Core Emotion Framework (CEF): TS 19 Appendix A — Inference Ruleset

Canonical Inference Logic for the CEF Reasoning Engine
Version 1.0 — Phase 4

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Status: Canonical Appendix (TS-19)

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0. Purpose and Canonical Position

Appendix A defines the **formal inference rules** used by the CEF Reasoning Engine (TS-19).
These rules specify how the engine:

- derives new knowledge
- propagates constraints
- computes lawful transitions
- infers modulation cascades
- evaluates stability
- predicts drift and collapse
- computes plasticity adjustments
- enforces governance behavior

This appendix introduces **no new emotional constructs**.
It defines the **logic** that operates on the ontology defined in TS-18.

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1. Inference Rule Structure

Each inference rule has:

- **Name**
- **Input Conditions**
- **Inference Logic**
- **Output**
- **Canonical Constraints**

Rules are grouped into seven families, matching TS-19.

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2. Identity Inference Rules (TS-1, TS-11)

Rule I-1: Facet Ordering Transitivity

If:

- facetPrecedes(F_1, F_2)
- facetPrecedes(F_2, F_3)

Infer:

- facetPrecedes(F_1, F_3)

Constraint:

- No facet may invert canonical order.

Rule I-2: Center Membership Closure

If:

- belongsToCenter(O, C)

Infer:

- centerContains(C, O)

Constraint:

- Operator must belong to exactly one center.

Rule I-3: Operator Identity Preservation

If:

- operatorId(O_1) = operatorId(O_2)

Infer:

- $O_1 = O_2$

Constraint:

- No operator duplication.

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3. Directionality Inference Rules (TS-1)

Rule D-1: Transition Transitivity

If:

- $O_1 \rightarrow O_2$
- $O_2 \rightarrow O_3$

Infer:

- $O_1 \rightarrow O_3$

Constraint:

- Only forward transitions allowed.

Rule D-2: Successor Closure

If:

- canonicalSuccessor(O_1) = O_2

Infer:

- transitionFrom(T, O_1)
- transitionTo(T, O_2)

Constraint:

- Successor must match TS-1.

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4. Modulation Inference Rules (TS-3)

Rule M-1: Modulation Cascade

If:

- modulates(A, B)
- modulates(B, C)

Infer:

- modulates(A, C)

Constraint:

- Only lawful modulation pathways allowed.

Rule M-2: Modulation Reciprocity

If:

- modulates(A, B)
- modulationElasticity > threshold

Infer:

- B partially modulates A

Constraint:

- Reciprocity must match TS-3.

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5. Stability Inference Rules (TS-12)

Rule S-1: Capacity Proximity

If:

- activationLevel(O) ≥ 0.8 × capacityLimit(O)

Infer:

- stabilityRisk(O) = “High”

Rule S-2: Threshold Compression

If:

- thresholdSpacing(O) < minimumSpacing

Infer:

- instability(O) = “Likely”

Rule S-3: Coherence Drift

If:

- centerMicroShift(C) accumulates over time

Infer:

- coherenceScalar decreases

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6. Predictive Inference Rules (TS-13)

Rule P-1: Drift Projection

If:

- driftVelocity(O) > driftThreshold

Infer:

- predictsDrift(O)

Rule P-2: Collapse Projection

If:

- modulationDecayRate > collapseThreshold

Infer:

- predictsCollapse(C)

Rule P-3: Overflow Projection

If:

- loadAccumulationRate > overflowThreshold

Infer:

- predictsOverflow(Pathway)

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7. Plasticity Inference Rules (TS-16)

Rule PL-1: Micro-Adjustment Accumulation

If:

- microAdjustmentStep(O) accumulates
- AND facetReorderingDelta < inversionThreshold

Infer:

- longTermShift(O)

Rule PL-2: Facet Drift Prevention

If:

- facetReorderingDelta > safeLimit

Infer:

- rejectFacetReordering

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8. Governance Inference Rules (TS-17)

Rule G-1: Self-Correction Trigger

If:

- stabilityRisk(O) = “High”
- AND selfCorrectionGain(O) ≥ correctionThreshold

Infer:

- selfCorrects(O)

Rule G-2: Coherence Protection

If:

- coherenceScalar < minimumCoherence
- AND coherenceProtectionFactor ≥ protectionThreshold

Infer:

- selfProtects(Coherence)

Rule G-3: Autonomous Balancing

If:

- centerImbalance detected
- AND selfBalances(C) enabled

Infer:

- centerBalanceAdjustment(C)

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9. Canonical Constraints of Appendix A

All inference rules must:

- preserve identity
- preserve facet boundaries
- preserve center architecture
- preserve directionality
- preserve modulation legality
- preserve stability
- preserve predictive logic
- preserve plasticity limits
- preserve governance rules

No inference may introduce:

- new operators
- new facets
- new centers
- illegal transitions
- illegal modulation
- facet migration
- center blending

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10. Canonical Status

Appendix A is the authoritative inference ruleset for TS-19.
It defines the computational logic that the Reasoning Engine must apply when interpreting TS-18 ontology objects.

It is subordinate only to:

- Core Essence Document
- TS-1 → TS-19
