SENTINEL AUTHORITY
Conformance Determination for Autonomous Systems

ODDC Overview

Operational Design Domain Conformance Framework

Version 1.0 · January 2026 · Public Distribution

Executive Summary

Sentinel Authority publishes ODDC (Operational Design Domain Conformance)—a voluntary conformance and evidence framework for autonomous systems. ODDC provides a structured methodology for attesting that operational evidence supports system behavior within a formally declared Operational Design Domain (ODD), with runtime enforcement mechanisms present and auditable.

This document provides a conceptual overview of the ODDC framework. It is non-normative and intended for regulators, insurers, enterprise partners, and other stakeholders evaluating conformance approaches for autonomous systems.

What Sentinel Authority Is

Sentinel Authority is an independent conformance determination body for autonomous systems. It does not build AI systems, sell robotics platforms, or issue regulations. Instead, Sentinel Authority:

• **Defines standards** — Publishes ODDC criteria for bounding autonomous behavior within declared operating domains.

• **Issues determinations** — Evaluates implementations through structured assessment procedures and issues conformance determinations.

• **Specifies enforcement requirements** — Defines ENVELO, the requirement for non-bypassable runtime enforcement of declared boundaries.

- **Maintains audit frameworks** — Specifies tamper-evident logging suitable for insurer, regulator, and judicial review.

> *In essence, Sentinel Authority converts statements like "this AI is safe" into explicit, enforceable, and reviewable claims.*

The Framework: ODDC + ENVELO

The Sentinel Authority framework comprises two complementary components:

ODDC — Operational Design Domain Conformance

ODDC is the conformance determination. It answers the question: *"Where is this autonomous system allowed to operate?"* An ODD defines the formally specified boundary of permitted autonomous action—the conditions, contexts, and constraints within which the system is authorized to operate autonomously.

ENVELO — Enforcer for Non-Violable Execution & Limit Oversight

ENVELO is the enforcement requirement. It answers the question: *"What prevents the system from operating outside that boundary?"* ENVELO specifies requirements for non-bypassable runtime interlocks that make ODDC meaningful. Without enforcement, conformance would be paperwork. With ENVELO, conformance becomes auditable and actionable.

> *Note: ENVELO is a method designation describing non-bypassable enforcement requirements. Sentinel Authority defines requirements; operators implement them. ENVELO is not software, a platform, or a product.*

Framework Posture

The ODDC framework adopts a specific posture toward autonomous system governance:

- **From trust to verification** — Autonomous systems are no longer trusted implicitly. ODDC enables independent verification that systems operated within declared limits, supported by cryptographic evidence.

- **From forensic ambiguity to legible accountability** — When incidents occur, ODDC shifts the question from speculative intent to verifiable fact: Was the system operating within its declared domain?

- **From uninsurable to underwritable** — By certifying the operating domain rather than the internal AI model, risk becomes quantifiable. Insurers can underwrite bounded autonomy.

• **From regulatory gridlock to scalable oversight** — Regulators can assess the conformance framework and evidence structure rather than evaluating every model iteration.

• **From implicit risk to explicit discipline** — ODDC requires operators to formally define limits before deployment, constraining overreach and preventing mission creep.

Scope of Application

ODDC is designed for autonomous systems that make consequential decisions or take physical actions with limited human oversight. Applicable domains include:

- Autonomous vehicles and mobile robotics
- Industrial automation and manufacturing systems
- Autonomous drones and unmanned aerial systems
- AI-driven infrastructure control systems
- Autonomous agents operating in digital environments
- Medical and healthcare automation systems

The framework is domain-agnostic—it provides a consistent methodology regardless of the specific autonomous application.

Conformance Lifecycle

ODDC conformance follows a structured lifecycle:

• **Declaration** — Operator formally specifies the Operational Design Domain, including conditions, constraints, and boundaries.

• **Implementation** — Operator implements ENVELO-compliant enforcement mechanisms.

• **Assessment** — Sentinel Authority evaluates conformance through structured procedures including CAT-72.

• **Determination** — Upon successful assessment, conformance determination is issued with defined scope and validity period.

• **Monitoring** — Continuous enforcement and audit logging during operational deployment.

• **Renewal or Revocation** — Conformance determinations are time-bounded and subject to suspension upon evidence of material deviation.

What ODDC Is Not

For clarity, the ODDC framework does not:

- Certify AI models, training data, or algorithmic correctness
- Replace regulatory requirements or constitute legal compliance
- Provide runtime monitoring services or operational support
- Guarantee safety—it provides auditable evidence of bounded operation
- Cover human oversight requirements or organizational governance

Further Information

For technical requirements, assessment procedures, or partnership inquiries, contact Sentinel Authority:

info@sentinelauthority.com · sentinelauthority.com

◆