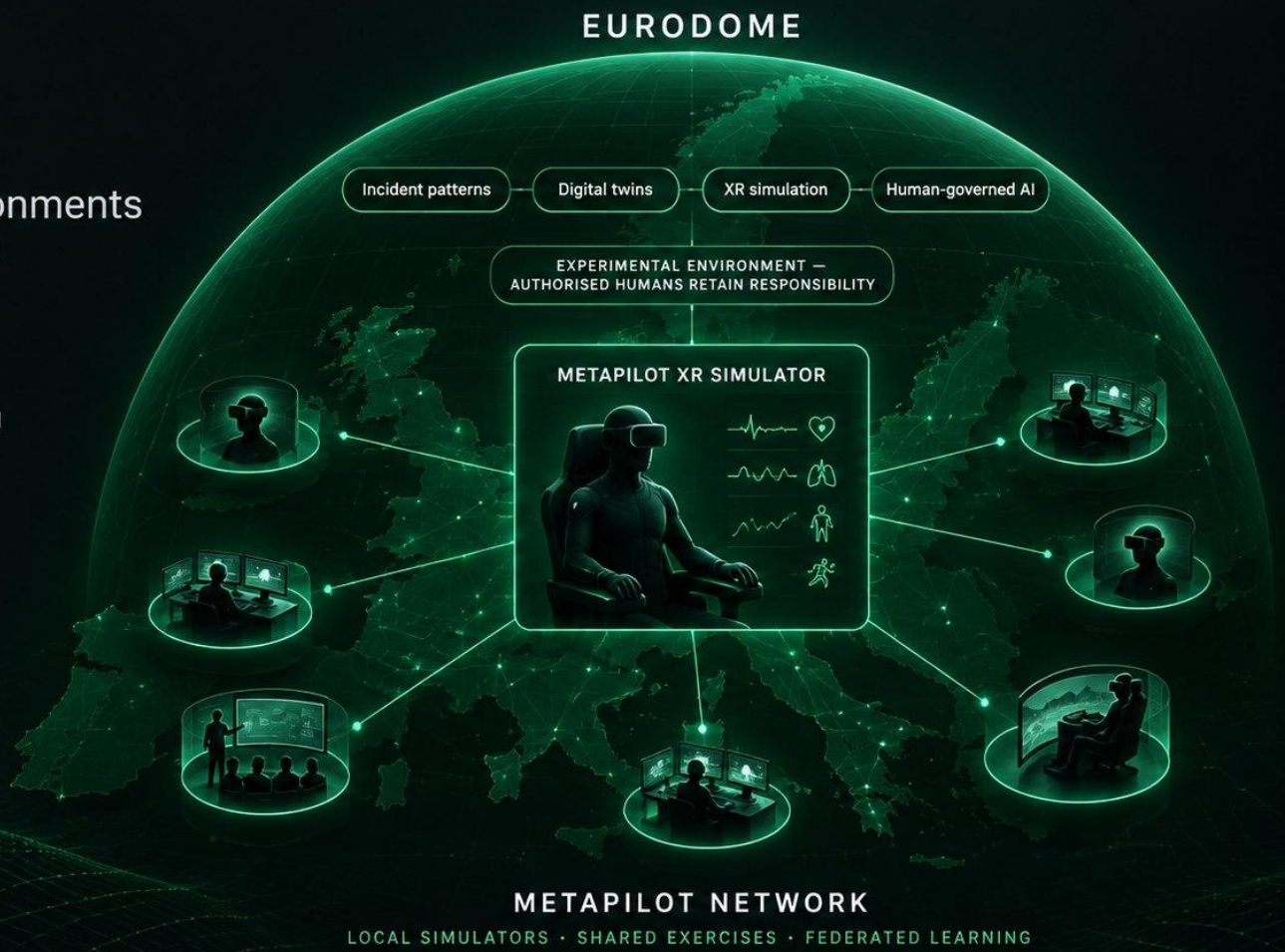
METAPILOT

Experimental Digital Twin Environments for NATO-Relevant Multi-Domain Defence Scenarios

Metapilot presents a NATO-relevant experimental environment for analysing, simulating and rehearsing complex unmanned-system scenarios.

We combine incident-pattern analysis, digital twins, XR simulation, human-performance research and AI-enabled decision support to reduce avoidable decision latency while preserving accountable human authority.



Diana Deca
Metapilot Academy / Metapilot NERVA
NATO CA2X2 Forum 2026 · Rome, Italy

2026 NATO Chief Scientist Grant · NATO STO

A low-cost threat must not create a high-cost decision

KEY POINT

Each incursion forces fighters, pilots, missiles and closed airspace against drones worth tens of thousands.

NATO STO RESEARCH

SCI-301 capable missiles are “often too expensive” for small drones; there is “no silver bullet”.

STO Strategy 2025 “very few, very costly” assets vs “masses of cheap and sufficiently effective” kit.

Trends 2025–45 AI and autonomy enable effects “below the threshold of armed conflict”.

Source: NATO STO SCI-301 · NATO S&T Strategy 2025 · NATO STO Trends 2025–2045

What the incident record shows

Metapilot analysis of eight representative 2025–2026 incidents. Timings are only those publicly reported.

Date	Country	Objects	Detection → outcome	Response	Payload
9–10 Sep 2025	Poland	19 incursions	Overnight; no public per-drone timeline	F-35, F-16, helicopters; 3–4 downed	Examined Gerbera decoys: no explosives
25 Apr 2026	Romania	1 Geran-2 + debris of 2	15 km low-altitude flight, crashed	Not intercepted	**Carrying explosives**
7 May 2026	Latvia	2 drones	Crossed and crashed; no interception	None; minister resigned	**One exploded at oil depot**
24 Jul 2026	Romania	1 Shahed-type	09:30 → ~11:00 (≈90 min)	Romanian F-16	Not stated
16 Aug 2026	Romania	1 drone	≈17 min to engagement (05:01)	Spanish F-18 (NATO)	Not stated
20 Aug 2026	Romania	1 drone	02:23 → 03:24 crash (61 min)	2 F-18 + helicopter; no engagement	Not stated
20 Aug 2026	Romania (sea)	1 sea drone	Spotted by coastguard near gas field	Romanian F-16	**Explosive-laden**
15 Sep 2026	Lithuania	1 drone	≈30 min over Lithuania	2 Italian Eurofighters	**Likely explosive**

Source: BBC · AeroTime · bne IntelliNews · Reuters · Reuters · France 24 · Grosswald timeline · ITV

Twelve months turned an incident into a pattern

From Poland's 19 incursions to armed drones over Lithuania, the Eastern Flank now faces repeated, low-cost probes.

9–10 SEP 2025

Poland

19 incursions; 3–4 drones downed by F-35/F-16; four airports closed; Article 4 requested.

12 SEP 2025

NATO

Eastern Sentry launched to bolster posture along the eastern flank.

7 MAY 2026

Latvia

Stray drone explodes at Rēzekne oil depot; minister resigns as anti-drone systems "not deployed fast enough".

7 JUL 2026

NATO

Drone Edge: >US$40bn for counter-drone over five years, C-UAS marketplace, 5× drone operators by 2027.

JUL–AUG 2026

Romania

Four drones shot down in 2026, all by crewed fighters (F-16, F-18).

15 SEP 2026

Lithuania

Italian Eurofighters down a drone "likely" carrying explosives.

Takeaway The threat is now recurring. The response is still largely fighter-centric and decided case by case.

Source: BBC · NATO Eastern Sentry · Reuters · NATO's Drone Edge · Reuters (Romania) · ITV

Tens of minutes where seconds are needed

Published timings show 17–90 minutes from detection to outcome. Targets are Metapilot research objectives.

17-90 min — detection to outcome in the four incidents with published timings (mean ≈ 50 min)

4 of 8 — incidents in our dataset involved confirmed or likely explosive payloads

100% — of 2026 drone kills over or off NATO territory were made by crewed fighters

IDEAL REACTION TIME · METADOME EXERCISE TARGETS

< 10 s	trusted, shared track distributed to every authorised node
< 60 s	classify, generate options and identify the deciding authority
Minutes, not hours	authorised, proportionate effect—the shortest lawful time

NATO STO EVIDENCE SCI-301 found radar/EO-IR C-UAS “can generate many false alerts” and are “manpower intensive”. NATO lessons (Feb 2026) urge rehearsing detect–decide–defeat–report in under 60 s.

Source: Reuters · France 24 · bne IntelliNews · Grosswald timeline · NATO STO SCI-301 · NATO LL portal / CALL

Do not accept an unfavourable exchange

Accepting exchanges that cost you more than your opponent slowly wears you down. Cheap drones do the same.

ADVERSARY MOVE

- Low-cost drone or decoy
- Estimated US$10–20k each
- Ambiguous intent and payload

→

ALLIANCE RESPONSE

- Fighter sortie, pilots and tankers
- Air-to-air missile or cannon
- Closed airports, alerts, coordination

→

CUMULATIVE EFFECT

- Readiness and pilot-hour erosion
- Stockpile pressure
- Fatigue and political cost

Poland reportedly spent ~US$1.2bn countering drones costing US$10–20k each. **The goal is not always the cheapest response. It is to preserve the expensive response for the threat that genuinely requires it.**

NATO STO EVIDENCE The STO S&T Strategy (2025) frames the trade-off between “very few, very costly” assets and “masses of cheap and sufficiently effective” kit; SCI-301: capable missiles are “often too expensive” for inexpensive drones.

Source: bne IntelliNews · NATO S&T Strategy 2025 · NATO STO SCI-301

BRIEFING OVERVIEW

One question, six steps

How can the Alliance detect, decide and neutralise low-cost drone incursions within seconds to minutes—without wasting high-value assets?

1
PROBLEM
Low-cost threats create high-cost decisions

2
EVIDENCE
Our incident dataset and reaction-time gap

3
DIAGNOSIS
Why the decision gap persists

4
METADOME
Federated decision-readiness layer

5
PEOPLE
Training one million Metapilots

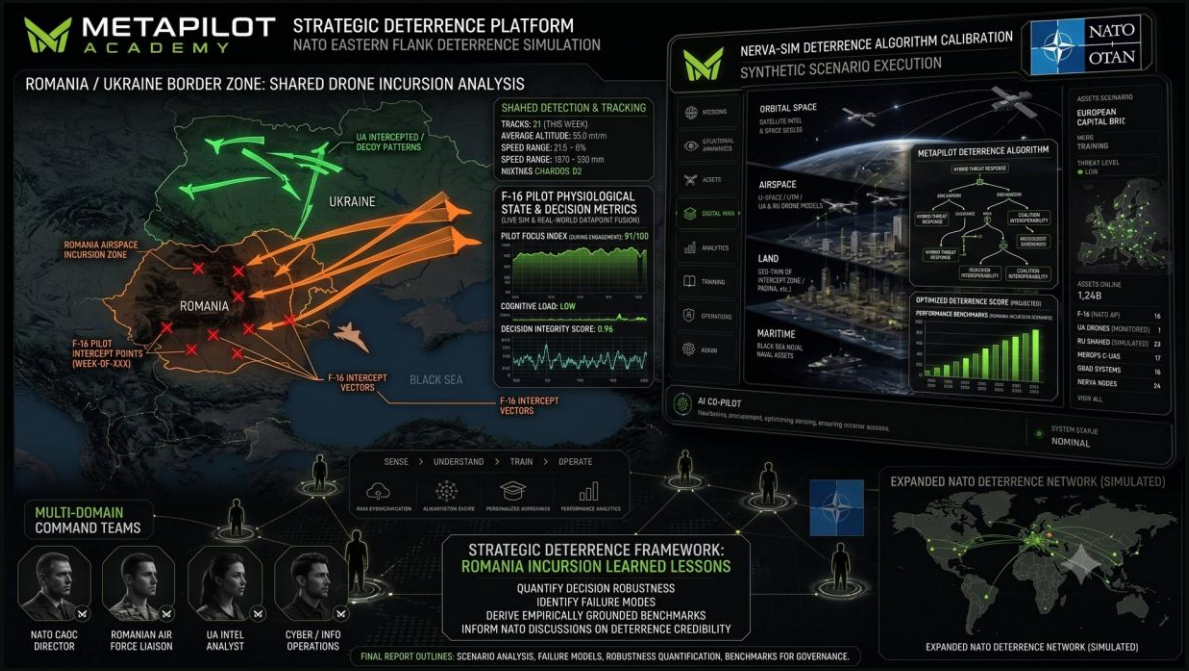
6
PATH
Grant, demonstrator and partners

GRANT CONTEXT 2026 NATO Chief Scientist Grant (1 of 8 from 173 applications): “Experimental Digital Twins for AI-Enabled Deterrence and Strategic Competition in the NATO Alliance”.

NATO STO EVIDENCE Every step is anchored in NATO STO research: SCI-301 (C-UAS), SET-322 (fusion), SAS-143 (multi-domain C2), IST-192 (AI decision support), TR-HFM-330 (human control), MSG-195/179 (M&S for acquisition).

Source: NATO STO grant announcement · STO newsletter Jun 2026 · STO 2024 Highlights

Detection is improving. Coordinated action is the bottleneck



KEY POINT

Sensors now see more. The delay lies in fusing, classifying, routing authority and acting together.

NATO STO RESEARCH

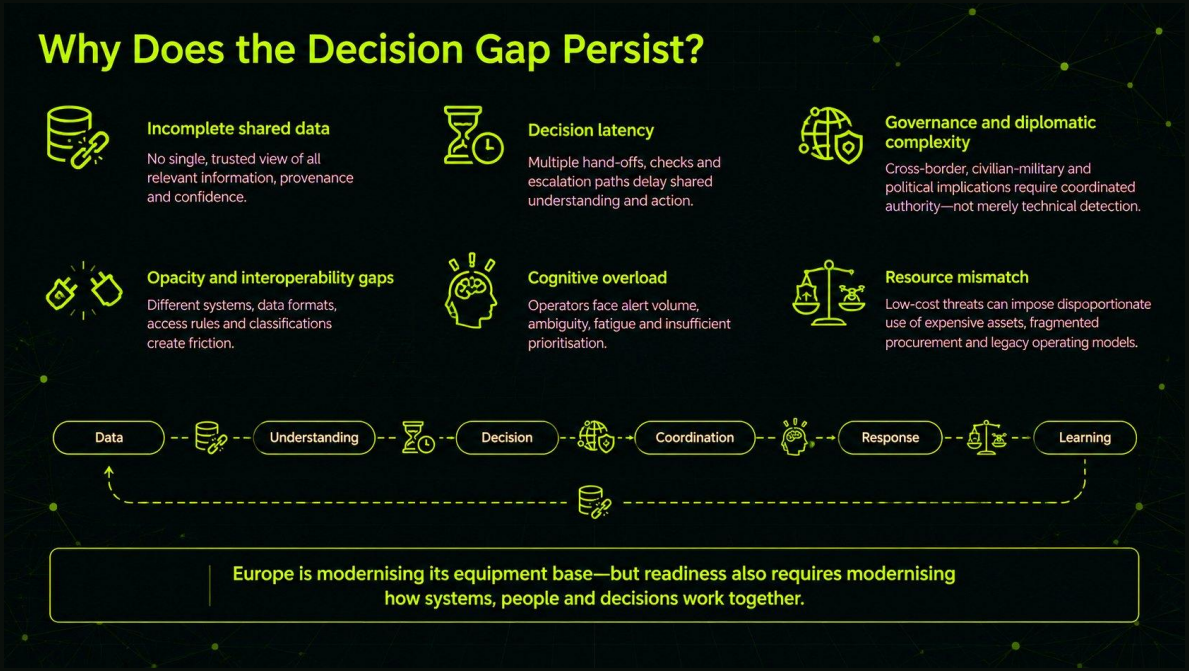
SET-307 · SET-348 · IST-SET-204 radar, EO/IR and RF detection of small UAS; drone RF database (2026).

SET-322 tracking and fusion evaluation framework, concluded March 2026.

SAS-158 AI to federate sensors “across NATO through resource pooling”.

Source: NATO STO CPoW 2025 · IST-SET-204 · SET-322 · STO 2024 Highlights (SAS-158)

Why does the decision gap persist?



KEY POINT

Six gaps—data, latency, governance, interoperability, cognitive overload, resource mismatch—compound under stress.

NATO STO RESEARCH

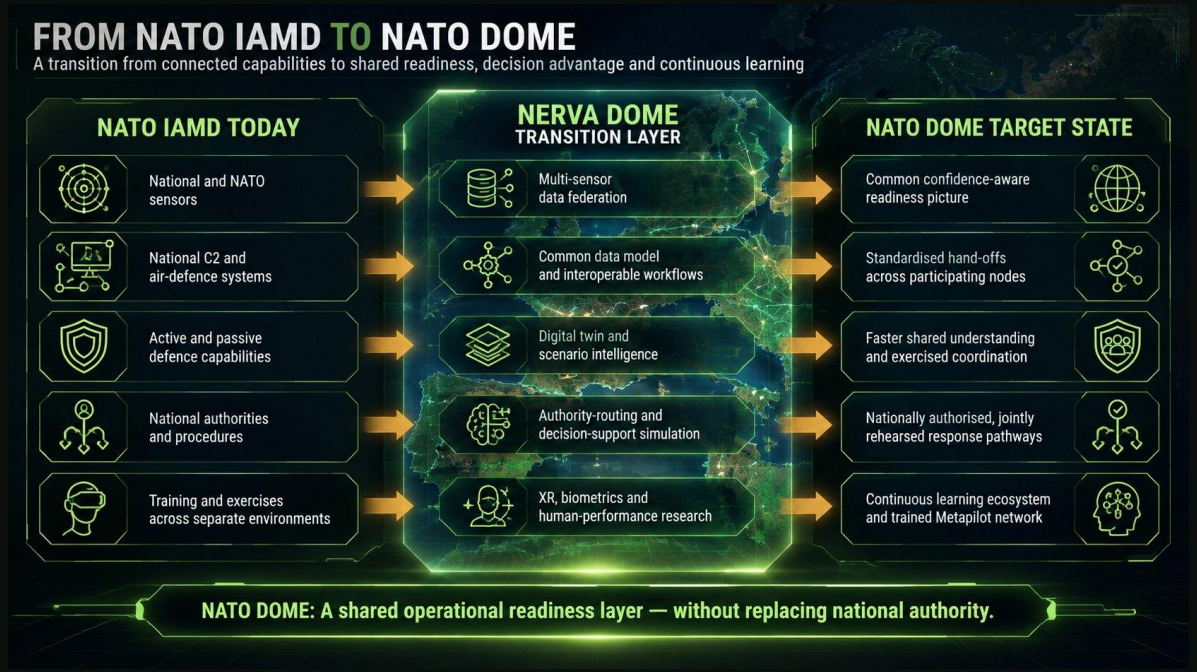
SAS-143 multi-domain operations “are likely to fail in the absence of harmonization”.

IST-192 first AI decision aid tested in an Article 5 exercise; studied trust and operator workload.

TR-HFM-330 human control across four nested loops, from operator to governance.

Source: STO 2024 Highlights (SAS-143, IST-192) · TR-HFM-330 summary · NCIA TIE26

From NATO IAMD to MetaDome



KEY POINT

A shared operational readiness layer on top of existing IAMD—without replacing national authority.

NATO STO RESEARCH

NATO Data Strategy 2025 secure data-sharing "while ensuring Allies retain control over their data".

IST-176 successful federated interoperability of C2 and IoT systems.

SDP 12000 new NATO IAMD plan from one-way attack drones to cruise missiles.

Source: NATO Data Strategy · STO 2024 Highlights (IST-176) · Caliber (SDP 12000)

From unmeasured cycle to rehearsed response

Every stage has an observed gap, a MetaDome target and a NATO STO research anchor.

Stage	Observed gap (2025–26)	MetaDome target	NATO STO anchor
Detect	Low-airspace gaps; a drone crossed into Bulgaria undetected	Radar, RF, EO/IR and acoustic ingest	SET-307, SET-348, IST-SET-204
Fuse	Separate national and technical pictures	One confidence-aware shared track	SET-322 tracking & fusion framework
Classify	Decoy or armed? Often unknown for hours	AI-assisted type with explicit uncertainty	IST-SET-204 drone RF database
Route authority	National vs NATO hand-offs	Pre-rehearsed authority pathway	TR-HFM-330 nested control loops
Decide & act	17–90 min; fighter by default	Human-authorised, lowest suitable effect	SCI-301 “system of C-UAS systems”
Learn	Fragmented after-action reporting	Federated replay and decision trace	NMSG M&S-as-a-Service

Source: NATO STO CPoW 2025 · SET-322 · IST-SET-204 · STO newsletter Mar 2026 · TR-HFM-330 · SCI-301 · MSaaS · bne IntelliNews

Evidence Coverage and the MetaDome Integration Gap

Research streams provide essential building blocks, but no single approach integrates the full human-authorised incident-to-decision workflow.

Research stream	Coverage in literature	Persistent limitation	Specific gap	MetaDome response	Core references	Integration status
Digital twins & systems-of-systems	Integrated modelling, simulation, semantic representation and ontology-based architectures.	Semantic, interface and service integration remain difficult across heterogeneous systems and lifecycles.	No full incident-lifecycle representation linking evidence, uncertainty, roles, authority, decision and outcomes.	Federated incident graph connecting observations, tracks, provenance, confidence, roles, approvals, actions and outcomes.	Li et al., 2022; Lu et al., 2021; Zheng et al., 2021.	Partial foundation
Human–machine teaming, trust & workload	Trust calibration, workload, task allocation, collaboration and human-in-the-loop evaluation.	Transparency alone does not ensure appropriate reliance under time pressure.	Limited full locutrinal chains combining sensor ambiguity, multi-role coordination, authority routing and response options.	Role-based views, confidence displays, evidence-gap indicators, override, logs and trust/workload measures.	Dubois & Ny, 2020; Boy & Morel, 2022; Zeilli et al., 2022.	Partial foundation
Governance & authority allocation	Authority sharing, role assignment, continuity and meaningful human control.	Authority is often conceptual, not traceable as permissions, handovers, escalation and approvals.	No experimental mechanism for tactical, operational, strategic and civil-military authority pathways.	Authority-routing layer with roles, permissions, thresholds, handovers, approvals, escalation and override.	Boy & Morel, 2022; Pekárev & Várno, 2026.	Partial foundation
Military AI & doctrinal decision support	Doctrine-compatible override, calibrated confidence, escalation states and accountable human control.	Usually limited to targeting, classification or local decision support.	Limited coverage of the complete multi-actor drone-incursion chain.	Human-authorised support spanning cue, fusion, routing, response comparison, action and replay.	Pekarev & Várno, 2026; Boy & Morel, 2022:	Partial foundation
C-UAS, layered defence & multi-domain C2	Layered sensing, tracking, classification, mitigation, network topology and synchronisation.	Sensor, mitigation and C2 studies remain separated.	No repeatable environment tests evidence conflict, handovers, responses alternatives and resource constraints together.	Scenario iibrary with radar/RF/EO/IR/ acoustic inputs, airspace context, incomplete evidence, roles and replay.	Mondal, 2025; Wang & Pan, 2024; Topor, 2026.	Partial foundation
Decision latency & C2-network structure	Rapid information flow, coordinated decision cycles, synchronisation and network efficiency.	Hierarchical relays can create congestion and inhibit same-level coordination.	Technical delay, ambiguity, handovers, authority routing and workload are rarely measured together.	Stage timestamps across observation, fusion, classification, routing, decision, action and learning.	Klerx et al., 2021; Wang & Pan, 2024; Boy & Morel, 2022.	Partial foundation
Resource propertionality & response selection	Layered defence and matching resources to threat, mission and uncertainty.	Technical or cost studies often omit the effects of weak evidence, delays and workload.	Limited evidence of when fragmentation drives costly or escalatory response selection.	Bounded response options: monitor, deconflict, non-kinetic, dedicated C-UAS and high-value assets.	Topor, 2026; Mondal, 2025.	Partial foundation
Federated learning & decentralised collaboration	Privacy-preserving collaboration, distributed learning, reduced raw-data transfer and local data sovereignty.	Poisoning, backdoor, inference and communication risks require strong security engineering.	No operational representation of incident states, provenance, human approvals or replay.	Authorised/synthetic/metadata inputs; least privilege, segmentation, provenance, secure logging and controlled release.	Abhishek et al., 2022; Bellavista et al., 2021: Rodriguez-Barroso et al., 2022: Mothhuri et al., 2021:	Partial foundation
MetaDome proposed contribution	Combines digital twins, C2, HMT, AI support, C-UAS, federation and simulation.	Existing streams remain technically and organisationally separated.	Missing federated, human-authorised experimental layer for end-to-end decision readiness.	**One secure, measurable workflow: observation → fusion → classification → authority routing → human decision → authorised action → replay learning.**	This study; informed by the cited literature.	**Integrated contribution**

Figure X. Evidence coverage, persistent limitations and the MetaDome integration gap. MetaDome does not replace sovereign C2 or automate consequential force decisions; it provides a federated, human-authorised experimental environment for measuring decision readiness.

Rehearse every level of authority—together

Each role sees what it is entitled to see, acts within its authority, and experiences the cost of delayed hand-offs.

TACTICAL

Sensor operators, C-UAS teams, air-defence crews, pilots

OPERATIONAL

Duty officers, CAOC Uedem / Torrejón, joint staff

STRATEGIC

SACEUR delegation, ministries, NATO consultation

CIVIL & DIPLOMATIC

Civil aviation, emergency services, attribution and diplomatic liaison

WHAT CHANGED IN 2026 At the July 2026 Ankara summit, Baltic Air Policing became an air-defence mission, with engagement authority vested in SACEUR and delegated through CAOC Uedem. Romanian shoot-downs were cleared through CAOC Torrejón. New authority paths must be rehearsed before they are used under pressure.

NATO STO EVIDENCE TR-HFM-330 (Dec 2025) models control as four nested loops—operator, mission, design, governance—and warns against using people as a “moral crumple zone”.

Source: Grosswald timeline · bne IntelliNews · NATO SDP 12000 (Caliber) · TR-HFM-330 summary · STO newsletter Mar 2026

AI accelerates; Metapilots decide

The objective is always to de-escalate, avoid wasted resources and keep accountable humans in charge.

AI DOES

- Fuse sensor data and flag inconsistencies
- Estimate confidence and expose uncertainty
- Compare response options and resource costs
- Adapt training scenarios to team performance
- Record every decision for replay

METAPILOTS DECIDE

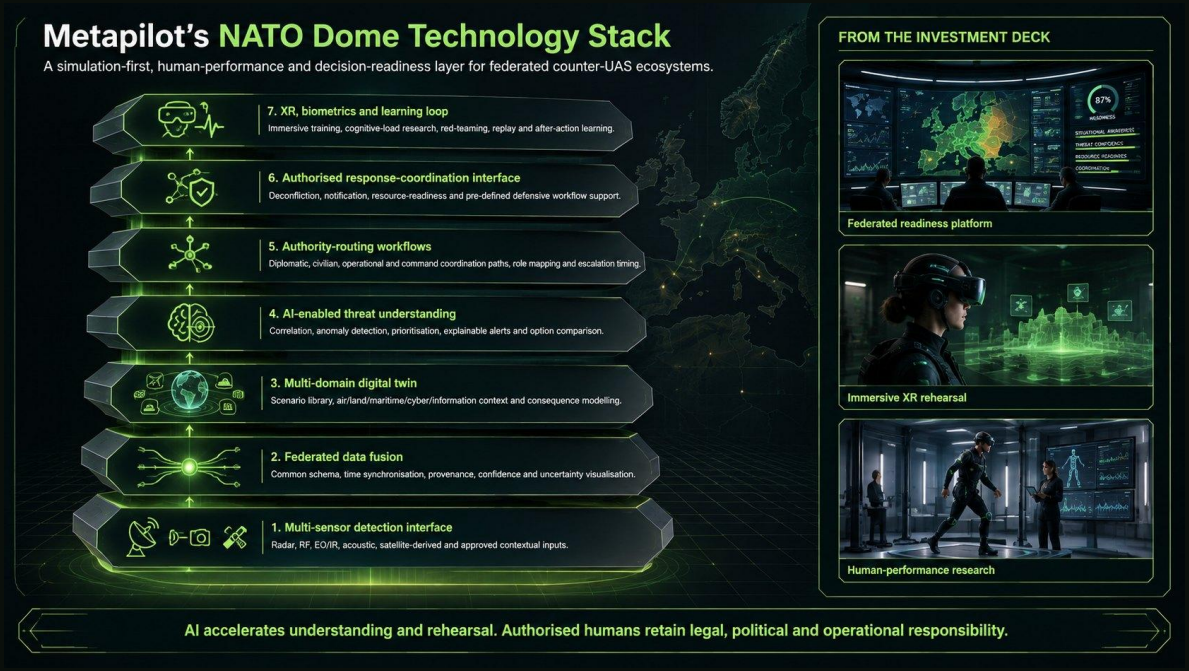
- Whether, when and how to act
- Which level of effect is proportionate
- When to escalate or de-escalate
- What is shared, and with whom

No autonomous escalation. No live weapon control by MetaDome.

NATO STO EVIDENCE STO Trends 2025–45: Allied militaries “require humans to be ‘in the loop’”. IST-192 tested AI decision support in an Article 5 exercise; TR-HFM-330 recommends “human-machine co-training”.

Source: NATO STO Trends 2025–2045 · STO 2024 Highlights (IST-192) · TR-HFM-330 summary · SAS-181 review

MetaDome technology stack



KEY POINT

Seven layers, from sensor federation to governance. AI accelerates understanding; authorised humans decide.

NATO STO RESEARCH

MSG-195 M&S as a Service: composable, on-demand simulation, adopted by acquisition programmes.

MSG-205 digital-twin interoperability across OEMs, IP and data ownership.

IST-208 data-centric security and provenance at the tactical edge.

Source: STO 2024 Highlights · MSG-205 (STO-MP-AVT-369) · NMSG 2026 symposium

Neutralise with the lowest suitable effect

Train a response ladder so the least escalatory effective option is chosen—and fighters are kept for threats that need them.

Interceptor drones such as Merops are reported at ~US$15k per round; Romania integrated Merops in 2026.

1
MONITOR & VERIFY
Improve classification and preserve evidence

2
PROTECT & DECONFLICT
Warn, reroute, shelter or restrict airspace

3
NON-KINETIC DEFEAT
Electronic effects where lawful and suitable

4
DEDICATED C-UAS
Interceptor drones, guns, short-range effectors

5
HIGH-VALUE ASSETS
Fighters and missiles reserved for threats that require them

NATO STO EVIDENCE SCI-301 concluded there is “no silver bullet against the LSS air threat”; effective defence is “a system of C-UAS systems”.

Source: NATO STO SCI-301 · Grosswald timeline (Merops) · bne IntelliNews

We ran MetaDome on 23 public incidents

Level-2 reconstructed digital twin · 6 NATO countries · conditions C0–C4 · 20,000 Monte Carlo draws per event

23

events in 6 countries: RO 9, LV 4, LT 4, EE 3, FI 3, PL 1

16

events with an airborne response; 7 crash, debris or impact events

≈40

fighter sorties modelled (≈67 flight hours)

11-13

air-to-air missiles modelled across 8 engagements

HOW THE RUN WORKS

1 **Corpus** Table B public incident record, source-graded

2 **Incident graph** G_I = (V, E, T, P, U, R, A, O); unknowns kept as uncertainty

3 **Baseline C0** Observed fighter-led response, open-source unit costs

4 **MetaDome C1–C4** Shared graph, AI explanations, authority routing, replay

5 **Ground layer** Interceptor drones, guns, low-cost rockets; recon-UAS confirmation

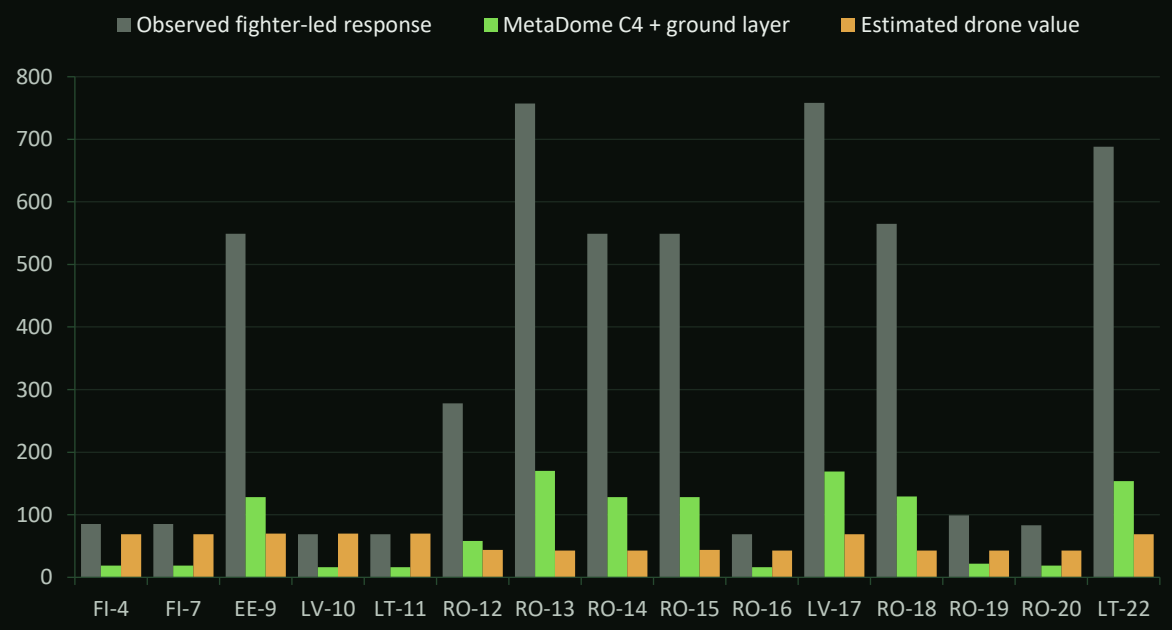
6 **Coverage** 50% (2026) · 80% (2027) · 90% (2028) scenarios

METHOD NOTE Only 5 of 16 airborne intervals are publicly calculable (8, 17, 20, 50, 83 min); 11 are imputed. Condition effects are priors to be tested in Level-3 trials, not measured results.

Source: Table B public corpus · Popular Mechanics · Militarnyi · CSIS

Fighter-led responses spent ~US$5 per US$1 of drone

Modelled expected cost per airborne event, baseline vs MetaDome C4 + ground layer at 80% coverage (US$ thousand)



US$8.0M

modelled baseline cost of all 23 events vs US$1.7M of drones

~70%

of baseline cost was air-to-air missiles, not flight hours

US$757k

vs a US$43k drone: Romania, 24 Jul 2026 (F-16 missile kill)

US$2.7M → 0.9M

Poland, 9–10 Sep 2025, 19 objects (not charted)

Source: Popular Mechanics · Militarnyi · CSIS · Military Times · Escudo Digital · RBC-Ukraine / Bild

Authority routing and ground effect save most time

Mean first-cue-to-outcome interval across 16 airborne events, cumulative conditions (minutes, 80% coverage scenario)

Event	Observed	MetaDome
RO 24 Jul 2026	83 min	**≈40 min**
LV 14 Aug 2026	≈50 min	**≈26 min**
LT 15 Sep 2026	≈20 min	**≈13 min**
RO 16 Aug 2026	17 min	**≈12 min**
RO 25 Jul 2026	≈8 min	**≈7 min**

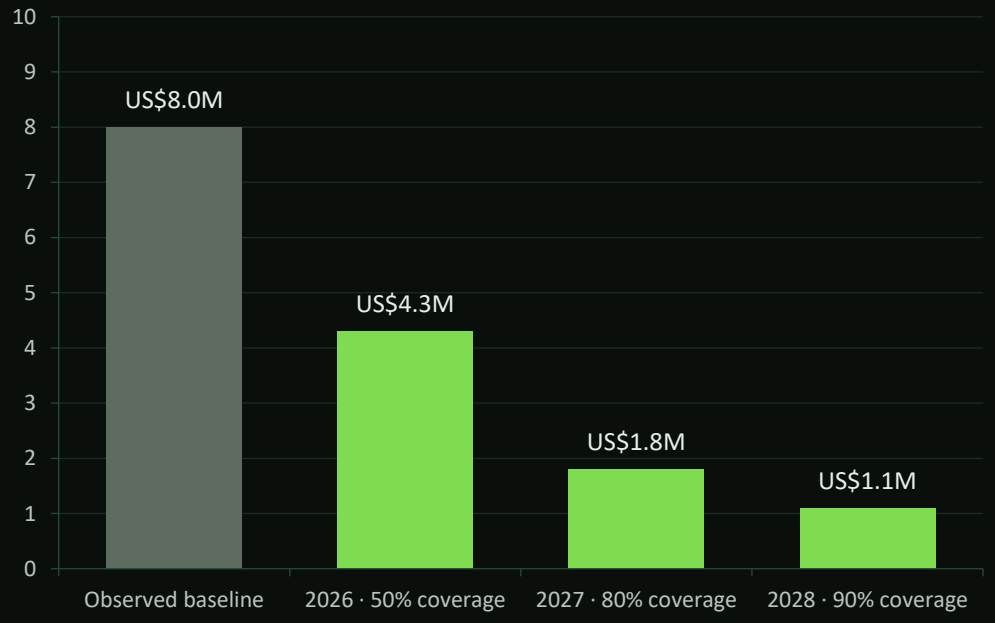
36 → 20.5 min

mean interval; summed across events 453 → 265 min. Fast responses (8–17 min) gain little; long multi-national chains gain most.

Source: Reuters · France 24 · Metapilot MetaDome simulation (Level 2)

Ground coverage drives savings from −46% to −86%

Total modelled response cost for all 23 events by ground-layer coverage scenario (US$ million, median)



−46% · −77% · −86%

median savings at 50%, 80% and 90% coverage

4-5 of 7

crash or impact events (incl. Auvere and Rēzekne) detectable before impact with persistent recon at 80% coverage

Not the business case

US$6M saved on 23 events is small vs capex; value lies in missile stocks, fighter availability and impact prevention

Source: EU Readiness Roadmap 2030 · ECFR · War on the Rocks

Buy response portfolios, not single platforms

Use one scenario library to generate evidence before money is committed.

DEFINE	SIMULATE	TEST	EVALUATE	PROCURE
requirements	mission fit	controlled TEVV	evidence pack	authorised route

EVIDENCE PACK

Mission effectiveness	Interoperability	Cyber assurance
Human workload	Training burden	Cost per defeat

WHY NOW

>US$40bn

NATO counter-drone investment over five years, plus a NATO counter-drone marketplace (Drone Edge, July 2026).

SDP 12000

New NATO integrated air and missile defence plan, from one-way attack drones to cruise missiles.

NATO STO EVIDENCE MSG-179 built a framework linking acquisition to M&S; MSG-195 results were “adopted by various international acquisition programmes”. From July 2026, Capability Coordination Groups tie STO research to capabilities.

Source: NATO’s Drone Edge · Caliber (SDP 12000) · STO 2024 Highlights (MSG-179, MSG-195) · STO newsletter Jun 2026

Country milestones aligned to EU deadlines

Each gate is measured with the Figure 7 metrics: time to shared track, authority and decision; sorties and missiles per incident

	Romania	Poland	Baltics (LT · LV · EE)	Finland
Q4 2026	Level-2 replay of 9 events; 2 cells IOC	Replay of Sep 2025 raid; link to Eastern Sentry	Delegated-authority rules; legal reviews; first cells funded	Legal review; C2 federation pilot
Q2 2027	50% coverage; quarterly authority drills	4 cells IOC; joint procurement lot 1	1–2 cells IOC each; Baltic hand-off drills; EDPCI start	2 cells IOC
Q4 2027	80% coverage; fighters as fallback only	80% coverage on priority sectors	Tri-Baltic federated incident graph live	Nordic–Baltic federation link
2028	90% coverage; Level-3 validation	90% coverage; Level-3 validation	Level-3 controlled validation	Level-3 controlled validation

EU MILESTONES European Drone Defence Initiative and Eastern Flank Watch: initial capacity end 2026; EDDI full capacity end 2027; Eastern Flank Watch end 2028.

Source: EUR-Lex Readiness Roadmap · ECFR · LSM (Latvia EDPCI)

People, law and funding make the ground layer real

NEW POSITIONS (PER CELL)

- Authority-Routing Duty Officer
- Duty Legal Adviser (LOAC / national law)
- Recon-UAS pilots and ground-effector crews
- Incident-graph engineer; AI assurance and replay analysts

TRAINING FOR CURRENT PERSONNEL

- QRA pilots: hand-over to the ground layer, fallback-only engagement
- Controllers: decoy vs armed recognition, calibrated AI reliance
- Commanders: quarterly cross-border authority drills
- Civil protection and airports: joint alert drills

LEGISLATION

- NATO: common drone ROE and threat categories under Eastern Sentry
- Pre-delegated authority to ground C-UAS commanders
- Nations: build on Romania (2025) and Lithuania (2025) laws
- Debris liability, peacetime EW cover, fast airspace restriction

FUNDING

- SAFE loans: Poland €43.7bn, Romania €16.7bn
- Lithuania €6.37bn, Latvia €3.49bn
- EDDI and Eastern Flank Watch flagships; EDPCI
- EDF / EDIP for incident-graph R&D and TEVV

Source: Reuters (Romania law) · Reuters (Lithuania law) · Reuters (SAFE) · Breaking Defense

Train separately. Rehearse together.

KEY POINT

One shared digital twin; national nodes keep release rules, data and after-action review.

NATO STO RESEARCH

NATO Data Strategy 2025 "a secure and impactful data-sharing ecosystem" for Alliance, industry and academia.

IST-208 new cybersecurity approaches for increasingly complex systems.

NCIA TIE26 radars, RF sensors and C2 from many nations exchanged data "in a common and operationally meaningful way".

Source: NATO Data Strategy · STO 2024 Highlights (IST-208) · NCIA TIE26

Training the NATO and Allied defence workforce

Interdisciplinary pathways for military personnel, scientists, technologists, policymakers and industry specialists.

- Command & decision-making
- Counter-UAS operations
- AI training & assurance
- Diplomacy & civil–military coordination
- Data management & cybersecurity
- Acquisition & capability development
- Legal & ethical governance
- **Neurotechnology, starting with fNIRS**

COLLABORATION MODEL Multiple joint projects with universities, military academies, research centres, defence primes, governments, OEMs and NATO and national innovation ecosystems.

NATO aims to train five times as many drone operators by the end of 2027.

NATO STO EVIDENCE TR-HFM-311 (2024) reviews fNIRS for brain-state monitoring; HFM-334 reported multimodal workload assessment including fNIRS; STO ran a 2026 “Decision-Making for the Future” summer school.

Source: NATO’s Drone Edge · NATO STO TR-HFM-311 · STO-MP-HFM-334 · STO newsletter Jul 2026

The human layer: one million Metapilots

The Human Layer: One Million Metapilots for NATO Dome Readiness

A distributed training and certification ecosystem—not a centrally controlled force.

NATO Dome requires more than sensors and software. It requires a shared workforce able to understand uncertainty, coordinate across domains, operate responsibly and learn continuously.

METAPILOT ROLES

- Simulation operators and scenario designers
- Data and digital-twin analysts
- XR trainers and exercise facilitators
- Counter-UAS ecosystem and interoperability specialists
- Responsible-AI and assurance practitioners
- Civil-military, diplomatic and escalation-awareness professionals
- Technical integrators, trainers and after-action analysts

LOCAL COHORTS • SHARED SIMULATION ECOSYSTEM

Academy Hub · Simulation Node · Partner Lab

IMMERSIVE TRAINING & CERTIFICATION

LONG-TERM INFRASTRUCTURE VISION

- Metapilot Academy hubs in major European cities.
- Shared curriculum, training standards and interoperability exercises.
- Local national cohorts connected through a common simulation ecosystem.

One million trained participants in a common readiness language—not one million people under a single command.

KEY POINT

Jobs across diplomacy, AI training, pilots, data, legal, cyber, command, acquisition and innovation.

NATO STO RESEARCH

HFM-374 COGARMY cognitive training and teamwork assessment of army personnel.

HFM-369 leader development for multinational NATO forces.

Drone Edge 2026 NATO aims for 5× drone operators by end-2027.

Source: Chief Scientist report, Cognitive Warfare · STO 2024 Highlights (HFM-369) · NATO's Drone Edge

Chief Scientist Grant: from research question to demonstrator

Experimental Digital Twins for AI-Enabled Deterrence and Strategic Competition in the NATO Alliance.

RESEARCH QUESTION

How much faster and more proportionate can federated teams decide on drone incursions?

→

EXPERIMENTAL DIGITAL TWIN

Eastern Flank scenario library built from our incident dataset

→

MEASURED EXERCISES

Decision latency, authority routing, workload, cost of response

→

EVIDENCE PACK

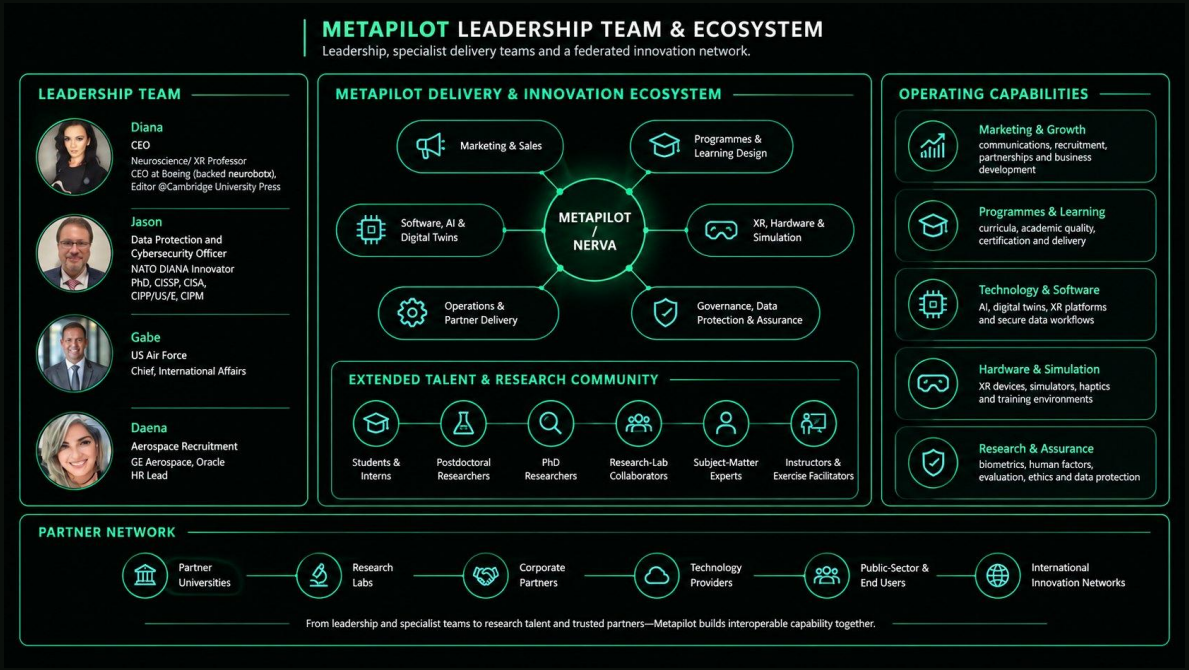
Findings for NATO STO, CCGs, nations and acquisition

ASKS Scenario co-design with Allied units · access to unclassified incident timelines · a pilot nation on the Eastern Flank · a route into STO activities (NMSG, SAS, HFM).

NATO STO EVIDENCE SAS-181: explaining RL decision policies to decision-makers is “an almost unexplored feature”. MSG-179 identifies “critical acquisition activities where M&S bring added value”.

Source: NATO STO grant announcement · SAS-181 review (2026) · STO 2024 Highlights (MSG-179) · NMSG 2026 symposium

Metapilot leadership team and ecosystem



KEY POINT

A delivery and innovation ecosystem connecting research, training and industry partners.

NATO STO RESEARCH

Chief Scientist Grant 2026 Metapilot (Romania) among eight recipients alongside RAND, MUT and DTI.

Grant priorities AI and decision integrity; future warfare and defence industrial capacity.

Source: NATO STO grant announcement

Build the MetaDome readiness layer together

Six ways to take part, from the first Level-2 replay to Level-3 validation in 2028.

Testing

Co-run Level-2 replays and Level-3 controlled trials

End users

Units and ministries shaping scenarios and metrics

Consortium partners

Universities, primes, OEMs and C-UAS providers

Common grants

NATO STO, EDF, EDIP, SAFE and national calls

Investors

Scale the platform, cells and the training pipeline

Academy

Train the Metapilots who run the readiness layer

Join us for consortiums, investment and partnerships admissions@metapilotacademy.com

EuroDome

A Safer, More Resilient Europe

Q&A

Thank you for your attention.