

ISO/TS 15926-8:2011-10 (E)

Industrial automation systems and integration - Integration of life-cycle data for process plants including oil and gas production facilities - Part 8: Implementation methods for the integration of distributed systems: Web Ontology Language (OWL) implementation

Contents		Page
Foreword		vi
Introduction		vii
1	Scope	1
2	Terms, definitions, and abbreviated terms	1
2.1	Terms and definitions	1
2.2	Abbreviated terms	7
3	Fundamental concepts and assumptions	8
3.1	General	8
3.4	User-defined taxonomy	8
3.5	Templates and specialized templates	9
3.6	Use of OWL	9
3.7	Namespaces	9
4	ISO 15926-2 data model	12
6	OWL template specifications	13
6.1	General	13
6.2	Contents	13
7	Templates	14
7.1	General	14
7.2	Template model	14
7.3	Metadata	15
7.4	Lifted templates	15
7.5	Lowered templates	16
7.5.1	Instantiating lowered templates	16
7.6	Templates in RDF	16
7.7	Example: A proto-template	16
7.8	Templates as template instances	16
7.8.1	p7tm classes for meta-templates	16
8	Object information models (OIMs) and specialized templates	17
8.1	General	17
8.2	OIM versus specialized template construct	18
8.3	Specialization	18
8.4	Cardinalities	19
8.5	OIM for assemblies	19
8.6	Naming convention on template roles	19
8.7	Uniqueness context of template roles	20
Annex A (normative)	Information object registration	21
A.1	Document identification	21
A.2	Schema identification	21

A.2.1	OWL ontology for data model	21
A.2.2	Template specifications	21
A.2.3	OWL ontology for templates	21
A.2.4	OWL ontology for reference data	21
A.2.5	OWL ontology for metadata	22
Annex B (normative) Templates as RDF/OWL n-ary relations		23
B.1	General	23
Annex C (normative) Rules for usage of OWL		27
C.1	OWL native representation	27
C.2	Template translation from EXPRESS-native to OWL-native instance model	28
C.3	Library object translation from EXPRESS-native to OWL-native instance model	28
C.4	owl:Class	28
C.5	Individual	29
C.6	Property	29
C.6.1	Object property	29
C.6.2	Datatype property	29
C.6.3	Annotation property	29
C.7	Identifiers	30
C.7.1	rdf:ID	30
C.7.2	rdf:about	30
C.7.3	URI reference for handed-over objects	30
C.8	Inheritance	31
C.8.1	Declaration	31
Annex D (normative) Computer interpretable listings		32
D.1	Ontology for data model	32
D.2	Ontology for template model	32
D.3	Ontology for proto templates and templates initial set	32
D.4	Ontology for metadata	32
Annex E (informative) Pattern for an ontology for reference data		33
Annex F (normative) Metadata		34
F.1	General	34
F.2	Metadata declarations for provenance	34
F.3	Metadata declarations for security and rules	35
Annex G (informative) Assertion versus terminological components		36
Annex H (informative) Example use		37
H.1	General	37
H.2	Example: A proto-template	37
H.2.1	The template defined as a class	37
H.2.2	A statement using the template	37
H.3	Example: OIM	39
H.3.1	Description	39
H.3.2	Manchester syntax	39
H.4	Example: temporal parts	40
H.4.1	General	40
H.4.2	Generic representation	41
H.4.3	Specialized template IdentificationOfPhysicalObject	41
H.4.4	Specialized template IdentificationOfPhysicalObject-processplant	42
H.5	A specialized template and a template instance	43
Bibliography		47

Index	49
Figures	
Figure 1 -- Dependencies between ontologies	12
Figure B.1 -- W3C's working group note: defining n-ary relations	23
Figure C.1 -- Reified relationship	27
Figure C.2 -- OWL-native relationship	27
Figure H.1 -- Generic temporal parts, identification OIM	41
Figure H.2 -- ProcessPlant temporal part, name OIM	43
Tables	
Table 1 -- URIs under control of the World Wide Web Consortium	9
Table 2 -- Namespaces that are used for the examples in this part of ISO 15926	10