

Predictive Intelligence and Admissible Execution Governance

THE CONSEQUENCE BOUNDARY

When a system predicts what should happen, what establishes that a proposed action has sufficient evidence, authority, and standing to happen NOW?

Core governing question

Does this proposed consequence have sufficient Admissible Evidence, Applicable Authority, and Established Standing to become reality NOW?

Version 2.0 | 11 October 2026 | Independent architectural demonstration

STATUS: REFERENCE ARCHITECTURE - NOT LIVE CONTROL CERTIFICATION. Every scenario, interface, numerical example, and disposition in this reference is illustrative. No deployed integration, regulatory approval, certified safety performance, formal TA14 case ruling, third-party participation, or endorsement is claimed.

01 / Executive thesis

Predictive building systems increasingly move beyond alarms into diagnosis, prognosis, and recommended interventions. A recommendation may be persuasive, but it does not establish permission to change a physical system. TA14 proposes an independent, auditable decision boundary between the intelligence that proposes and the locally accountable environment that executes.

Prediction is not permission. Capability is not authority. Understanding is not permission. Observed is not inferred. Inferred is not authorized. Commissioned once is not authorized forever.

Three distinct responsibilities

Predictive provider	TA14 consequence examination	Local execution authority
Observe and infer likely faults; produce evidence-linked proposals.	Examine admissibility, authority, standing, scope, continuity and timing; return bounded disposition.	Independently enforce permissions, safety interlocks, operational constraints, and physical execution.
May update model confidence.	Preserves traceable reasons and decision validity.	Records commands, acknowledgements, physical response and deviations.

What this reference does not claim

TA14 does not replace equipment safety systems, manufacturer requirements, licensed professional judgment, local policy, fire/life-safety functions, or legal obligations. The proposed bridge is an architectural model that must be tested against independent, adversarial acceptance criteria before deployment.

02 / End-to-end consequence chain

REALITY → RECORD → CONTINUITY → ADMISSIBILITY → BINDING → COMMIT → EXECUTION → OUTCOME

Anchor	Proof obligation
Reality	Establish the actual condition and unresolved physical uncertainty.
Record	Capture original signals, units, timestamps, actor and operating context.
Continuity	Preserve source-to-decision lineage, versions and transformations.
Admissibility	Assess relevance, provenance, quality and uncertainty for the proposed action.
Binding	Bind authority and standing to actor, asset, action, scope and validity.

Anchor	Proof obligation
Commit	Issue a bounded ALLOW, HOLD, DENY or ESCALATE decision.
Execution	Verify that local controls independently permitted and performed the action.
Outcome	Compare expected versus measured response; preserve exceptions and new reality.

03 / The architectural bridge

The reference interoperability sequence is CP → AVP → AFA → EABA → AEA → REALITY. This maps established TA14 architectural concepts to a proposed predictive integration; it is not evidence of a production implementation.

Layer	Boundary responsibility
CP / Connection Profile	Declare system relationships, endpoints, exchanged claims and connection context.
AVP / Authority Passport	Represent identity, scope, conditions and verifiable authority context.
AFA / Admissible Federation Architecture	Carry authority context across organizations without transferring execution permission automatically.
EABA / Execution Authority Boundary Architecture	Keep remote proposals separate from locally established execution authority.
AEA / Admissible Execution Architecture	Examine admissible evidence, applicable authority and established standing.
REALITY	Verify the physical action and resulting condition.

Locality rule: Authority context may cross organizational and technical boundaries. Execution authority must still be established locally, including when derived authority passes through multiple entities.

04 / Proposal-to-outcome trace

A Prediction-to-Consequence Trace (PCT) is proposed here as a practical record format. It is a candidate implementation artifact, not an already deployed or registered TA14 specification.

Trace segment	Minimum retained evidence
PCT-01 / Observation	Original BAS points, raw values, units, source identities, clock quality, time window and operating state.
PCT-02 / Transformation	Normalization rules, unit conversions, adjusted values, method versions and uncertainty.
PCT-03 / Inference	Hypothesis, alternatives, model version, confidence method, limitations and evidence references.
PCT-04 / Proposal	Proposed action, target asset, parameters, actor, reason, urgency, expiry and idempotency key.
PCT-05 / Authority	Standing, delegation chain, local permissions, role, scope, restrictions and revocation state.
PCT-06 / Decision	Disposition, rationale, governing baseline, reviewer, validity and required conditions.
PCT-07 / Execution	Local gate result, actual command, acknowledgement, operator override and rollback record.
PCT-08 / Outcome	Measured physical response, verification window, unexpected effects and closure status.

Preservation rule

Raw observations remain primary. Normalized, adjusted, derived and inferred values must be stored separately, with methods, lineage and uncertainty. A model confidence score is not a substitute for source evidence or independently established authorization.

05 / Technical teaching case: low VAV airflow

This is an independent, hypothetical reconstruction inspired by a publicly discussed BAS diagnostic example. It is not a verified diagnosis of a specific product, facility or installation.

Displayed signal	Illustrative value	What remains unknown
Requested airflow	375 CFM	Whether the request is valid for the current mode.
Reported actual airflow	48 CFM	Sensor calibration, pressure and flow-measurement reliability.
Reported damper position	100%	Whether this is command, feedback or measured blade position.

Displayed signal	Illustrative value	What remains unknown
Operator state	Force Max Airflow selected	Who set the override, when and under what authority.
Analytics conclusion	Control-logic fault / 90%	Model validation, competing hypotheses and confidence calibration.
Review state	Open / unreviewed	Whether a competent reviewer accepted the inference.

Competing hypotheses

Sequence or control-logic error; stuck or disconnected actuator; invalid flow sensor; insufficient upstream static pressure; duct restriction; mapping or point-label error; operating-mode mismatch. The displayed data alone cannot resolve these alternatives.

Three different proposed consequences

Proposal	Illustrative decision	Why
Preserve trends and request technician review	ALLOW if locally authorized	Evidence preservation and review may be permissible without changing physical operation.
Issue an additional automatic damper override	HOLD	Command state, mechanical response, sensor validity and authority remain unresolved.
Suppress life-safety interlocks to restore airflow	DENY	A proposed safety bypass conflicts with essential constraints.

An ESCALATE result is appropriate when a qualified person or responsible authority must decide. None of these illustrative dispositions is a formal TA14 ruling.

06 / Decision semantics

Disposition	Meaning	Execution effect
ALLOW	Evidence and authority sufficient for one bounded proposal.	Still requires fresh local permission and safety checks.
HOLD	Material evidence, standing or authority unresolved.	No execution of held proposal; request missing proof.
DENY	Proposed action violates a governing constraint or lacks an allowable path.	Reject and preserve reason; no execution.

Disposition	Meaning	Execution effect
ESCALATE	Named accountable reviewer or higher authority required.	Route for review; never treat escalation as permission.

A decision is not a reusable blank check

Bind every disposition to proposal ID, evidence version, action, asset, actor, governing baseline, operating conditions, expiry, and local enforcement point. Re-examine after a material change, revocation, model update, operating-mode shift, emergency condition, or missed validity window.

Non-bypass invariant: No TA14 disposition may bypass BAS permission controls, physical interlocks, manufacturer constraints, fire/life-safety systems or emergency procedures.

07 / Candidate interface contract

A predictive system could submit a signed, versioned proposal envelope to an examination service. The service returns a bounded decision artifact. The local BAS or accountable operator remains the final execution gate. The following is a design example, not a live API.

Message	Fields that must be explicit
PROPOSAL	proposal_id, asset_id, action, parameters, units, timestamp, expiry, requester_id, nonce/idempotency key, model_version, evidence_refs, alternatives
AUTHORITY CONTEXT	actor identity, standing basis, delegation chain, local scope, approver, permitted actions, constraints, revocation/expiry
DISPOSITION	decision_id, proposal_hash, baseline_version, disposition, reasons, conditions, evidence_version, signer, validity, reexamination triggers
EXECUTION RECEIPT	decision_id, local authorization result, command ID, actual parameters, controller acknowledgement, time, override state
OUTCOME RECEIPT	pre/post measurements, verification method, window, unexpected effects, rollback, reviewer, closure status

Contract safeguards

The candidate protocol must define authentication, signature verification, canonical serialization, replay prevention, idempotency, time synchronization, revocation checks, deterministic fail-closed behavior on missing authority, and evidence-retention requirements. These are design requirements to test, not implemented assurances.

08 / Adversarial pressure tests

Failure injected	Expected governance behavior
Stale or contradictory BAS points	HOLD and request fresh, traceable observations.
Wrong units or swapped point mappings	Reject unsupported interpretation; preserve raw source.
High-confidence but false diagnosis	Do not equate confidence with proof; test alternatives and thresholds.
Expired delegation or forged identity	DENY or HOLD; never inherit authority from connection alone.
Remote federation with no local permission	No physical execution even if remote evidence is valid.
Override or occupancy changes after approval	Invalidate or re-examine bounded decision.
Replay of previously allowed proposal	Reject duplicate/stale command under idempotency and expiry rules.
Command acknowledged but no physical response	Record failed outcome, prevent false success, escalate as required.
Rollback failure or unsafe side effect	Activate existing safety response; record and independently investigate.

Pilot acceptance criteria

A candidate pilot should demonstrate reproducible evidence lineage, false-positive and false-negative characterization, authority enforcement independent of analytics, safe handling of missing data, deterministic disposition records, named human escalation, revocation and replay controls, and independently verified physical outcomes. Any compliance or safety certification requires a separate applicable process.

09 / Eight-scene flagship showroom

Scene	Teaching moment
01 / Predictive Revolution	BAS observations feed analytics, but data collection and prediction are distinct.
02 / The Diagnosis	90% confidence is a model claim, not verified physical causation.
03 / Proposed Consequence	An inference becomes a requested command, dispatch or operator intervention.
04 / Evidence Boundary	Raw, normalized, adjusted and inferred records remain separately traceable.

Scene	Teaching moment
05 / Authority Boundary	Standing, scope, delegation, locality and time are tested.
06 / TA14 Examination	ALLOW / HOLD / DENY / ESCALATE with evidence-linked reasons.
07 / Authorized Execution	Independent local enforcement, safeguards and command receipts.
08 / Verified Reality	Expected outcome compared with measured result; new reality begins the next cycle.

Interactive public demonstration

Offer selectable evidence and authority conditions in a hypothetical VAV scenario. Show how a proposed action changes disposition, why it changes, what proof is missing, and what local controls still apply. Label every sample as simulated. Keep narration associated with numbered scenes, with free manual scrolling and no automatic scroll.

10 / Institutional and commercial pathway

The first credible product is a narrow, auditable proposal-to-disposition interface, not universal building autonomy. Candidate users include predictive maintenance vendors, BAS integrators, AI agent developers, building owners, data centers, healthcare facilities and environmental operators.

Stage	Deliverable	Proof obligation
1 / Public showroom	Eight scenes, PDF, simulated examination	Clarity and traceability; no live control.
2 / Vendor sandbox	Reproducible recommendation replay	Versioned evidence, decision consistency, no commands.
3 / Controlled pilot	Registered governance, frozen baseline, advisory mode	Independent review, negative testing, measured outcomes.
4 / Bounded execution	Local authorization and safety-tested integration	Proof of enforceable constraints and verified consequence.

Invitation to predictive system developers

Submit one reproducible prediction, its original observations, diagnostic interpretation, proposed action, authority context and known limitations. TA14 can examine the candidate against a documented governance baseline. Formal examination standing and engagement terms are subject to TA14 governance registration.

Independence and attribution

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Architectural conclusion: Predictive intelligence proposes. Admissible evidence, applicable authority, and established standing govern whether a consequence may be authorized NOW. Local execution controls enforce the boundary. Verified outcomes close the record.

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