ETHOSGRID OPEN STANDARD

A Regulatory-Ready Framework for Governance of Delegated Machine Authority in Critical Infrastructure

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EthosGrid Open Standard

Artificial intelligence and advanced automation now participate directly in operational, market, and reliability decisions across critical infrastructure. In many cases, these systems act at speeds and levels of complexity that exceed traditional human-mediated governance. Existing regulatory regimes primarily govern outcomes *after execution* through audits, enforcement actions, and retrospective review.

EthosGrid addresses a structural gap: authority exercised at execution time without explicit authorization, constraint, or attribution. It defines a governance-at-execution framework ensuring that machine-mediated actions with reliability, safety, or market consequence are:

- explicitly authorized;
- bounded in scope and duration;
- attributable to a responsible institutional authority;
- auditable before and after execution; and
- reviewable under existing oversight and enforcement mechanisms.

This framework does not mandate specific technologies, vendors, or architectures. Instead, it specifies governance semantics and invariants that regulators and system operators may incorporate into reliability standards, market rules, operating agreements, compliance programs, or technical standards.

Regulatory Scope and Intended Use

EthosGrid applies to systems in which machine-mediated recommendations or actions materially influence or execute decisions with public, economic, safety, or reliability consequence, including but not limited to:

- AI-assisted operational control and restoration systems;
- automated or algorithmic dispatch and market optimization;
- decision-support systems that practically determine operator action;
- coordination systems operating at tempos that preclude meaningful real-time human intervention.
- This framework does not:
- mandate autonomous operation;
- replace retained human authority or statutory responsibility; or
- prescribe implementation technologies.

Alignment with Existing Regulatory Constructs

EthosGrid is intentionally aligned with established regulatory concepts:

Regulatory construct	EthosGrid analogue
Responsible entity	**Constitutional Authority**
Separation of duties	**Runtime trust boundaries**
Authorization	**Capability-based execution**
Emergency operations	**Emergency mode with scope lock**
Audit & compliance	**Pre-execution governance records**
Change management	**Formal amendment control**

Nothing in this framework displaces existing jurisdiction, enforcement authority, or reliability obligations.

Governance Model Overview

Separation of Functions

A conforming implementation shall enforce separation among:

proposal (untrusted cognition);

authorization (trusted governance);

execution (constrained actuation); and

override (institutional human authority).

This mirrors established expectations for independence, checks and balances, and accountability in regulated systems.

Governed Unit: Proposed Action

All consequential machine-mediated activity shall be expressed as a **Proposed Action** carrying sufficient semantic information for governance evaluation without requiring disclosure of model internals or epistemic completeness.

Authorization and Execution Control

Explicit Authorization Requirement

No machine-mediated action with operational, market, or reliability consequence shall execute without explicit authorization issued by the designated authority function.

Capability-Based Execution

Authorization shall take the form of a scoped, time-bounded capability token bound to an approved governance artifact set. Execution systems shall reject actions lacking valid authorization regardless of urgency or technical feasibility.

Audit, Evidence, and Compliance

Pre-Execution Audit Capture

Governance evaluation outcomes shall be recorded prior to execution, including denials, deferrals, and blocked actions.

Audit Independence and Review

Audit records shall be tamper-evident and independent of the systems they govern. Failure to conduct interpretive review at an institutionally defined cadence shall constitute a governance deficiency independent of operational outcome.

Emergency Operations

Emergency conditions may accelerate approval pathways. They shall not expand permissible scope, targets, impact tiers, reversibility classes, or governing policy sets. This preserves operational flexibility while preventing emergency-driven authority expansion.

Change Management and Amendment Control

Changes to governance artifacts or authorization scope shall be treated as reallocations of authority and shall require:

- explicit scope definition;
- documented risk and impact assessment;
- approval by the designated Constitutional Authority; and
- versioned retention for regulatory review.
- Performance improvement alone shall not justify expansion of delegated authority.

Oversight, Roles, and Accountability

EthosGrid distinguishes four institutional roles: Constitutional Authority, Operating Authority, System Implementer, and Independent Review Authority. These roles may be held by the same organization but shall remain functionally distinct.

Adoption Pathways

Regulators and system operators may adopt EthosGrid by:

- incorporating its invariants into new or revised reliability standards;

- referencing it within market rules or operating agreements;
- using it as a benchmark for compliance and audit sufficiency; or
- piloting it in limited-scope deployments with audit-only enforcement.

Closing Note

EthosGrid does not ask regulators to approve machines as decision-makers. It provides a mechanism to ensure that authority remains explicit, bounded, and reviewable as technology changes how decisions are prepared and executed.

The question is not whether AI participates in critical decisions—it already does. The question is whether governance operates where authority now resides.