



**MARIA TSAKOS**  
TCM ACADEMY  
maritime training center



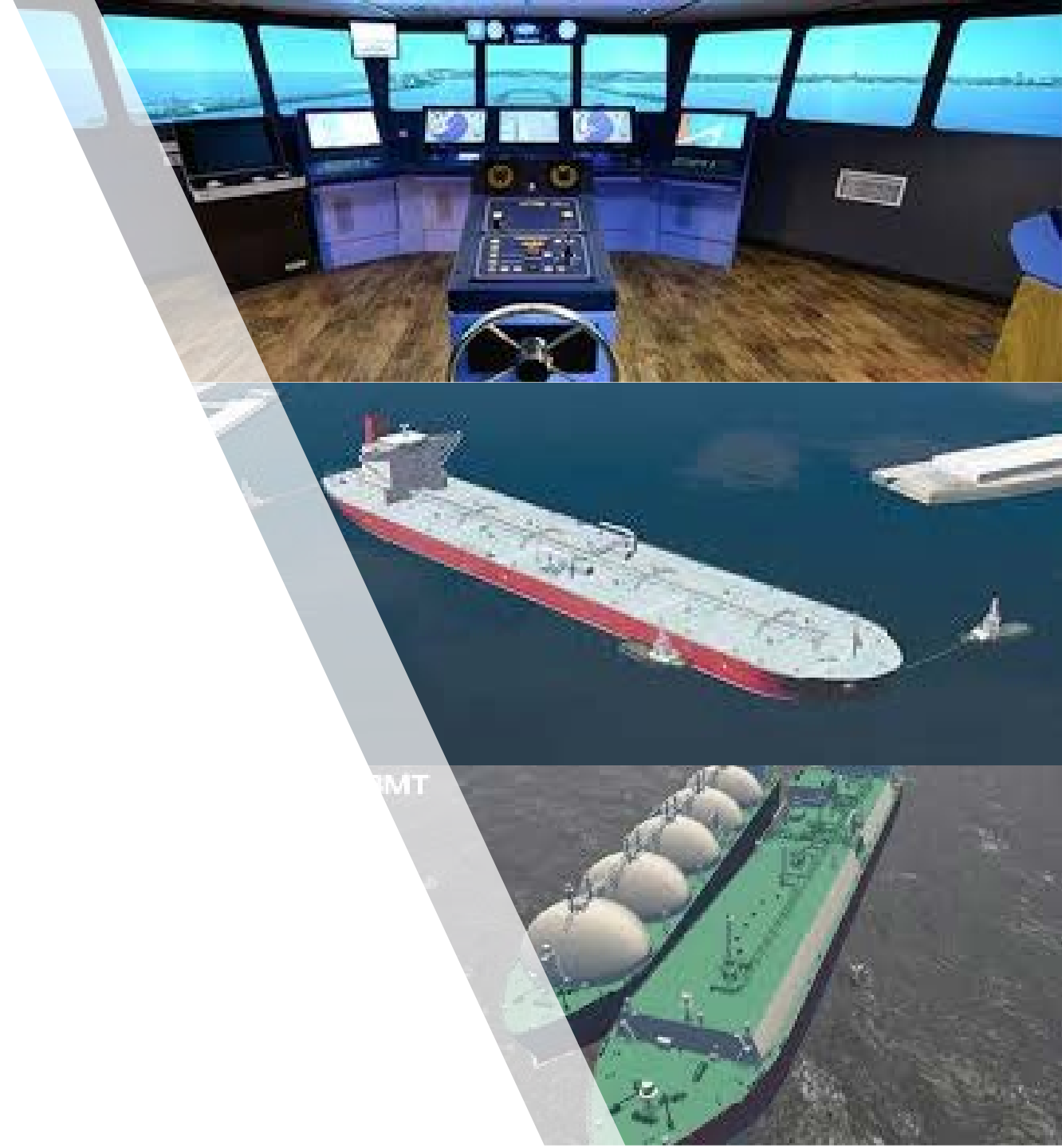
# The value of Simulator in STS operations

Capt Ioannis Fragkos



# Introduction

- Training
- Assessment of competency (Manila amendments)
- Case studies
  - Recommended procedures
  - No turning back point
- Incident investigation



The Maria Tsakos TCM Academy- Training centre was established in 2013 by Tsakos Columbia Shipmanagement S. A. in order to cater for the arising training needs of Fleet's Officers, Crew and shore staff employees. The Maria Tsakos TCM Academy is accommodated in its own premises, within the Group's headquarters and is equipped by state of the art training facilities.

The Maria Tsakos TCM Academy defines the Company's inherent duty and obligation to provide the best training facilities to our seafarers and shore personnel and to ceaselessly develop and advance their competence in order to ensure operational excellence, both in terms of safety, as well as, efficiency and performance towards our clients.





Integral part of the Maria Tsakos TCM Academy's training curriculum is our Company's Safety Management Procedures as well as feedback and lessons learnt from actual fleet experience.

In said manner our seagoing personnel benefit from integrating theoretical knowledge with practical training, whilst using actual scenarios as simulation exercises. This process allows our seafarers to further develop their skills and competence, whilst further reinforcing a culture of alertness and proactive safety.



## The latest State-Of-The-Art interactive Kongsberg Simulator

- Full Mission Bridge Simulator 240 degrees vision;
- Additional four desktop bridge simulators;
- Three K-POS DP Stations;
- One APOS Station;
- Four ECDIS Simulators;
- Four Cargo Handling Simulators;
- Four desktop Engine Room Simulators;
- Wall-to-wall screen that stimulates engine room and cargo handling operations.

Maria Tsakos TCM Academy, in co-operation with Dynamarine, established a pioneering Ship-to-Ship course as means of providing superior tailor-made services to meet Officers, Crew and Clients requirements.



Ship to Ship transfer operations (STS) are high risk and require thorough understanding and specialized knowledge. The scope of this training course has been to provide Deck Officers and Captains with thorough understanding in ship handling principles focused on STS interaction and best operating practices.

## Scope of Project

- Study Best Practices
- Weather limitations
- Test Critical Failures
- Effectiveness of specific Reactions
- No turning back points  
Specify unmanageable situations
- Compare Open Sea vs Sheltered Sea



# Ultimate Scope

Avoid to engage to possible unmanageable scenarios





# Weather conditions

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*“ It is impractical to lay down limiting weather conditions under which STS operations can be carried out. Much will depend on the effect of the sea and swell on the fenders or mooring lines and the rolling movements induced in the participating ships, taking into account their relative freeboard and displacement. Factors for at sea operations also include the physical sizes of the ships and their maneuvering capabilities, the speed of the approaching weather, free surface effect, sloshing limitations, manning and work boat capabilities. “*

- (OCIMF) STS Guidelines par.2.4



# Mooring Master

Capt Gordon Ghirxi

- **Location:** Malta
- **Qualifications:** Qualified for POAC
- **Experience:** many operations at Malta and Augusta OPL
- **Performance:**

Statistics of the POAC from OSIS	
Performance indicator	100%
Skills indicator	100%

# Scenarios



Approaching at Anchor



Mooring Underway



Weather increase while alongside



Double Banking

# 01

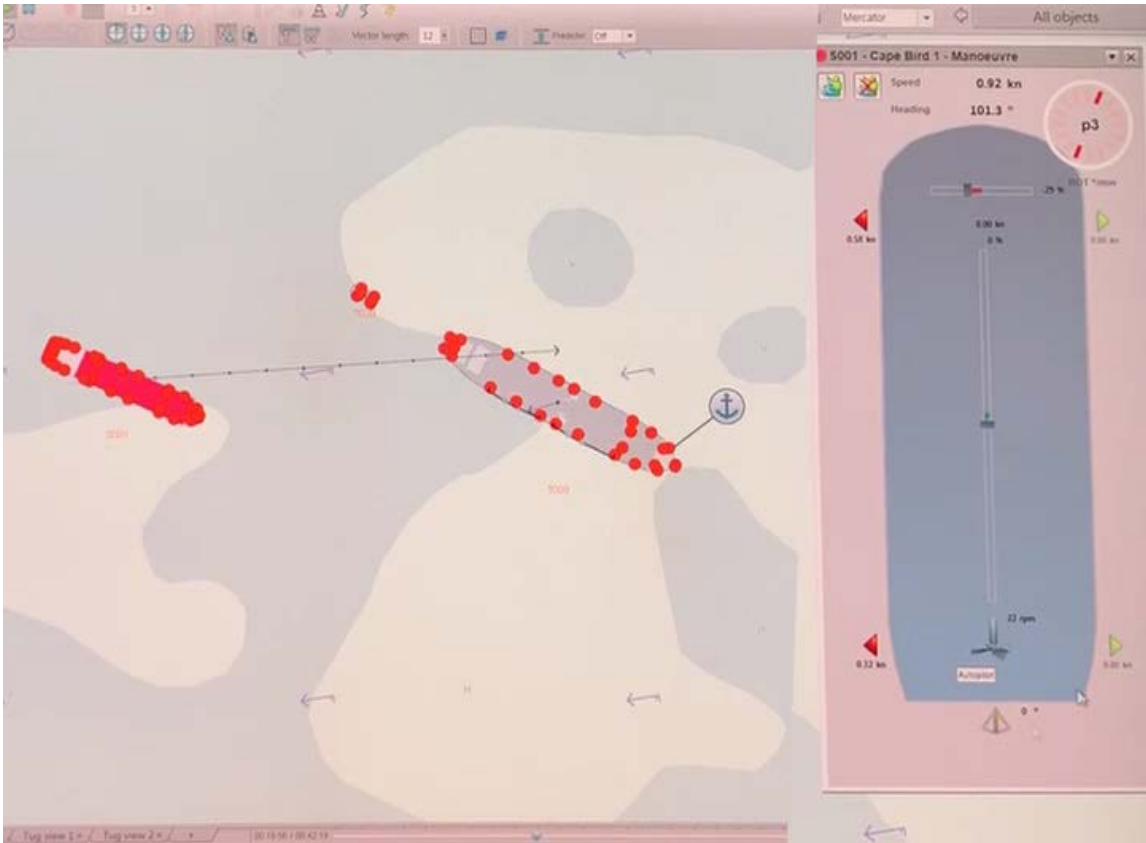
# Approach at Anchor

- No tugs, bow thruster failure



At Anchor	26	Loaded	P	@Anchor	S
Manouvering	22	Ballast		26	deg
				15	22
				m	
				50	
Current (Kn, deg)	<1.0	30 P (bow)			
Wind (Kn, deg)	>15	30 P (bow)			
Wave/Swell (m-s, deg)					
Heading difference	15	deg			

**Bowthruster failure of maneuvering (22) during approach**



**Scenario:**

Bow Thruster Failure during Approach with heading difference 15 deg. Weather 30 deg from Port.

**Actions:**

Come alongside. Use lines to keep bow in. use engine with rudder to control stern.

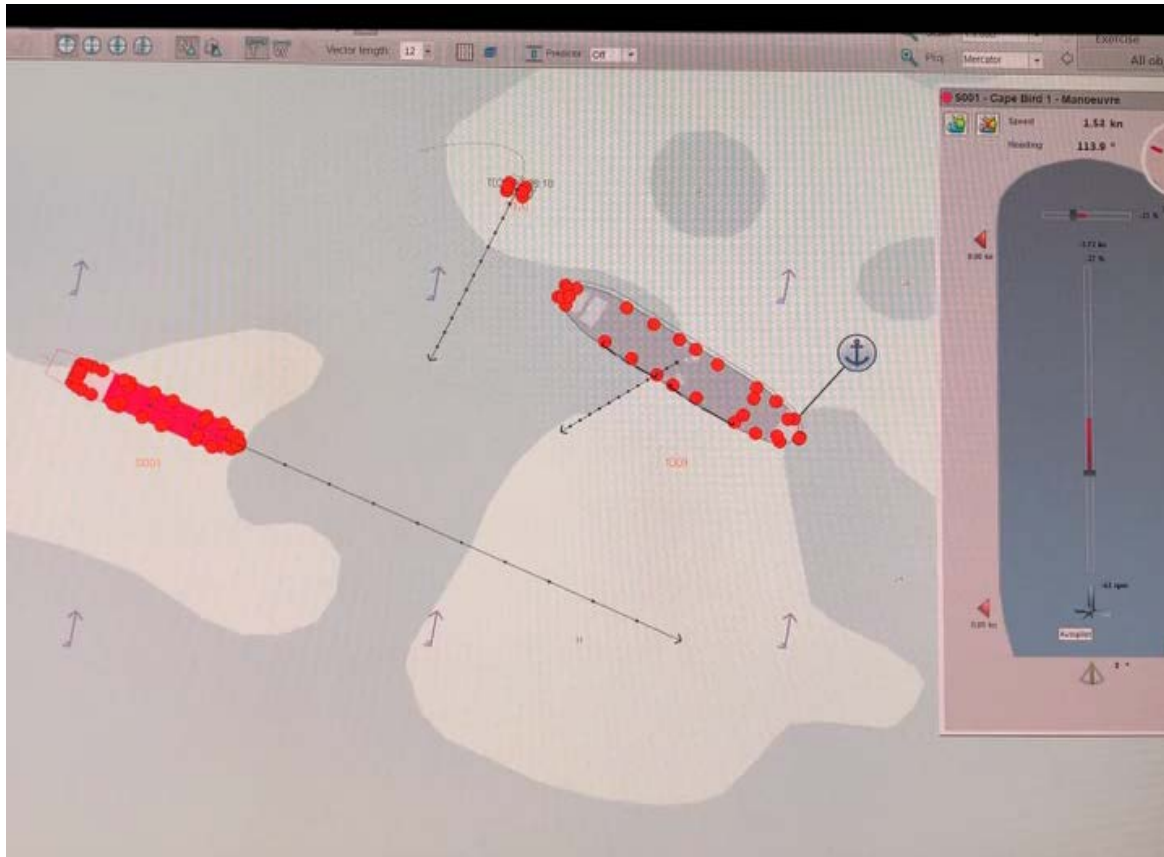
**Conclusions:**

- Speed has to be kept low.
- Anchored vessel is swinging to Port.

# 02

## Approach at Anchor

- No tugs, bow thruster failure



At Anchor	26	Loaded	P	@Anchor	S
Manouvering	22	Ballast		26 deg	22
Current (Kn, deg)	1.2	30 P (bow)		0 m	
Wind (Kn, deg)	>15	90 S (beam)		50 m	
Wave/Swell (m-s, deg)					
Heading difference	~0	deg			

**Bowthruster failure of maneuvering (22) during approach**

### Scenario:

Bow Thruster Failure during Approach with parallel heading. Weather 90 deg from Starboard.

### Actions:

Push Stern with port rudder and engine.

### Conclusions:

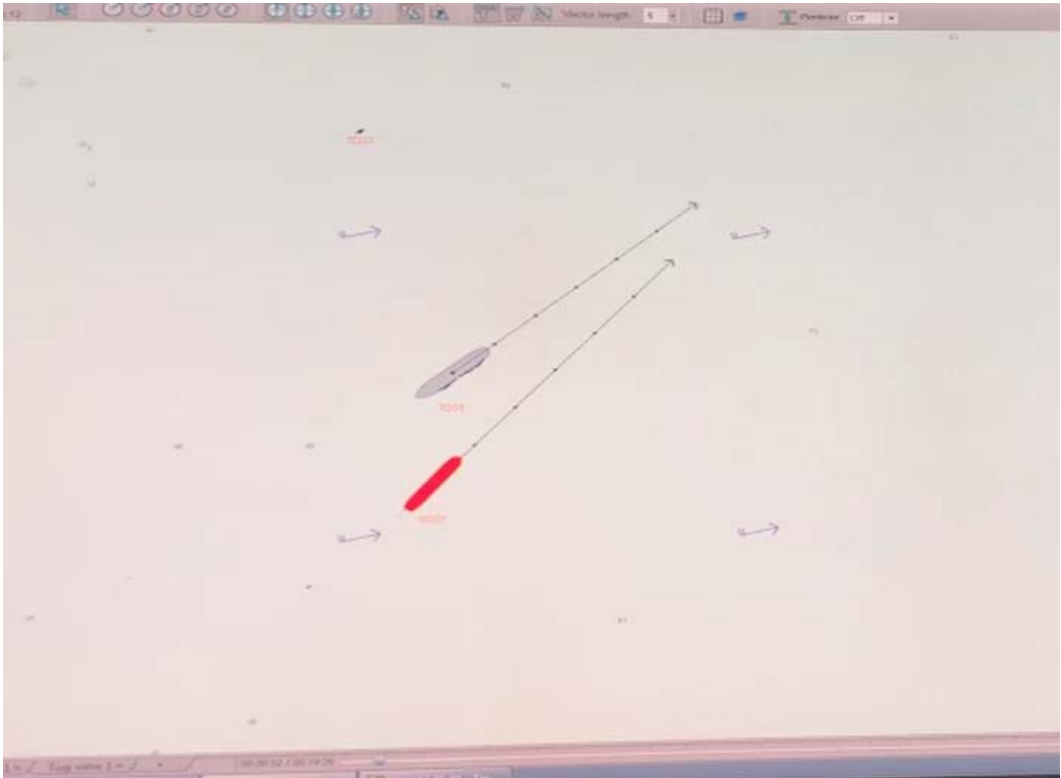
- Stern was falling too fast. Actions results excessive speed.
- Recommendation: Use engine to aboard.

05

# Approach Underway



- No tugs, rudder failure



Const. Heading	26	Loaded	P	Underway	S
Manouvering	16	Ballast		26 deg	
Current (Kn, deg)		?		m	16
Wind (Kn, deg)	20	135P (qtr.)			
Wave/Swell (m-s, deg)		?			
Heading difference	~0	deg			

**Constant Heading (26) Rudder Failure - Hard Port**

**Scenario:**

Approaching underway. Weather 135 deg Port. Constant heading vessel Rudder Failure Hard Port.

**Actions:**

Try to keep parallel and disengage.

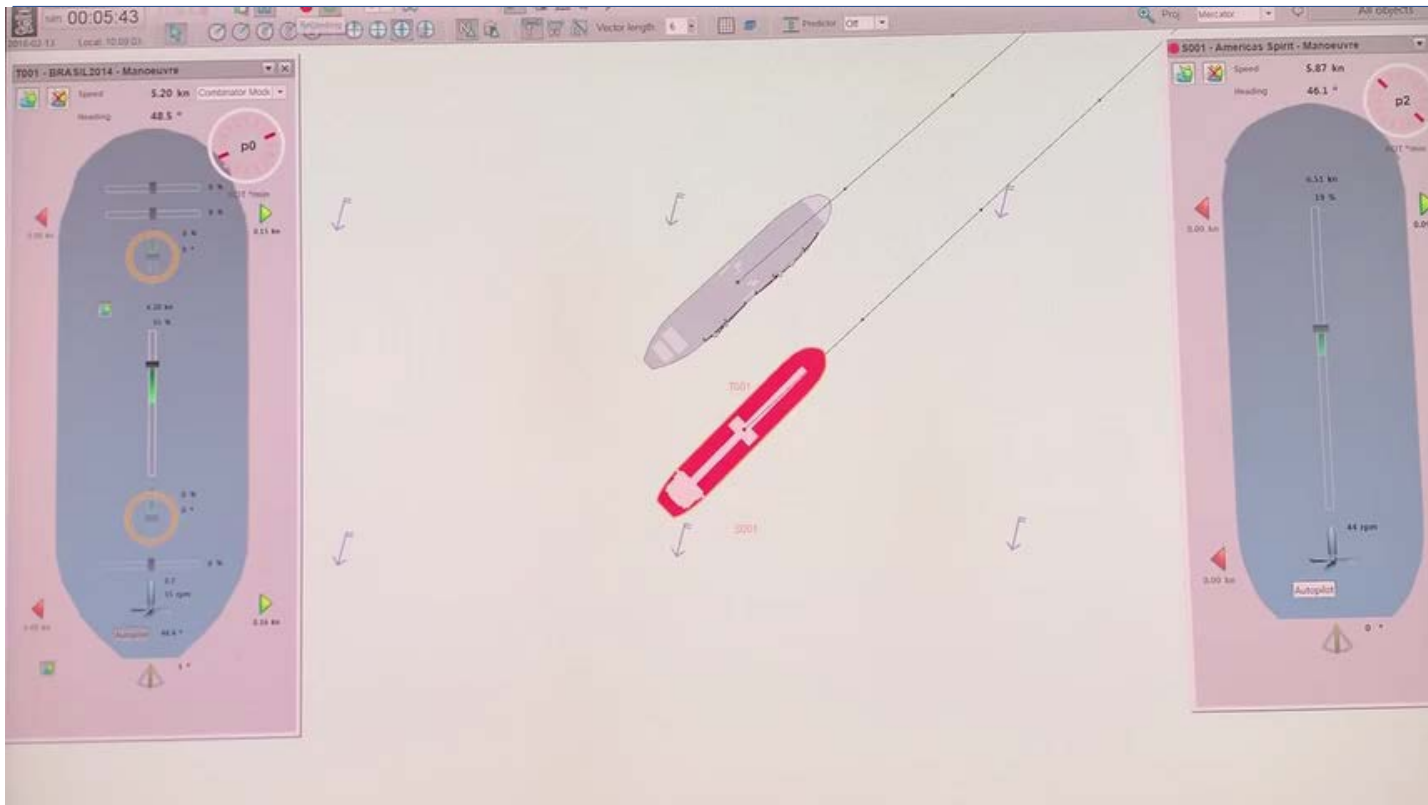
**Conclusions:**

- Maneuver vessel with lesser rate of turn than constant vessel
- Keep engines running
- Increase speed of maneuvering vessel, stop engines of constant heading vessel

# 06

## Approach Underway

- No tugs, rudder failure



Const. Heading	26	Loaded	P	Underway	S
Manoeuvring	16	Ballast		26 deg	16 m
Current (Kn, deg)		?			
Wind (Kn, deg)	20	30 P (bow)			
Wave/Swell (m-s, deg)		?			
Heading difference					
<b>Constant Heading (26) Rudder Failure - Hard Port</b>					

### Scenario:

Approaching underway. Weather 30 deg Port. Constant heading vessel Rudder Failure Hard Port.

### Actions:

Try to keep parallel and disengage.

### Conclusions:

- Vessel turns to port. Wind will be on Stb.
- It is difficult to aboard.
- Adjust Rudder and Engine to land on fenders.

07

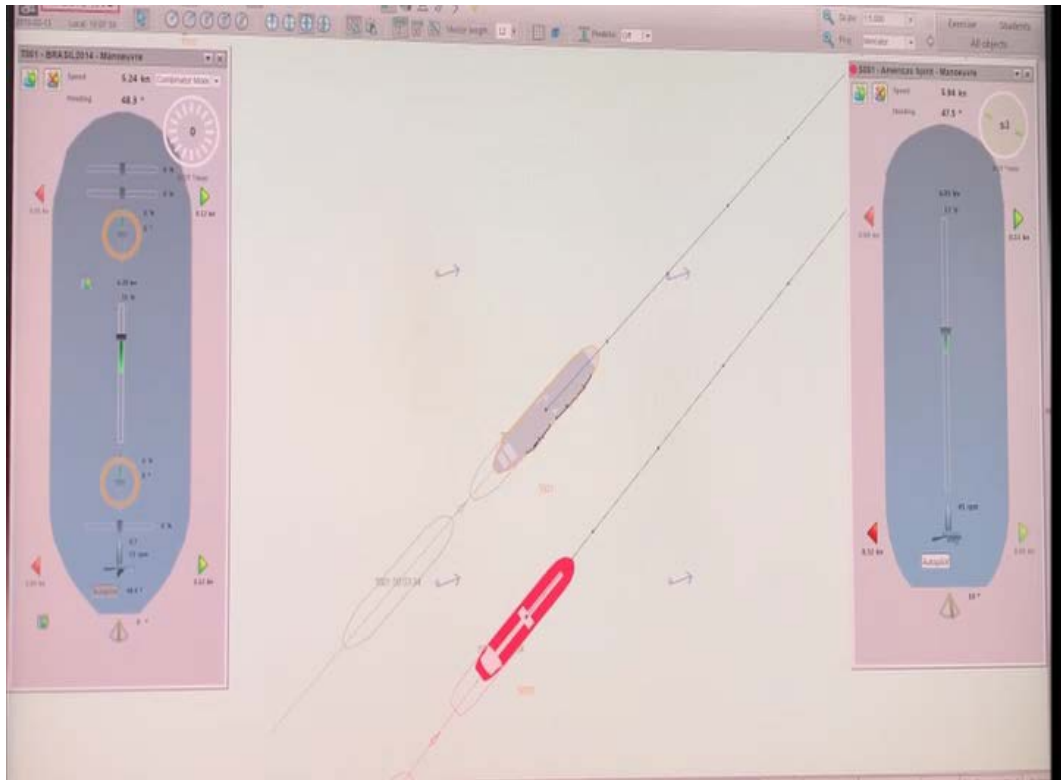
# Approach Underway\*\*\*\*

- No tugs, rudder failure



Const. Heading	26	Loaded	P	Underway	S
Manouvering	16	Ballast		26 deg	16 m
Current (Kn, deg)		?			
Wind (Kn, deg)	20	135P (qtr.)			
Wave/Swell (m-s, deg)		?			

Heading difference  
**Constant Heading (26) Rudder Failure - Hard Stb**



**Scenario:**

Approaching underway. Weather 135 deg Port. Constant heading vessel Rudder Failure Hard Stb.

**Actions:**

Try to keep parallel and disengage.

**Conclusions:**

- Maneuvering vessel rudder hard Stb..
- It is difficult to aboard.



- Long Periods

Mooring Loads will increase with wave period.

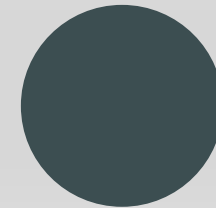
- At Anchor

Combined effect of current and weather conditions and the tension of the anchor should be considered.



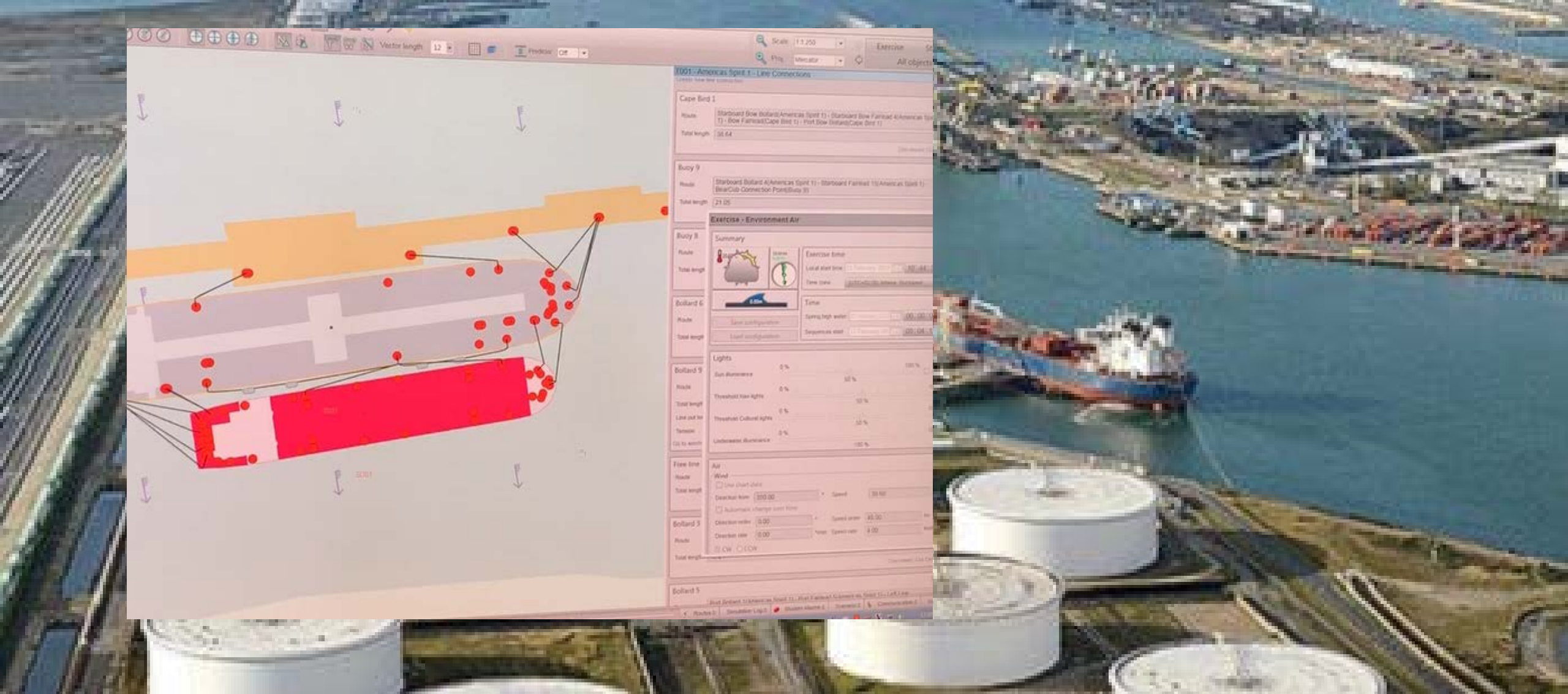
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# Mooring Loads





Weather  
increase  
while  
alongside



Double banking

# Conclusions

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Avoid approaching with Weather from starboard.

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Take immediate actions, when vessel start rolling. Swell alone, causing rolling, is very hazardous.

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During Joint Plan discussion, prepare the emergency scenarios.

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Avoid standing moor with strong wind on berthing side.

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Avoid casting off with maneuvering vessel on windward side.

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Swell is the dominant factor that defines sheltered sea conditions. Strong wind only, without waves and swell, needs to be excessively strong to make an impact.

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Drifting but rolling do not solve anything. However drifting allows vessels to take actions earlier than when having to heave up anchor.