Governed Active Probing With Disclosure Cost

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What Disclosure-Cost Admissibility Specifies

When the operating system needs information that passive sensing cannot provide, an active probe becomes a candidate. The probe is itself a governed actuation request: a credentialed observation describing the contemplated transmission, projection, or emission. The admissibility evaluator considers four classes of factors: spectrum licensing (am I authorized to transmit in this band, at this power, in this geography), mission policy (does the mission ROE permit disclosure of my presence), adversarial-awareness state (what does my disclosure reveal that the adversary doesn't already know), and information value (how much does the probe-information actually contribute beyond what I already have).

The output is a graduated decision: full probe under permissive conditions, low-power probe under partial disclosure tolerance, deferred probe pending updated mission policy, refused probe when disclosure cost exceeds information value. The decision is recorded in lineage with the supporting computation.

Why Reflexive Probing Is Operationally Wrong in Contested Environments

Single-medium hardening systems often probe reflexively when their primary observation channel produces ambiguous signals. The reflex makes sense in benign environments — probing reveals the cause of the ambiguity. The reflex is operationally wrong in contested environments — probing reveals the probing system's presence and capabilities to whatever adversary is producing the ambiguity.

Defense ELINT (electronic intelligence) literature documents this trade-off explicitly: every active emission is information for the adversary's signals intelligence collection. Counter-UAS operations, contested-airspace deployment, and adversarial-environment autonomy all face the same trade-off. The trade-off is not capturable by static rules; it requires context-dependent admissibility evaluation.

How Composite Admissibility Handles the Trade-off

The admissibility evaluator consumes credentialed observations across all four factor classes. Spectrum licensing comes from the credentialed spectrum authority (FCC, NTIA, allied equivalents). Mission policy comes from the credentialed mission authority (theater command, fleet operator). Adversarial-awareness state comes from the disruption-modeling primitive's signature library and current-environment classifications. Information value comes from the operating system's own assessment of what the probe would resolve.

The evaluation is graduated. A high information-value probe under permissive spectrum and mission policy with adversary-already-aware signals proceeds at full power. A modest information-value probe under restricted spectrum, ambiguous mission policy, and adversary-not-aware conditions defers or refuses. The architecture supports the spectrum of operational realities rather than collapsing to permit-or-suppress.

What This Enables for ELINT-Aware Operation

Defense systems gain structural ELINT discipline. Every probe is evaluated against its disclosure cost; reflexive probing becomes governance-credentialed exception rather than default behavior. Counter-UAS operations gain probe discipline that the current 'detect-then-counter' pattern lacks.

Commercial spectrum-aware operations (5G in shared spectrum, white-space radio, dynamic spectrum access) gain governance for opportunistic emissions. The same primitive serves defense and commercial use cases with different credentialing chains. The patent positions the primitive at the layer that adversarial-aware and spectrum-aware operation require.