

ELECTRONIC SOLUTIONS

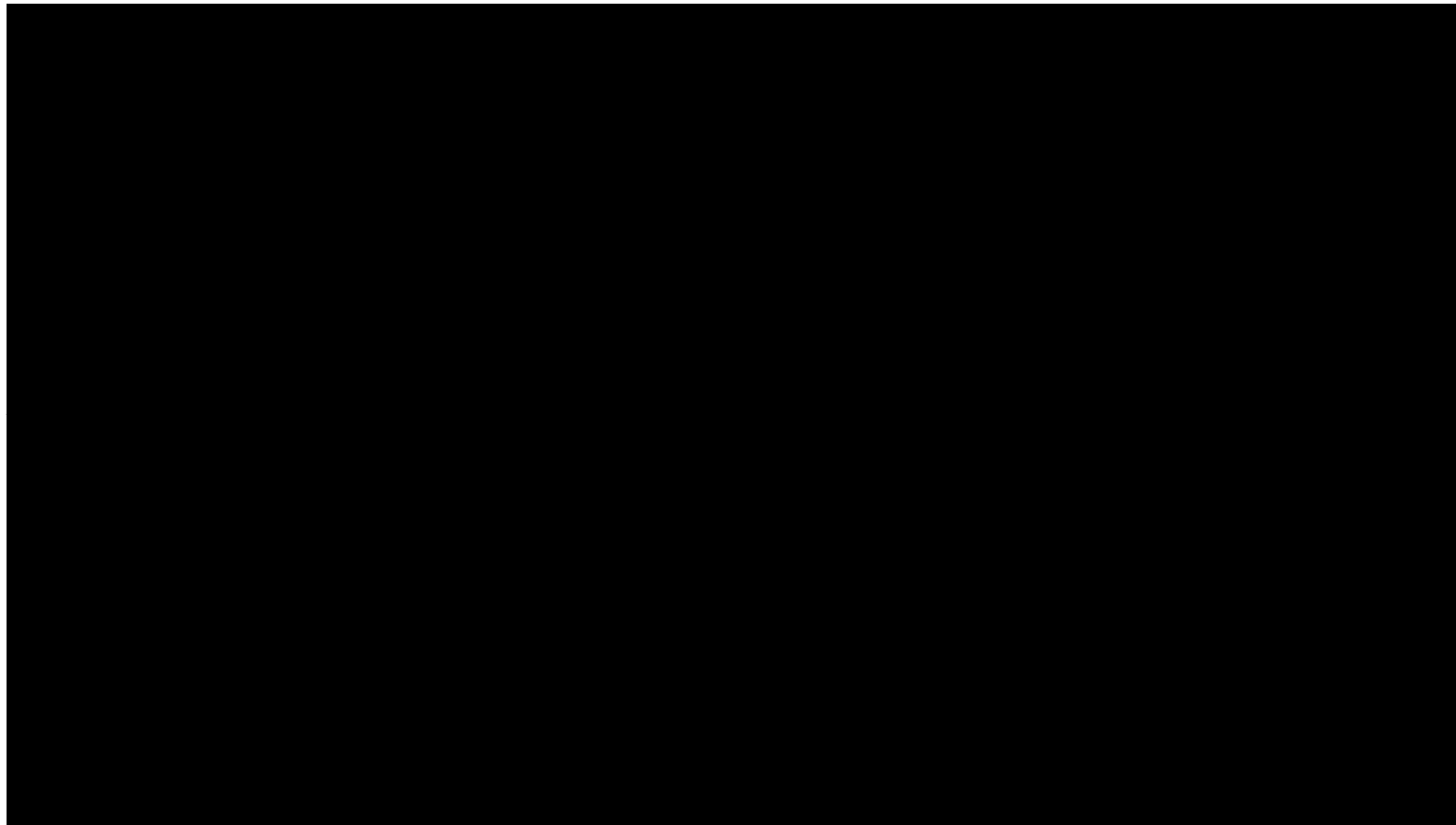


Simulation in der Aus- und
Weiterbildung in der Binnenschifffahrt

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Vice President Sales
Maritime Simulation

März 2017

"Are you one of those who think that education and training only costs money?"



from YouTube by SMS / Trondheim



- Try an Accident!! -

Training is Critical



Criticality of Training is defined by Lessons Learned from large accidents

like:

- Waldhof Accident
- Costa Concordia
- Deepwater Horizon Disaster
- Exxon Valdez Oil Spill
- ...

Reasons for these catastrophes repeat:

- wrong operation or missing / erroneous procedure
- wrong interpretation by staff
- bad communication
- failure of material
 - functionality not proven
 - bad or missing maintenance

⇒ **more than 80 % Human Factors**

Users of Electronic Learning Tools and Simulation in the „Maritime World“

- **Public Education Sector:**
 - ⇒ University of Applied Sciences- / Maritime Academies, Rescue Organisations
- **Navy Education Sector:**
 - ⇒ Navy Academies, Coast Guards
- **Privat Education Sector:**
 - ⇒ Marine Training Centres, Pilots, Shipping Companies, Offshore Industry, Manning Agencies
- **Scientific Analysis and Research**
 - ⇒ Universities, R&D Institutes, Port Construction, Water Way Design, Shipyards, Consultants, Suppliers



RDE Visual System DISI-Xtreme

Major Regulations influencing Maritime Simulator World

- International Convention on Standards of Training, Certification and Watchkeeping of Seafarers - STCW
- IMO Model Courses
- International Convention for the Safe of Life at Sea – SOLAS
- Standards on Certification of Maritime Simulators – DNV GL or NI
- ISM / ISPS, MARPOL, TOTS, OPITO and others
- only limited regulation for Inland Waterway education and training



RDE Visual System DISI-Xtreme

Teaching in Changing Times

earlier days:

Classroom –

chalk and talk



today:

computer supported instruction



LC Simulator (MTC Hamburg)

computer supported
self-study

FM Simulator supported team
training



FM Ship Handling Simulator (MITAGS Baltimore)

Consistent Training Concept

- fully Customized Training
 - content
 - processes
 - equipment
- well Defined Scope of Training
- state-of-the-Art Training Methodologies
- tracking of Progress
- integration by Learning Management System
- regular Re-Training
- motivating Environment



RHEINMETALL

Step 1: Basic Know-How

Step 2: Simulation Based Training

Step 3: Scale Models

Step 4: Team Training /

Training in Virtual Reality

Dangerous and in Reality only executable under highest Risk



U212 Submarine Control Simulator

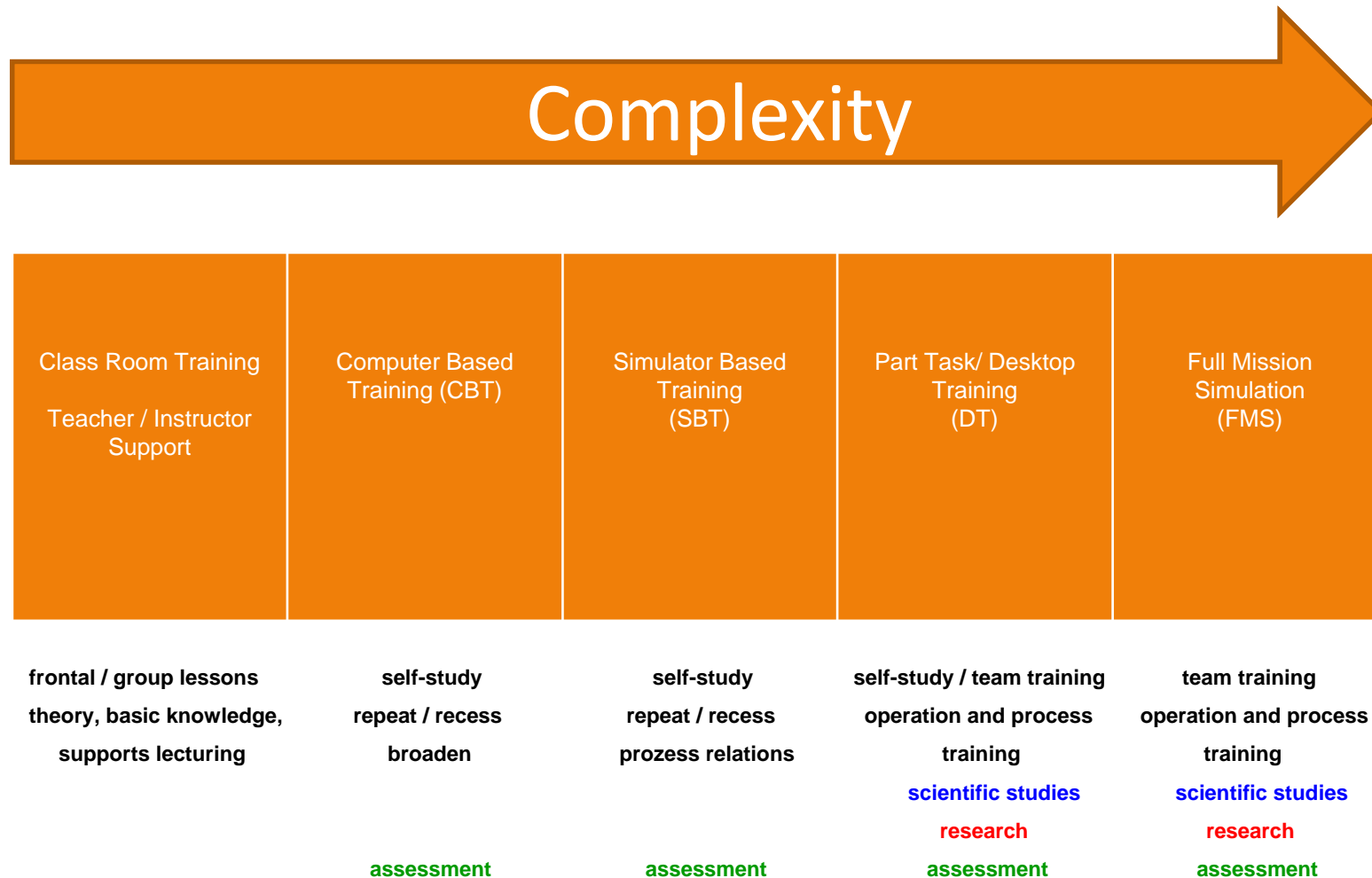
Interactive and Riskless Practice with little Efforts



e.g. Advanced Fire Fighting (STCW Section A-VI/3)



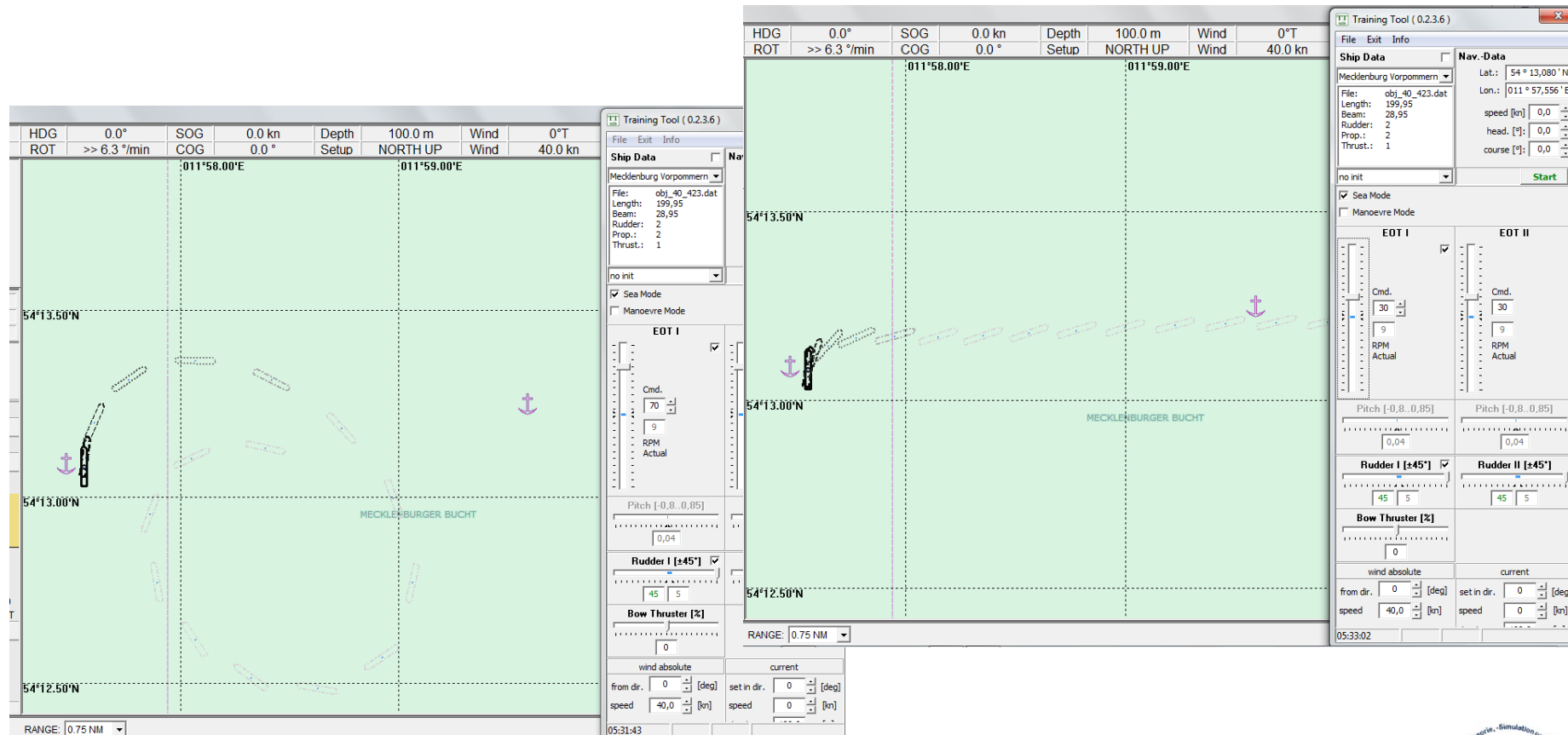
SST₇ Screen Shot



SAMMON* – Manoeuvring, Design, Trial & Planning Module

Fast Time Simulation Demo – in less than a second...

What you always wanted to know about turning crabbing, wind impact etc...



* developed by



Training Challenges

- growing industry faces lack of sufficient and qualified personnel
- experienced personnel is leaving or retiring
 - ⇒ Know-How is being lost
- extreme variation in available qualification
- significant fluctuation rates
- international crews / intercultural problems



Computer Based Training (CBT)

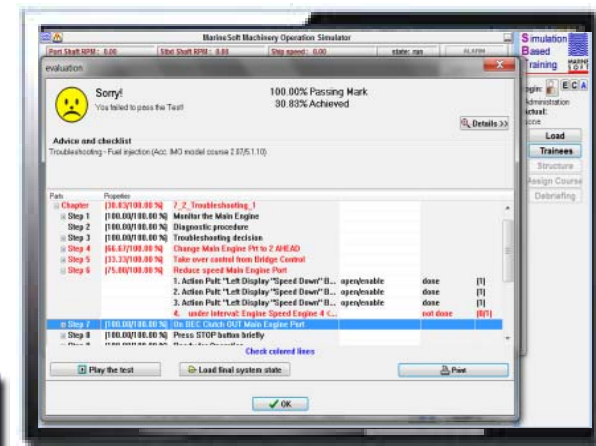
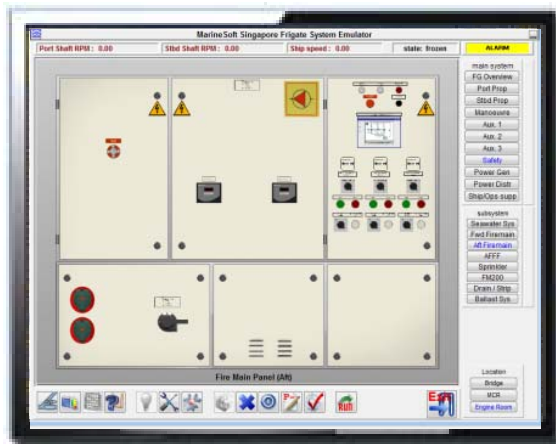
- no restrictions on choice of topics
- rapid transfer of knowledge / theory
- short-term developments
- presentation of current content / changes to rules
- reference book
- single and team training available
- final test with evaluation possible
- simple documentation and evidence



- seafaring personnel, land-based personnel
- complement of courses and events
- learning content prepared in capital
- keyword dictionary for research
- examples: ISPS Code / MLC 2006

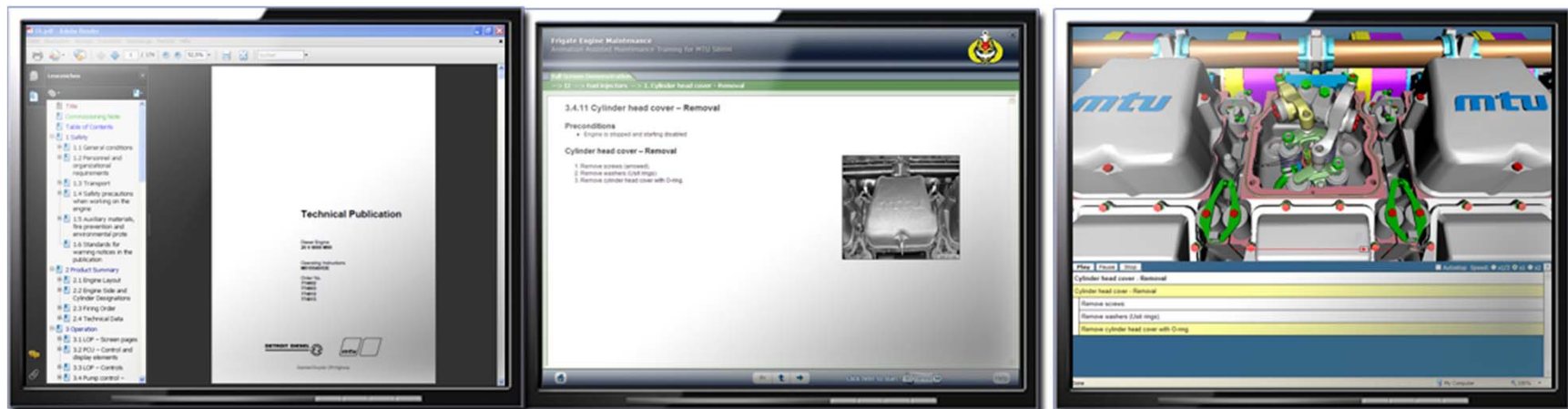
Computer Based Training – Operating Processes

- equipment / system familiarisation
- training for individuals or teams
 - exercises and / or courses
- tests / assessment
- automatic tracking of learning progress



Maintenance and Service Training

- familiarisation with systems, equipment, spare parts, tools
- process training for maintenance, e. g.
 - single tasks / steps (untighten of a specific screw...)
 - procedures (dismounting of injection nozzle)
 - complete maintenance processes (exchange of injection nozzle)



Simulator Based Training (SBT)

- Combination of CBT and Simulator based on CBT with entry points simulator functional running in the background

=> cross-linking of two learning systems

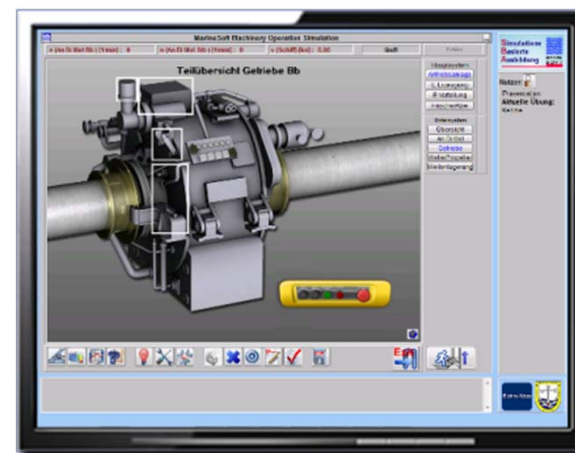
- CBT: basic functionality of an element
- Sim: integration of the element into a functional process
- Simulator is running in ILT mode (Instructorless)
- Tracking of all process operations during a Chapter CBT
- Review and consolidation of subject just learned



Operation and Troubleshooting

Simulation & Simulator Based Training (SIM / SBT)

- Simulation + interactive learning modules (CBA) = SIM / SBT
- SIM / SBT as dual monitor solution
- imparts knowledge for:
 - operation
 - maintenance
 - trouble shooting and fixing



Part Task Trainer / Desktop Trainer / Expert Systems



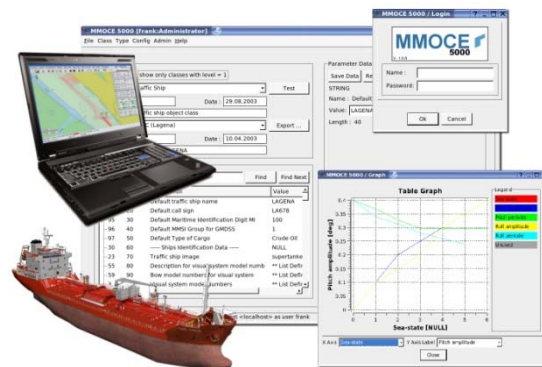
Stand alone Radar Simulator (no visual)



Onboard Application



Portable SHS Laptop incl. 3-Channel Visual



**small
compact
flexibel
portable**



SES incl. Smartboard

Full Mission Simulatoren

Harbour Scene DISI-Xtreme



FM SHS incl. original IBS (MTC Hamburg)



FM SES (SGC Semarang)



SMCSim (combined SMCS / SST7)

**highly
realistic
team-oriented
CRM / BRM**

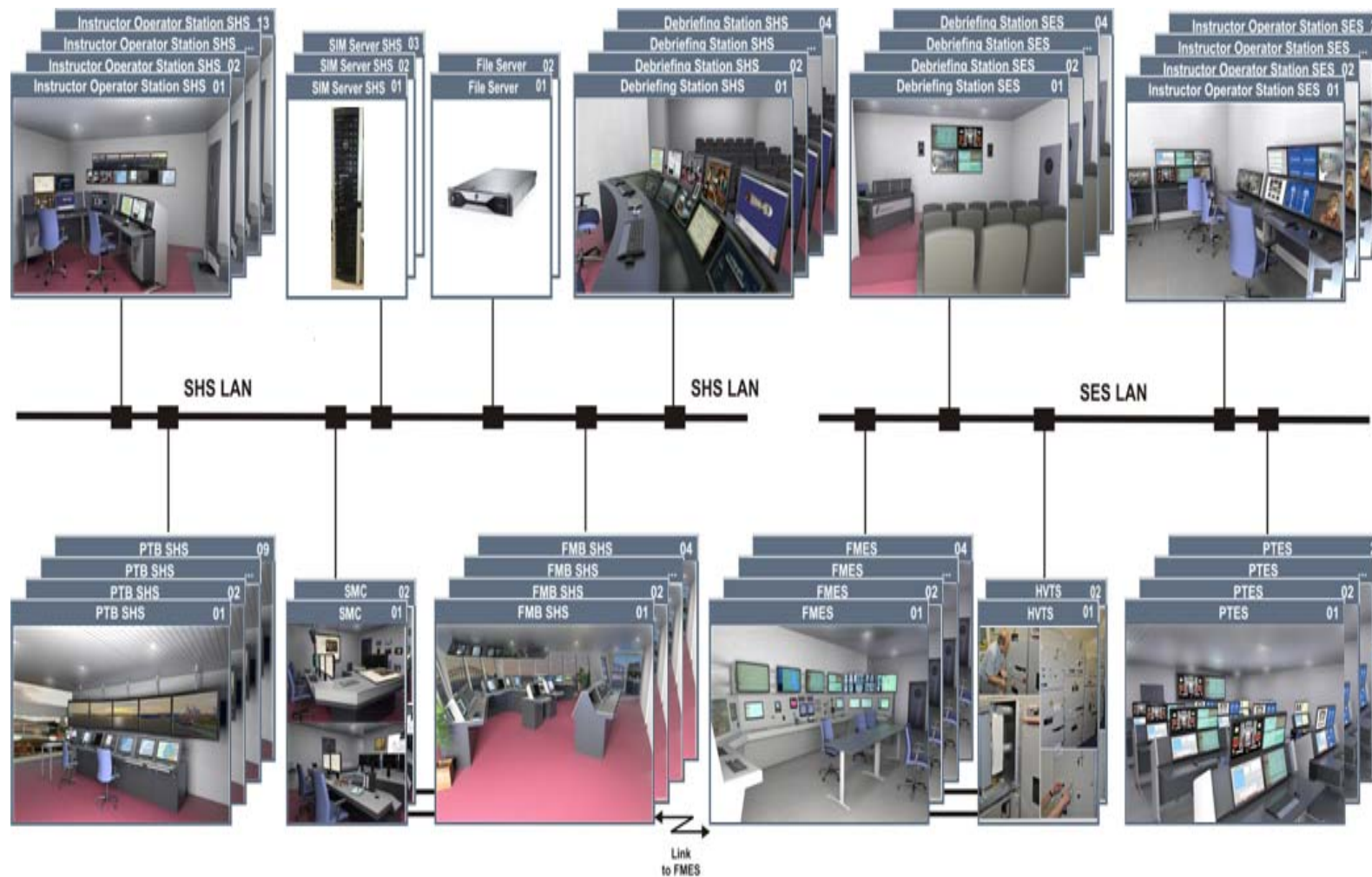


Heavy Lift Simulator (Elsfleth)

Maritime Training Centre



Maritime Training Centre



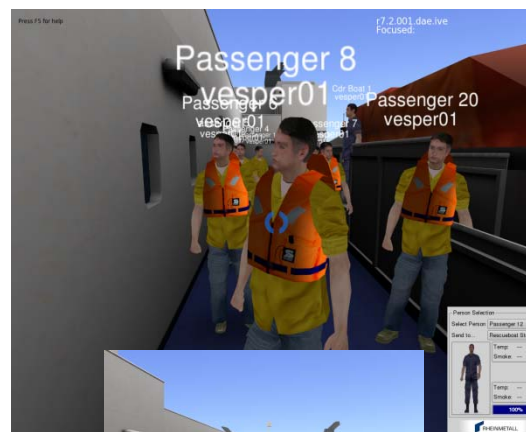
Real World

Emergencies, Fire, Explosions, Water Inrush



Asymmetric Threats





**transferred into a virtual
3D-training environment**



Emergency Response and Crisis Management Training by integrated Simulation



Target Personnel:

- Rescue Coordination Staff
- Offshore Installation Manager (OIM) and Emergency Response Team (ERT) Personnel
- Support Forces Team Members

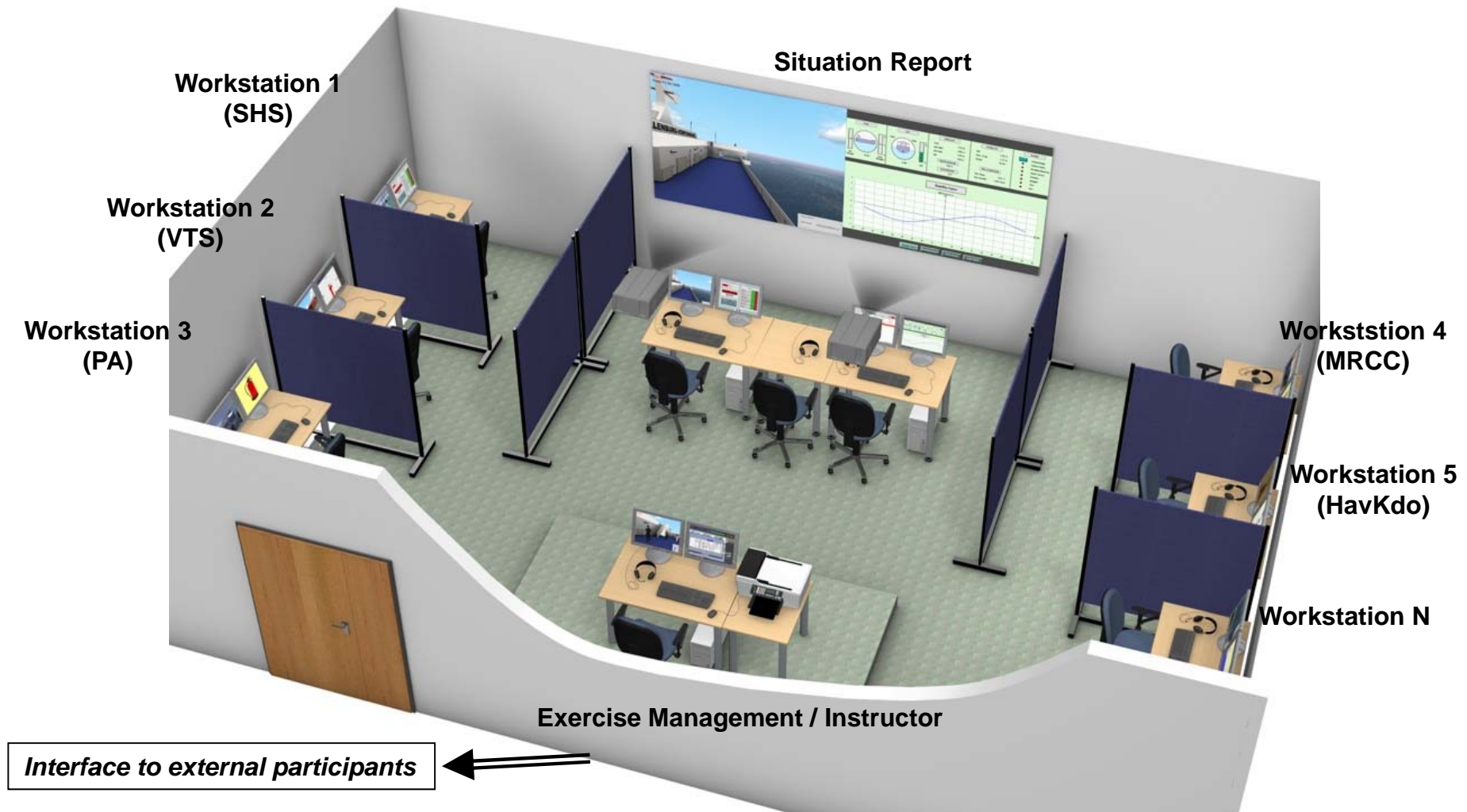
Disaster Scenarios:

- Search and Rescue Operations
- Oil Spill accident
- Gas release accident
- Damage after Explosion
- Fire
- Helicopter damage and fire after landing
- Terror or protest attack

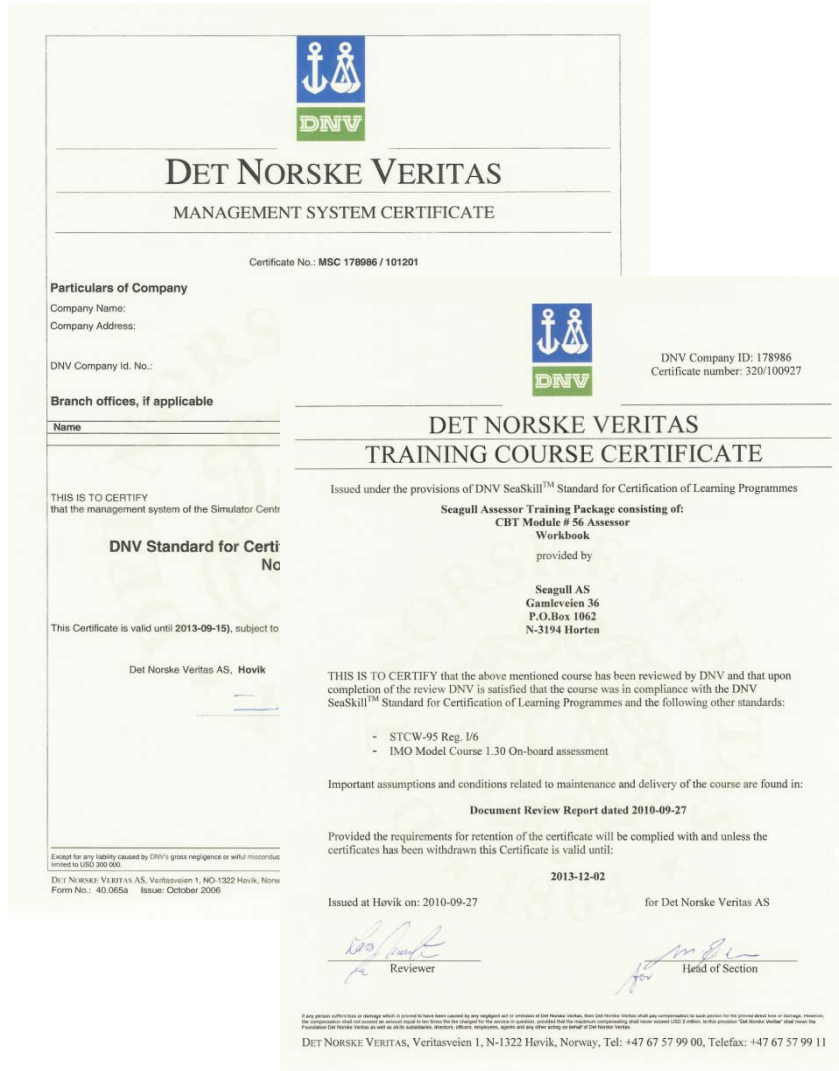
Challenges to manage:

- procedures according to Crisis Management Plan
- information gathering after incident
- information to platform personnel
- communication with local support forces
- coordination of external support forces
- communication with headquarters
- search, rescue and fly-out of injured persons
- evacuation scenarios

Harbour Crisis Management – Simulator HCM



General Conditions



DET NORSKE VERITAS
MANAGEMENT SYSTEM CERTIFICATE

Certificate No.: MSC 178986 / 101201

Particulars of Company
Company Name:
Company Address:
DNV Company Id. No.:
Branch offices, if applicable
Name:

THIS IS TO CERTIFY that the management system of the Simulator Centre

DNV Standard for Certification

This Certificate is valid until 2013-09-15, subject to

Det Norske Veritas AS, Hovik

Except for any liability caused by DNV's gross negligence or willful misconduct limited to USD 300 000.
DET NORSKE VERITAS AS, Veritasveien 1, NO-1322 Hovik, Norge
Form No.: 40.065a Issue: October 2006

DET NORSKE VERITAS
TRAINING COURSE CERTIFICATE

Issued under the provisions of DNV SeaSkill™ Standard for Certification of Learning Programmes

Seagull Assessor Training Package consisting of:
CBT Module # 56 Assessor Workbook
provided by

Seagull AS
Gamleveien 36
P.O.Box 1062
N-3194 Horten

THIS IS TO CERTIFY that the above mentioned course has been reviewed by DNV and that upon completion of the review DNV is satisfied that the course was in compliance with the DNV SeaSkill™ Standard for Certification of Learning Programmes and the following other standards:

- STCW-95 Reg. I/6
- IMO Model Course 1.30 On-board assessment

Important assumptions and conditions related to maintenance and delivery of the course are found in:

Document Review Report dated 2010-09-27

Provided the requirements for retention of the certificate will be complied with and unless the certificates has been withdrawn this Certificate is valid until:

2013-12-02

Issued at Hovik on: 2010-09-27 for Det Norske Veritas AS

[Signature] Reviewer *[Signature]* Head of Section

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DET NORSKE VERITAS, Veritasveien 1, N-1322 Hovik, Norway, Tel: +47 67 57 99 00, Telefax: +47 67 57 99 11

Development and design is always in accordance to IMO guidelines, for example STCW, SOLAS, ISM / ISPS, Model Courses, etc.

Certification by:
Det Norske Veritas (DNV GL)
Commission on River Rhine Shipping

tell me - and I will forget

show me - and I will remember

let me do it - and I will understand

(Konfuzius)

Success factors for Lifelong Learning by using modern Technologies

⇒ **Take positive experience away!**

some requirements:

⇒ **trainee must identify himself**

⇒ **acceptance must be ensured**

⇒ **well-trained instructors necessary**

⇒ **didactic training**

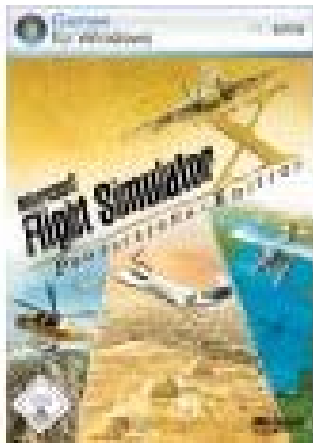
⇒ **realistic training scenarios**

⇒ **realistic simulation**

⇒ **reliable systems**



Quality of Training Means - Selection Criterias



“A major breakthrough in price and quality”

- most of the simulators are selected by evaluation of papers
- certification (DNV Class A / B / C / S)
 - ⇒ configuration and functions
 - ⇒ limited information on quality and performance
- selection according to individual requirements
- where are the main differences?
 - mathematical / physical models
 - sensor simulation (for example radar, ECDIS)
 - frame rate, synchronisation visual system channels, etc.
- future oriented, modularity, stability

Review – Questions – Quality-Test-Scenerios – Direct Operation

AINS 6000

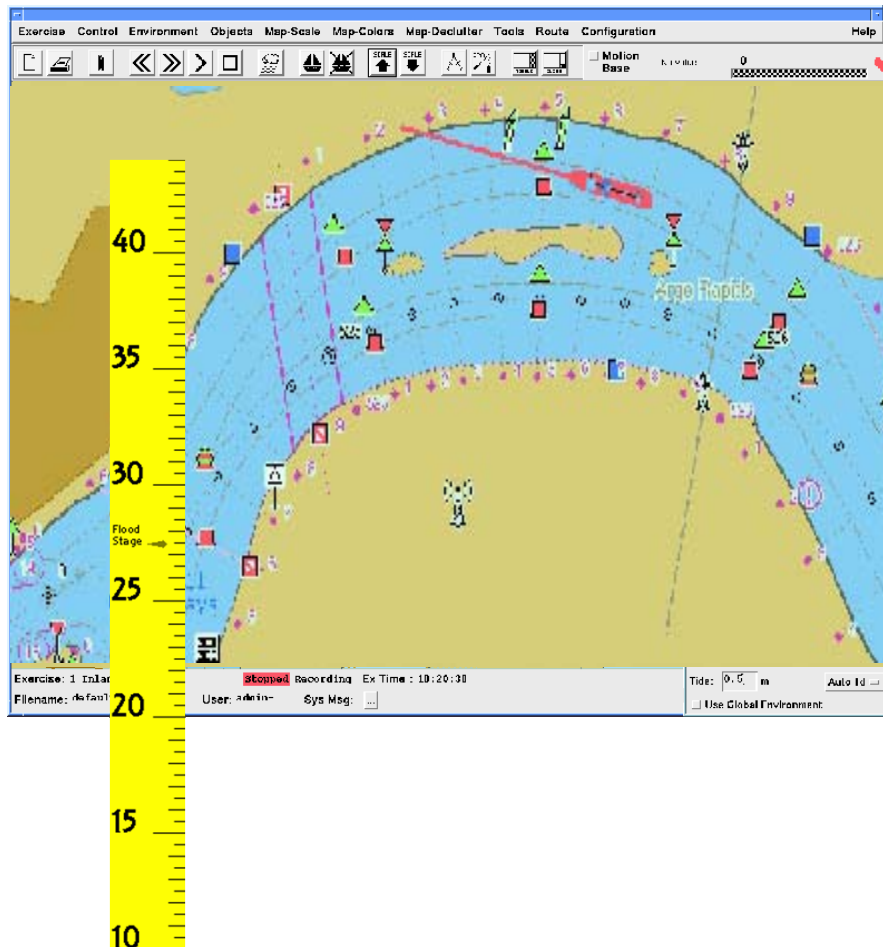
Inland Navigation Challenges and Capabilities



- **Advanced Inland Navigation Simulator**
AINS 6000 for:
 - Inland waterway navigation training
 - Research & Development like inland waterway -, inland harbour - and vessel - design
- **Simulated inland waterway vessel:**
 - Spits
 - Kempenaar
 - Europa vessel
 - Barge tow and pusher convoys
 - Tank vessel
 - Car vessel
 - Container vessel
 - Ro-ro vessel
 - Pallet ship
 - River boats etc.

AINS 6000

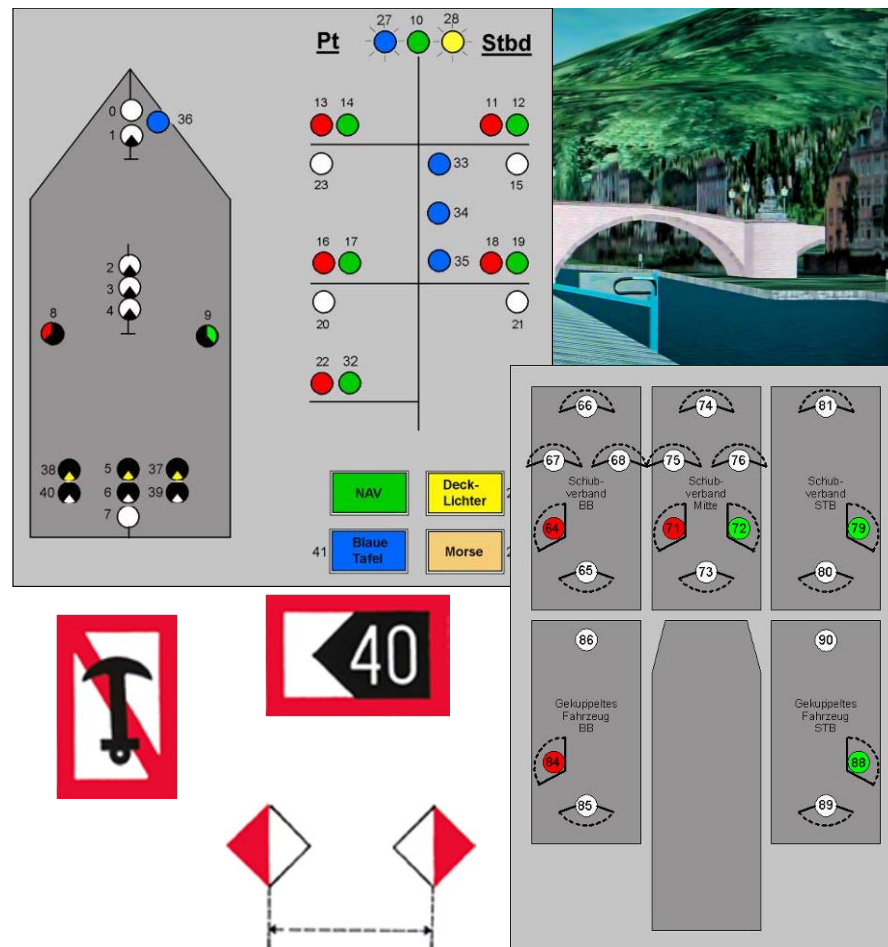
Inland Navigation Challenges and Capabilities



- Advanced Inland Navigation Simulator Features & Functions
 - Inland ECDIS with inland waterway specific objects
 - Distance and speed displays in metres, kilometres and km / h
 - Consideration of collision with bridges
 - “Current Follows River” function including variation of flow speed in function of curve radius
 - Consideration of water gauge river stages (decreasing water level towards estuary mouth).

AINS 6000

Inland Navigation Challenges and Capabilities



- Presentation of waterway signs
- Extended navigation lights for
 - Inland water vessel
 - Convoys
 - ..

AINS 6000

Inland Navigation Challenges and Capabilities



- Presentation of waterway signs
- Extended navigation lights for
 - Inland water vessel
 - Convoys
- Simulation of tow and pusher convoys in configurations from
 - Single lane / monomial to
 - Double lane / trinomial (class VIc)
 - Triple lane / bipartite (class VII)
- Presentation of inland waterway specific Radar objects
 - Bridges
 - Power poles
 - reflectors on power lines.

AINS 6000

Inland Navigation Challenges and Capabilities

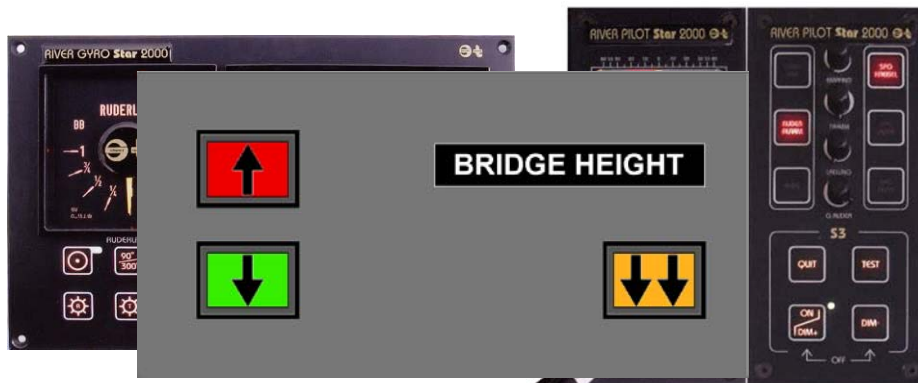


- Inland water vessel specific operating consoles with controls and displays

- Autopilot with radius control (river pilot)
- High resolution turn indicator
- Etc.

- Special functions

- Adjustable wheelhouse function
- Bow rudder
- Emergency rudder
- 3D Collision with bridges
- 3D Bow Waves.



The corporate sectors



RHEINMETALL AG

Employees: 21,800

Turnover: **€4.6 billion**

EBIT: **€112 million**



DEFENCE

Sales: **€2.2 billion**

Employees: **~ 12.000**



AUTOMOTIVE

Sales: **€2.5 billion**

Employees: **~ 9.800**

(Fiscal Year 2013)

Rheinmetall Defence Business Units:

A wide product portfolio for Forces, Simulation and Training

Combat Systems	Electronic Solutions	Wheeled Vehicles
Combat Platforms	Air Defence & Naval Systems	Logistic Vehicles
Infantry	Mission Equipment	Tactical Vehicles
Protection Systems	Simulation and Training	Customer Service
Propulsion Systems		
Combat International		

Comprehensive Competence for Simulation and Training

Wide range of training solutions for Industry, B2B and Military Customers



LAND



LIVE



FLIGHT



MARITIME



PROCESS

Comprehensive competencies in Management, Technical Solutions and Services



E-LEARNING



PART TASK



FULL MISSION



TURN KEY TRAINING
CENTRES



SERVICE AND OPERATION

Maritime and Process Simulation



**Oil & Gas
E&P-Process
Simulation**

Submarine Simulation



**Offshore
Simulation**

**Safety and
Security Trainer**

**Ship Handling
Simulation**



ASW & Naval Procedure Simulation



Heavy Lift Simulation



Power Plant Simulator

Simulators Worldwide



Oil & Gas Simulation

- Upstream Production Process Simulation
- Scale Models

Maritime Simulation

- Ship Handling Simulation
- Engine Room Simulation
- Submarine Simulation
- (Liquid) Cargo Simulation
- Heavy-Lift and Sea Safety Training
- Procedural and Tactics Simulation

Process Simulation

- Nuclear Power Plant Simulation
- Fossil Power Plant Simulation
- Combined Cycle Power Plants

Land-based and Live Simulation

- Battlefield and Combat Simulation
- Air Defence Simulation
- Tactics Simulation
- Driving Simulation

Flight Simulation

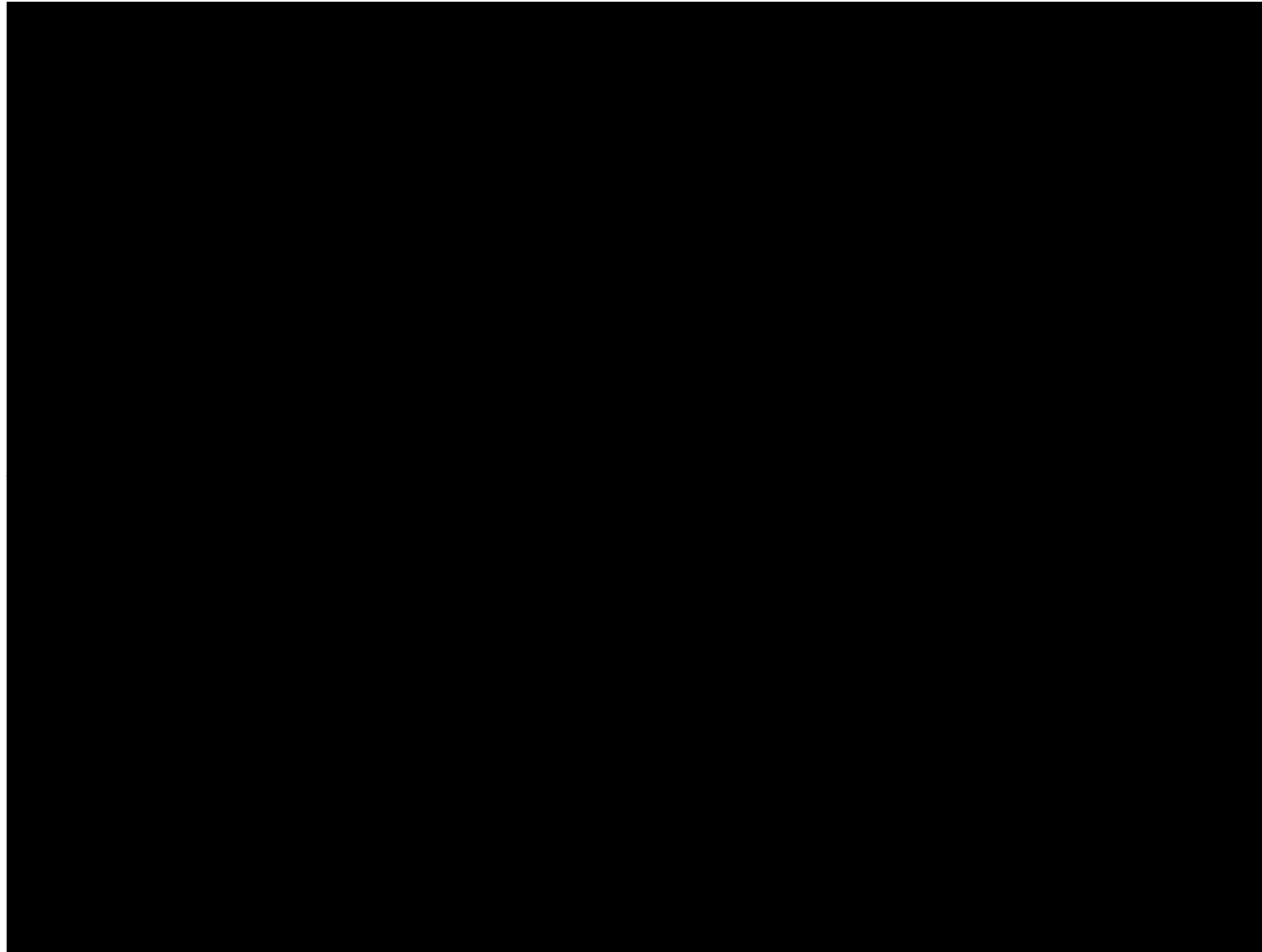
- Full Mission/Full Flight Simulation
- Part Task Trainer
- Visual Systems

Computer Based Training Systems

> 2,000 simulators delivered world wide



“Modern Simulation today- a world full of imagination”





Thank you for your audience!



Contact

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