

ENTROPICA FORENSIC MODEL

# EFM System Guide

Consolidated Operational Reference

Version 1.0

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## Abstract

This document consolidates operational guidance from README.md, CONTRIBUTING.md, CODE\_OF\_CONDUCT.md, and the Operator's Guide into a unified reference. It maps governance artifacts to the EFM architectural framework for seamless Clide publisher integration.

## Contents

# 1 Document Purpose

The EFM System Guide serves as the single source of truth for:

- Operational procedures mapped to EFM layers
- Contribution governance aligned with escalation pathways
- Code of conduct enforcement via capsule accountability model
- Quick-start deployment guidance

Table 1: Source document mapping.

Source	EFM Anchor	Guide Section
README.md	Architecture overview	§2
CONTRIBUTING.md	Layer 2 (Arbiter) governance	§3
CODE_OF_CONDUCT.md	Reflex-Heuristic norms	§4
Operator's Guide	All operational layers	§5

## 2 Architecture Quick-Start

### 2.1 Layer Model Summary

Table 2: EFM layer summary for operators.

Layer	Name	Function	Modifiable
0	Vault	Immutable commandments	Never
0.5	Reflex-Core	Sub-10ms safety response	Never
0.5+	Reflex-Heuristic	Learned patterns	Arbiter only
1	Execution	Capsule runtime	Standard
2	Arbiter	Deliberative resolution	d-CAM quorum
3–5	Forest	Distributed evolution	Profile-dependent
6	Constitutional	Bounded self-modification	Constitutional quorum

### 2.2 Reversibility Principle (Updated Terminology)

#### The Reversibility Principle

*“Autonomy is inversely proportional to irreversibility.”* — Volume I §5

**Key Insight:** Gate actions by recoverability, not perceived danger.

#### Terminology Updates (v1.8):

- “Treatment ( $H < 0.6$ )” → “ $\Delta S$  treatment ( $H < 0.6$ )” — explicit entropy reference
- Added “Micro-Heuristic deployment” to Irreversible tier — reflects Reflex-Heuristic update process

Table 3: Reversibility matrix with corrected terminology.

Reversibility	Autonomy Level	Examples	Oversight
<b>Fully Reversible</b>	Full Autonomy (act immediately)	$\Delta S$ treatment ( $H < 0.6$ ), Rollback, QUARANTINE	Post-hoc notification
<b>Partially Reversible</b>	Arbiter Oversight (deliberate briefly)	Reversible rollback, De-enshrinement, Judicial ruling	Post-hoc + logging, Arbiter quorum
<b>Irreversible</b>	Deliberation Required (think carefully)	External API calls, Physical actuations, Micro-Heuristic deployment	Pre-action review, Arbiter deliberation
<b>Constitutional</b>	Gardener Approval (human-in-loop)	PURGE, Constitutional mutation, Layer 0/6 changes	Formal approval, Constitutional quorum

### 3 Contribution Governance

#### 3.1 Mapping to Arbiter Layer

Contribution governance follows the Arbiter Layer (Layer 2) model:

1. **Proposal Submission**  $\equiv$  Escalation request
2. **Review Process**  $\equiv$  d-CAM deliberation
3. **Merge Decision**  $\equiv$  Arbiter verdict
4. **Precedent Setting**  $\equiv$  Heuristic update

#### 3.2 Pull Request Protocol

Table 4: PR process mapped to EFM escalation.

PR Stage	EFM Equivalent	Requirement
Draft PR	Level 1 (self-review)	Author validates locally
Ready for Review	Level 2 (peer review)	Passes CI tests
Requested Changes	Probation (monitored)	Address feedback
Approved	Arbiter verdict	Quorum approval
Merged	Precedent set	d-CTM logged

#### 3.3 Testing Requirements

All contributions MUST include:

- Unit test definitions (per affected appendix)
- Integration test scenarios (if cross-component)
- Invariant specifications (if safety-critical)
- Formal proof sketches (for P1–P8 changes)

## 4 Code of Conduct Enforcement

### 4.1 Mapping to Reflex-Heuristic

The Code of Conduct functions as a **social Reflex-Heuristic**:

- Positive behaviors = Low  $\Delta S$  (system stability)
- Unacceptable behaviors = High  $\Delta S$  (triggers escalation)

### 4.2 Escalation Pathway

Table 5: CoC violation escalation.

Severity	Behavior	Response	EFM Equivalent
S1	Minor violation	Warning	Reflex alert
S2	Repeated violation	Temporary restriction	Probation
S3	Serious violation	Suspension	Quarantine
S4	Egregious violation	Permanent ban	PURGE

## 5 Operational Procedures

### 5.1 Deployment Checklist

Before deploying EFM capsules:

1. Select deployment profile (Appendix I)
2. Verify spawn parameters within profile limits
3. Configure Gardener notification thresholds
4. Execute `efm-cli profile validate`
5. Initialize Genesis ceremony (Appendix J §3)

### 5.2 Emergency Procedures

#### Catastrophic Event Response

See Operator's Guide §7 for detailed runbooks:

1. **Cascading Failure**: Spawn cascade halt → ASG emergency ceiling
2. **d-CTM Corruption**: Read-only mode → Branch replay
3. **ZK-SP Chain Break**: Halt affected trunk → Forensic reconstruction
4. **Gardener Unavailable**: Dead Hand Protocol → Automatic safe mode

Table 6: Key metrics for operational monitoring.

Metric	Source	Threshold	Alert Level
$\Delta S$ (entropy)	Telemetry (App H)	$\geq \tau$ (default 0.7)	S2
SCI (coherence)	SHSL (App K)	$< 0.7$	S2
DDI (drift)	Forest (Vol II)	$> 0.4$	S2
Spawn rate	ASG (App N)	$> R_{max}$	S3
d-CTM latency	Forensic (App A)	$> 1000$ ticks	S1

### 5.3 Monitoring Integration

## 6 Cross-Reference Index

Topic	Primary Source	Appendix
Capsule lifecycle	Volume I §2	A
Reflex Engine	Volume I §3	F
Entropy ( $\Delta S$ )	Volume I §3.3	H
Arbiter Layer	Volume II §2	L
Forest Layer	Volume II §3	K, M
Spawn Governance	Volume I §4	N
Constitutional Kernel	Appendix J	J
Deployment Profiles	Appendix I	I
Gardener Interface	Appendix G	G
ZK-SP Proofs	Appendix E	E
Testing Framework	Testing Framework	C

Table 7: Topic cross-reference index.

## Version History

### v1.0 (December 2025)

- Initial consolidated system guide
- Integrated README, CONTRIBUTING, CODE\_OF\_CONDUCT
- Updated reversibility matrix terminology
- Added EFM architectural mappings