DARE TO DISCOVER A.I.

THE 4TH DIGITAL REVOLUTION IN ONE BOX

SMART SHIPPING EVENT

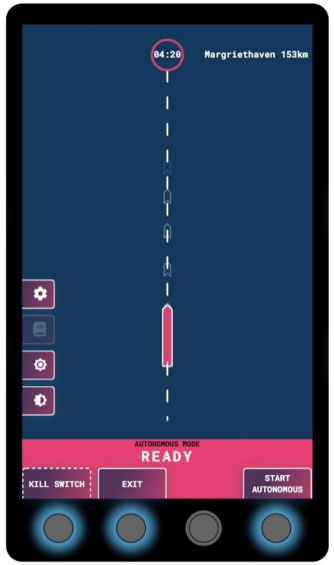
SHIPPING TECHNOLOGY

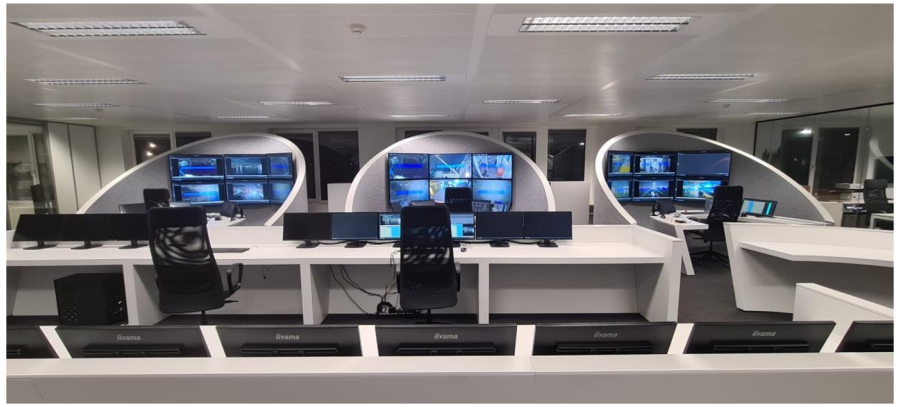
VORIG JAAR SME AANKONDIGING
UNIEKE EXCLUSIEVE SAMENWERKING

+

ST BRAIN

+





WAAROM **OOK ALWEER?**

	Level	Designation	Vessel command (steering, propulsion, wheelhouse, …)	Monitoring of and responding to navigational environment	Fallback performance of dynamic navigation tasks	Remote control
BOATMASTER PERFORMS PART OR ALL OF THE DYNAMIC NAVIGATION TASKS	0	**NO AUTOMATION** the full-time performance by the human boatmaster of all aspects of the dynamic navigation tasks, even when supported by warning or intervention systems *E.g. navigation with support of radar installation*				No
	1	**STEERING ASSISTANCE** the context-specific performance by a steering automation system using certain information about the navigational environment and with the expectation that the human boatmaster performs all remaining aspects of the dynamic navigation tasks *E.g. rate-of-turn regulator* *E.g. trackpilot (track-keeping system for inland vessels along pre-defined guiding lines)*				
	2	**PARTIAL AUTOMATION** the context-specific performance by a navigation automation system of both steering and propulsion using certain information about the navigational environment and with the expectation that the human boatmaster performs all remaining aspects of the dynamic navigation tasks				
SYSTEM PERFORMS THE ENTIRE DYNAMIC NAVIGATION TASKS (WHEN ENGAGED)	3	**CONDITIONAL AUTOMATION** the sustained context-specific performance by a navigation automation system of all dynamic navigation tasks, including collision avoidance, with the expectation that the human boatmaster will be receptive to requests to intervene and to system failures and will respond appropriately				Subject to context specific execution, remote control is possible (vessel command, monitoring of and responding to navigational environment and fallback performance). It may have an influence on crew requirements (number or qualification).
	4	**HIGH AUTOMATION** the sustained context-specific performance by a navigation automation system of all dynamic navigation tasks and fallback performance, without expecting a human boatmaster responding to a request to intervene[1] *E.g. vessel operating on a canal section between two successive locks (environment well known), but the automation system is not able to manage alone the passage through the lock (requiring human intervention)*				
	5	**AUTONOMOUS = FULL AUTOMATION** the sustained and unconditional performance by a navigation automation system of all dynamic navigation tasks and fallback performance, without expecting a human boatmaster responding to a request to intervene				

[1] This level introduces two different functionalities: the ability of "normal" operation without expecting human intervention and the exhaustive fallback performance. Two sub-levels could be envisaged.

COMBINATIE SEAFAR & ST HAALT **HORIZON LEVEL 5** NAAR VOREN

EEN VRESELIJK PLAATJE

			SEAFAR				Client Preparedness for type of automation;
			Control System		Service		
			No	Yes	No	Yes	
Shipping Technology	ST Brain	Yes	**A)** Integration synergies CCR LvL 0; No Automation	**B)** Benefits from data exchange between both systems CCR Lvl 1; No Automation	**C)** Operational SEAFAR data accessibility via ST Brain upon service usage CCR LvL 0; No Automation	**D)** Data sharing and analysis for operations optimization CCR LvL 3; Conditional Automation	LVL. 3 Conditional Automation
		No		**E)** Integration synergies Automation benefits CCR LvL 2 or 3; Partial of Conditional Automation		**F)** Immediate data accessibility in future of SF data via ST Brain CCR LvL 2 or 3; Partial or Conditional Automation	LVL. 2 Partial Automation
	ST BRAIN + Autonomous Lane Assist	Yes	**G)** Integration Synergies Automation benefits CCR LvL 1; Steering Assistance	**H)** Integration Synergies Automation benefits CCR LvL 4; High Automation	**I)** Integration Synergies Automation benefits CCR LvL 1; Steering Assistance	**J)** Human supervised autonomous technology with crew reduction permit CCR LvL 5; Autonomous/Full Automation	LvL 5 Full Automation
		No		**K)** Integration synergies CCR LvL 3 Conditional Automation		**L)** Benefits from data exchange between both systems CCR Lvl 2 or 3; Partial or Conditional Automation	LVL. 3 Conditional Automation

WAAR STAAN WE NU?

- Vergunningsaanvraag;
- Integratie systemen aan boord;
- Koppelen;
- **Redundancy testen;**
  - Back up als het ene systeem uitvalt
  - Back up als het andere systeem uitvalt
  - Kapitein als back-up
- Seafar afhankelijk van verbinding (veilig);
- ST ALA met ST BRAIN niet;
- Kapitein is er altijd als back-up.
- Dit alles onder toeziend oog van Rijkswaterstaat;

- Vergunning verleend en ook al een keer **verlengd** want we lopen natuurlijk uit ;-)
  - Installatie duurde langer door drukte installateurs en uitdagingen.
  - Kortom; **We zijn nog maar net klaar met de installaties & Integraties**

Toestemming BPR art 1.23 2e lid

Toestemming Experiment

Experiment vergaand geautomatiseerd varen

De Havenmeester van Rotterdam, werkzaam bij Havenbedrijf Rotterdam N.V. ,
tevens Rijkshavenmeester regio Rotterdam-Rijnmond,

Ministerie van Infrastructuur en Waterstaat

Toestemming

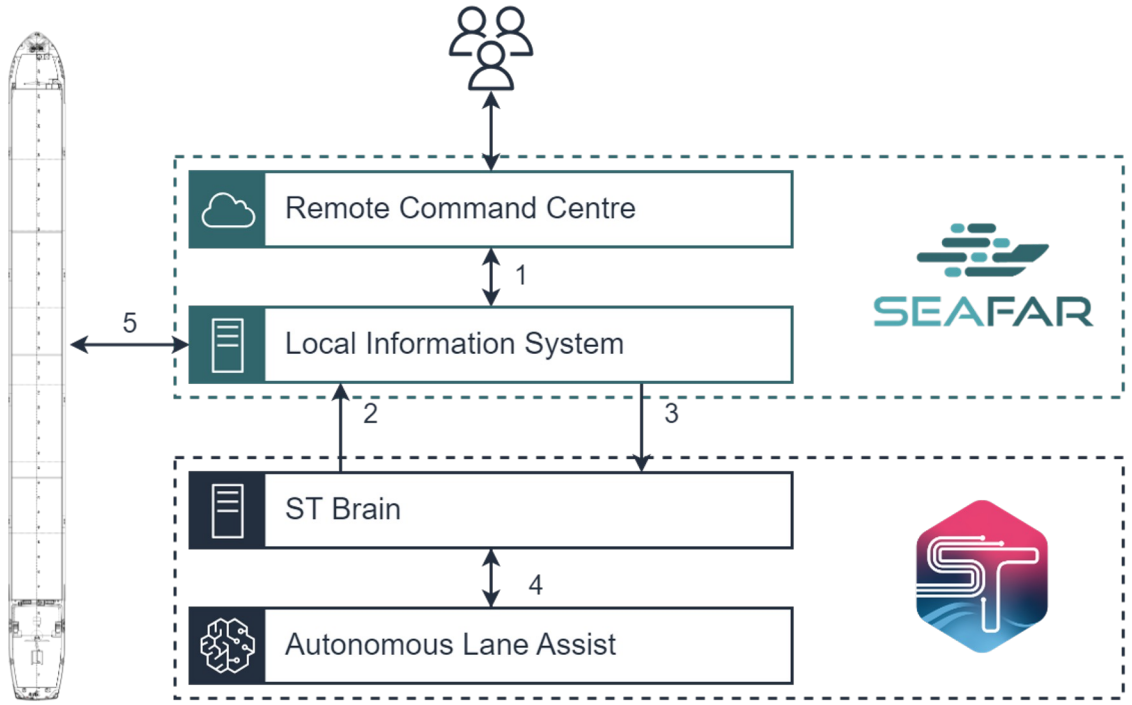
Datum 10 oktober 2023
Nummer SS2023-13; Shipping Technology

Onderwerp
Toestemming voor het uitvoeren van een experiment met een schip op de binnenwateren die in beheer zijn bij het Rijk, in het kader van vergaand geautomatiseerd varen.

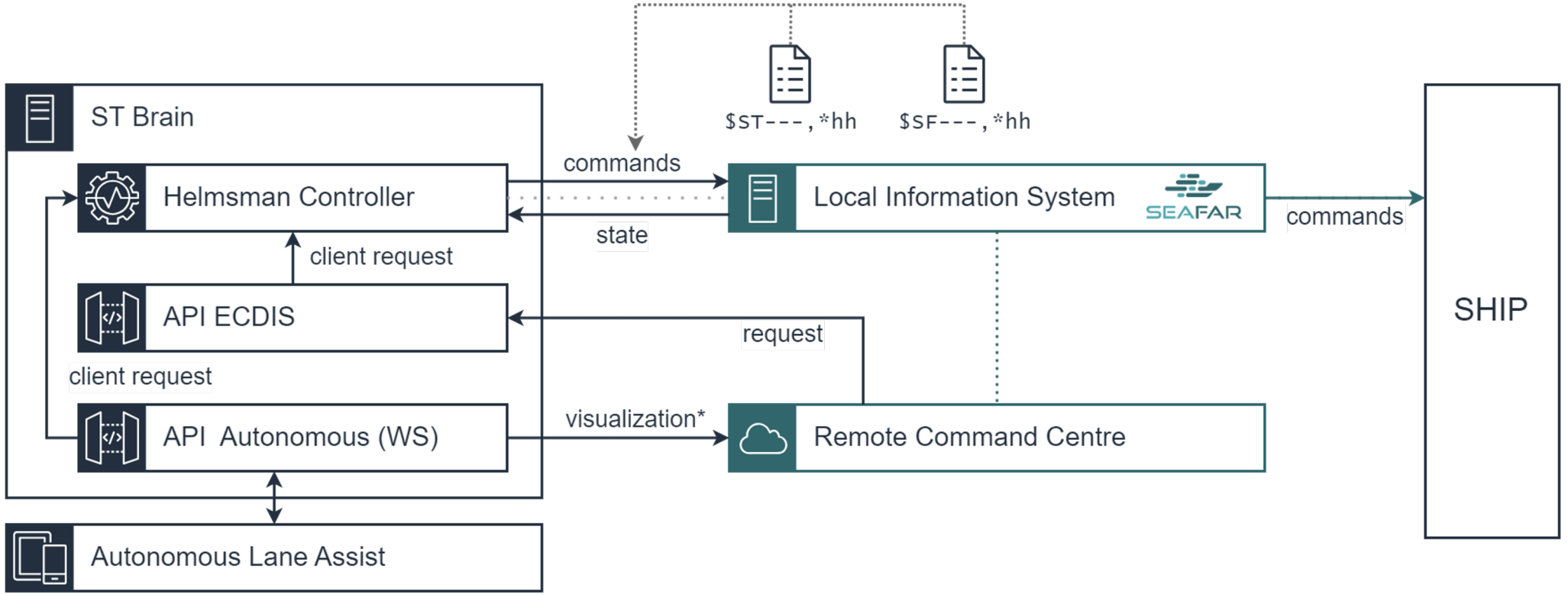
DE DIRECTEUR-GENERAAL RIJKSWATERSTAAT,

SEAFAR - ST INTEGRATION OVERVIEW

1. Secure connection to Remote Operating Center
2. Pilot commands + state of Autonomous Lane Assist
3. Pilot requests + state of Seafar missions
4. Process and respond all requests
5. Seafar commands the ship



SEAFAR - ST DETAILED VIEW



HOE DAARNA VERDER

- Hardware & software installaties doortesten;
- Protocollen opstellen en bijschaven;
- Rijkswaterstaat en geïnteresseerde wetgevende instanties **redundancy** aantonen
- Aantonen veiligheid en volwassenheid van producten → **stroomversnelling van autonomie;**
- Conclusies partijen incl. bemanning en management Bosman Shipping Group.

- Test Vergunningen uitbreiden;
- Testgebied uitbreiden;
- Verdere stappen maken.

- Snellere en concrete wetgeving met incentive voor scheepseigenaren.
- Hopen dat alles niet zo lang duurt als wetgeving voor “slechts” een trackpiloot.

Bosman Shipping Group

SEAFAR

Every Ship a **Smart Ship**

Vragen?

Shipping Technology B.V.
Veerkade 7D, 3016 DE Rotterdam
Info@shippingtechnology.com
+31 85 1304664