MARINE Safety Forum

All Members Meeting May 28th 2026 Agenda Item 4:

Safe Adoption of Targetless Sensors into DP

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Introduction:

A new generation of “targetless” Position reference sensors are reaching the market. Current DP practice is to treat them like their targeted versions. Can we do better and make more use of the “situational awareness” that they can provide? Navis DP will be undertaking trials through the Summer of 2026 to find out.

About Us:

Navis Engineering:

- Main product Navis DP
- Based Helsinki & Bulgaria
- DP systems make up 80% of the business since 2002
- Navis DP core philosophy:
  - Understand the sensor inputs in depth.
  - Deliver absolute resilience in complex marine environments.
  - Facilitate DPO decision making.
- Specialists in DP with Subsea inputs: dredgers, cable/pipe lay, dive support, jackups etc.

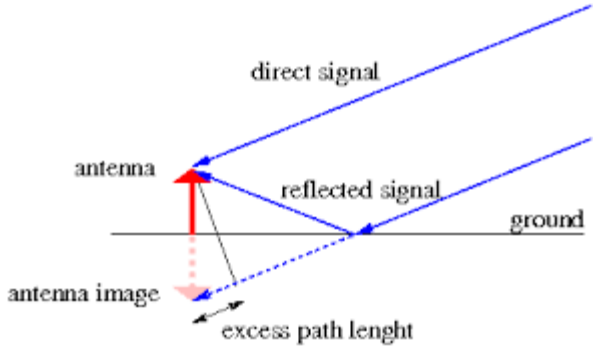
Thanks also to:

Sonardyne:

- Established 1971
- Leader in underwater tech
- Part of Covelya Group
- Sensors used throughout the North Sea and around the world.
- Supporting this trial with vessel time

Short Primer on DP Sensors

- Commonly known as Position Reference Sensors or PRS
- Used as a position input into a Dynamic Positioning System (DP).
- Global Navigation Satellite Systems (GNSS) – eg: GPS, GLONASS, Galileo etc. have two major failings:
  - Easily spoofed, disrupted (faint signal)
  - Subject to multipath distortions when operating close to an asset.
- Surface (laser, radar), subsea (sonar) and physical (tautwire) PRS are used to overcome these limitations.
- To date these have required targets - measuring range and bearing to an installed target.
- The new generation of PRS are “targetless”. They scan the area around them then use that “Situational Awareness” to infer relative position.



Images courtesy of Jan de Nul and Guidance Marine

Problems with targeted sensors:

Operational Issues:

- Target presence – not all assets have fitted targets
- Target occlusion (eg construction vessel or drilling mud hose)
- Target degradation (eg: salt riming, guano build up)
- Target movement (eg: jack up target placement, extreme vessel motion)
- Target confusion (eg: PPE and other retro-reflective surfaces)

All of the above requires the DPO to satisfy themselves that they have acquired a quality target. Can we eliminate/automate this step?

Cost Issues:

- Who is responsible for them?
- Who maintains them?
- OK in O&G where 1 target can support multiple PSVs - Not OK in Wind farm where each tower can have three landing stages and just one OSV.

Some of the targetless PRS available today:

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Other targetless sensors exist.

Modality	Sensor	Supplier	Image	Comments
Laser	SceneScan	Guidance		Single point laser. Sweeps horizontally. Works with some limitations (eg diagonal spars). Launched 2024. Order taking.
	Unity	Furlong		Multi point laser. Sweeps in a precessing circle giving a full 3D scan. Works both with and without targets. Launched 2025. Order taking.
	SpotScan	Kongsberg		No detailed information other than website. Launched? Order taking.
Radar	RS 24	Guidance		24GHz radar (I understand they also have a 77GHz radar under development)
Sonar	Sprint-Nav	Sonardyne		Targetless Sonar. Uses seabed and water column features, combined with excellent inertial sensing.

Navis DP are going to test all three targetless modalities.

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Test 1: Safety Risks of “targetless” PRS

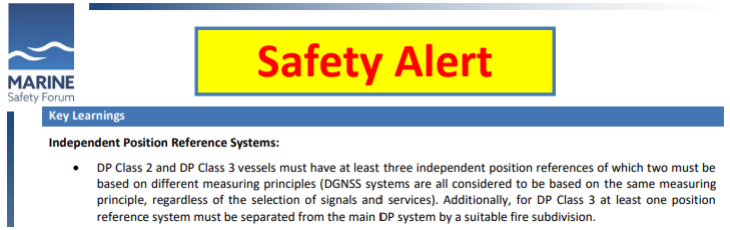
- What are they?
- How to detect them?
- How to handle any failures?

Examples:

- Black Body Scene and Scene Scale Occlusions:
  - Eg massive construction vessel taking up most of the scene
  - Dark, featureless bodies (eg Penguin FPSO)

- Extreme Vessel Motion
  - Breaking the Scan to Scan mapping and spatial logic
  - Closing circular vessel routes

- High Current Locations
  - Distorting acoustic references in the water column
  - Immunity to vessel borne noise – and recognising errors.



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Key Learnings

Independent Position Reference Systems:

- DP Class 2 and DP Class 3 vessels must have at least three independent position references of which two must be based on different measuring principles (DGNSS systems are all considered to be based on the same measuring principle, regardless of the selection of signals and services). Additionally, for DP Class 3 at least one position reference system must be separated from the main DP system by a suitable fire subdivision.

Test 2: Safety Benefits of “targetless” PRS

- Eliminates/reduces current target failure modes:
  - Target occlusion (eg construction vessel or drilling mud hose)
  - Target degradation (eg: salt riming, guano build up)
  - Target movement (eg: jack up target placement, extreme vessel motion)
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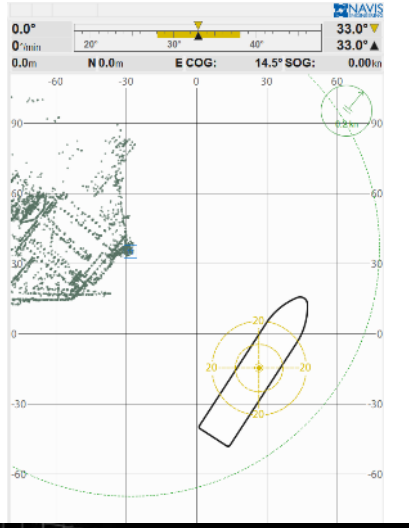
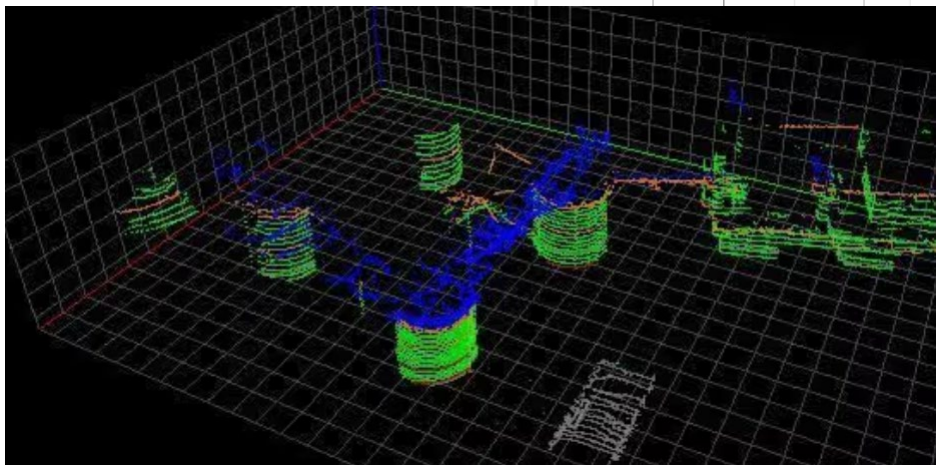
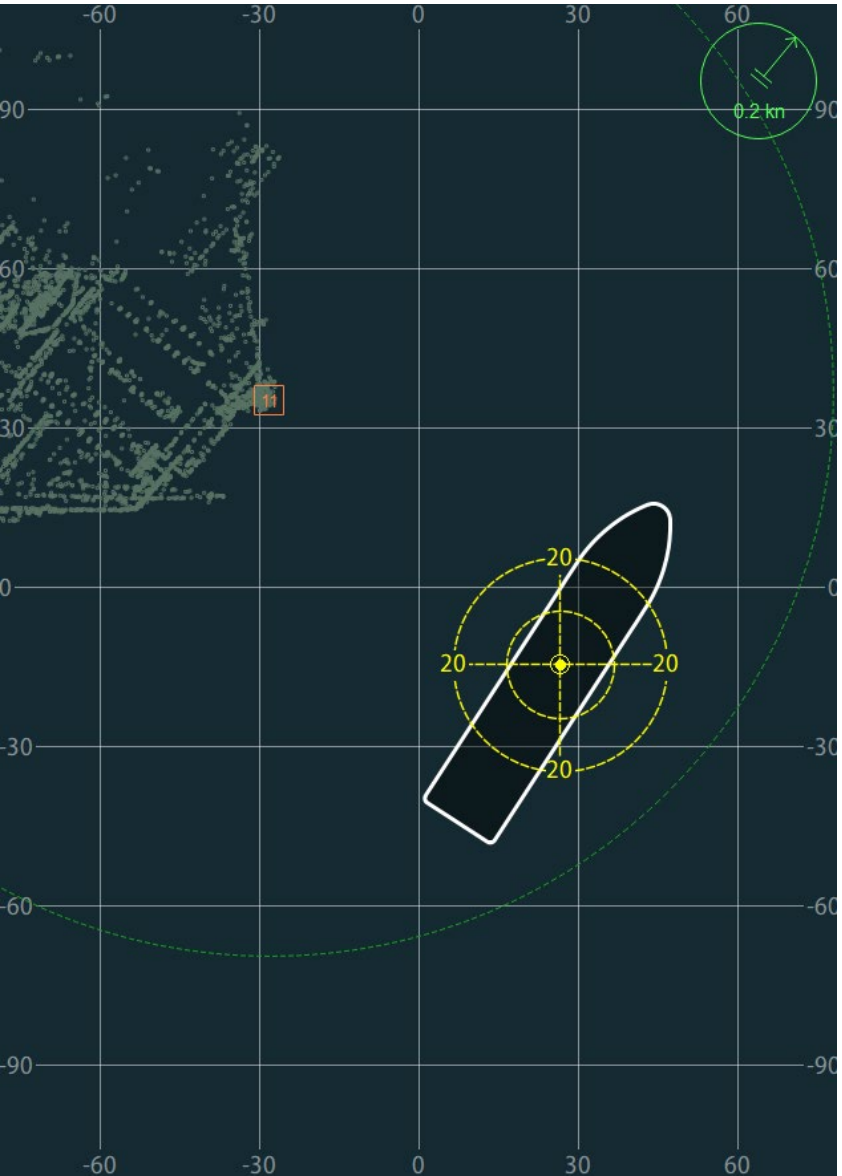


- Provides more situational data:
  - Laser: Scan of asset
  - Radar: Scan of area
  - Sonar: Seabed data, water column currents



- Do they introduce a “Different Measuring Principle”?

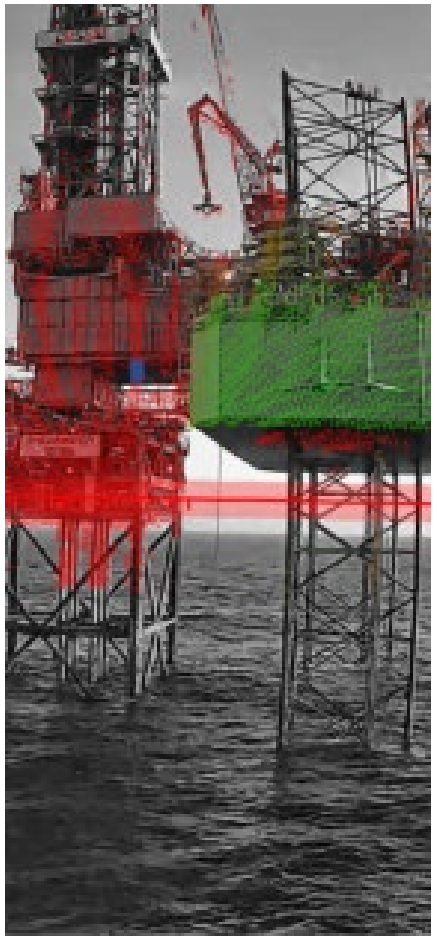
Test 3: Operational benefits:



- What does target elimination mean for the DPO and Operating Guidelines?
  - Can Navis DP make the “target” selection part of the process optional?
  - If no targets are being selected do we need a PRS monitor at all? Can it be integrated into the DP display?
  - Can we work in bigger weather windows/higher sea states in targetless mode?
- Is the additional situational data useful?
  - Use of a sensor specific message format that includes relative heading.
  - Is a plan view of the scan useful to the DPO while positioning?
  - Would electronic guard rails around asset be useful?
  - Can Navis DP use water column data to improve improve positioning models?

Additional Questions:

- Do they introduce a “Different Measuring Principle” to their targeted cousins?
- How should we “weight” the data from each modality?
- Under what conditions do the measurements breakdown and how can Navis DP best detect and handle any failure modes?
- How does the industry objectively report on sensor performance?



What's next?

- Phase 1: Summer 2026:

  Trials undertaken and results to be analysed over the summer.

- Phase 2: October 2026:

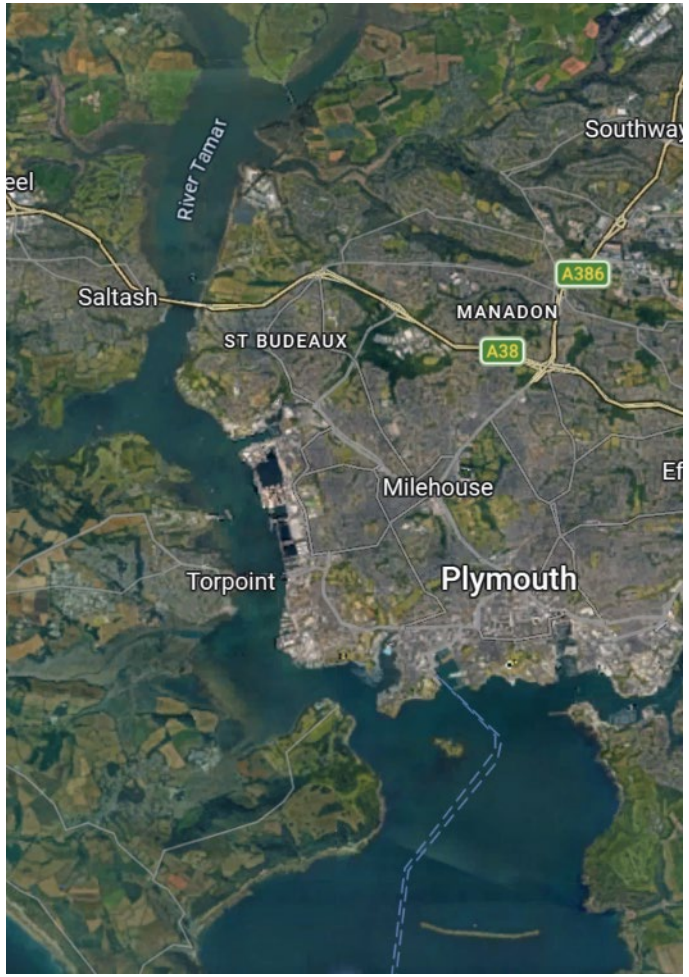
  Results to be shared at MTS DP conference in October.

- Phase 3: Late 2026:

  Extended capability support for SceneScan, Unity and Sonardyne Sprint-Nav rolled out across the Navis DP fleets.

First Trial: When and where?

- 1st – 4th June (next week!)
- Plymouth harbour courtesy of Sonardyne's "Echo Explorer" (pictured below).
- All welcome



Need your help:

If you share our vision for safer, smarter operations, we ask for your support:

Let us know your real-world experience

Vote Navis DP for the OSJ DP of the Year Award 2027

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Thank you

Andrew Stead

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