is a PC based set up which allows control and monitoring of the exercise.

Instructor can Launch, Pause, Resume exercises including replays. Some of the available features for control and monitoring during exercises include:

-) Control and monitoring of the available environmental conditions such as current, visibility, wind, swell, precipitation, clouds etc.
-) Easy monitoring of the own-ship parameters in graph or log and student actions
-) Start, stop, pause, continue, and restart of exercises
-) Replay of recorded exercise data
-) Control of the target ship shapes, signals, lights, etc.
-) Control for target ships' course, speed, etc.
-) Creating of hazardous and challenging conditions for trainee by fault injection in navigational equipment and machineries
-) Control of tug deployment and operations of Tug
-) Distress And Emergency Condition
-) Distress/ Safety Signal from selected target vessel, including Parachute flare, Bouyant smoke, Red Star, White
-) Assessment module for Trainee performance evaluation

2.2 TRAINEE BRIDGE LAYOUT & SPACE REQUIRE

Setup Bridge ARI Simulator dapat menggunakan layar TV LED dimana dalam penawaran ini sudah termasuk mock-up ruangan. Adapun untuk pelatihan (Training Center), kami menyarankan menggunakan bridge layout mulai dari 240°, menggunakan 7 LED TV dengan ukuran ruangan yang dibutuhkan **minimal 7m x 9m** namun jika dikemudian hari ingin dilakukan upgrade disarankan ruangan minimal 10m x 10m

Setup Tug Simulator ARI menggunakan layar TV LED dimana dibutuhkan 12 LED TV yang dipasang secara vertikal, dengan ukuran ruangan yang dibutuhkan **minimal 7m x 7m**.

Berikut adalah setup Field Of View (FOV) untuk Bridge Simulator dan Tug Simulator:

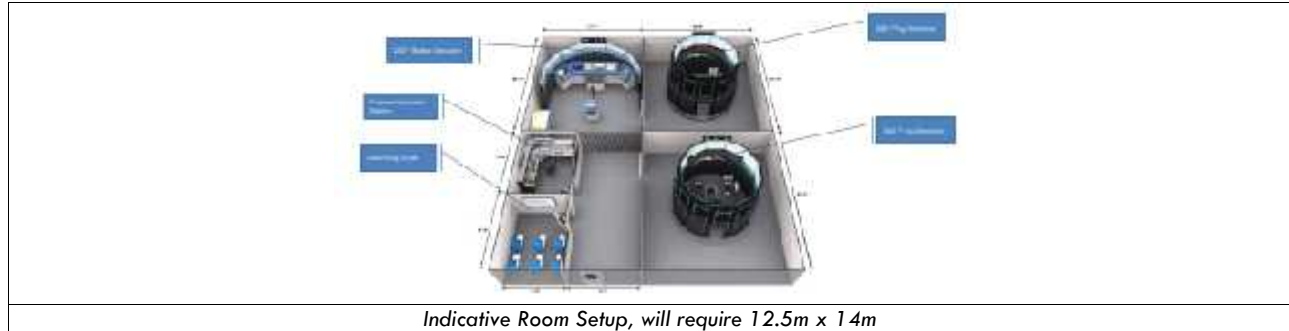
	
Indicative Layout using 12 Horizontal LED TV to create 360°FOV	Indicative Tug Layout using 12 Vertical LED TV to create 360°FOV



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2.3. HARDWARE HMI CONTROL DEVICES AND OTHER COMPONENTS [PROVIDED BY ARI]

MANEUVERING & CONNING CONSOLE HARDWARE CLASS A



Indicative Setup for Maneuvering Console DNV Class A

The Conning and Manoeuvring hardware control includes:

-) Thruster Control Panel with Alarms, Power Request, thruster ready status
-) Dual Handle Engine Telegraph
-) General Alarm Panel
-) Winch Panel
-) Anchor Panel
-) Doppler Log



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-) Engine Panel consisting of Alarm Panel, Control Panel and Status Panel
-) Sound Panel
-) View Port Control with joystick
-) Track Ball
-) Lamp Test and Dimmer Panel
-) CPP Pitch Controller

MANEUVERING CONSOLE AFT



LHS Control Console



RHS Control Console

OWN SHIP STEERING HARDWARE CONSOLE



Indicative picture of Ownship Screenbased Steering Hardware

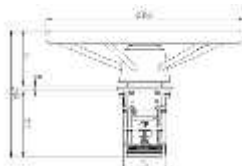
-) State of the art autopilot simulated panel
-) Main steering module display with Digital / Analogue Gyro/Magnetic compass display, steering motor/pump selectors, Digital/Analogue ROT and rudder angle, Fwd./Lateral speed displays, NFU Tiller, Auto, Hand, NFU and Remote Control steering modes, pump indicators and controls
-) Realistic Steering Wheel with main steering panel
-) Relevant alarms and indicators



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		Specification details basic versions	
		Materials / Finish	Steel A2, Al, POM, anodine, powder coating
		Weight (net)	Approx. 2 kg
		Movement, LF150-01-19 / LF150-01-30	±60° / ±150°
		Detent	In zero
		Panel plate	90 x 144 mm
		Wheel diameter / grip	350 mm / steel or padded
		Potentiometers	Single 5 kΩ, linear
		Termination	16 pins contact with plug
For external dimensions and cut-out, customization and options see page 2			

Indicative picture of Steering Hardware

Indicative picture of Steering Hardware

RADAR/ARPA & ECDIS KEYBOARD SERTA PERALATAN KOMUNIKASI (Indicative Picture)

		Radar Keyboard
		MARIS ECDIS Keyboard
 PTT Handset	 Dummy VHF	Peralatan Komunikasi untuk GMDSS

3. COTS AND OTHER PEHRIPERALS FOR FULL MISSION SHIP MANEUVERING

No.	PENGUNAAN (MODULE)	SPESIFIKASI PC
COTS FOR BASIC SCOPE OF SUPPLY		
1	Radar/ARPA; ECDIS; NAVAIDS; GMDSS; Conning	11x Intel I Core 5, 4GB RAM, 1TB Internal HDD, OS – Windows (64bit) 11x Monitor LED 24"
2	Docking Module	1x Intel I Core 5, 8GB RAM, 1 TB Internal HDD, OS – Windows (64bit) with Nvidia Graphic Card 1x Monitor LED 24"
3	Overhead Instrument Module	3x Intel I Core 7, 8 GB RAM, 1TB Internal HDD, OS - Windows (64 bit) with Nvidia Graphic Card 9x monitor LED 20"
4	240° Visual (Optional)	6x Intel I Core 7, 8 GB RAM, 1TB Internal HDD, OS - Windows (64 bit) with Nvidia Graphic Card



		12x LED TV 55"
5	Instructor Application Module	1x Intel I Core 7, 8 GB RAM, 1TB Internal HDD, OS - Windows (64 bit) with Nvidia Graphic Card 2x Monitor LED 24" 1x Printer (Print, Scan, Copy) 1x Keyboard + Mouse
6	Instructor GMDSS Module	1x Intel I Core 5, 4 GB RAM, 1TB Internal HDD, OS – Windows (64 bit) 1x Monitor LED 24"
7	Instructor Tug Application Module	2x Intel I Core 7, 8 GB RAM, 1TB Internal HDD, OS – Windows (64 bit) with Nvidia Graphic Card 2x Monitor LED 24"
8	Repeater	1x Radar Repeater LED 24"
		3x Visual Repeater LED 24" (Bridge View) 1x Intel I Core 7, 8 GB RAM, 1TB Internal HDD, OS – Windows (64 bit) with Nvidia Graphic Card
		6x Visual Repeater LED 24" (Tug View) 2x Intel I Core 7, 8 GB RAM, 1TB Internal HDD, OS – Windows (64 bit) with Nvidia Graphic Card
9	Debriefing	1x Intel I Core 5, 4 GB RAM, 1 TB Internal HDD, OS – Windows (64bit) 1x Projector with 70" Screen
10	BRIDGE MOCK UP 240° and 2 TUG MOCK UP 360°	Yes completed with Console & Chart Table on the Bridge and Air Conditioner (AC)
11	Network	1x Switch min 24 port, 1 Gbps 2x Switch min 16 port, 1 Gbps
12	UPS with Stabilizer, Electrical & LAN Cabling	Yes
13	Instructor Furniture & Standard room partition (Room size minimum 2m x 3m)	Yes
14	CCTV	Yes

4. SHIP STABILITY SIMULATOR

Fasilitas simulator kestabilan kapal dengan jenis kapal Bulk Carrier, yang mampu untuk mensimulasikan fenomena fisis stabilitas kapal. Simulator stabilitas kapal adalah software simulasi yang berfungsi untuk mensimulasikan fenomena kestabilan sebuah kapal dalam 3 sumbu vector (roll, pitch and heave).

Dengan pembebanan yang diberikan maka akan terjadi perubahan orientasi kapal setiap saat. Orientasi arah kapal dalam 3 sumbu vector setiap saat akan dihitung oleh software simulasi, kemudian dilakukan juga perhitungan parameter-parameter kestabilan kapalnya, yang ditampilkan dalam mode 2D maupun 3D. Dimana tampilan representasi 3D animation dimaksud dapat diperlihatkan perubahan-perubahan besar gaya dan posisi titik-titik sentral mekanika (center of gravity, center of buoyancy, metacentric, dll) setiap saat sebagai akibat perubahan bobot dan letak beban, yang ditunjukkan titik posisis dan magnitudo dari setiap vector. Selain itu computer juga akan menampilkan kurva-kurva parameter kestabilan kapal dari model kapal tersebut.

Dengan menggunakan simulator kestabilan kapal ini dapat diperkenalkan kepada siswa tentang:

- 1) Konsep displacement
- 2) Menghitung posisi G kapal sesungguhnya saat kosong atau Light-Ship



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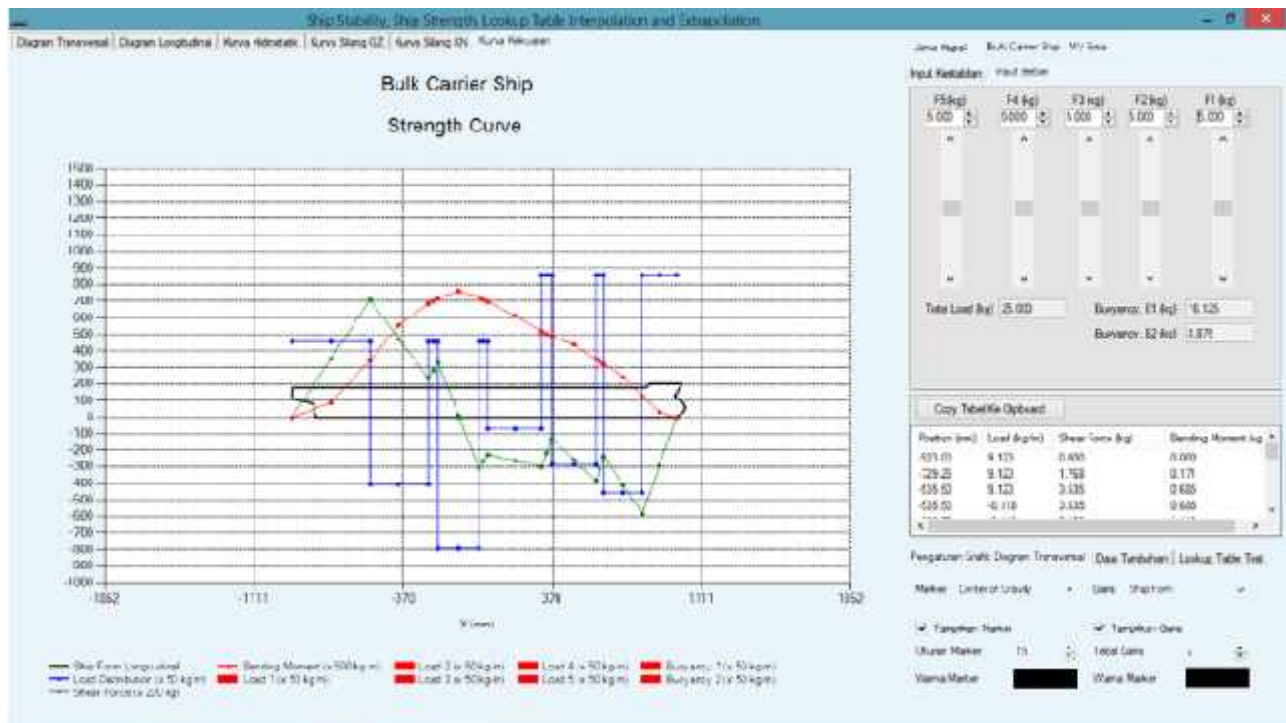
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- 3) Menghitung posisi G dalam arah membujur (Longitudinal): LCG
- 4) Menentukan posisi G dalam arah tegak (Vertikal): KG
- 5) Menentukan posisi G dalam arah melintang (transversal, lateral): TCG
- 6) Menghitung posisi G kapal akibat mengangkut muatan
- 7) Menghitung posisi G kapal akibat membongkar muatan
- 8) Menghitung posisi G kapal akibat memindah muatan
- 9) Menggeser muatan arah membujur untuk mengubah trim
- 10) Menggeser muatan arah melintang untuk mengubah senget
- 11) Mengatur tangki ballast untuk mendapatkan kondisi draft tertentu
- 12) Menilai kapal dalam kondisi tender atau stiff
- 13) Effect of slack water

Model kapal akan mengacu pada model kapal bulk carrier dengan konfigurasi sebagai berikut:

- Memiliki ruang palka
- Memiliki tangki ballast
- Memiliki tangki freshwater
- Memiliki tangki bahan bakar

Model kapal ini sekaligus digunakan untuk model kapal pada bridge simulator, sehingga efek kestabilan tadi dapat dirasakan perbedaannya pada saat kapal bergerak dan terganggu ombak.

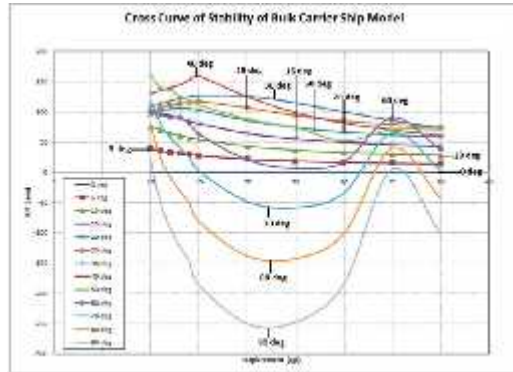




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Indicative Picture of Ship Stability Simulator

5. COTS AND OTHER PEHRIPERALS FOR SHIP STABILITY SIMULATOR

No.	PENGUNAAN (MODULE)	Keterangan
1	Instructor Station Software with PC Instructor	Intel I Core 7, 8 GB RAM, 2TB Internal HDD + 256GB SSD, OS - Windows (64 bit) with Nvidia Graphic Card 1 x Monitor LED 24.5"
2	Studen Station with Student PC	6x Intel I Core 7, 8 GB RAM, 2TB Internal HDD + 256GB SSD, OS - Windows (64 bit) with Nvidia Graphic Card 6 x Monitor LED 24.5"
3	Module CBT: Ship Stability Simulator	6 x Intel I Core 7, 8 GB RAM, 1 TB Internal HDD, VGA Minimal 1GB, OS - Win 8 6 x Monitor LED 21,5"
4	Module CBT: Ship Stability Tutorial	Yes
5	Scoring Computation	Yes
6	Database for Trainee Data Entry, Instructor Data Entry, Exercise Result Print out	Yes
7	Console Station	Yes
8	Instructor Furniture	Yes
9	Trainee Furniture	Yes
10	Network	2x Switch min 8 port, 1 Gbps
11	UPS with Stabilizer, Electrical & LAN Cabling	Yes
12	Projector with Motorized screen	Yes



6. GARANSI

Garansi yang diberikan adalah untuk masa waktu 12 bulan setelah dilakukan instalasi dan berita serah terima terhadap simulator dari pihak kami kepada pengguna yang mana dalam proses tersebut telah dilakukan pemeriksaan bersama yaitu semua komponen tidak bercacat baik secara bentuk simulator itu sendiri, komponen didalamnya termasuk komponen penunjang seperti tampilan luar yang telah sesuai dengan spesifikasi yang diberikan oleh kami dan simulator tersebut telah berhasil disimulasikan pada kondisi normal pelatihan.

Keamanan kelistrikan dan tempat peletakan simulator bukan merupakan bagian dari Garansi. PT. Javelin Global Famco memberikan garansi pada lingkup pekerjaan pengadaan simulator didalam ruangan yang disediakan oleh klien.

PT. Javelin Global Famco memberikan tanggap layanan dalam waktu 3x24 jam atau maksimal 5x24 jam (LUAR JABODETABEK) untuk melakukan pemeriksaan awal terhadap kendala yang ada.

Garansi meliputi:

1. Garansi software, PT. Javelin Global Famco memberikan garansi bahwa instalasi yang terdapat didalam PC merupakan instalasi asli dan original dari pabrikan, baik WINDOWS maupun dari Applied Research International merupakan milik klien. *Upgrade software* merupakan opsional, terkecuali sifatnya **mandatory** yang terkait akibat perubahan pada peraturan IMO dan STCW atau WINDOWS yang sudah *End Of Life*.

Garansi akan hangus jika ditemukan:

-) Virus yang diakibatkan oleh kelalaian pengguna, seperti memasukan *Flash Disc*, dll yang mengandung virus atau akibat pengaksesan internet yang tidak bertanggung jawab.

Catatan: Virus dapat menyebabkan "down time", sehingga pengerjaannya tidak terikat waktu

-) Crash pada software akibat kelalaian penggunaan seperti cara mematikan tidak sesuai prosedur dan juga mati mendadak akibat mati lampu), untuk itu disarankan pengguna menyiapkan UPS untuk mencegah kejadian diatas.
-) Melakukan *re-install* software simulator, tanpa memberitahukan ataupun berkoordinasi dengan pihak PT. Javelin Global Famco

2. Garansi PC dan Hardware penunjang, PT. Javelin Global Famco memberikan garansi bahwa spesifikasi tertera telah mendapat persetujuan dan telah sesuai standar yang diminta oleh pihak PT. Javelin Global Famco. Adapun jika spesifikasi yang tertera pada penawaran tidak lagi tersedia, maka kami akan memberikan **spesifikasi yang terbaru yang sesuai** untuk menjalankan aplikasi simulator. Garansi PC dan Hardware penunjang akan hangus jika terjadi hal-hal berikut ini:

-) PC dan Hardware penunjang tersiram air, kerusakan yang diakibatkan oleh hewan dan atau akibat kelalaian penggunaan lainnya yang tidak sesuai dengan *Standard Operating Procedure* (SOP) sehingga menyebabkan kerusakan pada PC dan hardware penunjang



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-) Kerusakan yang diakibatkan sambaran petir, lonjakan voltase listrik kedalam ruangan simulator, kebakaran, serta kerusakan yang terjadi karena pergeseran konstruksi bangunan yang diakibatkan oleh perubahan struktur maupun bencana alam yang menyebabkan kerusakan pada PC dan Hardware penunjang

Catatan: UPS tidak termasuk dalam garansi Hardware

INSTALASI & KUNJUNGAN

Pekerjaan instalasi simulator di lokasi adalah sebagai berikut:

-) Pembuatan jaringan internet dan kelistrikan didalam ruangan simulator
-) Pembuatan *mock-up* ruangan dan penempatan alat simulasi
-) *Setting up* LAN dan menghubungkan semua komputer kedalam jaringan
-) *Loading of SW* pada komputer yang disediakan
-) *Testing of Simulator*
-) Penyerahan dan pelatihan

Catatan: *Remote support dari India, diperlukan koneksi internet minimal 1Mbps dan pekerjaan PT. Javelin Global Famco tidak termasuk menghubungkan simulator ke jaringan internet serta penarikan kabel listrik dari luar kedalam ruangan*

Selama masa garansi kami memberikan batasan kunjungan adalah 10 hari kerja sedangkan untuk *remote support* (langsung dari PT. Javelin Global Famco) diberikan batasan 30 jam. Untuk kelebihan batasan kunjungan dikenakan biaya Rp. 3.000.000 per hari kunjungan dan untuk *remote support* dikenakan biaya Rp. 7.500.000 per hari. Untuk luar wilayah Jabodetabek, akan dikenakan biaya tambahan berupa akomodasi dan transportasi sesuai tagihan.

GARANSI HABIS

Setelah masa garansi habis, untuk menjaga agar peralatan tetap pada kondisi baik, maka kami menyarankan untuk melakukan perpanjangan masa garansi. Dengan memperpanjang masa garansi maka kami akan memastikan peralatan simulator tetap terjaga baik.

Jika klien tidak melakukan pembelian paket perpanjangan garansi atau jika telah melewati kuota waktu dari paket perpanjangan garansi, maka klien akan dikenakan biaya kunjungan Rp. 3.000.000,- per hari dan untuk *remote support* dari PT. Javelin Global Famco dikenakan biaya Rp. 7.500.000 per hari. Untuk wilayah luar Jabodetabek, akan dikenakan biaya tambahan berupa akomodasi dan transportasi sesuai tagihan. Jika terdapat penggantian Hardware maupun Human Machine Interface (HMI), maka pembeli akan dibebankan biaya perbaikan atau penggantian sesuai harga barang ditambahkan 15%.

PELATIHAN

PT. Javelin Global Famco akan menyediakan pelatihan, paska instalasi kepada pelatih (instruktur) maupun pihak yang bertanggung jawab terhadap operasi simulator. Rata-rata waktu pelatihan yang diperlukan adalah 4 hari kerja dan jika diperlukan perpanjangan waktu maka akan diberikan tambahan hari maksimal yaitu selama 2 hari kerja. Kegiatan



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pelatihan ini termasuk kegiatan peragaan alat simulasi (*commisioning*). Selain itu juga akan diserahkan manual penggunaan simulator kepada pengguna untuk dapat dipelajari lebih lanjut.

Perpanjangan masa pelatihan di Indonesia maka akan dikenakan biaya sebesar USD 1,350 per hari.

JAMINAN SUKU CADANG

PT. Jevelin Global Famco menjamin ketersediaan suku cadang khususnya untuk suku cadang PC dan Hardware penunjang adalah selama 5 tahun. Setelah masa tersebut kami menyarankan untuk melakukan *upgrade* PC, yang mana bila *upgrade* dilakukan tidak akan menghilangkan *software* simulator yang telah dimiliki. Namun hal ini tidak berlaku jika WINDOWS sudah *End Of Life (EOL)*, maka wajib dilakukan **Upgrade Software** PT. Jevelin Global Famco.

7. BUYER PREPARATION

1. Ruangan yang memadai/ mencukupi untuk meletakkan simulator tanpa tiang ditengah ruangan
2. Listrik masuk kedalam ruangan minimal adalah 20.000 Watt
3. Tenaga pengajar serta teknisi (IT)



9. CERTIFICATION

		DNV GL	
STATEMENT OF COMPLIANCE		Statement No: 023/180511 DNV GL Id No: 142681	
Particulars of Product			
Function Area:	<u>Bridge Operation Simulator</u>		
Class Notation	<u>INTEGRATED SIMULATOR SYSTEM, NAUT AW (SIM), DYNPOS - AUT (SIM), HSC, TUG, ICE, AHTS, IN</u>		
Name and type designation:	<u>ARI-NAVSIM10000An</u> Dry Cargo Ships, Container Ships, RO/RO Ships, Passenger Ships, Oil Tankers, Chemical Tankers, Liquefied Gas Tankers, Compressed Gas Tankers Naval, Naval Support, Naval Landing Craft Offshore Service Vessel - Anchor Handling, Towing, Supply, AHTS, Windfarm Maintenance, Standby Vessel, + Vessel of Special Operations - Crane Vessel, Cable Laying vessel, Pipe Laying vessel, Diving support Vessel, Fire Fighter, Semi-Submersible Heavy Transport Vehicle, Icebreaker, Tug, Dredger, Pusher, Inland Water Craft, Fishing Vessel, Stern Trawler		
Particulars of Manufacturer			
Manufacturer:	<u>ARI Simulation</u>		
Manufacturer address:	<u>Applied Research International</u>		
This is to confirm:			
That the above product is found to comply with Class A- Standard for Certification of Maritime Simulators No. DNVGL-ST-0033 April 2018.			
Application			
The above standard is based on requirements in the SOLW Convention, Regulation 1/12 and corresponding industry standard and guidelines.			
This Statement is valid until 2023-05-11 , provided the requirements for the retention of the Statement will be complied with.			
Issued at Sandefjord on 2018-05-11			
Nordholm, Aksel David		for DNV GL	
Digitally signed by Nordholm, Aksel David DN: cn=20180511 08:11:03 +0200			
Capt. Aksel David Nordholm Manager Simulator Certification		Partha Basu Auditor	
The Statement is subject to review and conditions are met. Any significant change to simulation performance may require the Statement to be renewed. Term code: MS3 301 Revision: 2018-03 www.dnvgl.com Page 3 of 3 © DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.			



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Lloyd's
Register

Current issue date:
Expiry date:
Certificate identity number:

1 July 2020
19 July 2023
0280622

Original approval:
ISO 9001 - 20 July 2008

Certificate of Approval

This is to certify that the Management System of:

**Applied Research International Pvt.
Ltd.**

46/13, E-Block, Okhla Industrial Area, Phase-II, New Delhi, 110020, India

has been approved by Lloyd's Register to the following standards:

ISO 9001:2015

Approval number(s): ISO 9001 - 0048141

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:

The design and development of software, simulators, computer and model based training aids.

Luis Cunha

Area Operations Manager - SAMEA

Issued by: Lloyd's Register Quality Assurance Limited



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