

# Reversibility Classifier

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## What the Reversibility Classifier Specifies

The classifier maintains credentialed classification per actuator type per operating context. Steering input is highly-reversible. Brake application is partially-reversible. Airbag deployment is committed. Surgical incision is committed. Weapon engagement is committed. Switch closure to a sealed substation is committed.

Classifications are governance-credentialed observations signed by relevant authorities (regulatory authorities for vehicle classifications, surgical-procedure authorities for medical classifications, defense authorities for weapons-relevant classifications). The classifier consumes the classifications and applies them to mode selection.

## Why Uniform Treatment of Actions Is Architecturally Wrong

Current autonomous-actuator architectures often treat all commands uniformly — same admissibility check, same commit semantics, same audit pattern. The pattern fits reversible commands; it fails for irreversible commands where the structural decision moment matters.

Reversibility-aware classification fits the actual decision structure. Most autonomous decisions are reversible at the contemplation moment but become committed at some

specific point in their execution. Architecturally identifying that point — and restructuring around it — eliminates the failure mode where irreversible decisions are made under architectural assumptions appropriate only for reversible ones.

## **How Classification Composes With Mode Selection**

When mode selection considers an action, the reversibility classification informs which modes are admissible. Highly-reversible actions admit full-mode commit because re-evaluation can intervene. Committed actions favor stage-gated mode that decomposes the commit into bounded reversible decisions; advisory or consultative mode requiring explicit ratification.

The classification per actuator type per operating context is updateable through credentialed governance updates. New actuator types receive classifications through the same governance flow that handles other policy updates.

## **What This Enables for Domain-Specific Operation**

Aviation autonomous landing systems gain reversibility-aware classification of descent vs flare vs touchdown. Surgical autonomous procedure progression gains classification of retraction vs dissection vs resection vs closure. Defense engagement gains classification of target classification vs weapon arming vs engagement commit.

The cross-domain reuse is structural. Reversibility classification varies across domains; the architectural mechanism is invariant. The patent positions the primitive at the layer above each domain's specific safety logic.

