# KFX Extreme Expression
# (Minimal Decidability Form)

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## Uniqueness Criterion

Given a fixed observation scale $X$, if there exists *exactly one* stable decision gate $F$ that is *executable, rollback-capable, and responsibility-locatable*, then the KFX expression of the system is unique.

## Failure Conditions (Any One Implies Collapse)

1. The decision gate is not executable (only narrative or intention remains);
2. The decision gate is not rollback-capable (irreversible upon activation);
3. Responsibility of the decision gate is not locatable (execution and consequence are disconnected).

## Minimal Non-Rigid Extension (Irreducible)

The symbol $\kappa$ is permitted to exist as a naming anchor. However, $\kappa$ does not participate in decision-making, does not generate new decision gates, and does not introduce any value or reward function.

## Core Sentence at the Compression Limit

KFX = the existence test, at scale $X$, of a unique executable and rollback-capable responsibility decision gate.

## KFX — Symbolic Extreme Shell

### Given

- $X$: observation scale;
- $F$: decision gate;
- $\kappa$: naming anchor;
- $\perp$: collapse state.

**Existence Definition**

$$\mathrm{KFX}(X) \iff \exists! F$$

**Constraint Predicate**

$$\mathrm{Exec}(F) \ \wedge \ \mathrm{Rollback}(F) \ \wedge \ \mathrm{Resp}(F)$$

Define

$$\Phi(F) \ \equiv \ \mathrm{Exec}(F) \wedge \mathrm{Rollback}(F) \wedge \mathrm{Resp}(F).$$

**Uniqueness**

$$\exists F_1, F_2 : \ \big(\Phi(F_1) \wedge \Phi(F_2)\big) \ \Rightarrow \ F_1 = F_2.$$

**Failure (Collapse)**

$$\neg\Phi(F) \ \Rightarrow \ \mathrm{KFX}(X) = \bot.$$

**Position of $\kappa$**

$$\kappa : \text{name-only}, \qquad \kappa \notin \mathrm{Dom}(F).$$

## One-Line Symbolic Form

$$\mathrm{KFX}(X) = \begin{cases} 1, & \exists! F \text{ s.t. } \Phi(F), \\ \bot, & \text{otherwise.} \end{cases}$$

## KFX — Zero-Dimensional Decidability Shell

$$\exists! F \ \mid \ \bot$$

## Auxiliary Invariants (Not Expanded)

$$\kappa \ \bot \ F$$

## Reading (Irreducible Semantics)

- $\exists! F$ : the system holds;
- $\bot$ : the system collapses;
- $\kappa \bot F$ : naming does not participate in decision (otherwise the system is invalid).

## Limit Statement

- Further compression leaves only $1/0$, erasing observation scale $X$ and responsibility structure;
- The present form is the minimal decidable expression.

**Compression complete.**