Core Emotion Framework (CEF): TS 20 Appendix C — Graph Validation Rules

Canonical Validation Logic for the CEF Knowledge Graph (CEF-KG)
Version 1.0 — Phase 4

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Status: Canonical Appendix (TS-20)

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0. Purpose and Canonical Position

Appendix C defines the **graph-level validation rules** for the CEF Knowledge Graph (CEF-KG) described in TS-20.

It ensures that:

- all nodes and edges conform to TS-18 ontology structure
- all inferences conform to TS-19 reasoning logic
- all serialized graphs conform to TS-20 Appendix A
- all queries conform to TS-20 Appendix B
- all canonical constraints from TS-1 → TS-17 are preserved

This appendix introduces **no new emotional constructs**.
It defines the **validation logic** that ensures the CEF-KG remains canonical and contamination-free.

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1. Validation Architecture Overview

Graph validation occurs in **four canonical passes**:

1. **Schema Validation**
2. **Identity Validation**
3. **Structural Validation**
4. **Constraint Validation**

Each pass is mandatory and must be executed in order.

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2. Schema Validation

Schema validation ensures that the graph conforms to:

- TS-18 ontology classes
- TS-18 property definitions
- TS-20 Appendix A serialization formats

Rule S-1: Node Type Validity

Every node must be one of:

- Operator
- Facet
- Center
- Transition
- Modulation
- Capacity
- Threshold
- DysregulationPattern
- PredictiveIndicator
- PlasticityParameter
- GovernanceSignal

Rule S-2: Edge Type Validity

Every edge must be one of:

- Identity
- Structural

- Dynamic
- Predictive
- Plasticity
- Governance

Rule S-3: Serialization Validity

Graph must be valid in at least one canonical format:

- JSON-LD
- Turtle
- RDF/XML
- GraphML

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3. Identity Validation

Identity validation ensures that the graph preserves the core identity constraints of the CEF.

Rule I-1: Operator Identity

- operatorId must be unique
- operator must belong to exactly one center

Rule I-2: Facet Identity

- facetId must be unique
- facet must belong to exactly one operator

Rule I-3: Center Identity

- centerId must be one of: Head, Heart, Gut

Rule I-4: No New Entities

No node may appear that is not defined in TS-1 → TS-18.

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4. Structural Validation

Structural validation ensures that the graph preserves the architecture defined in TS-1 → TS-11.

Rule ST-1: Directionality Validity (TS-1)

- All transitions must follow canonical successor rules
- No reversed transitions
- No illegal cross-center transitions

Rule ST-2: Facet Ordering Validity (TS-11)

- facetPrecedes(Fi, Fj) must hold if i < j
- no facet inversion allowed

Rule ST-3: Center Membership Validity

- operator must remain in its canonical center
- no operator reassignment

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5. Dynamic Validation

Dynamic validation ensures that the graph preserves lawful emotional dynamics.

Rule D-1: Modulation Validity (TS-3)

- modulates(A, B) must be canonical
- no modulation inversion
- no chronic modulation loops

Rule D-2: Transition Validity

- transitions must match TS-1
- no illegal multi-step transitions

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6. Predictive Validation

Predictive validation ensures that forecasting logic remains lawful.

Rule P-1: Predictive Mapping Validity (TS-13)

- predictive edges must map to valid patterns
- no contradictions with TS-12 stability rules

Rule P-2: Drift Validity

- driftVelocity must be within canonical bounds

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7. Plasticity Validation

Plasticity validation ensures that micro-adjustments preserve identity.

Rule PL-1: Facet Reordering Validity (TS-16)

- facetReorderingDelta must not invert canonical order

Rule PL-2: Micro-Adjustment Validity

- cumulative micro-adjustments must not break identity

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8. Governance Validation

Governance validation ensures that autonomous processes preserve coherence.

Rule G-1: Self-Correction Validity (TS-17)

- selfCorrects must not destabilize coherence

Rule G-2: Coherence Protection Validity

- coherenceProtectionFactor must exceed minimum threshold

Rule G-3: Autonomous Balancing Validity

- selfBalances must not override center identity

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9. Global Constraint Validation

The final pass ensures that the graph remains globally canonical.

Rule C-1: No Contamination

- no facet migration
- no operator merging
- no center blending

Rule C-2: No Illegal Edges

- all edges must belong to canonical edge families

Rule C-3: No Structural Drift

- no new transitions
- no new modulation pathways

Rule C-4: Coherence Preservation

- coherenceScalar must remain within canonical bounds

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10. Validation Workflow Summary

function validateGraph(graph):

validateSchema(graph)

validateIdentity(graph)

validateStructure(graph)

validateDynamics(graph)

validatePrediction(graph)

validatePlasticity(graph)

validateGovernance(graph)

validateGlobalConstraints(graph)

return VALID

If any rule fails:

return INVALID with errorCode

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11. Canonical Status

Appendix C is the authoritative graph validation specification for TS-20.
It defines the rules that ensure the CEF-KG remains canonical, identity-preserving, and contamination-free.

It is subordinate only to:

- Core Essence Document
- TS-1 → TS-20
