Quality MET: essential for Quality Shipping
A GlobalMET perspective

Prof. Capt. S.J.Cross, Director of Projects
Maritime Institute Willem Barentsz, Netherlands

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Questions to answer

- What is GlobalMET?
- STCW 95 revision issues?
- Transfer of real competence based learning?
- Potential results of quality simulation?
- Conclusions?

GLOBALMET FACTS

MET organizations

- IMLA (International Maritime Lecturers Association)
  - Incorporating INSLC, ICERS, IMEC
- IAMU (International Association Maritime Universities)
- Various regional organizations
- IMSF (International Marine Simulator Forum)
- GlobalMET (Global Maritime Education and Training association providers, formerly AMETIAP)

Global MET

- Established 1996 by 18 MET institutes in Asia/Pacific
- Per 2010: over 100 full and associate members
- Promote, develop and support the interests of members in development and quality of maritime education and training

Global challenges

- STCW 95 is often called the minimum standard of MET
- STCW 95 does not contain a minimum level or depth of training or education
- There are many interpretations of criteria possible
- STCW 95 does contain the minimum amount of competences required of a seafarer
- Harmonization of interpretation would be beneficial, possibly through global network

AMETIAP from regional to global

- Originating in Asia/Pacific region
- Support aims and objectives of IMO
- Cooperate with IMO, ILO, ASF, ITF, IUMI
- Increasing global interest through membership
- Change of name to Global MET

GlobalMET’s geography

American Samoa, Australia, Bangladesh, Belgium, Bulgaria,Canada, Chile, China, Cyprus, Georgia, Greece, India, Ireland, Indonesia, Japan, Malaysia, Maldives, Monaco, Myanmar, Netherlands, New Zealand, Norway, Pakistan, Papua New Guinea, Philippines, Russia, Singapore, South Africa, Sri Lanka, Sweden, Trinidad, Turkey, United Arab Emirates, United Kingdom, United States, Vietnam

STCW95 AND REVISION

Time frame

- 2010 STW 41 revision proposal draft
- Manila diplomatic conference June 2010
- 2012 implementation
- Transition period until January 2017

Objectives

- Main goal for revision to bring Convention “up to date” with maritime industry and Maritime Labour Convention (MLC)
- Extend application to include personnel on watch and personnel with tasks relating to safety, security, protection of environment
- Update general training requirements to align these with developments of other regulations and requirements

Conditions

- Retain structure and goals of 1995 revision, do not amend articles of Convention nor down-scale standards
- Address inconsistencies, interpretations, outdated provisions, MSC instructions, clarifications issued, technological advances
- Address special character and circumstances of short sea shipping and offshore industry
- Address security-related issues and requirements for effective communication
- Provide flexibility for compliance and required levels of training, certification and watchkeeping due to innovation in technology

Mandatory Code Part A

New mandatory training for:

- ECDIS
- Bridge resource management
- Engine room resource management
- Requirements of leadership ability on all levels
- Communication
- Security training all personnel with security tasks.

In detail additional

- Leadership and managerial skills, situational awareness and decision making training in both deck/engine CoCs
- Greater use of simulation for training of marine engineers
- Inclusion of competences for able seafarer deck/engine
- Enhanced refresher training/revalidation and identification of refresher training that cannot be done on board
- Training for oil/chemical/gas tankers and fire fighting
- Inclusion of competences and qualifications of optional Electro-Technical Officer

Guidance Code Part B

New training guidelines have been developed on:

- Navigation in polar areas
- Offshore Supply Vessels (OSV) (Anchor handling)
- Dynamic Positioning (DP)
- Damage control.

Comments heard

- The review may well have been comprehensive but the changes are ‘minimal’
- No reduction of the established standards
- More training has been added but not many outdated provisions have been removed

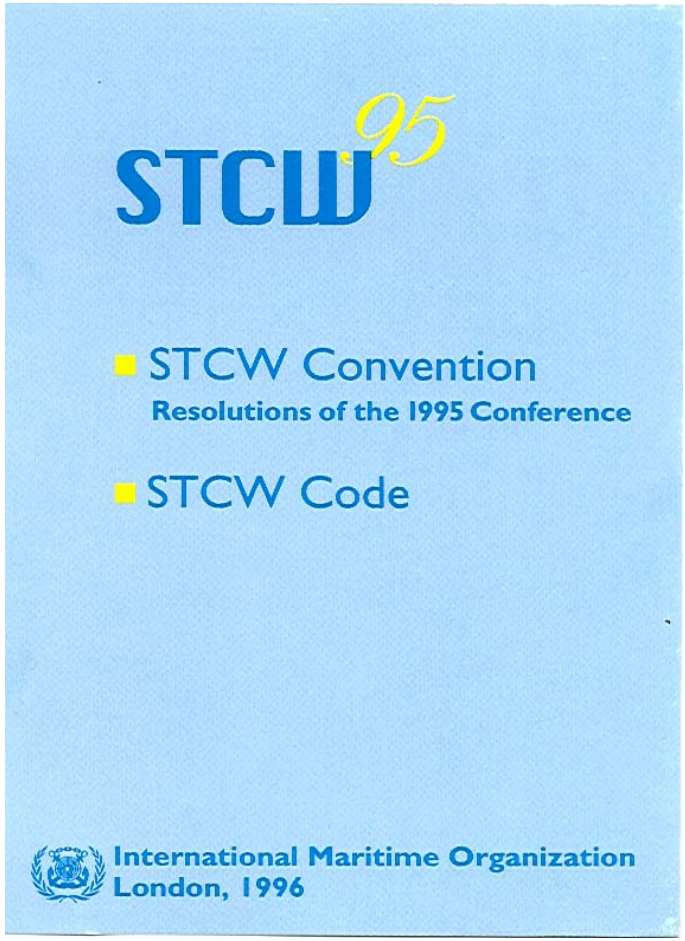
Seafarer training/education issues

- Which type of education or training is required?
- How to transfer knowledge into competence?
- Which training tools?
- Which assessment tools?
- Is acquiring competence possible ?

Those were the days.....

The way it is now .....

Rules and regulations



- I/6 Training and assessment
  - within an institution
  - competence assessment
- I/8 Quality standards
  - training programmes
  - examinations
  - personnel qualifications
- I/12 Use of simulators
  - performance standards
  - programmes/assessment
  - personnel

Table A-II/2

Specification of minimum standard of competence for masters and chief mates on ships of 500 gross tonnage or more

Function: Navigation at the management level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Plan a voyage and conduct navigation	Voyage planning and navigation for all conditions by acceptable methods of plotting ocean tracks, taking into account, e.g.: .1 restricted waters .2 meteorological conditions .3 ice .4 restricted visibility .5 traffic separation schemes .6 areas of extensive tidal effects Routeing in accordance with the General Principles on Ships' Routeing Reporting in accordance with the Guidelines and Criteria for Ship Reporting Systems	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved simulator training, where appropriate .3 approved laboratory equipment training using: chart catalogues, charts, nautical publications and ship particulars	The equipment, charts and nautical publications required for the voyage are enumerated and appropriate to the safe conduct of the voyage. The reasons for the planned route are supported by facts and statistical data obtained from relevant sources and publications. Positions, courses, distances and time calculations are correct within accepted accuracy standards for navigational equipment. All potential navigational hazards are accurately identified.

Competence ?…….

- Competence (Keen 1992, Parry 1996) : combination of skill, attitude, knowledge
- Competence (Fletcher 1995): ability to perform a particular activity to a prescribed standard.
- Competence (Dutch Higher Education Council 2002): potential to handle new, unexpected, untrained situations

Competence required!!

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Assessment ?……..

- Multi - methodical reflection procedure in order to collect evidence of performance
- Assessment framework through competence based standards
- Testing looks back to say something about the past learning
- Assessment looks ahead in competence based learning

Competence based assessment

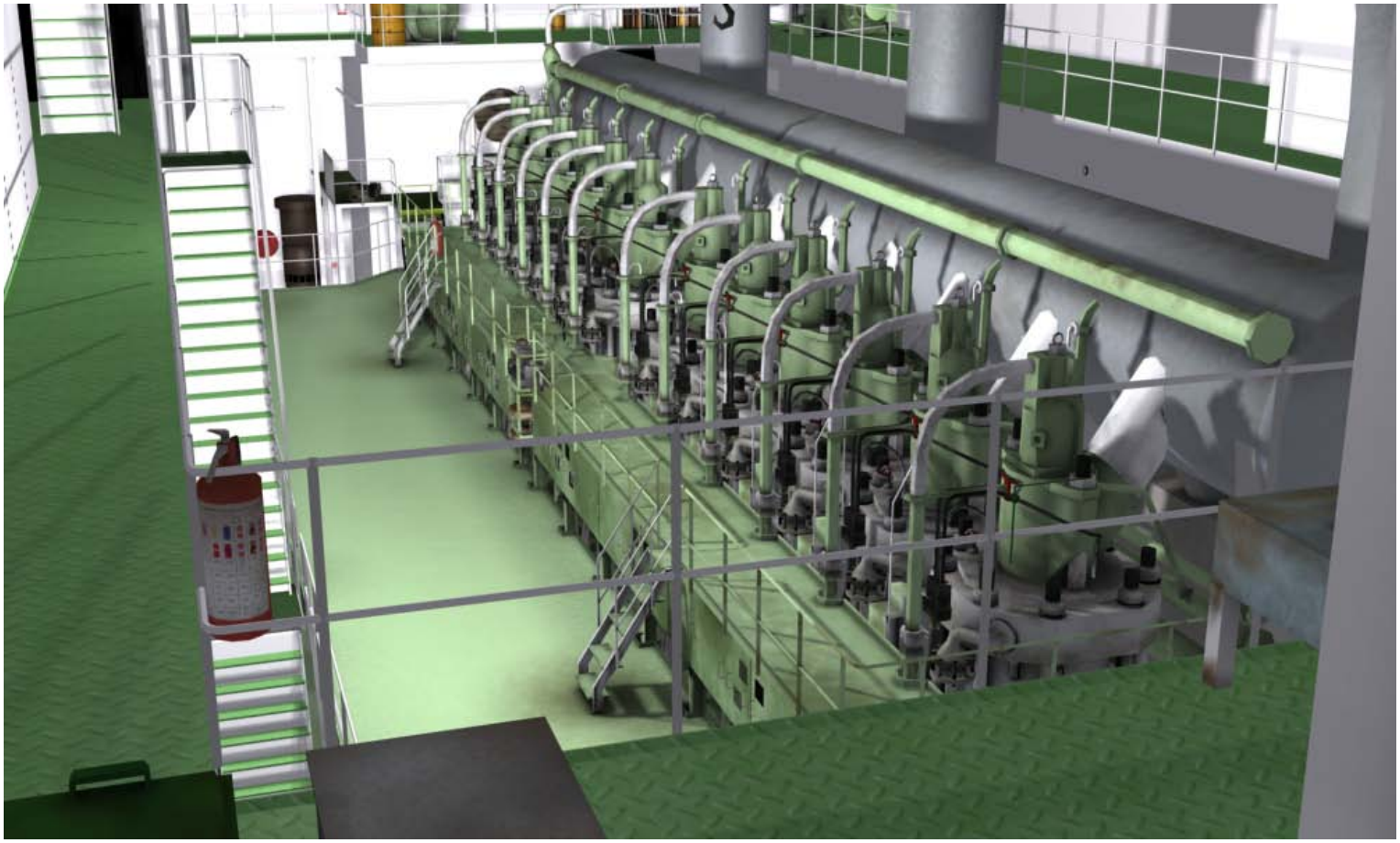
- Criterion-referenced versus norm-referenced
- Limited written exams
- Workplace performance is best proof
- Onboard options limited and complex to achieve
- Next best are realistic relevant simulators

STCW 95 section A-I/12

”.....the simulator shall be capable of simulating the operating capabilities of shipboard equipment concerned, to a level of physical realism appropriate to the training and assessment objectives.....”

Realistic ship bridge simulator

Interactive virtual engineroom simulator



VRER in action …!!

TRANSFER OF LEARNING

Transfer ?…….

Transfer is the extent to which skills (competences), acquired in learning (simulation), are transferable to real life situations.

From here……..

..... to here!

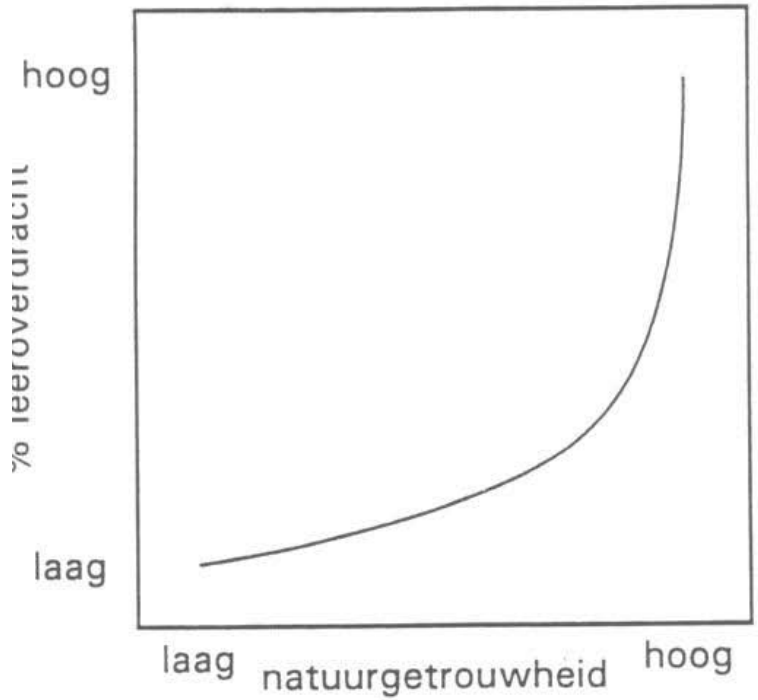
Transfer of simulator learning

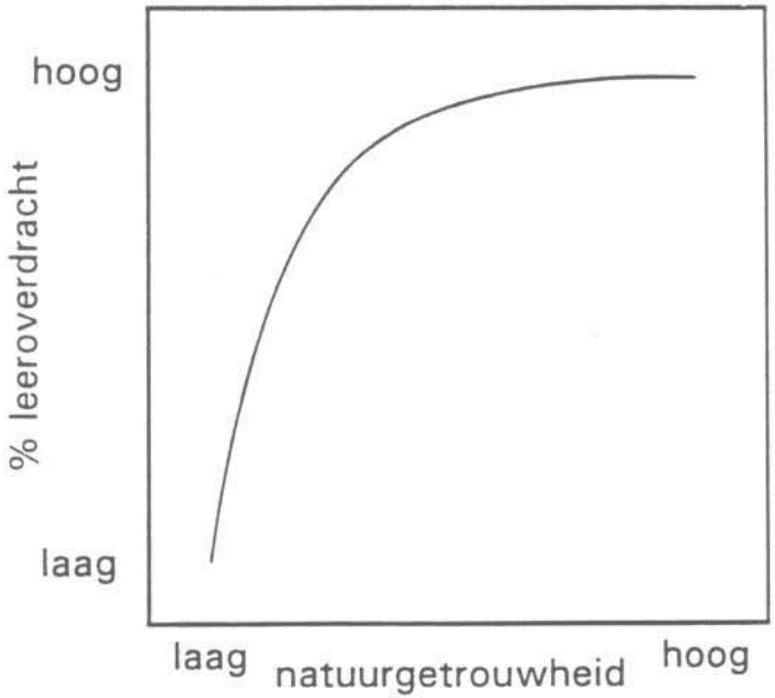
- Numerous studies to prove transfer of simulator learning
- Mainly airline pilot training , some in driving, very few in maritime
- Trainees performing with/without simulatortraining/shipboard practice are compared

Transfer conditions

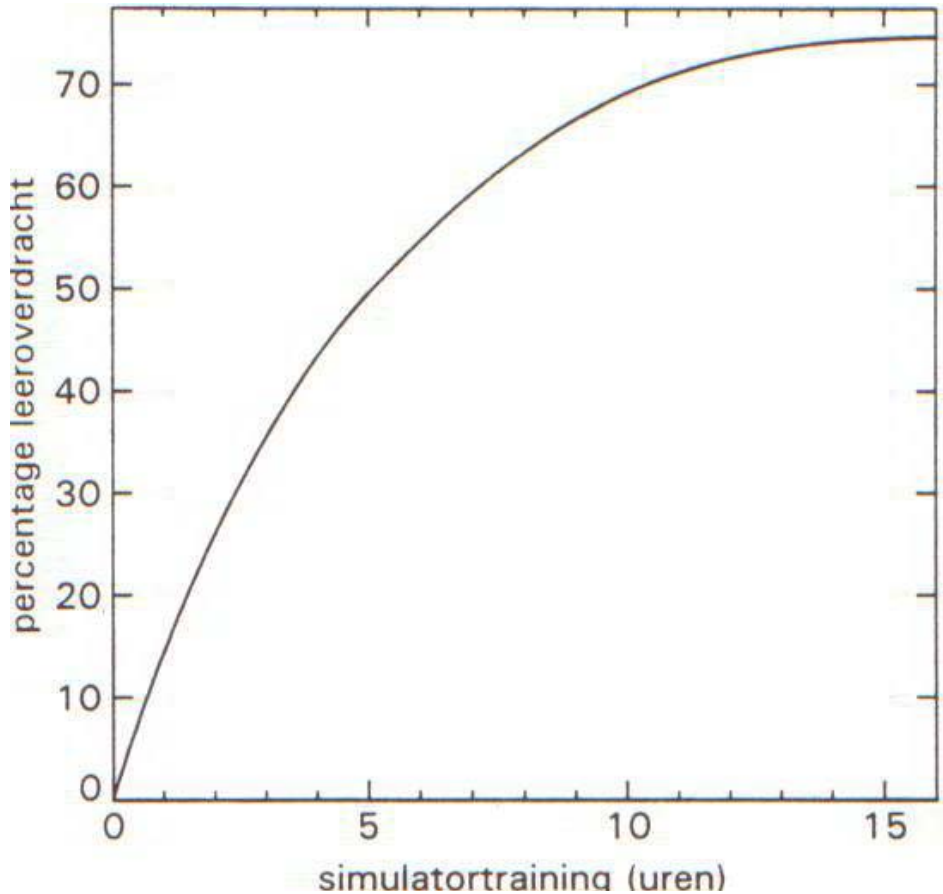
- Well designed training programmes
- Sufficient training time
- Skilled simulator instructors
- Motivated students
- Realistic simulator environment

Realism vs. transfer percentage





Time vs. transfer percentage (example)



Amount of transfer

- Learning theoretics 35 – 65% (average 50%)
- Simulation learners -11 – 90% (average 40%)
- Example army tank sim 50 – 90% (average 70%)

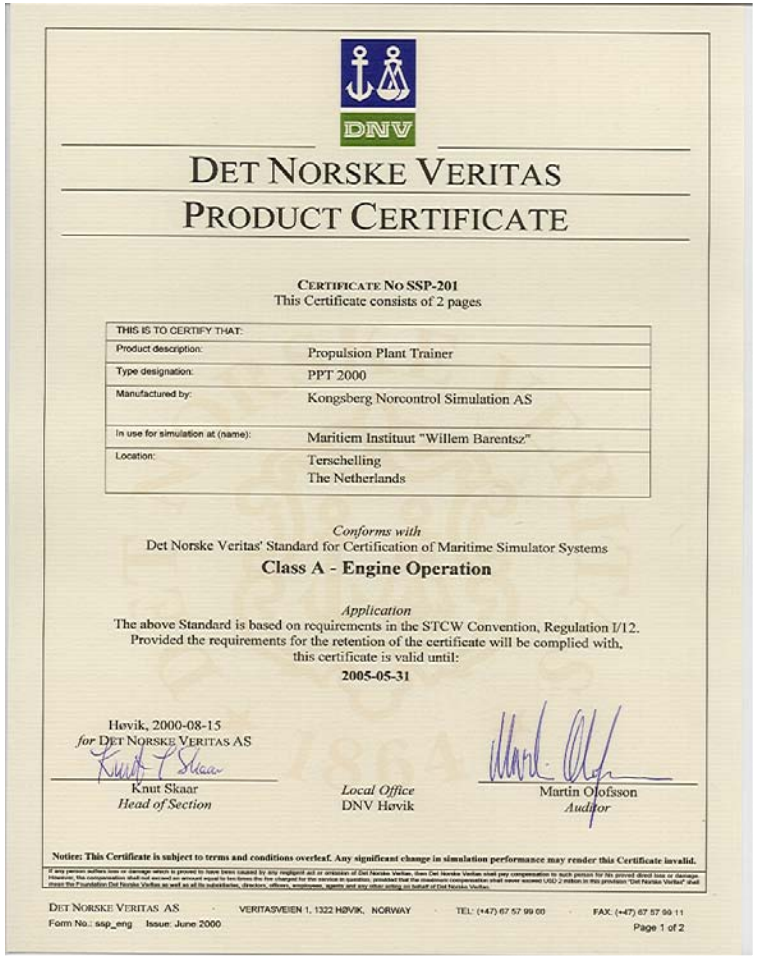
Transfer observations

- Transfer is apparent and related to realism
- Transfer increases as technology improves
- Simulator is a learning accelerator

Norwegian maritime project (1987)

- Shortage of 2nd engineers
- 6 weeks ER lab + 3 weeks ER simulator + 12 months seatime
- Replacing 18 months seatime
- 9 weeks for 26 weeks (1 : 3)

Netherlands facility requirements



DNV

DET NORSKE VERITAS

PRODUCT CERTIFICATE

CERTIFICATE No SSP-201
This Certificate consists of 2 pages

THIS IS TO CERTIFY THAT:	
Product description:	Propulsion Plant Trainer
Type designation:	PPT 2000
Manufactured by:	Kongsberg Norcontrol Simulation AS
In use for simulation at (name):	Maritiem Instituut "Willem Barentsz"
Location:	Terschelling The Netherlands

Conforms with
Det Norske Veritas' Standard for Certification of Maritime Simulator Systems
Class A - Engine Operation

Application
The above Standard is based on requirements in the STCW Convention, Regulation I/12.
Provided the requirements for the retention of the certificate will be complied with,
this certificate is valid until:
2005-05-31

Høvik, 2000-08-15
for DET NORSKE VERITAS AS

Knut Skaar
Head of Section

Local Office
DNV Høvik

Martin Olofsson
Auditor

Notice: This Certificate is subject to terms and conditions overleaf. Any significant change in simulation performance may render this Certificate invalid.

DET NORSKE VERITAS AS · VERITASVEIEN 1, 1322 HØVIK, NORWAY · TEL: (+47) 67 57 99 00 · FAX: (+47) 67 57 99 11
Form No.: ssp_eng Issue: June 2000 Page 1 of 2

- Approval by MarAd Shipping Inspectorate
- DNV classification standards
  - Class A Bridge
  - Class A Engine
  - Class A Cargo

Netherlands maritime study (1994)

- Performance levels respectively

  50%, 76%, 83% after 40, 80,120 hours simulation
- Conditions applying

  Simulator facility approved by Marad (DNV)

  Simulation: 40% bridge, 40% engine, 20% cargo
- Seatime remission during cadet year

  5 days (40hours) simtime = 10 days seatime (1:2)

  10 days (80hours) simtime = 10+20 = 30 days (1:3)

  15 days (120hours) simtime = 10+20+30 = 60 days (1:4)

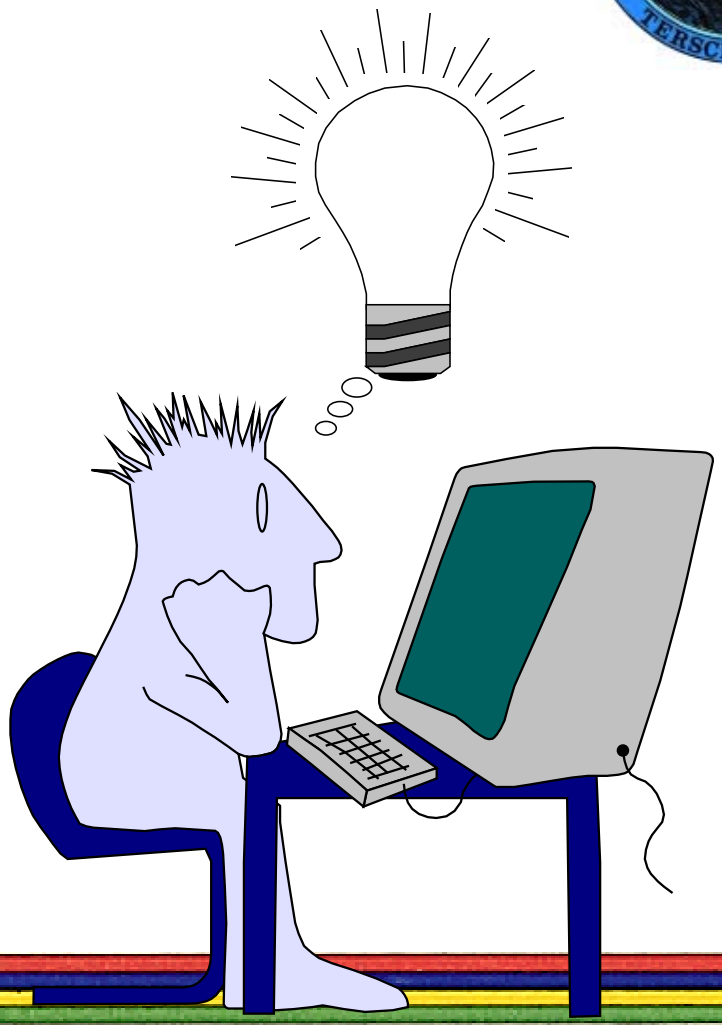
POTENTIAL OPERATIONAL ROI

Possible methods to measure

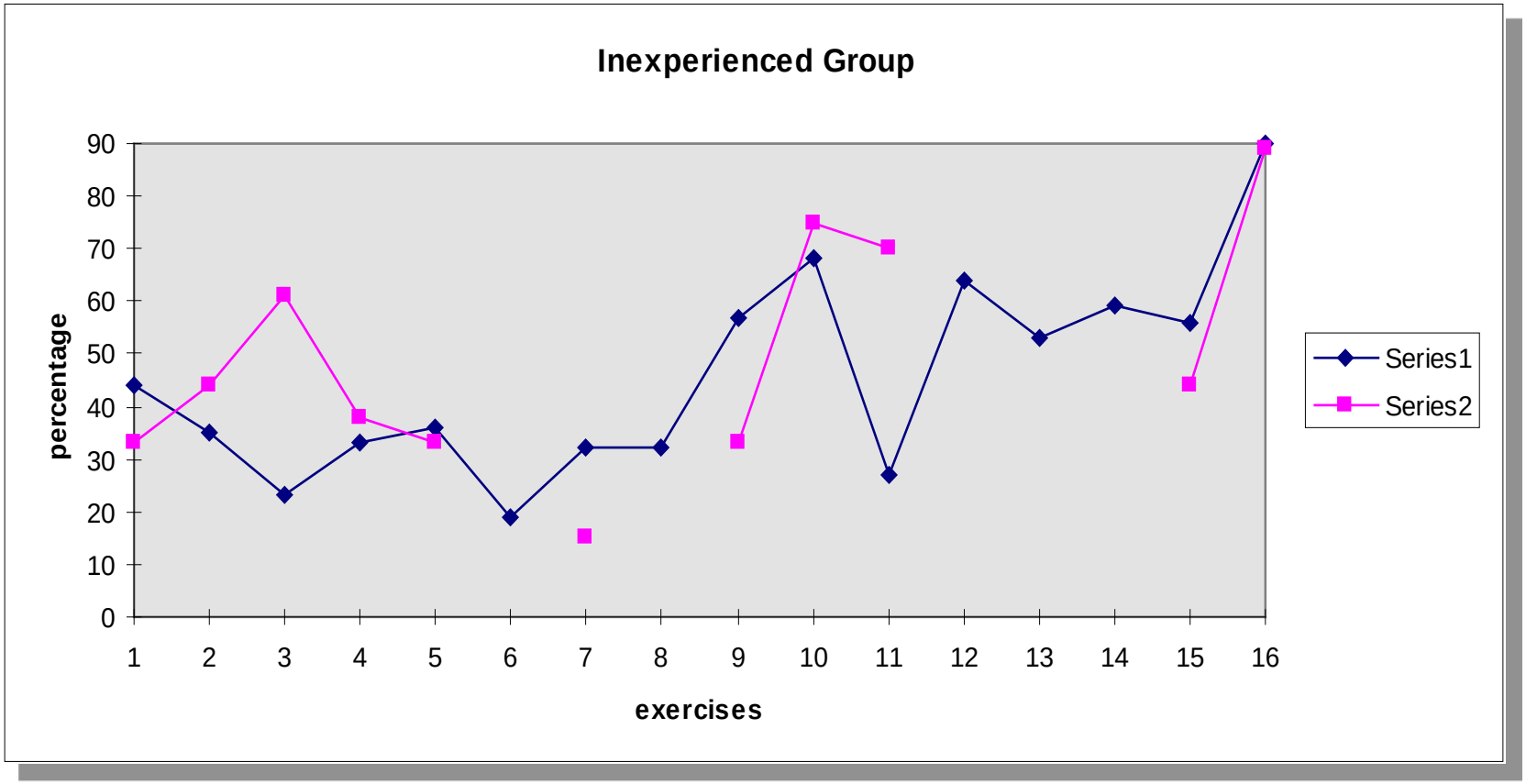
- pre and post simulator training test
- casualties in relation to personnel simulator training
- near misses in relation to personnel simulator training

Alternative Method

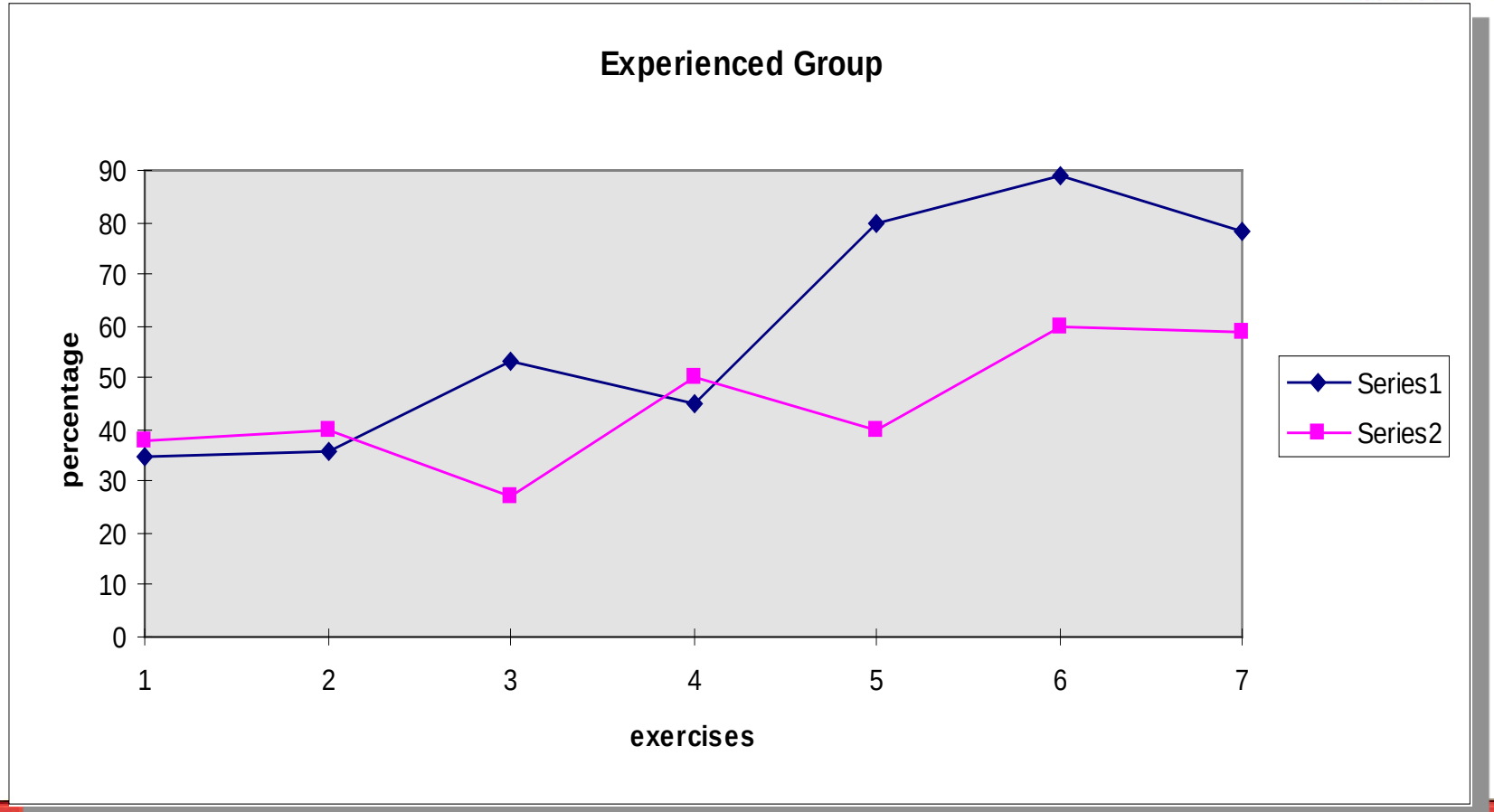
- Identify possible faults in
  - navigation
  - shiphandling
  - colregs
  - seamanship
- Count faults made
- Calculate relationship
- Graph course result



Inexperienced Trainees



Experienced Trainees



Results

- bridge simulator is valid learning tool
- learning effect benefits from regular sessions
- both experienced as well as inexperienced benefit
- experienced crews have higher initial results, learn faster
- progress: average 45%

30 - 90 = 60 %

33 - 89 = 56 %

35 - 78 = 43 %

38 - 59 = 21 %

Accident reduction potential

	Percentage	Absolute
Total number of accidents occurring	**100%**	**1.00 x**
Percentage (of 1.00x) of accidents which can be related to human error	**80%**	**0.80 x**
Percentage (of 0.80x) of training related accidents within human error category	**65%**	**0.52 x**
Percentage (of 0.52x) of competences in training related to simulators	**58%**	**0.30 x**
Percentage (of 0.30x) of competence improvement through simulator training	**45%**	**0.14 x**
Resulting percentage of accident reduction	**14%**	

Costly imbalance

- Sim Training/1 week/ 0.000250 M$

- Atlantic Empress /collision /23 M$
- Herald Free Enterprise /capsize/40 M$
- Amoco Cadiz /grounding /85 M$
- Betelgeuse /explosion /123 M$
- Exxon Valdez /grounding /2500 M$

CONCLUSIONS

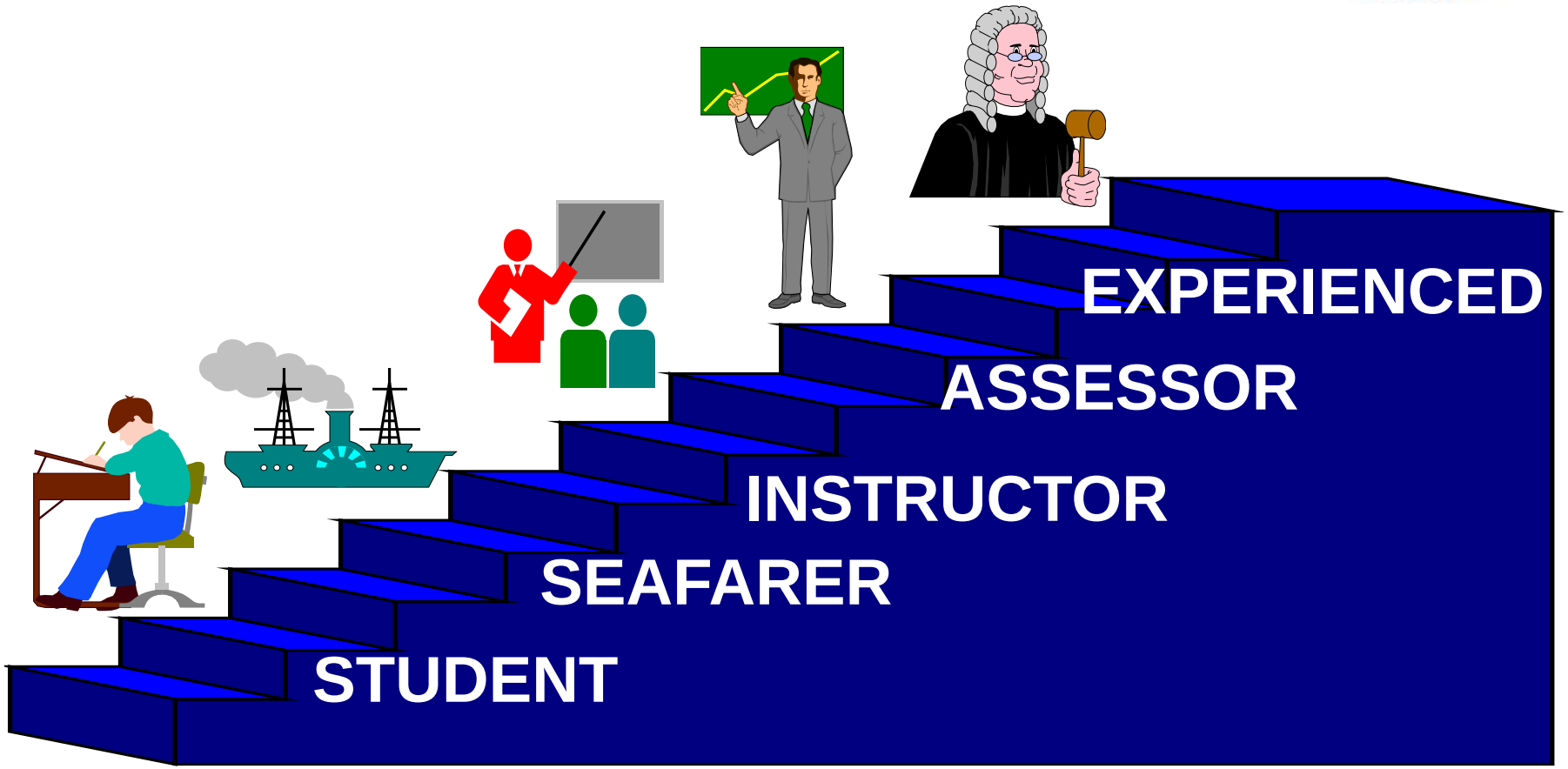
Drewry manning report 2009

- Global officer supply in 2009 some 517000
- In 2009 shortage estimated at 33000
- In 2013 shortage assumed 56000 (with fleet growth 14%)
- In 2013 still 42000 shortage assumed (fleet growth 4% due to cancellations, scrappings etc.)

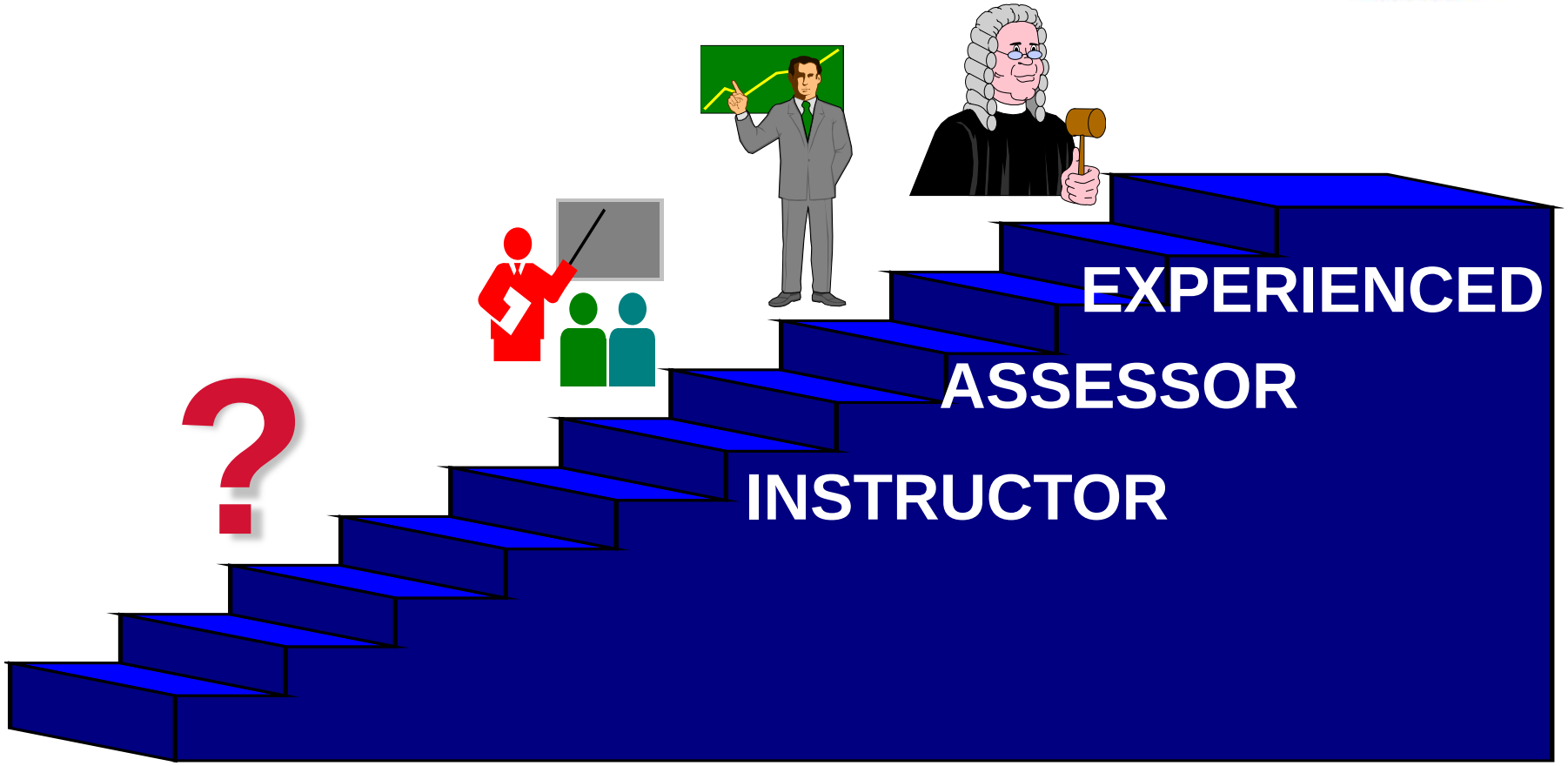
Manning future

- Continuing seafaring manpower shortage
- Shorebased maritime manpower shortage soon
- Western countries seafaring less popular
- New seafaring countries emerging
- Younger education systems
- Faster promotion, less experience
- Less competence, more accidents

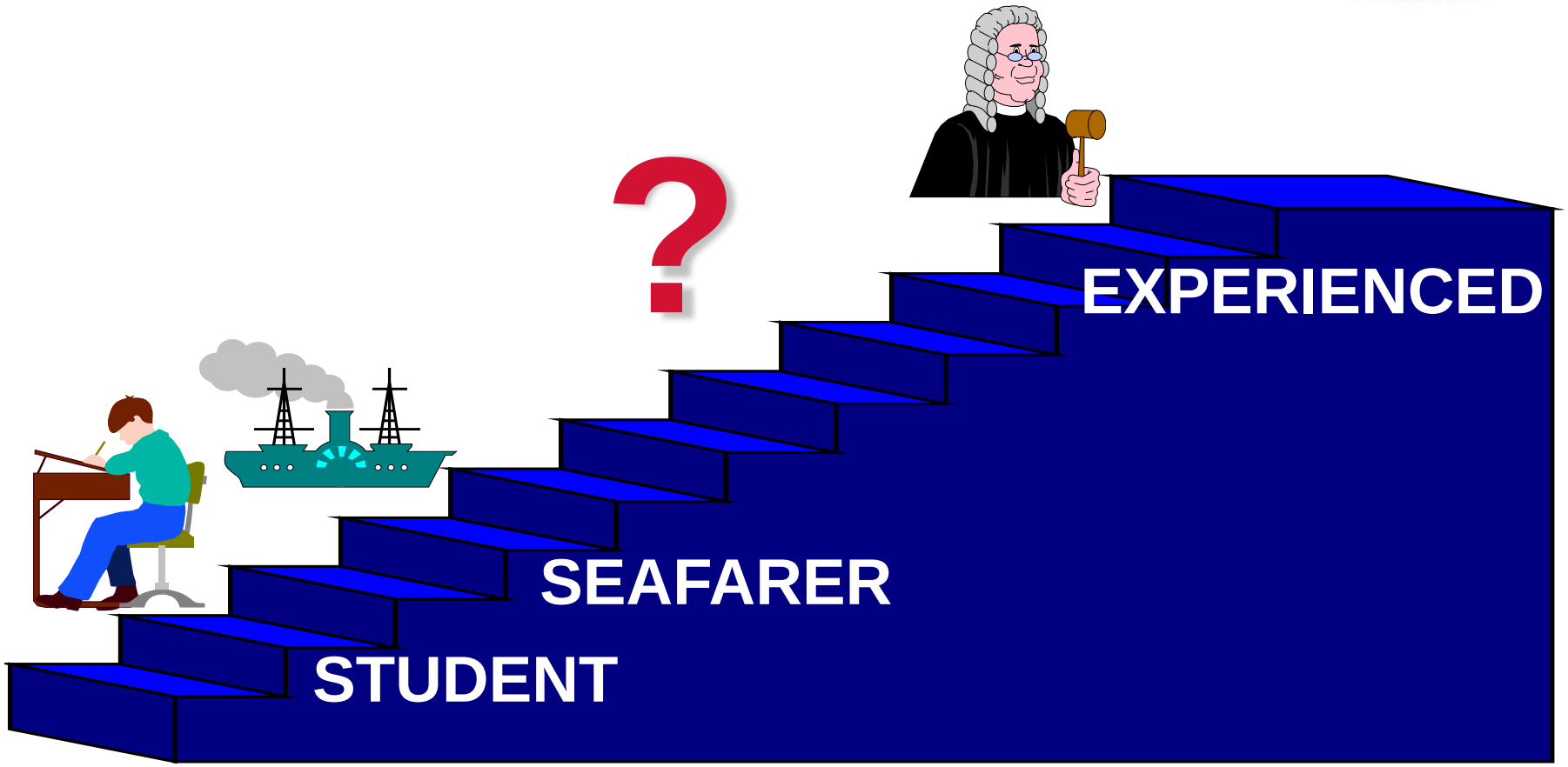
Related MET career path



MET challenge # 1



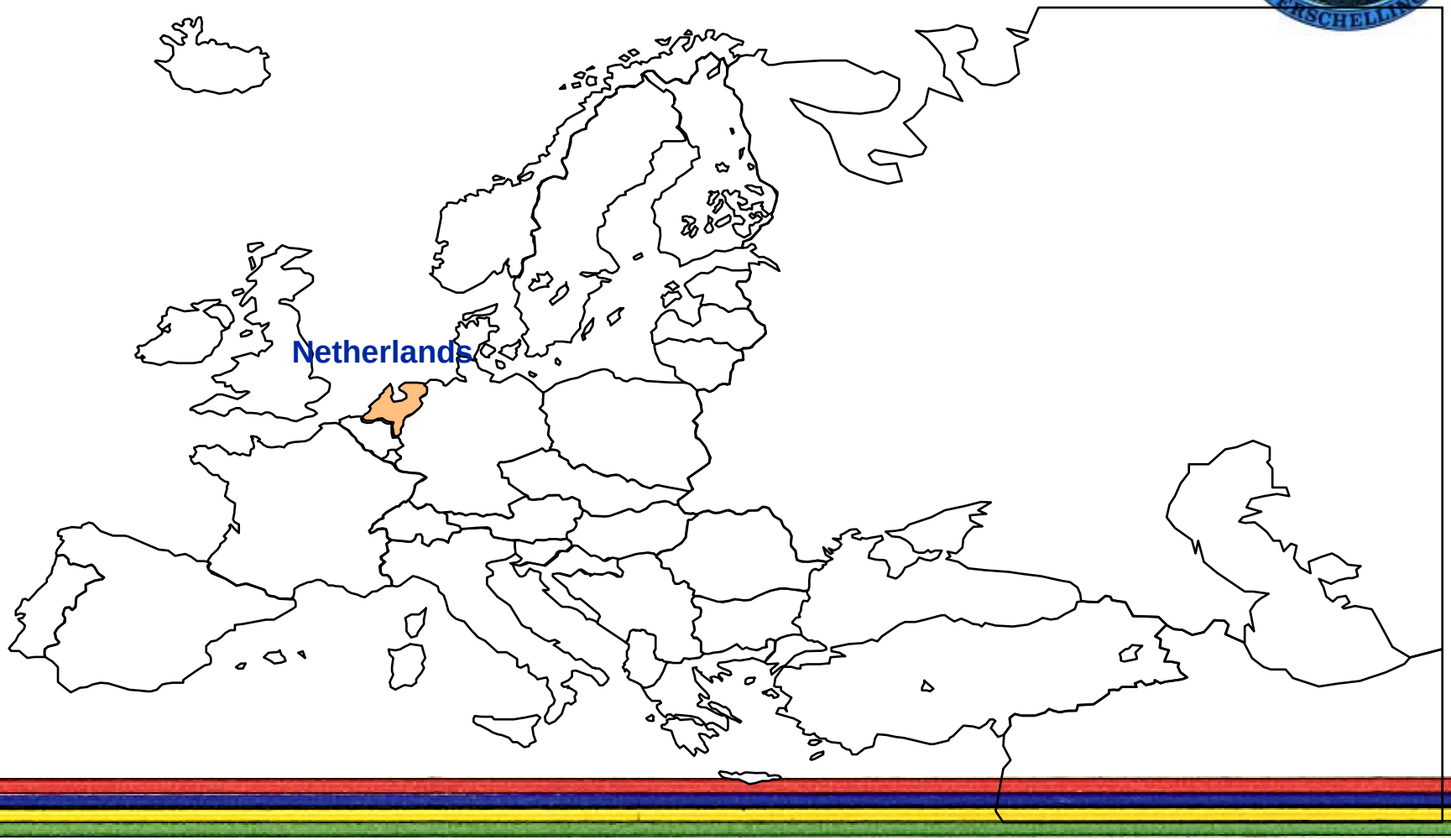
MET challenge # 2



Finally…….

1. Drastic and unconventional measures necessary to attract present generation “western” youngsters.
2. As a teaching tool simulators apparently work, as there is no significant increase of casualties with Netherlands flag vessels and crew !!
3. Educators, teachers, trainers, instructors,assessors are becoming Achilles Heel in shipping!!

Needle in the haystack



Terschelling

Maritime Institute Willem Barentsz

www.
miwb.nl

sjcross@
hetnet.nl