



Steering bar system for enhanced and intuitive vessel control

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Agenda

- Challenges controlling High-Speed boats
- Objective of designing a HSBCockpit
- Sensory overload
- Intuitive interfaces
- The Ullman Intuitive Steering System



With great power comes
great responsibility

=>

- Demands on the operators increase.
- Margins for mistakes shrink.
- Consequences of mistakes get worse.



Challenges controlling High-Speed boats

- Conventional vessels vs. HSC
 - Different driving techniques
 - Higher relative power
 - Higher forces acting on craft and crew



Conventional Cockpits





Conventional cockpits





Sensory overload

The brain receives thousands of signals every second.

Only a fraction reaches conscious levels.

Several factors affect our capacity to register these signals

- Stress
- Fatigue
- Noise
- Exposure to impact and vibration
- Gunfire & Missiles
- Sea state
- Bad visibility

When critical information is missed or misinterpreted – we are faced with sensory overload



Sensory overload

The bulk of the signals are just filtered,
but a huge amount is used to control
reflex patterns.

subconscious response

conscious response



Sensory overload

Moving routine tasks from cortical (conscious) levels of the brain to the brain stem (reflex levels) will free mental capacity.

This is an effective way to increase perception, capacity and safety.

Existing reflexes can be used when controlling a boat!







The future of HSC Cockpits?





Objective when designing a HSC Cockpit

Operators of HSC's should have an
environment that is:

Safe

Comfortable

Flexible

Relaxing

After 4 hours as well as after 20 years



Operator Interfaces

There are a few “rules”

- Identify crucial controls
- Minimize the static and dynamic load
- Avoid extreme positions
 - like slouching or stretching/reaching

Intuitive interfaces

- Human compatible
- Multimodal feedback



Steering bar system for HSC







Steering bar cockpit





Intuitive interfaces

It works the way you would expect

- Shorter response times
- Reduced risk of mistakes
- Reduced sensory load
- Reduced stress
- Increased comfort
- Faster learning – “Reflexation”