

# Development of a Small Vessel Training Simulator

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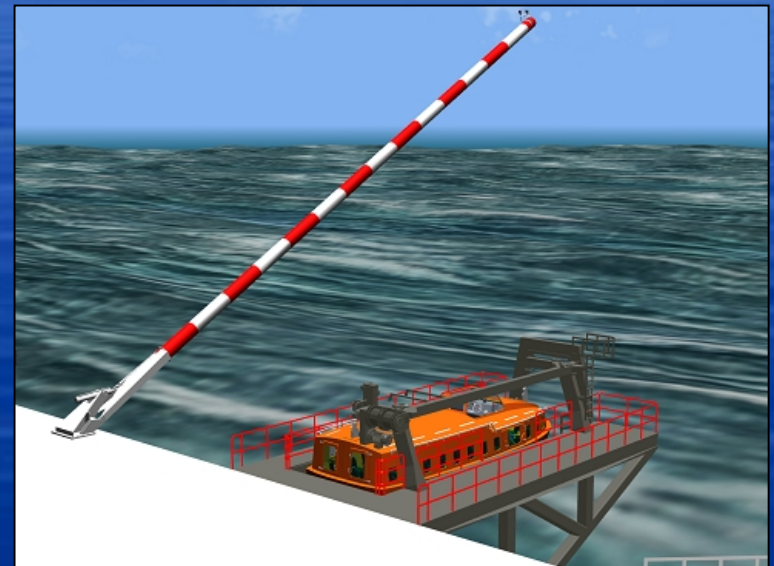
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Institute for Ocean Technology

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Memorial University of Newfoundland



# Content

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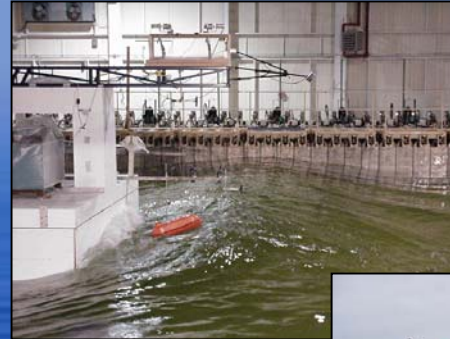
1. Problem statement and motivation
  - Saving lives with simulation
2. Assembling the proper team
  - The strength of the local community of expertise
3. Design and implementation of a Lifeboat Launching Simulator
  - From concept to reality
4. Lessons learned
  - Improving the design process

# Motivation

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*“To improve the safety of life at sea”*

- Institute for Ocean Technology and Memorial University of Newfoundland have performed extensive studies on lifeboat performance
- Extremely dangerous conditions that become a greater risk with inexperience
- Unable to perform launches in rough weather using live boat training

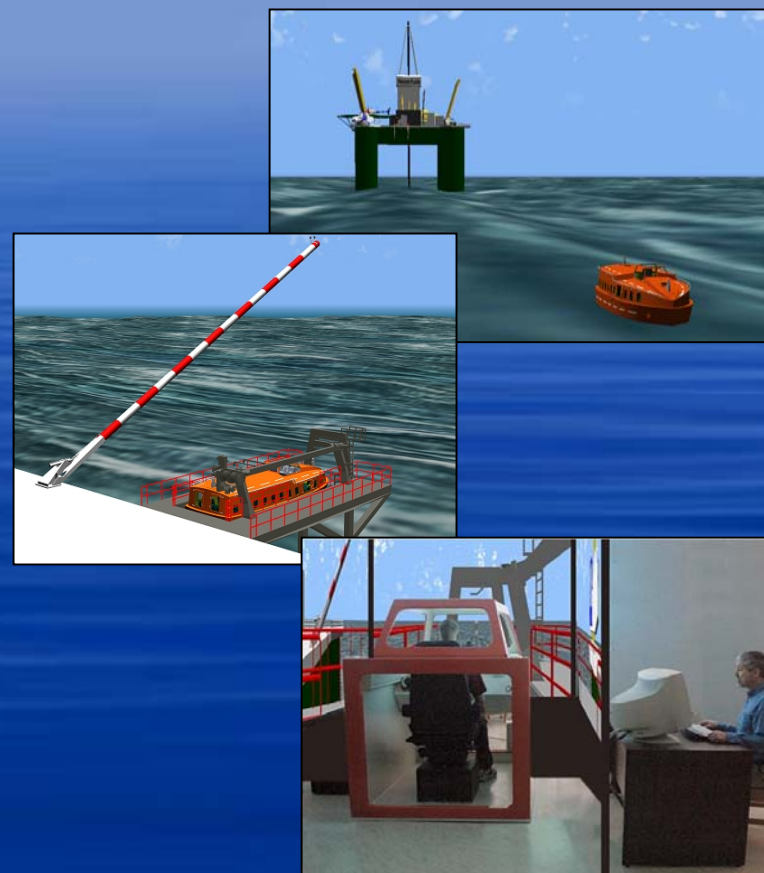


# Motivation

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*“To improve the safety of life at sea”*

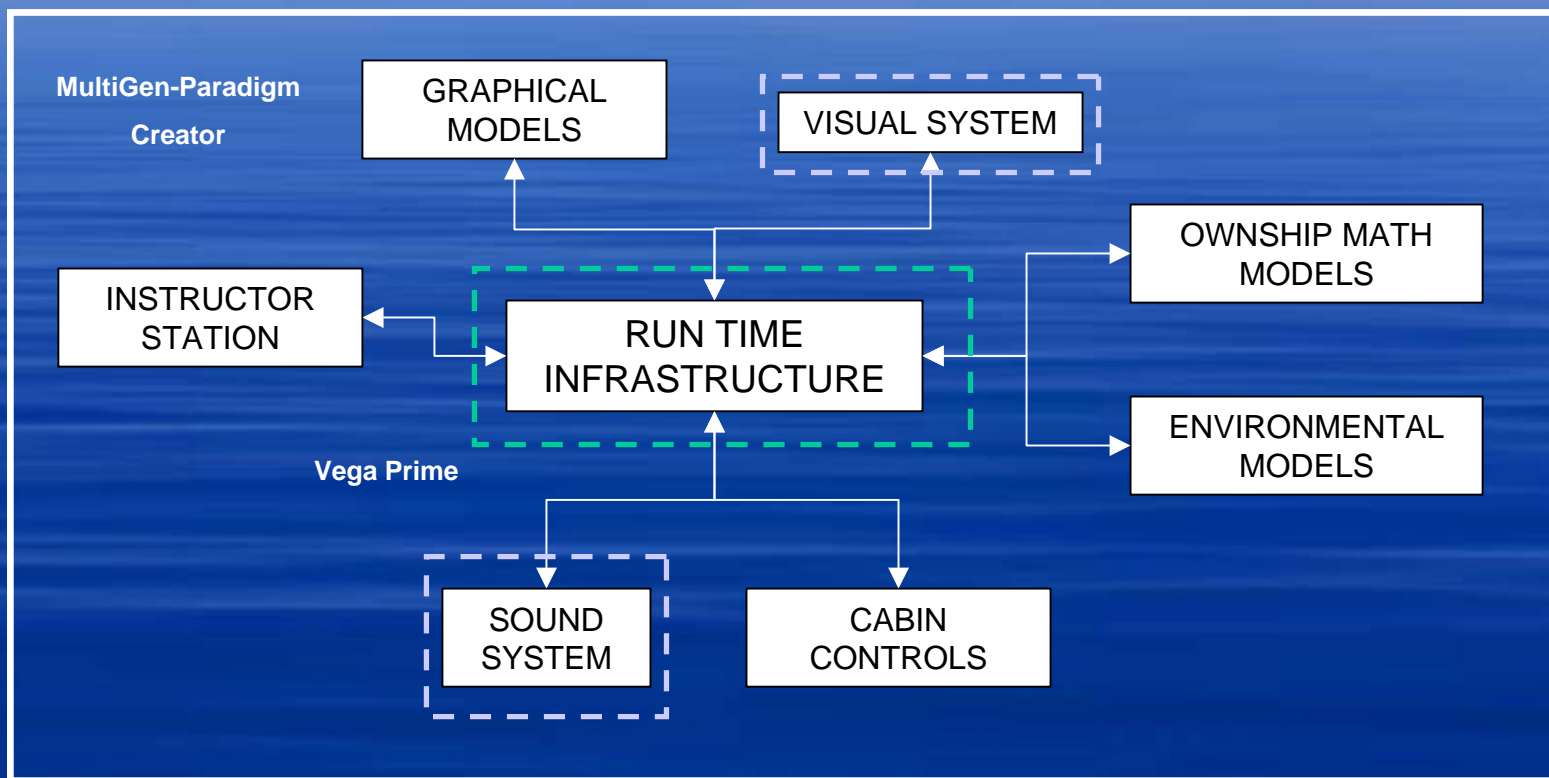
- Simulation as a training tool
  - Increased situational awareness
  - Experience of launching into severe weather environments
  - Minimal risk to trainee
  - Reduced cost
  - Increased convenience



# Designing The Full Mission Simulator

*The full mission simulator is a harmony of technology*

## Training Curriculum

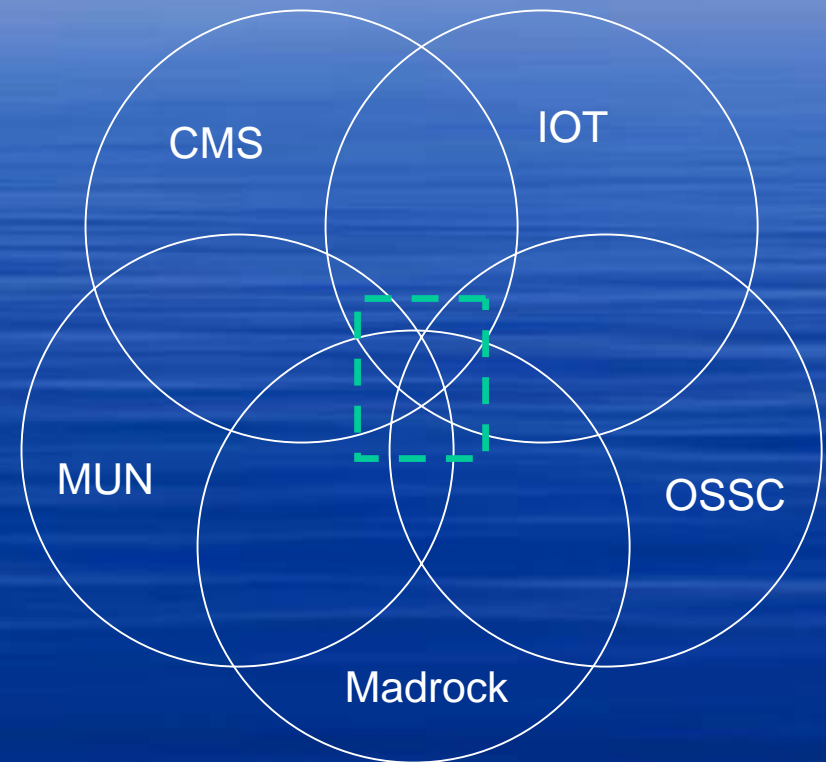


# Assembling the team

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*All of the ingredients exist for a strong marine simulator development team*

1. Center for Marine Simulation (CMS)
  - simulation based training
2. Offshore Safety and Survival Center (OSSC)
  - live boat instruction
3. Memorial University of Newfoundland (MUN)
  - Engineering expertise and support
  - Human behavior studies
4. Institute for Ocean Technology (IOT)
  - scale model testing facilities and mathematical support
5. Madrock Marine Solutions
  - Lifeboat design and support

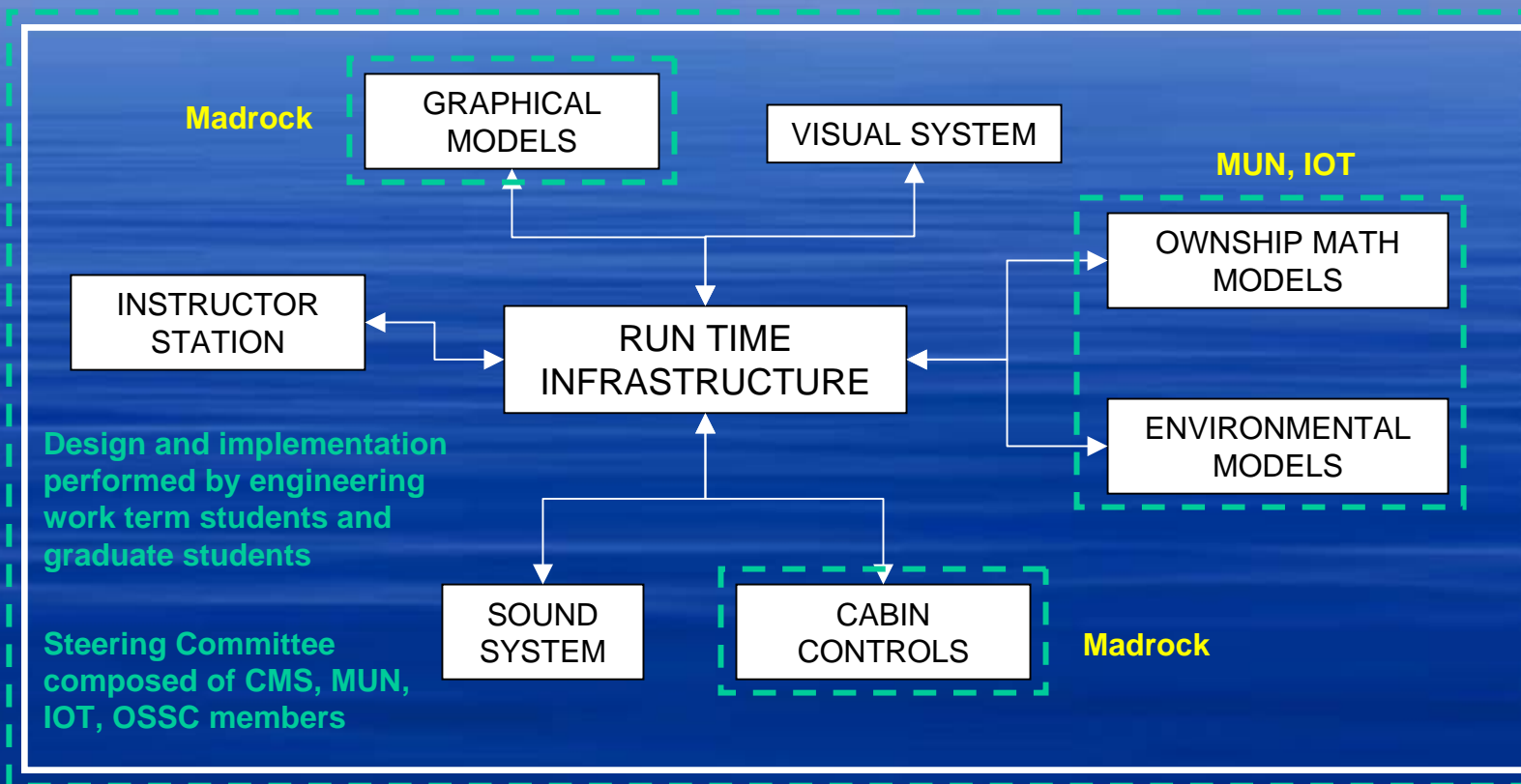


# Designing The Full Mission Simulator

*Realizing the recipe when you have the ingredients in your hand*

Training Curriculum

CMS, OSSC



# The Design Process

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*Putting the pieces into place*

- Steering committee comprised of members of the CMS, MI, MUN, and IOT.
- Design and implementation performed by engineering work term students
- Funding for the project obtained from various sources
  - Petroleum Research Atlantic Canada (PRAC)
  - NSERC Idea to Innovation
  - Panel on Energy Research and Development (PERD)
- Two year projected timeline for the duration of the project

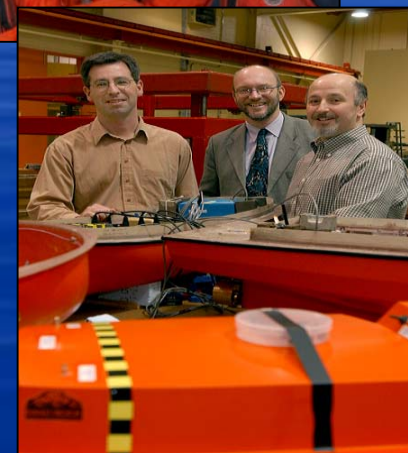


# Ensuring Success

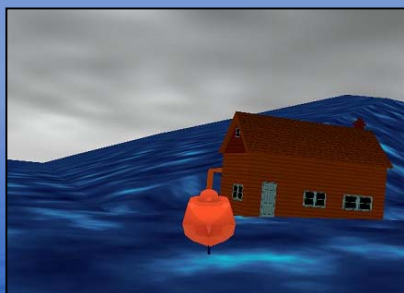
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*Keeping the project on track*

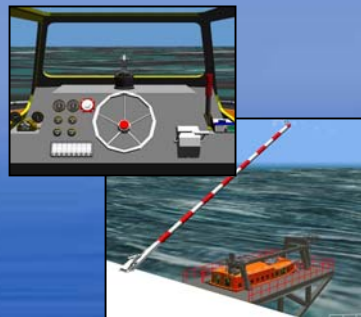
- Process governed by Verification, Validation and Accreditation Process
- Team grew gradually and expertise called upon as required
- In kind contribution of management and resources
- Discontinuity of work force a great concern
- Documentation a critical component



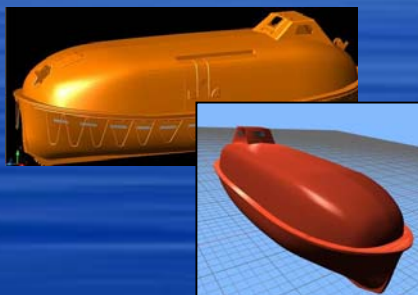
# The Simulator Evolution



6 months  
elementary graphical  
models  
basic animation



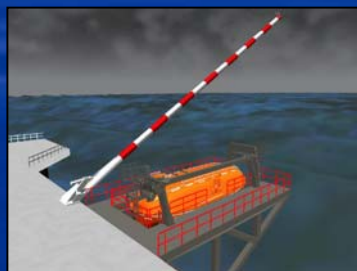
16 months  
Wave model iteration  
Math model iteration  
Desktop simulator  
Instructor station  
Madrock lifeboat  
Cabin controls design



8 months  
improved graphical models  
RTI obtained  
Launching platform



20 months  
Cabin controls design  
Math model Iterations  
Wave model iterations  
RTI management  
Multiple view design



12 Months  
RTI and federation design  
Use of Computer  
Peripherals to launch  
Instructor station



24 Months  
Cabin controls finalization  
Math model Iterations  
Sound system  
Visual system

# Evaluating Success

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*Evaluating the success of the R&D project*

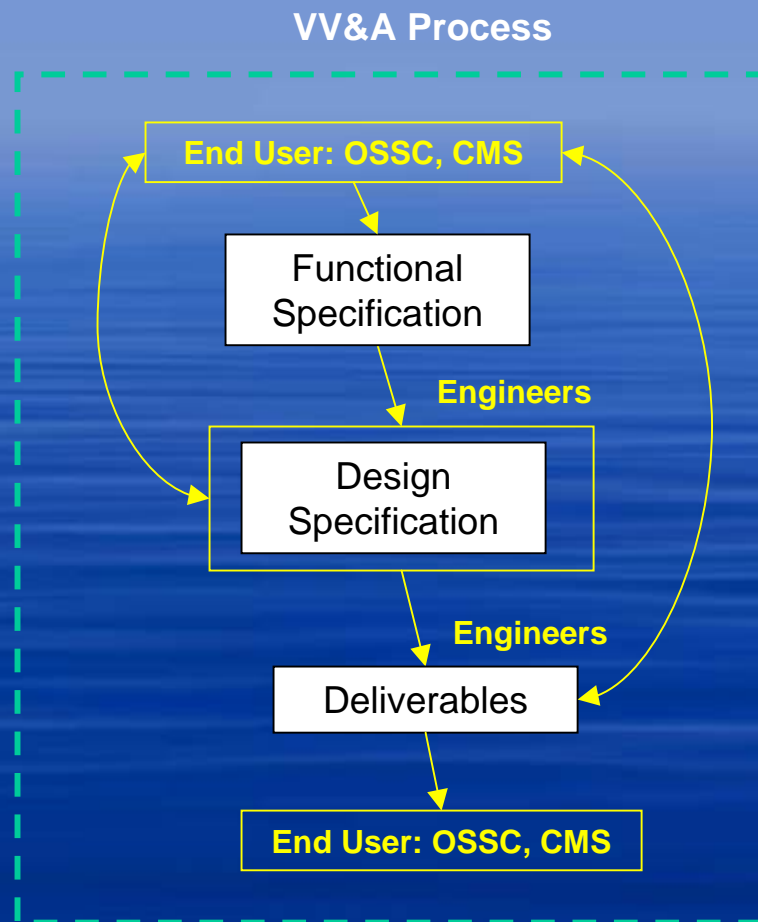
- Program accelerated by hard working students and additional funding
- Positive feedback on the realism of the simulator
- The collective effort of the local cluster of ocean expertise resulted in a successful R&D project
- Room for improvement



# Lessons Learned

*Increase effectiveness by minimizing lost time*

- Discontinuity due to changing student work force
  - Improve documentation
  - Introduce full time personnel
- Ensure the VV&A is not a linear process
  - Implement early
  - Let the end user define the project goals
  - Involve the user in the design process with continual feedback



# The Road Ahead

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*Making use of the simulator will improve the product*

- Simulator is to be incorporated into a training program at the OSSC
- Technical refinements to be made
  - Product will improve as feedback is obtained
  - VV&A process is ongoing
- Technology has been expanded to additional simulator projects
- Move from R&D to commercialization
  - Virtual Marine Technology Inc.



# Thank you

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*Thank You for your attention!*

*Visit our exhibit for a ride in the  
Lifeboat Simulator*

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