

Monitor-Validity Failures: LLM Safety Evidence Paths at Evolving Framework Boundaries

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Author. Junchi Liao (single author). No affiliation appears in the arXiv front matter; the HTML rendering (arxiv.org/html/2610.23362v1) returned HTTP 429 and could not be read, so **no institution is attributed** in the edition.

Subject. Runtime monitors in LLM applications — components that inspect tool calls, traces, streams, detector outputs and verifier inputs. The paper describes a reliability class in which the framework keeps running while safety-relevant evidence never reaches the point at which a decision is made. The motivating example: a regex detector flagged content, and the framework dropped the result before the block decision.

Method — canary contracts. Parent/fixed confirmation units that place a known payload *only* on the changed evidence surface, and record monitor visibility together with the downstream decision for action-boundary cases.

Results.

- 18 evidence-path failures confirmed across 11 LLM or agent safety project groups.
- Four implementation ecosystems.
- Composition: nine established-boundary repairs, eight new-surface policy-coverage gaps, one boundary-only evidence case.
- 14 of the 18 reach enforcement points (E1): seven native action outcomes, six configured enforcement boundaries, one synthetic-consumer consequence.
- The remaining 4 affect verifier, safety-prompt or observability channels.
- Failure families: carrier, adapter, authority, surface.

Argument. Monitor assumptions need regression tests at schemas, streams, tools and adapters.

Limitation recorded by this edition. The cases were reconstructed from public framework repairs, so the sample is biased towards defects somebody had already noticed and fixed. 18 is a confirmed count from one author, not a population rate.