PREDICTION IS NOT PERMISSION

Yesterday's patterns cannot independently authorize today's consequences.

Prediction may inform a proposed consequence. It cannot independently establish permission to execute.

Expanded technical and governance reference | Version 2.0 | Eight-image showroom foundation

Status: proposed governance architecture and hypothetical teaching cases. This document does not claim a validated school deployment, regulatory approval, safety certification, or demonstrated superiority over existing safety-engineered controllers.

Executive thesis

Prediction estimates what may occur. Observation reports what is presently measured. Admissibility examines whether a record is fit for a particular determination. Applicable Authority identifies the governing rules. Established Standing identifies whether a particular actor, in a declared capacity, can invoke those rules for a bounded consequence. These are different claims and none should be silently substituted for another.

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

The TA-14 proposal is not to abolish predictive control. It is to separate forecasting and optimization from the independently examinable authorization of consequential actions. A forecast may be a valid analytical input without being sufficient evidence of the present state, safety, or permission.

Five claims that must remain separate

Claim	What it can establish	What it cannot establish alone
Prediction	Expected future condition; assumptions and uncertainty	Present measurement or execution permission
Observation	Reported present condition with source and timestamp	Fitness for a particular decision
Admissibility	Reliability, provenance, continuity, relevance, sufficiency	A right to act
Applicable Authority	Codes, policies, procedures and delegated limits governing action	That this actor has standing
Established Standing	Actor, capacity, standing basis and authority relationship	That the action succeeded

Two distinct failure modes

• Unauthorized success: an action appears beneficial but lacked permission when issued. The good outcome does not retroactively authorize it.

• Authorized failure: a properly authorized action has an adverse result. Authorization does not prove execution quality or outcome; deviations must be recorded and examined.

01 | The sports-car authority test

A father permits his son to drive a sports car on Monday at 8:00 AM. The next Monday, at the same hour, the son takes the same car without checking the permission boundary. The father asks who authorized this trip. The son points to the prior pattern. The father explains that permission for one trip did not grant indefinite permission for later trips.

> **A 99.9% predicted probability of approval is still not an approval.**

The important qualification: standing authorization

A standing authorization can legitimately cover recurring trips. The question is whether its scope, validity interval, conditions, revocation status and the driver's standing remain satisfied now. The doctrine is not "ask again every time." It is "prove that the permission being invoked still applies to this particular action."

Condition	Example	Governance implication
Scope	Permission covers school travel only	A leisure trip is outside scope
Validity	Permission expires after one Monday	Prior permission is historical evidence
Revocation	Parent withdraws permission	A forecast cannot reverse revocation
Context	Vehicle develops a safety defect	Prior authorization may be inapplicable
Standing	Another driver takes the keys	Permission is actor-specific

Transfer to industrial automation

A controller that previously adjusted a damper under acceptable conditions does not thereby acquire unrestricted future authority. The next action must fall within the present, verifiable permission envelope, including applicable safety constraints and any changed configuration.

02 | Classroom ventilation: the proposed action

The following is a hypothetical, deliberately simplified teaching scenario, not a documented school incident. At 9:55 AM a model forecasts a classroom CO2 rise at 10:00 AM from prior occupancy patterns. It proposes opening an outdoor-air damper. Current indoor CO2 is 650 ppm. An independent outdoor monitor reports PM2.5 of 185 micrograms per cubic meter. Filtration performance, outdoor-air intake conditions, actual airflow and the applicable ventilation minimum are not yet verified.

Time	Record / event	Governance significance
Before 09:55	Historical occupancy and CO2 patterns	Useful for forecasting, not proof of present need
09:55	Prediction: CO2 likely to rise	Model output with uncertainty
09:55	Indoor CO2 = 650 ppm	Single present observation; not comprehensive IAQ
09:55	Outdoor PM2.5 = 185 µg/m³	Potential severe competing exposure concern
09:55	Damper opening proposed	A proposed consequence, not a permission
Before command	Filtration and mandatory ventilation unresolved	Specific unsupported increment held for examination
After decision	Actual airflow and IAQ must be measured	Command receipt is not outcome proof

Why a forecast can be correct while an action is wrong

CO2 may indeed rise later, while increasing poorly filtered outdoor air now may increase particle exposure. The controller could predict accurately and still lack sufficient cross-domain evidence for its specific command. Conversely, normal CO2 does not justify shutting off required ventilation: occupancy, other pollutants, infection-control needs and applicable codes remain binding.

03 | Classroom ventilation: governed examination

The proposed consequence

Increase the outdoor-air damper opening by a specified amount for a specified duration. The action contract must name the equipment, operating zone, objective, magnitude, timing, rollback capability and predicted environmental effects. Without those fields, the requested consequence is not sufficiently bounded for examination.

The evidence needed

• Indoor CO2 and, where relevant, indoor particulate trends with device identity, time, calibration and freshness.

• Outdoor PM2.5 representative of the actual intake location, including measurement uncertainty and time alignment.

• Filtration class, installation integrity, bypass or leakage, actual delivered airflow and equipment state.

• Occupancy, required ventilation minima, local operating procedures and emergency or infection-control obligations.

• Current actuator position, sequence of operations, known overrides, sensor health and available safer alternatives.

Illustrative disposition

HOLD the specific unsupported incremental outdoor-air command. ESCALATE if the governing procedure requires qualified facilities or EHS review. Preserve mandatory protective operation.

This is not a universal PM2.5 damper threshold, nor a direction to violate minimum ventilation. The eventual disposition may change when additional admissible evidence, an applicable procedure and a properly authorized actor establish a compliant intervention. Alternative controls may include verified filtration or another site-approved measure.

After action is separately examined

Capture the actual actuator position, airflow if measured, indoor/outdoor environmental response, alarms, overrides, deviations and follow-up observations. An ALLOW receipt is a record of permission, not proof that the physical command occurred or that the outcome was safe.

04 | AIR: evidence before action

Atmospheric Integrity Records (AIR) are the proposed evidentiary layer for atmospheric observations. Their purpose is not to make a sensor infallible; it is to preserve source, context, transformations and limitations so an examiner can reconstruct what was known when a decision was made.

Evidence field	Minimum examination question
Source identity	Which instrument, endpoint or observer produced the reading?
Calibration / health	Was it operating within documented fitness and range?
Time / freshness	When was it observed, received and used? Is it stale?
Location / context	Does it represent the relevant zone or actual intake?
Continuity	Are gaps, replacements, corrections and custody changes visible?
Uncertainty	What error, limitations or conflicting observations apply?
Transformation	What raw data, normalization and derived values are linked?
Decision binding	Which proposed action and determination relied on this record?

Admissibility is decision-specific

A perfectly preserved historical reading may be authentic but too old for a present damper decision. A current reading may be timely but unreliable due to sensor drift. Neither case should be silently promoted to sufficient evidence. Preserve the source record and the reason for any limitation, rejection or quarantine.

Missing evidence is a finding

If a critical outdoor monitor is unavailable, record the gap. Do not replace it with a predicted outdoor value without marking that value as a model estimate and assessing whether the governing procedure permits reliance on it. Evidence deficiency ordinarily supports HOLD of the unsupported discretionary action, while separate mandatory safety obligations remain in force.

05 | EIG: examine the environmental consequence

Environmental Integrity Governance (EIG) examines the interaction between an intended intervention and the actual environmental conditions it may change. Ventilation decisions cannot be reduced to one CO2 number or one outdoor PM2.5 number.

Coupled operating conditions

Domain	Examples of relevant variables
Indoor	CO2, PM2.5, other pollutants, humidity, occupancy and exposure duration
Outdoor	PM2.5 at intake, weather, source events, intake location and infiltration
Equipment	Filter performance, bypass, fan capacity, damper feedback, pressure relationships
Obligations	Ventilation codes, emergency response, infection control, EHS procedures
Outcomes	Delivered outdoor air, indoor concentrations, alarms and adverse effects

A correct optimization objective can be incomplete

An energy-optimization model may minimize fan power while failing to preserve an environmental constraint. A CO2 controller may increase outdoor air without adequate particle-exposure checks. EIG asks whether the proposed action is acceptable across all applicable consequence domains, not merely whether one objective improves.

Safety hierarchy

The governance layer must be designed around locally established codes, engineered interlocks and emergency protections. It must not block a legally required or urgent protective action merely because an ordinary discretionary-optimization record is incomplete. Any emergency pathway must itself be defined, bounded, attributable and auditable.

06 | AEA and ASA: authority is not standing

Admissible Execution Architecture (AEA) governs the boundary from proposal to bounded permission. The Admissible Standing Architecture (ASA) distinguishes the existence of an applicable authority from a specific actor's admissibly established capacity to invoke it. The architecture must not let an AI model, technician or vendor assign itself operating authority.

Element	What must be established
Actor	Named person, service identity or automation principal
Capacity	Role in which the actor proposes or authorizes the action
Standing basis	Delegation, appointment, procedure or other recognized basis
Authority relationship	Which applicable rule is invoked, within what limits
Consequence scope	Asset, action, magnitude, zone, time, conditions and revocation
Present validity	Evidence and permission remain applicable under current conditions

The AEA continuity chain

Reality → Record → Continuity → Admissibility → Binding → Commit → Execution → Outcome

Reality is the physical state; Record captures observation; Continuity preserves provenance and linkage; Admissibility evaluates fitness; Binding connects the decision to applicable authority and standing; Commit records the bounded determination; Execution records what physically occurred; Outcome verifies effects. Skipping an anchor creates a claim that cannot be fully reconstructed.

07 | Formal governance dispositions

Disposition	Meaning	Required next step
ALLOW	The bounded action is presently supported and authorized	Issue scoped, time-limited permission; verify execution and outcome
HOLD	Necessary evidence or applicability is unresolved	Do not execute this unsupported discretionary action; obtain missing evidence
DENY	The proposed action conflicts with applicable constraints or lacks required authority/standing	Reject the proposed action; preserve reasons; require a new valid proposal
ESCALATE	A qualified authority or designated review is required	Route to authorized reviewer with complete record and limits

Decision precedence and independent reporting

An invalid evidence chain cannot become admissible because authority exists. A valid evidence chain cannot create authority where none exists. Systems should report evidence status, authority status and standing status separately, then issue the applicable disposition under documented policy. A deployment must define deterministic precedence for conflicting conditions and demonstrate that it is followed.

HOLD is not a universal stop button

A HOLD applies to the proposed unsupported consequence and its specified scope. It must not silently suspend a distinct action required by code, an engineered life-safety interlock or a separately valid emergency procedure. The interaction among commands, interlocks and local operating authority must be tested before field deployment.

Changed-context revalidation

Permission may expire when time passes, a filter is replaced, the control sequence changes, a sensor fails, a safety condition changes or the delegated authority is revoked. Preserve the historical authorization and issue a new bounded determination when the applicable conditions no longer hold. Commissioned once does not mean authorized forever.

08 | Integration architecture and command contract

A predictive engine proposes an action. A building automation system (BAS) implements control within its engineered limits. AIR supplies examinable evidence. EIG evaluates cross-domain environmental consequences. AEA checks authority and standing and issues a bounded determination. A command gateway enforces that determination without replacing mandatory safety interlocks.

Interface	Required behavior
Proposal	Unique request ID; model version; asset; action; purpose; timing; expected effect
Evidence	Immutable references to raw readings; freshness; calibration; configuration
Decision	ALLOW/HOLD/DENY/ESCALATE; rationale; evidence and authority status
Permission	Authorized actor; scope; expiry; conditions; revocation token
Gateway	Verify permission matches exact command and present state; reject replay/out-of-scope
Execution	Record command acknowledgement, actual actuator feedback and overrides
Outcome	Link measured environmental effects and any deviation to original decision

Fail-closed, but safety-aware

For discretionary actions, missing or invalid authorization should prevent execution. For mandatory life-safety functions, the gateway must preserve the independently engineered protective pathway and document its operation. These paths cannot be safely specified by slogan alone; they require a site-specific hazard analysis, authority mapping and integration tests.

Threat and failure considerations

- Stale sensor data, clock skew, miscalibration, sensor spoofing and contradictory measurements.
- Replay of old ALLOW receipts, expired delegation, changed equipment and command substitution.
- Network loss, actuator mismatch, manual overrides, emergency interlocks and recovery after outage.

09 | Sample bounded decision receipt

The following is an illustrative schema, not a claim that a deployed TA-14 gateway currently emits this exact receipt.

Field	Illustrative value
Receipt / request	DEMO-VENT-0955 / request-042
Asset / action	AHU-3 outdoor-air damper / increase opening 20% for 10 minutes
Prediction	CO2 forecast to rise near 10:00; model version and confidence recorded
Current evidence	Indoor CO2 650 ppm; outdoor PM2.5 185 µg/m³; source IDs attached
Known gaps	Filter performance, intake exposure and ventilation obligation unresolved
Evidence status	INSUFFICIENT for requested incremental action
Authority / standing	Operating procedure and automation delegation require verification
Disposition	HOLD specific requested increment; ESCALATE for qualified review
Validity	This HOLD applies to request-042 only; no ALLOW token issued
Safety exception	Mandatory ventilation and independently engineered interlocks remain active
Follow-up	Recheck filtration, code minimum, current conditions and authorized alternatives

Why the receipt matters

An examiner should be able to identify the proposed physical change, the evidence considered, the unresolved conditions, who or what had standing, why the disposition was issued and what happened afterward. A dashboard screenshot or model confidence score alone cannot reconstruct this chain.

10 | Independent validation: put the claim on trial

A credible study compares a properly engineered predictive controller with its existing safety interlocks against that same controller plus an independent consequence gate. Comparing TA-14 only against a deliberately unsafe prediction-only straw man would not establish an advantage.

Pre-register the evaluation

• Freeze test cases, baselines, acceptance criteria, failure thresholds, model versions and data provenance before observing outcomes.

• Use identical simulated or test-rig conditions for both configurations, including mandatory ventilation and emergency pathways.

• Include cases where prediction is right, prediction is wrong, the evidence is stale, authority is revoked, and TA-14 issues an unnecessary HOLD.

• Keep independent reviewer access to raw traces, control actions, permission records and negative results.

Measure	Evaluation target
Safety	Unsafe commands blocked, exposure impact and missed required protections
False intervention	Beneficial actions incorrectly held/denied; reviewer workload
Timeliness	Authorization latency, emergency response and recovery time
Performance	IAQ, minimum ventilation compliance, energy and comfort
Auditability	Independent reconstruction of proposal, decision, action and outcome
Robustness	Drift, missing data, spoofing, time skew, replay, override, context change

Falsifiability

TA-14's proposed benefit is not demonstrated if it fails to improve consequential safety or traceability, introduces unacceptable delay, blocks mandatory protections or cannot produce independently reproducible records. Publish limitations and failed cases as well as successes.

11 | Adversarial scenario matrix

Case	Injected condition	Expected examination
A	Accurate CO2 forecast; safe outdoor air; valid permission	May ALLOW if all constraints and standing are met
B	Accurate forecast; high outdoor PM2.5; filtration unknown	HOLD unsupported increment; preserve mandatory ventilation
C	Stale outdoor sensor; otherwise normal system	Record insufficiency; obtain evidence or invoke documented safe pathway
D	Valid evidence; expired automation delegation	DENY or otherwise reject unauthorized action under policy
E	Old ALLOW replayed after filter replacement	Reject stale permission; revalidate changed context
F	Emergency smoke control interlock operates	Do not obstruct required protective action; preserve event record
G	Actuator does not reach commanded position	Record execution deviation; do not infer successful outcome
H	TA-14 wrongly blocks beneficial action	Measure false HOLD, harm, delay and remediation

What the tests must not assume

A low CO2 reading is not a universal indication of sufficient ventilation. A high outdoor PM2.5 reading is not a universal command to close every intake. An accurate forecast is not automatically safe, and a governance gate is not automatically safer. Each conclusion depends on site-specific evidence, applicable rules and observed outcomes.

12 | Eight-image showroom production brief

Image	Visual thesis / teaching objective
01 — The Sports Car	The same day, time and vehicle do not establish a still-valid permission.
02 — The Classroom	A correct forecast can propose an unsafe outdoor-air change under present conditions.
03 — The Pattern Trap	Distinguish predictive confidence, present observation, admissibility and authority.
04 — AIR	Trace raw readings through identity, calibration, time, custody and uncertainty.
05 — EIG	Examine coupled indoor/outdoor exposure, filtration and mandatory ventilation.
06 — AEA / ASA	Show the independent gate and separate actor, capacity, authority and standing.
07 — Put It on Trial	Show adversarial A/B testing, false holds, emergency response and auditability.
08 — Admissible Reality	Trace bounded permission through execution, outcome and revalidation.

Narration and learning transitions

Each image should include a short on-image teaching headline and only the labels needed for comprehension. Place Samantha narration beneath the image, followed by "What You Learned" and "What You're About to Learn" between sections. Narration must distinguish hypothetical cases from documented facts and explain what evidence would change the decision.

Visual accuracy constraints

Use fictional people, not implied portraits of real contacts. Show measurement values as illustrative. Do not portray a HOLD as permission to shut down required ventilation. Depict the authorization gate as a proposed architecture, not an independently certified deployed safeguard. Use the same vocabulary, numbering and evidence-to-outcome chain throughout all eight images.

Glossary and publication boundaries

Term	Working definition
AIR	Atmospheric Integrity Records: proposed provenance and continuity layer for environmental observations.
EIG	Environmental Integrity Governance: examination of coupled environmental consequences.
AEA	Admissible Execution Architecture: pre-execution evidence, authority and standing gate.
ASA	Admissible Standing Architecture: actor, capacity, standing basis and authority relationship.
Admissible Evidence	Evidence reliable, relevant, continuous and sufficient for a specific determination.
Applicable Authority	Rule or delegated permission that governs a proposed consequence.
Established Standing	Admissibly supported capacity of this actor to invoke that authority now.
Bounded permission	Authorization limited by actor, asset, action, conditions and validity.

Engineering and evidentiary limitations

This reference is an architectural and educational proposal. It does not establish that existing BAS controllers universally lack safeguards, that TA-14 has passed independent validation, or that any specific school event occurred. Site-specific application must consult current codes, ventilation standards, manufacturer requirements, public-health guidance and authorized safety procedures. This document intentionally states no universal CO2 or PM2.5 control threshold.

Reference domains for a future deployment

Relevant technical examination may include ASHRAE ventilation and indoor-air-quality standards as applicable to the building, EPA and public-health particulate guidance, manufacturer equipment instructions, site EHS procedures, cybersecurity and functional-safety engineering practices, and local legal delegations. No external standard is represented here as independently verified or incorporated by reference; the governing editions must be identified for each deployment.

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NO ADMISSIBLE EVIDENCE. NO ADMISSIBLE EXECUTION.

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