

PNT Report from the Red Zones

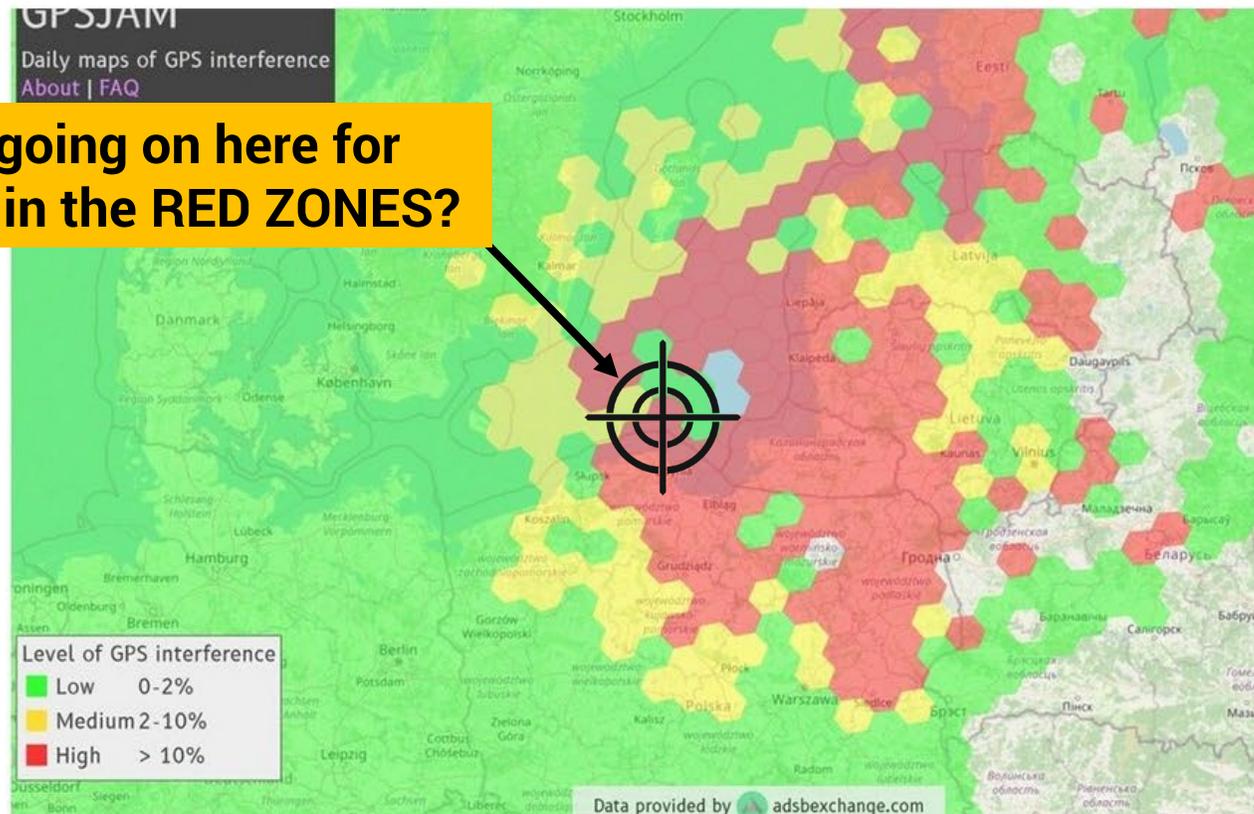
Nunzio Gambale – CEO



Baltic States Seek to Fight Back Against Russian Signal Jamming – gCaptain

by Editor | Aug 27, 2025 | Blog

What is *really* going on here for civilian systems in the RED ZONES?



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5447 Views



Port of Gdansk Outlines \$3 Billion Expansion Plan

PUBLISHED NOV 7, 2019 4:46 PM BY THE MARITIME EXECUTIVE



Illustration courtesy DCT Gdansk

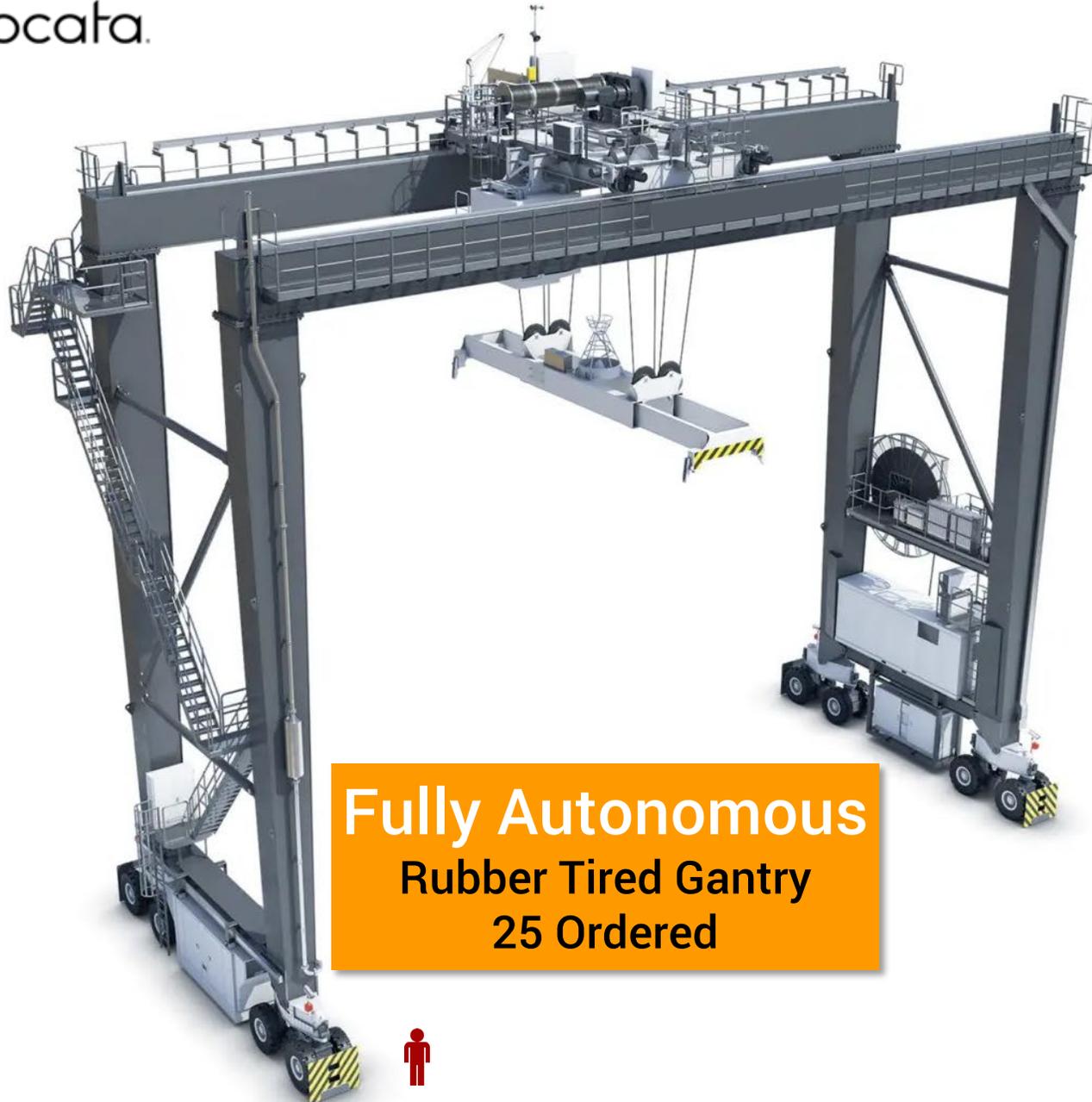
**Commenced November 2019
"Will create one of the EU's largest
Container Terminals"**

The Port of Gdansk, Poland is set to cement its position as a top maritime hub in the Baltic following the award of a contract to build a new \$245 million container terminal.

Spanish multinational company Ferrovial has announced that its Polish subsidiary

- **Automation is key expansion of Polish port infrastructure**
- **Capacity boost = 3 million to 4.5 million containers/year**
- **Enables the handling of the world's largest containerships**





**Fully Autonomous
Rubber Tired Gantry
25 Ordered**

Specs...

- 26mtr (H) x 30mtr (W)
- \$20 million each
- 3 x RTK GNSS for Autosteer + Place

MUST HAVE...

- < 2cm, 3 Sigma
- 24/7/365 without fail!!



Red Zone – FAIL!

What's your replacement?

Fully Autonomous
Rubber Tired Gantry
25 Ordered



Specs...

- 26mtr (H) x 30mtr (W)
- \$20 million each
- 2 x RTK GNSS for Absolute + Place

MUST HAVE...

- < 2cm, 3 Sigma
- 24/7/365 without fail!!



The Baltic Sentinel > Hybrid War

BALTIC SEA POWER UNDER PRESSURE > Russia's GPS Warfare in Kaliningrad Disrupts Poland's Offshore Wind Construction, says Prime Minister Tusk



11th August 2025, 12:18



Polish PM Donald Tusk warns Russia's GPS interference from Kaliningrad is now disrupting Poland's offshore wind farm construction as well as air traffic. Poland will convene a Baltic Sea summit to safeguard critical maritime infrastructure amid growing hybrid threats.

Polish Prime Minister Donald Tusk has revealed a new harmful effect of Russia's GPS jamming in the region. While Russia's GPS disruptions had already been raised by defense and aviation officials, Tusk is the first to formally highlight their ramifications for offshore wind energy projects.

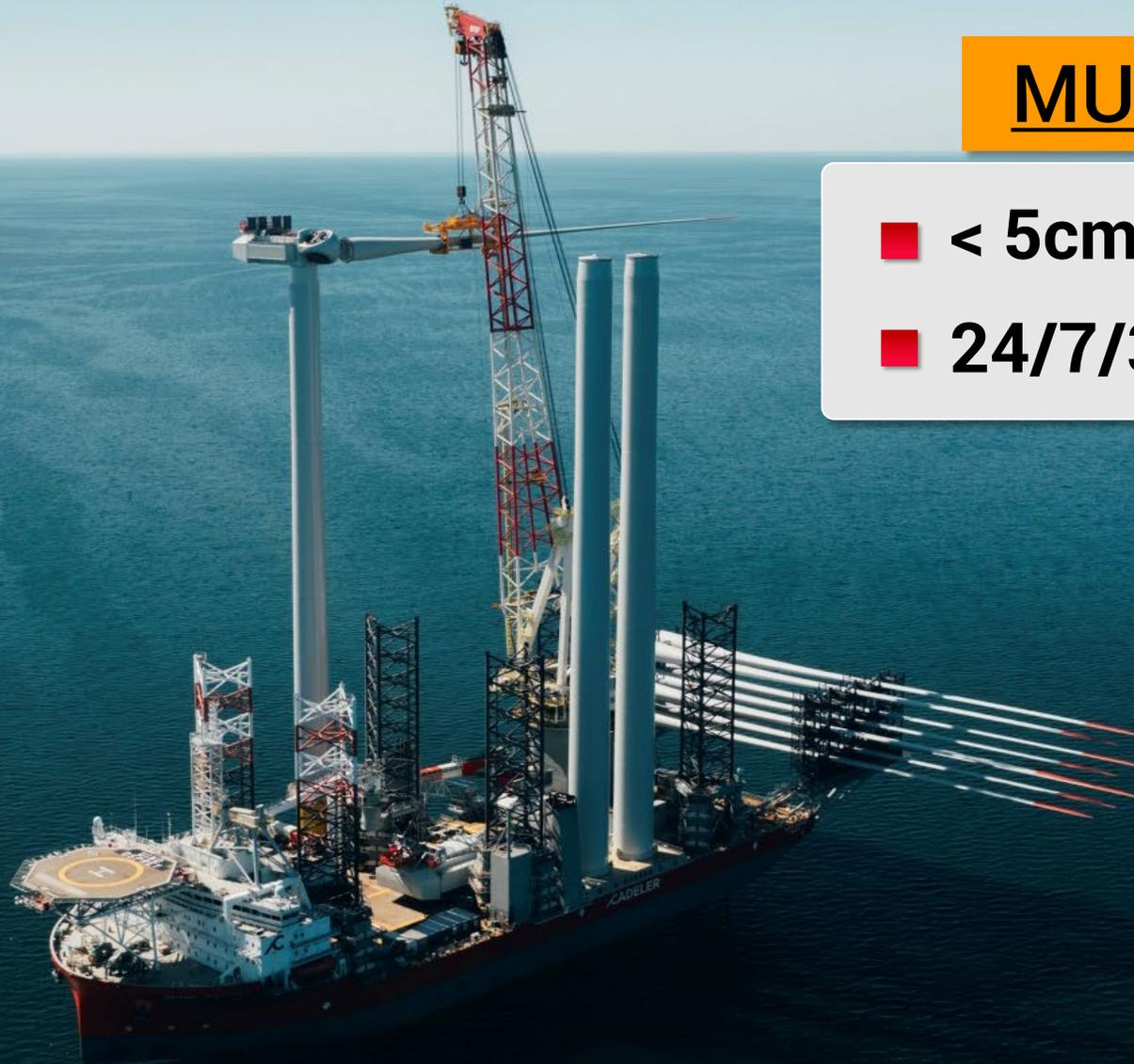
Speaking during a visit to the construction site of the Baltic Power offshore wind farm near the seaside resort town of Leba, Tusk warned that such disruptions — which he said are believed to be caused by Russia — could have serious consequences for critical infrastructure projects.

“Even this project has experienced GPS jamming, which can seriously impact the construction process,” he said, referring to the wind farm currently under construction.

Show desktop

- **\$5.1 billion** Baltic Power Project = “gigantic investment”
- Poland “closer to full energy security & independence”
- **Massive critical infrastructure - 76 Vestas 15 MW turbines**





MUST HAVE...

- < 5cm, 3 Sigma
- 24/7/365 without fail!!



MUST HAVE...

- < 10cm, 3 Sigma
- 24/7/365 without fail!!



*“ This interference... threatens our strategic projects” Prime Minister Tusk said. He added that **“precision is essential”** for such operations. ”*

The background is a photograph of a construction site, overlaid with a semi-transparent red filter. Several men are visible, some wearing hard hats and safety vests. One man in the center is pointing towards the right. In the background, there is a large piece of machinery with the text "PALFINGER PK 2350" visible.

Red Zone – FAIL!

What's your replacement?

“ *This interference... threatens our strategic projects” Prime Minister Tusk said. He added that **“precision is essential”** for such operations. ”*

**Precision Agriculture
is a vital National Critical Capability**



±2.5cm

Academic Journals and Conferences

ISTCGCAP / All Volumes and Issues / Volume 99, 2024 / New challenges for exploitation of continuously operating reference GNSS stations during hostilities. Case study of Ukraine

New challenges for exploitation of continuously operating reference GNSS stations during hostilities. Case study of Ukraine

ISTCGCAP. 2024; Volume 99,2024, Number 99: 28-37

<https://doi.org/10.23939/istcgcap2024.99.028>

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Reality in the Ukraine today..

“ Greatly affected by jamming... ”

“ We discovered a coordinate shift of approx. 400 meters from the field survey location. ”

Precision Agriculture
is a vital National Critical Capability

GNSS

Red Zone – FAIL!
What's your replacement?

±2.5cm

Dr. Irv Leveson 2013 PNTAB Report – first signs of future needs

Summary of Preliminary 2013 US GPS Benefit Estimates

| | Application Category | Range of Benefits (\$ billions) | Mid-range Benefits (\$ billions) |
|---------------|--|------------------------------------|-------------------------------------|
| A. Confident | A Precision Agriculture – grain* | 10.0-17.7 | 13.7 |
| B. Indicative | A Earthmoving with machine guidance in construction* | 2.2-7.7 | 5.0 |
| | A Surveying | 9.8-13.4 | 11.6 |
| C. Notional | A Air Transportation | .120 -.170 | 0.145 |
| | C Rail Transportation – Positive Train Control | .010-.100 | 0.055 |
| | C Maritime Transportation – nautical charts and related marine information | .106-.263 | 0.185 |
| | A Fleet Vehicle Connected Telematics* | 7.6-16.3 | 11.9 |
| | A Timing 1 – Loran | .025-.050 | 0.038 |
| | A Timing 2 – GEOs | .025-.075 | 0.05 |
| | B Consumer Location-Based Services 1 – vehicle – willingness-to-pay* | 4.7-6.3 | 5.5 |
| | A Consumer Location-Based Services 2 – vehicle – value of time | 9.8-31.4 | 20.6 |
| | TOTAL (with alternative estimates for timing and consumer LBS averaged) | 37.1-74.5 | **68.7 |

* Includes indirect benefits from cost savings. Mid-ranges of alternative estimates are averaged.

Slide from: US Positioning, Navigation and Timing Advisory Board Meeting Presentation; October 30-31, 2015

Dr. Irv Leveson 2013 PNTAB Report – no denying the reality!

Summary of Preliminary 2013 US GPS Benefit Estimates

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| A. Confident | Precision Agriculture – grain* | 10.0-17.7 | 13.7 |
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2013

NB! Approx 70% of the Nations value derived from PNT required <3 mtr accuracy

| | | | |
|---|--|------------------|---------------|
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EU's PNT Vision 2035 White Paper **confirms what's needed...**



4.3.3 Expected performances and operational requirements

The following table summarizes the expected performances and operational requirements of the PNT solutions for different users and critical applications by 2035:

Table 2.- Foreseen performance and operational requirements for different user types and critical applications.

| User type | Application | Accuracy (H / V) | Availability | Continuity | Integrity | Alert time | Alert limit | Geo coverage |
|----------------|--|------------------|--------------|--|------------------------------------|------------|-------------|---|
| Aviation | CAT I – III landing | 16 – 3 m | 99 – 99.999% | >1 -8.10 ⁻⁶ in any 15 s | >1-2.10 ⁻⁷ per approach | 6s – 1s | 4 -1 m | Regional or local Outdoors |
| Marine | MAAS harbour approach, waterways | 10 – 2 m | 99.8 – 99.9% | 99.97% in any 15 min | TBD | 10s | | Global Outdoors |
| Road | Collision avoidance, autonomy L3 and above | 10 cm | 99.90% | >10 ⁻⁸ /h | 1-10 ⁻⁸ / h | 5 s | 20 cm | Regional or local Outdoors, indoors, urban |
| Agriculture | Precision irrigation, cultivation | 15 – 2 cm | 99.90% | TBD | TBD | 5 s | 25 cm | Regional or local Outdoors |
| Geomatics | Kinematic survey | 6 – 4 cm | 99% | 10 ⁻⁴ /h to 10 ⁻⁶ /h | TBD | 1s | TBD | Regional or local Outdoors |
| Railways | Positive train control | 1 m | 99.90% | TBD | TBD | 6 s | 2 m | Regional or local Outdoors Tunnels Urban |
| Precise timing | 5G and DVB | 10 ns | TBD | TBD | TBD | TBD | TBD | Global Outdoors Indoors |

White Paper downloadable from:
<https://tinyurl.com/3cxujs7t>

EU's PNT Vision 2035 White Paper **confirms what's needed...**

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Before 2035

NB! 80% of the Nations value derived from PNT apps will need < 1 meter accuracy and < 10ns time!

| | | | | | | | | |
|----------------|------------------------|-------|--------|-----|-----|-----|-----|---|
| Railways | Positive train control | 1 m | 99.90% | TBD | TBD | 6 s | 2 m | Outdoors Regional or local Outdoors Tunnels Urban |
| Precise timing | 5G and DVB | 10 ns | TBD | TBD | TBD | TBD | TBD | Global Outdoors Indoors |

Lesson 1 from the Front

Many valuable apps today (and most future apps) need HIGH ACCURACY.

Unless C-PNT apps can NATIVELY deliver
CM-ACCURACY & SUB-NANOSECOND TIME
they will be NEXT TO USELESS for many users – and most future apps!

DO NOT DEPLOY YOUR GRANDFATHERS GPS BACKUP!

Operation Spider's Web

WSJ



In total, Ukrainian officials said 117 drones were used,

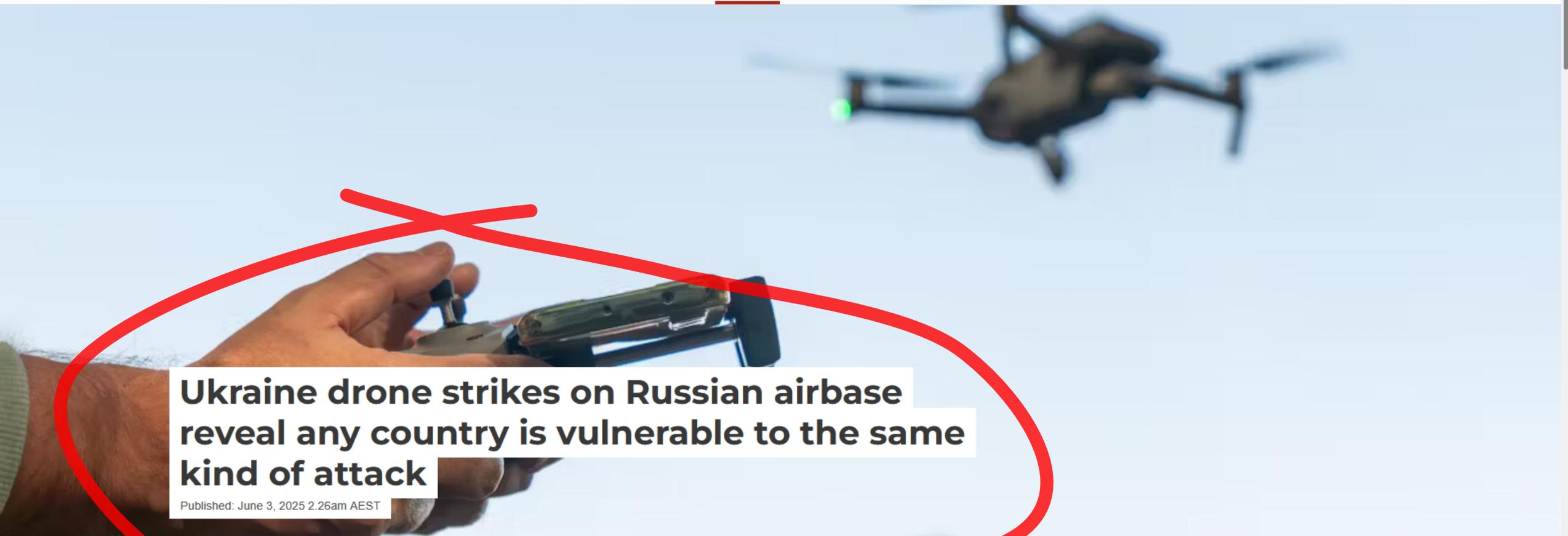
Operation Spider's Web

WSJ



MARK THESE WORDS

Ukraine's unprecedented **COVERT DRONE ATTACK**
on Russian airfields on 1 June 2025
changed the world of GPS forever.



Ukraine drone strikes on Russian airbase reveal any country is vulnerable to the same kind of attack

Published: June 3, 2025 2.26am AEST

Melnikov Dmitry / Shutterstock

Ukrainians are celebrating the success of one of the most audacious coups of the war against Russia – a coordinated drone strike on June 1 on five airbases deep inside Russian territory. Known as Operation Spiderweb, it was the result of 18 months of planning and involved the smuggling of drones into Russia, synchronised launch timings and improvised control centres hidden inside

Author

Michael A. Lewis
Professor of Operations and Supply Management,
University of Bath

Sir Abu Nu Ayr
صنير بو نجر

United Arab Emirates (UAE)

United Arab Emirates (UAE)



MUST HAVE...

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Zayed Military City

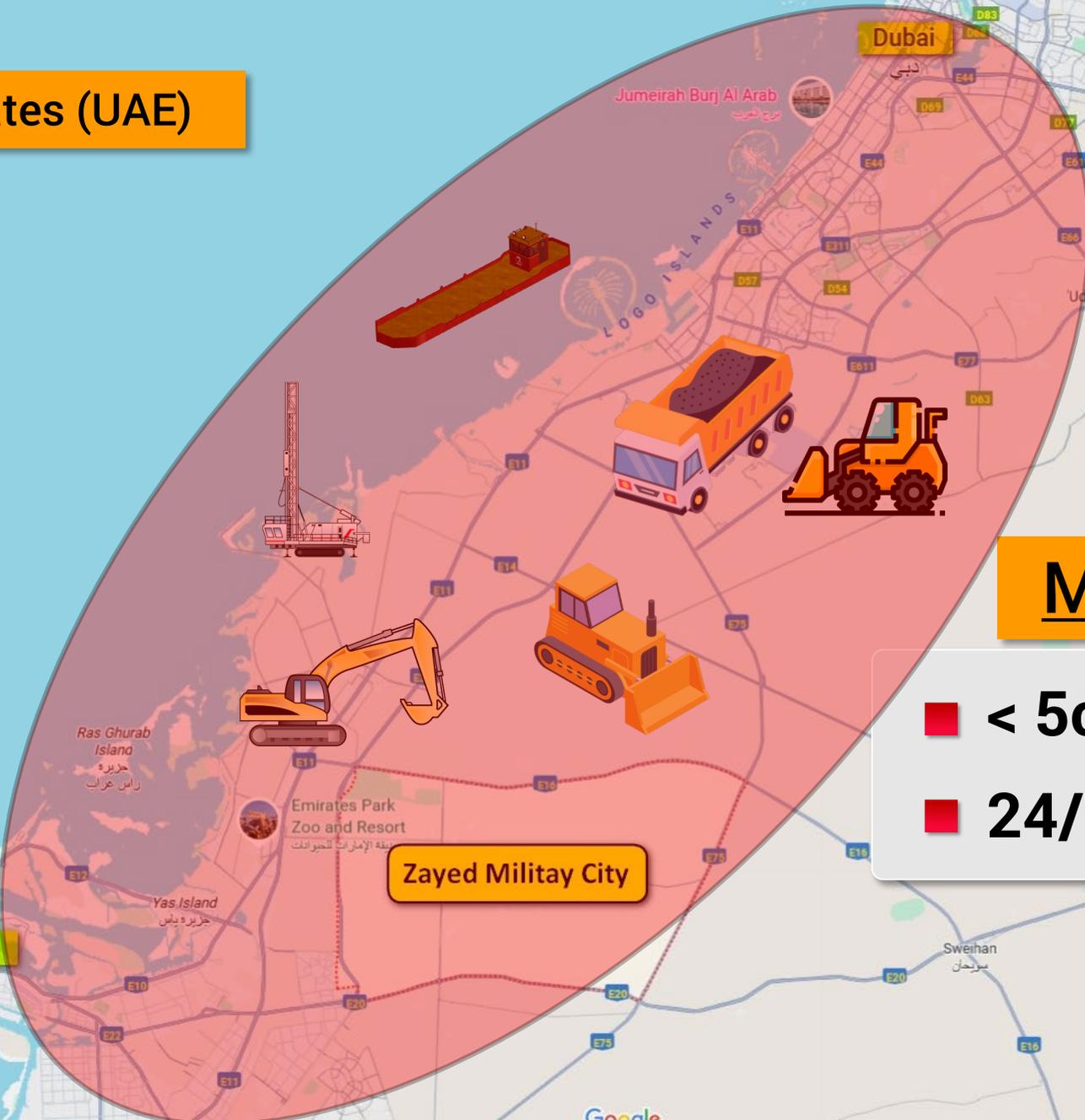
Abu Dhabi

Dubai



Sir Abu Nu Ayr
صنير بو نجر

United Arab Emirates (UAE)



MUST HAVE...

- < 5cm, 3 Sigma
- 24/7/365 without fail!!



➡ So what just happened?

Where Are

We Now?

**Wow... we
actually
did NOT
see this
coming...
at all!**



The consequences now
of the Spiders' Web
drone attack will
change the game of
GNSS applications
forever ...

Lesson 2 from the Front

Being “DRONED” now forces us to return to thinking of “Selective Availability”.

You **MUST** jam GPS around your own Critical Infrastructure
to protect your national assets.

Your **civilian systems** be will collateral damage –
and they will **SUFFER**.

What's REAL and What's NOT REAL for C-PNT??

A 3D rendered compass rose is centered on a circular scale. The scale is marked with the word 'FUTURE' in large, blue, sans-serif capital letters. The compass rose has multiple points, and a prominent blue arrow points towards the 'FUTURE' text. The background is a dark blue gradient with a subtle grid pattern.

Frankly, we see **WAY** too much BS, simulations and “marketing” from technologies now touting their ability to deliver mission critical capabilities...

It's past time to now separate the TRUTH from Marketing BS...



Dr. Bradford Parkinson ("The Father of GPS")
at the Assured PNT Summit-DC-April 2025

“ Until I see fully-verified proof from an independent source, all your claims are just a piece of paper. ”

NEVER has a truer word been spoken!

The FUTURE of C-PNT MUST HAVE VALIDATED:

A = **Accuracy** (cm-level)

I = **Integrity** (safety of life)

R = **Resilience** (tenacious!)

Lesson 3 from the Front

Prove “aviation-like” MOPS to be “mission ready”!

**Most “candidate C-PNT technologies” proposed today
are UNPROVEN IN THE REAL WORLD & NOT ACCURATE ENOUGH!**

**All C-PNT tech for CRITICAL INFRASTRUCTURE & HIGH-TECH APPS must
PROVE BASELINE CAPABILITY THRESHOLDS IN THE REAL WORLD FOR REAL APPS!**

Or they are “just pieces of paper”!

WITHOUT A – I – R MANY OF YOUR APPS WILL DIE!

Report ends
Thank you.