

# ISO 15704:2000-06 (E)

Flüssiggas-(LPG-)Geräte und Ausrüstungsteile\_ - Flüssiggas-(LPG-)Antriebssysteme für Boote,  
Industrial automation systems\_ - Requirements for enterprise-reference architectures and methodologies

---

## Contents

Foreword .....	vi
0 Introduction.....	vii
0.1 Rationale for enterprise-reference architectures and methodologies .....	vii
0.2 Key principles of enterprise integration .....	viii
0.2.1 Applicability to any enterprise.....	viii
0.2.2 Enterprise identification and mission definition .....	viii
0.2.3 Separation of mission-fulfilment functions from mission-control functions.....	viii
0.2.4 Identification of process structures.....	ix
0.2.5 Identification of process contents.....	ix
0.2.6 Recognition of life-cycle phases .....	ix
0.2.7 Evolutionary approach to enterprise integration .....	ix
0.2.8 Modularity .....	x
0.3 Aim and benefits of deploying enterprise-reference architecture and methodologies.....	x
0.4 Benefits of this standard .....	x
1 Scope.....	1
2 Normative References.....	1
3 Terms and definitions .....	1
4 Requirements for enterprise-reference architectures and methodologies .....	4
4.1 Applicability and coverage of enterprise-entity types.....	4
4.1.1 Generality.....	4
4.1.2 Enterprise design.....	4
4.1.3 Enterprise operation .....	4
4.2 Concepts .....	4
4.2.1 General .....	4
4.2.2 Human-oriented.....	4
4.2.3 Process-oriented .....	5
4.2.4 Technology-oriented.....	5
4.2.5 Mission-fulfillment oriented.....	5
4.2.6 Mission-control oriented.....	5
4.2.7 Framework for enterprise modeling .....	5
4.2.8 Life cycle.....	5
4.2.9 Life history.....	5
4.2.10 Modelling views.....	6
4.2.11 Genericity.....	6
4.3 Components of enterprise-reference architectures .....	6
4.3.1 Engineering methodologies .....	6
4.3.2 Modelling languages .....	6
4.3.3 Generic elements .....	6
4.3.4 Partial models .....	7
4.3.5 Particular models .....	7
4.3.6 Tools.....	7
4.3.7 Modules .....	7
4.3.8 Enterprise-operational systems.....	7
4.4 Representation .....	7
4.5 Glossary .....	8
5 Completeness and compliance .....	8
Annex A (informative) GERAM: Generalised enterprise-reference architecture and methodologies ..	9
A.1 Introduction .....	9
A.1.1 Background.....	9
A.1.2 Scope.....	9
A.2 The framework for enterprise engineering and enterprise integration.....	10
A.2.1 General.....	10
A.2.2 Definition of GERAM framework components.....	11
A.2.2.1 GERA – Generic Enterprise Reference Architecture.....	11

A.2.2.2	EEMs – Enterprise engineering methodologies.....	12
A.2.2.3	EMLs – Enterprise modelling languages.....	12
A.2.2.4	GEMCs – Generic enterprise modelling concepts.....	12
A.2.2.5	PEMs – Partial enterprise models.....	12
A.2.2.6	EETs – Enterprise engineering tools.....	13
A.2.2.7	EMs – (Particular) enterprise models.....	13
A.2.2.8	EMOs – Enterprise modules.....	13
A.2.2.9	EOSs – (Particular) enterprise operational systems.....	13
A.3	Description of GERAM framework components .....	13
A.3.1	GERA – Generalised Enterprise Reference Architecture .....	13
A.3.1.1	General.....	13
A.3.1.2	Human oriented concepts.....	14
A.3.1.3	Process oriented concepts.....	16
A.3.1.3.1	General.....	16
A.3.1.3.2	Life cycle.....	16
A.3.1.3.2.1	General.....	16
A.3.1.3.2.2	Entity identification.....	16
A.3.1.3.2.3	Entity concept.....	17
A.3.1.3.2.4	Entity requirement.....	17
A.3.1.3.2.5	Entity design.....	17
A.3.1.3.2.6	Entity implementation.....	18
A.3.1.3.2.7	Entity operation.....	18
A.3.1.3.2.8	Entity decommissioning.....	18
A.3.1.3.3	Life history.....	18
A.3.1.3.4	Entity types in enterprise integration.....	19
A.3.1.3.4.1	General.....	19
A.3.1.3.4.2	Operation oriented entity types.....	20
A.3.1.3.4.2.1	Project Enterprise Entity (Type A).....	20
A.3.1.3.4.2.2	Repetitive Service- and Manufacturing Enterprise Entity (Type B)..	20
A.3.1.3.4.2.3	Product Entity (Type C).....	21
A.3.1.3.4.3	Recursive enterprise entity types.....	21
A.3.1.3.5	Process modelling.....	22
A.3.1.4	Technology oriented concepts.....	23
A.3.1.4.1	General.....	23
A.3.1.4.2	IT support for enterprise engineering and enterprise integration.....	23
A.3.1.4.3	Enterprise Model Execution and Integration Services (EMEIS).....	24
A.3.1.5	Modelling framework of GERA.....	25
A.3.1.5.1	General.....	25
A.3.1.5.2	Enterprise modelling.....	26
A.3.1.5.3	View concepts.....	26
A.3.1.5.3.1	General.....	26
A.3.1.5.3.2	Entity model content views.....	27
A.3.1.5.3.3	Entity purpose views.....	28
A.3.1.5.3.4	Entity implementation views.....	28
A.3.1.5.3.5	Entity physical manifestation views.....	29
A.3.2	EEMs – Enterprise engineering methodologies.....	30
A.3.2.1	General.....	30
A.3.2.2	Human factor.....	30
A.3.2.3	Project management.....	32
A.3.2.4	Economic aspects.....	33
A.3.3	EMLs – Enterprise modelling languages.....	33
A.3.4	GEMCs – Generic enterprise modelling concepts.....	34
A.3.4.1	General.....	34
A.3.4.2	Glossary.....	35
A.3.4.3	Meta-models.....	35
A.3.4.4	Ontological theories.....	35
A.3.5	PEMs – Partial enterprise models.....	35
A.3.5.1	General.....	35

A.3.5.2	Partial human role models .....	36
A.3.5.3	Partial process models .....	36
A.3.5.4	Partial technology models .....	36
A.3.5.4.1	General.....	36
A.3.5.4.2	Partial models of IT systems.....	36
A.3.6	EETs – Enterprise engineering tools.....	37
A.3.7	EMOs – Enterprise modules.....	38
A.3.8	EMs – Enterprise models .....	38
A.3.9	EOSs – Enterprise operational systems.....	38
A.4	Glossary of references .....	39
A.4.1	General references.....	39
A.4.2	Standards.....	40
Annex B (informative) Bibliography .....		41
B.1	CIMOSA references .....	41
B.2	GRAI-GIM references.....	41
B.3	PERA references.....	42
B.4	GERAM references .....	42
B.5	References on the work of the IFAC/IFIP Task Force .....	43
B.6	Other important references in the field of enterprise integration.....	43