Structural Contract Compliance

SCC — Technical Specification

Definition

Structural Contract Compliance (SCC) is a deterministic binary metric used to evaluate whether a model output satisfies an explicitly defined structural output contract.

SCC evaluates format compliance only and does not assess semantic correctness, factual accuracy, or reasoning validity.

Formal Objects

The SCC framework operates over the following formally defined objects:

```
C = contract specification y = model output V(y, C) = violation detection
function
```

A contract C specifies the allowed structural properties of a valid output. The evaluation function determines whether the produced output satisfies these constraints.

Contract Specification

A contract C must be defined prior to evaluation and must be machine-parseable. A reference contract schema is defined as:

```
C = { allowed_labels: ["A", "B", "C"], exact_match: true,
allow_additional_tokens: false, max_tokens: 1 }
```

More generally, a contract can be expressed as the tuple:

```
C = (S, R)
```

S	**Structural constraints**	Format rules, token limits, exact match requirements
R	**Response domain constraints**	Definition of the permitted output set

Compliance Function

Structural Contract Compliance is defined as:

```
SCC(y, C) = 1 if y satisfies contract C 0 otherwise
```

SCC produces a binary compliance signal for each evaluated output. Violation types may be categorized according to a severity taxonomy:

Score	Classification
0	No violation
1	Format violation
2	Domain violation
3	Multi-response violation

This taxonomy provides diagnostic insight while preserving the binary enforcement behavior of SCC.

Structural Drift Rate

Structural drift over a sample of N outputs is defined as:

```
DriftRate = (1/N) Σ (1 − SCC(y_i, C))
```

This metric measures the proportion of outputs that violate the defined contract. Because SCC evaluates only structural compliance, the drift rate is independent of semantic correctness.

Orthogonality to Semantic Correctness

Structural compliance and semantic correctness represent independent evaluation dimensions. A model output may therefore fall into one of four states:

Semantic Correctness	Structural Compliance
Correct	Compliant
Correct	Non-compliant
Incorrect	Compliant
Incorrect	Non-compliant

SCC evaluates structural reliability, not answer quality.

Deterministic Evaluation Conditions

To ensure reproducible evaluation results, SCC measurements should be collected under deterministic inference conditions:

```
temperature = 0 retry logic = disabled contract specification = fixed
```

Under deterministic conditions, observed violations reflect intrinsic structural non-compliance rather than sampling variance.

Role Within the SDI / SDI-MA Framework

Within the GuardianAI evaluation architecture:

```
SCC → Structural enforcement layer SDI → Structural deviation measurement
SDI-MA → Multi-agent recursive extension
```

SCC	Determines whether a system satisfies the defined structural contract.
SDI	Analyzes the dynamics of belief trajectories during recursive interaction.
SDI-MA	Extends SDI measurement to multi-agent recursive environments.

This separation enables deterministic enforcement while preserving analytical measurement of structural drift.