8. Failure Modes of the Framework (Explicit Falsifiability)

CEDA is a diagnostic framework, not a theory. As such, its credibility depends not on its conclusions, but on the clarity with which it can specify **where it would fail, be incomplete, or require revision**. This section enumerates explicit conditions under which CEDA would be judged inadequate or wrong, either in whole or in part. These are not rhetorical concessions; they are operational failure modes that would mandate revision or abandonment of specific components of the framework.

CEDA claims no immunity from criticism. It earns relevance only insofar as it survives confrontation with counterexamples.

8.1 Failure Mode F-CEDA-1: Illicit Ontological Bias

Condition.
CEDA would be inadequate if a model introducing a genuinely nonlocal, horizon-coupled, or otherwise non-EFT mechanism:

- satisfies all declared admissibility criteria (A0),
- passes conservation accounting,
- survives D1–D4 stress tests under honest exchange-term derivation,
- remains stable under admissible coarse-graining variation,

yet is rejected *solely* because it violates implicit locality, continuum, or EFT intuitions not stated in the framework rules.

Implication.
Such a case would demonstrate that CEDA has smuggled in ontological prejudice under the guise of diagnostic neutrality. The appropriate response would be to revise the admissibility layer and stress tests, not to dismiss the model.

Status.
No such counterexample has yet been identified. The framework explicitly allows discrete,

holographic, and nonlocal descriptions provided they self-specify equivalence, conservation, and causal structure. Failure to honor this allowance would constitute a framework error.

8.2 Failure Mode F-CEDA-2: Breakdown of the WF1.2 Null Result

Condition.
CEDA would be wrong in a substantive sense if it were demonstrated that:

- quantum open-system dynamics,
- horizon-mediated accessibility changes,
- or nonperturbative entanglement effects

generically produce stable, vacuum-like negative pressure under conservation-honest accounting, without introducing new dynamical degrees of freedom or hidden control parameters.

This would correspond to a decisive failure of the WF1.2 result and its strengthened variants (e.g., WF1.2b).

Implication.
Such a result would invalidate one of CEDA's central empirical constraints: that repartitioning of radiation-like or dilution-obeying degrees of freedom does not, by itself, yield w≈−1w \approx -1w≈−1. The framework would then require revision to accommodate a new class of genuinely emergent mechanisms.

Status.
At present, all controlled stress tests indicate that such behavior does *not* arise generically. However, CEDA treats this as a provisional constraint, not a theorem.

8.3 Failure Mode F-CEDA-3: Irreducible Analyst Dependence

Condition.
CEDA would fail as a diagnostic instrument if, after enforcing:

- Translation Cards,
- Ambiguity Budgets,
- mandatory branching rules,

independent auditors still cannot converge on diagnostic outcomes for the same model within declared admissibility boundaries.

Convergence does not require agreement on interpretation, but it does require agreement on **where** disagreements originate and whether verdicts are stable or conditional.

Implication.
Persistent divergence would indicate that the framework's primitives are insufficiently well-posed, or that key diagnostic criteria remain underdefined. In that case, CEDA would not meet minimal standards of reproducibility.

Status.
Initial blind audits suggest partial convergence with localized disagreement. Whether full convergence is achievable remains an empirical question for the framework itself.

8.4 Failure Mode F-CEDA-4: Representational Incompleteness

Condition.
CEDA would be inadequate if a physically coherent framework:

- satisfies standard conservation laws,
- has well-posed causal structure and evolution,
- makes explicit equivalence and coarse-graining commitments,

yet **cannot be represented** in CEDA's descriptive primitives (degrees of freedom, partitions, horizons, exchange accounting) without distortion or loss of essential structure.

Implication.
This would signal that CEDA's abstraction layer is too narrow to function as a general diagnostic tool. The correct response would be extension or replacement of the primitives—not forced translation.

Status.
CEDA does not claim completeness over all conceivable physical frameworks. This failure mode is explicitly acknowledged as a boundary condition on its applicability.

8.5 What These Failures Mean—and Do Not Mean

These failure modes do **not** imply that CEDA must be abandoned if any individual diagnostic result is overturned. They imply that:

- the framework must track where its constraints come from,
- null results must remain revisable,
- and neutrality must be enforced procedurally, not rhetorically.

CEDA's ambition is deliberately limited. It does not seek to decide which early-universe model is *true*. It seeks to clarify **what has actually been earned**, and under what assumptions.

If CEDA were ever shown to block a genuine mechanism, miss a robust emergent effect, or collapse into analyst-dependent disagreement, that would not be an embarrassment. It would be evidence that the framework is being tested in the way it demands others be tested.