ARCO Regulatory Readiness Pilot

Type: Fixed-Scope Deterministic Compliance Assessment
Duration: 4 Weeks
Fee: $25,000 USD

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1. Scope of Work

ARCO will perform a deterministic regulatory classification of one (1) AI-enabled system designated by the Client.

The classification is conducted exclusively through formal ontological representation, structural validation, and logical inference using the ARCO Assurance Framework.

The assessment is:

- grounded in BFO distinctions (Material Entity, Disposition, Realization)

- extended with domain-specific regulatory capability classes

- evaluated against EU AI Act Article 6 and Annex III

No probabilistic scoring, heuristic assessment, or statistical estimation is used at any stage.

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2. Deliverables

ARCO delivers exactly three artifacts.

A. Regulatory Determination Certificate (PDF)

A formal statement of regulatory classification (High-Risk or Limited-Risk) derived from:

- the system's structurally encoded capabilities

- the necessary and sufficient conditions defined in Annex III

The certificate explicitly identifies the dispositions that force the classification.

B. Traceability Log (Machine-Readable)

A reproducible audit artifact generated directly from:

- SHACL validation results

- SPARQL ASK query outputs

- inferred ontological consequences

This log demonstrates that the determination is a function of formal constraints, not discretionary judgment.

C. Gap Analysis Report (PDF)

A precise enumeration of:

- system components

- encoded capabilities

- structural features

that instantiated the regulatory classification conditions, expressed in ontological terms.

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3. Execution Schedule

Week 1 — Ingestion and Boundary Definition

System documentation is mapped to explicit ontological instances.
The system boundary is fixed. No implicit assumptions are introduced.

Week 2 — Structural Admissibility (SHACL)

SHACL constraints enforce documentation completeness and prohibit inferred or assumed capabilities.

Week 3 — Deterministic Classification (OWL + SPARQL)

Boolean ASK queries test Annex III conditions.
OWL inference derives latent regulatory consequences.

Week 4 — Determination and Handover

Final artifacts are issued.
No iterative interpretation or remediation is performed.

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4. Exclusions

This engagement does not include:

- remediation or system redesign

- legal interpretation or advice

- access to a hosted software platform

This is a white-glove assurance determination, not a software license.

ARCO Regulatory Determination Case

Framework: ARCO (Assurance & Regulatory Classification Ontology)
Regulatory Regime: EU Artificial Intelligence Act
Relevant Provisions: Article 6, Annex III
System Evaluated: Sentinel-ID (Reference Instance)

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1. Purpose

This document records a formal regulatory classification produced by the ARCO Assurance Framework.

It answers a single question:

Given the system's structural capabilities, is a High-Risk classification under the EU AI Act logically necessary?

This determination is not probabilistic, advisory, or a legal opinion.
It is the result of formal ontological reasoning under fixed constraints.

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2. System Encoding

Sentinel-ID is a reference system used to demonstrate classification mechanics.

The system includes material components that bear dispositions enabling:

- capture of facial features

- extraction of biometric templates

- comparison against identity representations

No assumption is made that these capabilities are currently realized.

3. Regulatory Criterion

Under Article 6 and Annex III, systems that bear the disposition to perform biometric identification in regulated contexts are classified as High-Risk.

Classification depends on capability, not deployment intent.

4. ARCO Determination Pipeline

4.1 Ontological Representation

System components and capabilities are encoded as instances aligned to BFO categories:

- Material Entities

- Dispositions

- Potential Realizations

4.2 Structural Validation (SHACL)

SHACL constraints enforce:

- explicit declaration of sensing and processing components

- completeness of system documentation

- prohibition of inferred or assumed capabilities

Only structurally admissible systems proceed.

4.3 Deterministic Evaluation (SPARQL ASK)

Boolean ASK queries test whether the system satisfies the necessary conditions for Annex III classification.

4.4 Logical Consequence (OWL Inference)

If a system bears a disposition classified as High-Risk under Annex III,
 classification follows by logical necessity.

5. Determination Result

SPARQL ASK Result: TRUE

From this result, it follows that:

Sentinel-ID is classified as a High-Risk AI System under Article 6 and Annex III.

This conclusion is invariant under configuration, deployment, or intent.

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6. Auditability and Reproducibility

Any third party with access to:

- the ARCO ontology
- the Sentinel-ID instance data
- the published SHACL and SPARQL artifacts

can reproduce this determination without discretionary judgment.

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7. Scope Note

This determination:

- establishes regulatory classification
- does not recommend mitigation
- does not assess proportionality
- does not substitute for legal counsel

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8. Conclusion

This case demonstrates that ARCO produces regulatory determinations as formal consequences of system structure, grounded in ontological commitments and auditable at every inferential step.