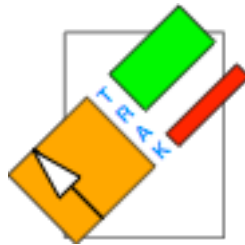


Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>



TRAK. ARCHITECTURE DESCRIPTION.

SUMMARY. CONFORMANCE ASSESSMENT – ISO/IEC/IEEE 42010:2011

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

COPYRIGHT

Copyright Nic Plum (2015)

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.3 or any later version published by the Free Software Foundation;

with Invariant Sections - GNU Free Documentation License, Warranty Disclaimers , Acknowledgements, Front-Cover Texts, and Back-Cover Texts.

A copy of the license is included in the section entitled "GNU Free Documentation License".

CONTENTS

COPYRIGHT.....	2
Contents.....	3
GNU Free Documentation License.....	5
Warranty Disclaimers.....	6
Network Location.....	7
History.....	8
Acknowledgements.....	9
Glossary.....	10
Abbreviations.....	12
1 Architecture Description Overview.....	13
1.1 Identification.....	13
1.2 Precedence.....	13
1.3 Stakeholders and Concerns Addressed.....	13
2 Assumptions, Limitations and Constraints.....	15
3 Voids.....	16
4 Architecture Views & Viewpoints.....	17
4.1 Architecture Viewpoints Used.....	17
4.2 Architecture Views with Governing Viewpoints.....	17
4.3 Models and Model Kinds.....	18
5 Architecture Relations.....	28
5.1 Consistency.....	28
5.2 Correspondences.....	28
5.3 Correspondence Rules.....	28
6 Architecture Description Languages.....	29
7 Tools & Implementation.....	30
8 Findings.....	31
8.1 The Conformance Assessment Process.....	31
8.2 The ISO/IEC/IEEE 42010:2011 Standard.....	32
8.3 Conformance of TRAK.....	33
8.4 Conformance of a TRAK-Compliant Architecture Description.....	33
8.5 Observations Against Defined Architecture Description Elements.....	34
9 Decisions and Recommendations.....	51
9.1 Decisions.....	51
9.2 Recommendations.....	51
10 References.....	52
BACK COVER.....	53

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

GNU FREE DOCUMENTATION LICENSE

GNU Free Documentation License Version 1.3, 3 November 2008

The text of the license is at <http://www.gnu.org/licenses/fdl-1.3.html>

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

WARRANTY DISCLAIMERS

This Document is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY;
without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

NETWORK LOCATION

This document is available at <http://sf.net/p/trak/files/ISO 42010>

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

HISTORY

Author(s)	Date	Changes
Nic Plum	26 th September 2015	Added 326 'MV-03 ISO/IEC/IEEE 42010:2011 Section 4.5 Architecture Frameworks and Architecture Description Languages - Figure 5' to Table 4-6. Expanded / clarified text concerning conceptual model and Figure 5 wrt Architecture Framework in 8.2 .
Nic Plum	12 th September 2015	Added Diagram IDs to Tables 4.1 to 4.11 Table 4-5. Added 324 - 'History (Non-TRAK)'. Changed names of 249 - 'Figure 1 - Context of Architecture Description (Non-TRAK)', 250 - 'Figure 2 - Conceptual Model of an Architectural Description (Non-TRAK)', 254 - 'Figure 3 - Conceptual Model of AD Elements and Correspondences (Non-TRAK)', 253 - 'ISO/IEC/IEEE 42010:2011 Figure 4 - Conceptual Model of Architecture Decisions and Rationale (Non-TRAK)', 252 - 'Figure 5 - Conceptual Model of an Architecture Framework (Non-TRAK)', 255 - 'Figure 6 - Conceptual Model of an Architecture Description Language (Non-TRAK)' Table 4-7. Changed name of 7 - 'SV-01 TRAK Organisation' Table 4-8. Changed names of 317 - 'MV-04 TRAK Claims Against Section 6.1 e) Correspondence Rules Requirements.' Table 4-11. Added 'TRAK View' column. Added observation on conceptual model being both a requirement and non-normative to 8.2 The ISO/IEC/IEEE 42010:2011 Standard.
Nic Plum	31 st July	Addition of Figure 1-1 and links to documents on the trak , trakviewpoints and trakmetamodel project sites on Sourceforge. Added 1.2 Precedence. Voids removed.
Nic Plum	25 th July 2015	Original issue.

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

ACKNOWLEDGEMENTS

The Document incorporates:

- advice on the interpretation of [ISO/IEC/IEEE 42010](#) from Rich Hilliard
- information created from the architecture description that provides the claims of compliance with ISO 42010 by Nic Plum at Eclectica Systems Ltd.

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

GLOSSARY

Term	Definition	Source
Architecture	(system) fundamental concepts or properties of a system in its environment embodied in its elements, relationships, and in the principles of its design and evolution.	ISO/IEC/IEEE 42010 [Ref.1]
Architecture Description	Work product used to express an architecture.	ISO/IEC/IEEE 42010 [Ref.1]
Architecture Description Language	An architecture description language is any language for use in an architecture description. Examples include Architecture Analysis & Description Language (AADL) , SysML], and ArchiMate.	ISO/IEC/IEEE 42010 [Ref.1]
Architecture Description Tuple	Fundamental unit of TRAK architecture description. Comprises of a named architecture description element (block) with a named relationship with itself or another architecture description element. Forms a declarative statement e.g. '(Organisation) Make This PLC has part (Organisation) Engineering Directorate'.	TRAK Metamodel.
Architecture Framework	Conventions, principles and practices for the description of architectures established within a specific domain of application and/or community of stakeholders	ISO/IEC/IEEE 42010 [Ref.1]
Architecture Viewpoint	Work product establishing the	ISO/IEC/IEEE 42010 [Ref.1]

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Term	Definition	Source
	<p>conventions for the construction, interpretation and use of architecture views to frame specific system concerns.</p> <p>Note: I Architecture Viewpoint governs I Architecture View</p>	

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

ABBREVIATIONS

AD	Architecture Description
ADL	Architecture Description Language
CSV	Comma-Separated Variable
MDG	Model Driven Generation

I ARCHITECTURE DESCRIPTION OVERVIEW

This document summarises the architecture description produced to support a compliance assessment against the international standard ISO/IEC 42010:2011 [Ref.1] . It supersedes the earlier assessment of conformance. [Ref.3] .

The architecture description itself addresses the conformance of TRAK as an architecture framework and the conformance of a TRAK-conforming architecture description against the requirements of the standard.

TRAK is an open source enterprise architecture framework. It provides a means of describing the architecture of systems and claims conformance with the requirements of ISO/IEC 42010. It is based on the concepts of the standard whereby a viewpoint addresses one or more concerns of stakeholders in the system of interest and is a specification for the construction and interpretation of the responding view.

TRAK allows you to describe an enterprise, a concept, a solution (and its procurement) and an architecture task. In [ISO/IEC terms each is a 'system of interest'](#) and has stakeholders who have concerns that need to be addressed through the resulting architecture description.

I.1 Identification

The architecture description itself is identified by the identifier – TRAK00013.

The creation and modification dates of each visible part of the architecture description – models - are shown in the views prepared. Each architecture description element also has a creation and modification date viewable in the properties for the selected element.

I.2 Precedence

If there is any conflict between this document and the contents of the architecture description, the architecture description shall take precedence over this document.

I.3 Stakeholders and Concerns Addressed

The concerns which the architecture description addresses are:-

- TRAK claims to meet ISO/IEC/IEEE 42010:2011 but the claims have not been assessed and verified by an independent assessor and therefore remain unproven / not accepted. This is a concern held by the TRAK organisation itself represented by the Chief Architect of TRAK as the sponsor for the task. Clearly potential users of TRAK are also stakeholders.

Uncontrolled When Printed
Master at [http://sf.net/p/trak/files/ISO 42010/](http://sf.net/p/trak/files/ISO_42010/)

- To what extent does a TRAK-compliant architecture description comply with ISO/IEC/IEEE 42010:2011? Although TRAK has been deliberately designed to meet ISO/IEC/IEEE 42010 there are requirements in the standard that affect architecture descriptions. As far as is possible the intent is that in conforming to TRAK an architecture description will automatically comply with the international standard. This is a concern primarily held by the users of TRAK and builders of TRAK architecture descriptions.

The stakeholders, concerns and the object of their concerns which the architecture description addresses is described using the TRAK MV-02 Architecture Description Design Record View and is expressed as the set of tuples in Figure I-I.

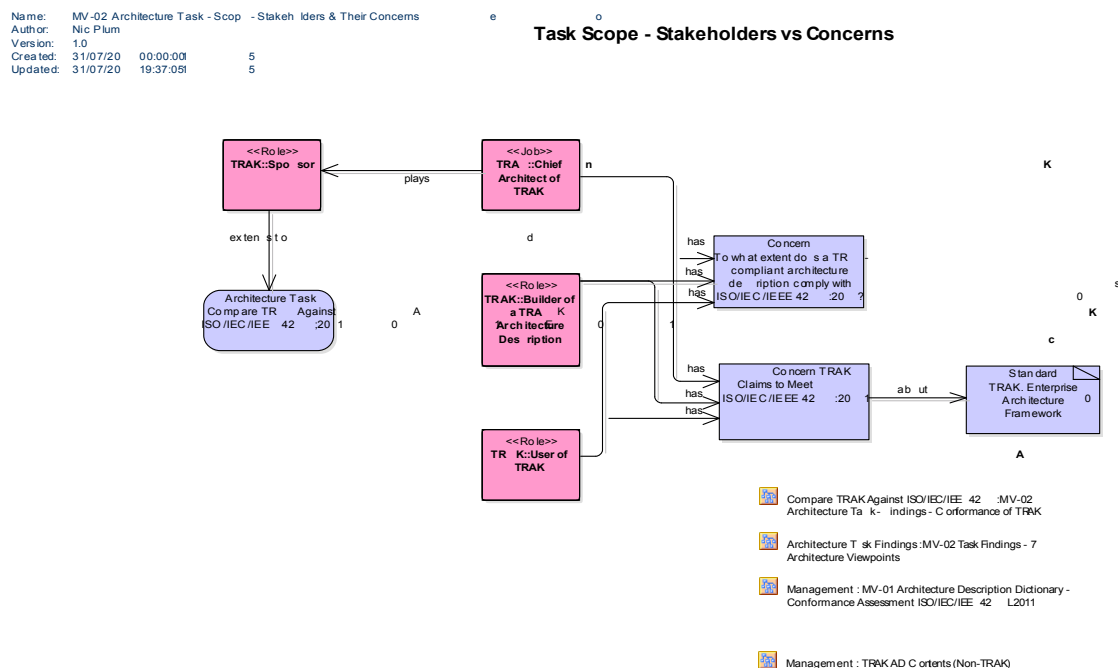


Figure I-I Stakeholders and Their Concerns

2 ASSUMPTIONS, LIMITATIONS AND CONSTRAINTS

The baseline for the assessment was:-

- ISO/IEC/IEEE 42010:2011

The definition of TRAK used for the assessment is:-

- TRAK00004. TRAK Enterprise Architecture Framework. 5th February 2013
- TRAK00001. TRAK Enterprise Architecture Framework. Viewpoints... 14th June 2015
- TRAK00002. TRAK, Enterprise Architecture Framework. Metamodel. Originally 23rd May 2015 (updated to 23rd July 2015 based on [recommendations](#)).

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

3 VOIDS

There are not currently identified voids in this document.

4 ARCHITECTURE VIEWS & VIEWPOINTS

4.1 Architecture Viewpoints Used

The architecture viewpoints used were those in the TRAK Viewpoints specification [Ref.5]. In the terminology of ISO/IEC/IEEE 42010 these are 'library viewpoints'.

The viewpoints used are identified in Table 4-1. The identifiers are taken from the TRAK Viewpoints specification.

They have been selected because of the typical concerns they address. Specifically MVp-02 addresses the

TRAK Viewpoint Identifier	Name	View -Governed
MVp-01	Architecture Description Dictionary	MV-01
MVp-02	Architecture Description Design Record Viewpoint	MV-02
MVp-03	Requirements and Standards Viewpoint	MV-03
MVp-04	Assurance Viewpoint	MV-04
SVp-01	Solution Structure Viewpoint	SV-01

Table 4-1 - Architecture Viewpoints Used

Name	Governing Specification
UML Package Diagram	UML Package Diagram [Ref.8]
UML Class Diagram	UML Class Diagram

Table 4-2 - UML Diagram Types Used

4.2 Architecture Views with Governing Viewpoints

The architecture views produced together with their governing viewpoints are listed in Table.

4.3 Models and Model Kinds

The base model kind used in all the TRAK-conforming views is a metamodel, specifically the TRAK metamodel.

Models - Describing the License				
Diagram ID	Package	Name	TRAK View	Governing Specification
323	Management	MV-02 GFDL License	TRAK::MV-03	TRAK::MVp-03

Table 4-3 - Models – Describing the License for Release of the Architecture Description

Models - Describing the Task				
Diagram ID	Package	Name	TRAK View	Governing Specification
322	Management	MV-02 Architecture Task – Scope – Stakeholders and Their Concerns	TRAK::MV-02	TRAK::MVp-02
229	Compare a TRAK-Compliant AD Against ISO/IEC/IEEE 42010:2011	MV-02 Architecture Task – Scope – TRAK-Conforming Architecture Description	TRAK::MV-02	TRAK::MVp-02
245	Compare a TRAK-Compliant AD Against ISO/IEC/IEEE 42010:2011	MV-02 Architecture Task – Findings - TRAK-Conforming Architecture Description	TRAK::MV-02	TRAK::MVp-02
1	Compare TRAK Against ISO/IEC/IEEE 42010:2011	MV-02 Architecture Task – Scope - Conformance of TRAK	TRAK::MV-02	TRAK::MVp-02
319	Compare TRAK Against ISO/IEC/IEEE 42010:2011	MV-02 Architecture Task – Findings - Conformance of TRAK	TRAK::MV-02	TRAK::MVp-02

Table 4-4 - Models – Describing the Task

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Models - Describing the Architecture Description				
Diagram ID	Package	Name	TRAK View	Governing Specification
320	Management	MV-01 Architecture Description Dictionary - Conformance Assessment ISO/IEC/IEEE 42010:2011	TRAK::MV-01	TRAK::MVp-01
324	Management	History (Non-TRAK)	-- Not a TRAK view --	UML Package Diagram

Table 4-5 - Models – Describing the Architecture Description

Models - Describing ISO/IEC/IEEE 42010:2011				
Diagram ID	Package	Name	TRAK View	Governing Specification
218	ISO/IEC/IEEE 42010:2011	MV-03 ISO/IEC/IEEE 42010:2011	TRAK::MV-03	TRAK::MVp-03
249	4.2.1 Context of Architecture Description	ISO/IEC/IEEE 42010:2011 Figure 1 - Context of Architecture Description (Non-TRAK)	-- Not a TRAK view --	UML Class Diagram
269	4.2.1 Context of Architecture Description	MV-03 4.2.1 Context of Architecture Description - Figure 1	TRAK::MV-03	TRAK::MVp-03
250	4.2.2 Architectures and Architecture Descriptions	ISO/IEC/IEEE 42010:2011 Figure 2 - Conceptual Model of an Architectural Description (Non-TRAK)	-- Not a TRAK view --	UML Class Diagram
224	4.2.2 Architectures and Architecture Descriptions	MV-03 4.2.2 Architectures and Architecture Descriptions - Figure 2	TRAK::MV-03	TRAK::MVp-03
254	4.2.6 AD Elements & Correspondences	ISO/IEC/IEEE 42010:2011 Figure 3 - Conceptual Model	-- Not a TRAK view --	UML Class Diagram

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Models - Describing ISO/IEC/IEEE 42010:2011				
Diagram ID	Package	Name	TRAK View	Governing Specification
		of AD Elements and Correspondences (Non-TRAK)		
272	4.2.6 AD Elements & Correspondences	MV-03 4.2.6 AD Elements & Correspondences - Figure 3	TRAK::MV-03	TRAK::MVp-03
253	4.2.7 Architecture Decisions and Rationale	ISO/IEC/IEEE 42010:2011 Figure 4 - Conceptual Model of Architecture Decisions and Rationale (Non-TRAK)	-- Not a TRAK view --	UML Class Diagram
274	4.2.7 Architecture Decisions and Rationale	MV-03 4.2.7 Architecture Decisions & Rationale - Figure 4	TRAK::MV-03	TRAK::MVp-03
326	4.5 Architecture frameworks and Architecture Description Languages	MV-03 ISO/IEC/IEEE 42010:2011 Section 4.5 Architecture Frameworks and Architecture Description Languages - Figure 5	TRAK::MV-03	TRAK::MVp-03
252	4.5 Architecture frameworks and Architecture Description Languages	ISO/IEC/IEEE 42010:2011 Figure 5 - Conceptual Model of an Architecture Framework (Non-TRAK)	-- Not a TRAK view --	UML Class Diagram
255	4.5 Architecture frameworks and Architecture Description Languages	ISO/IEC/IEEE 42010:2011 Figure 6 - Conceptual Model of an Architecture Description Language (Non-TRAK)	-- Not a TRAK view --	UML Class Diagram
214	5 Architecture Descriptions	MV-03 Section 5 Architecture Descriptions	TRAK::MV-03	TRAK::MVp-03
212	5.2 Architecture Description Identification and Overview	MV-03 Section 5.2 Architecture Description Identification and Overview - Requirements	TRAK::MV-03	TRAK::MVp-03
213	5.3 Identification of Stakeholders and Concerns	MV-03 Section 5.3 Identification of Stakeholders and Concerns -	TRAK::MV-03	TRAK::MVp-04

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Models - Describing ISO/IEC/IEEE 42010:2011				
Diagram ID	Package	Name	TRAK View	Governing Specification
		Requirements		
211	5.4 Architecture Viewpoints	MV-03 Section 5.4 Architecture Viewpoints - Requirements	TRAK::MV-03	TRAK::MVp-03
215	5.5 Architecture Views	MV-03 Section 5.5 Architecture Views - Requirements	TRAK::MV-03	TRAK::MVp-03
216	5.6 Architecture models	MV-03 Section 5.6 Architecture Models	TRAK::MV-03	TRAK::MVp-03
210	5.7 Architecture Relations	MV-03 Section 5.7 Architecture Relations Requirements	TRAK::MV-03	TRAK::MVp-03
218	5.8 Architecture Rationale	MV-03 Section 5.8 Architecture Rationale	TRAK::MV-03	TRAK::MVp-03
3	6.1 Architecture Frameworks	MV-03 ISO/IEC/IEEE 42010:2011 - 6.1 Architecture Frameworks	TRAK::MV-03	TRAK::MVp-03
209	7 Architecture Viewpoints	MV-03 Section 7 - Architecture Viewpoints Requirements	TRAK::MV-03	TRAK::MVp-03

Table 4-6 - Models – Describing ISO/IEC/IEEE 42010:2011

Describing TRAK				
Diagram ID	Package	Name	TRAK View	Governing Specification
12	TRAK	MV-03 Definition of TRAK	TRAK::MV-03	TRAK::MVp-03
7	TRAK	SV-01 TRAK Organisation Structure	TRAK::SV-01	TRAK::SVp-01
246	TRAK	SV-01 TRAK Stakeholders	TRAK::SV-01	TRAK::SVp-01

Table 4-7 - Models – Describing TRAK

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Describing Claims of TRAK				
Diagram ID	Package	Name	TRAK View	Governing Specification
317	Claims Against 6 - Architecture Framework Requirements	MV-04 TRAK Claims vs ISO/IEC/IEEE 42010:2011 Section 6.1 e) Correspondence Rules Requirements	TRAK::MV-04	TRAK::MVp-04
2	Claims Against 6 - Architecture Framework Requirements	MV-04 TRAK Claims vs ISO/IEC/IEEE 42010:2011 Architecture Framework 6 - Requirements	TRAK::MV-04	TRAK::MVp-04
9	Claims Against 6 - Architecture Framework Requirements	MV-04 TRAK Claims vs ISO/IEC/IEEE 42010:2011 Conceptual Model Requirements - Figure 1	TRAK::MV-04	TRAK::MVp-04
270	Claims Against 6 - Architecture Framework Requirements	MV-04 TRAK Claims vs ISO/IEC/IEEE 42010:2011 Conceptual Model Requirements - Figure 2	TRAK::MV-04	TRAK::MVp-0
271	Claims Against 6 - Architecture Framework Requirements	MV-04 TRAK Claims vs ISO/IEC/IEEE 42010:2011 Conceptual Model Requirements - Figure 3	TRAK::MV-04	TRAK::MVp-04
273	Claims Against 6 - Architecture Framework Requirements	MV-04 TRAK Claims vs ISO/IEC/IEEE 42010:2011 Conceptual Model Requirements - Figure 4	TRAK::MV-04	TRAK::MVp-04
226	Claims Against 7 - Architecture Viewpoints Requirements	MV-04 Claims Against ISO/IEC/IEEE 42010:2011 Section 7 - Architecture Viewpoints a) and b)	TRAK::MV-04	TRAK::MVp-04
227	Claims Against 7 - Architecture Viewpoints Requirements	MV-04 Claims Against ISO/IEC/IEEE 42010:2011 Section 7 - Architecture Viewpoints c) and d)	TRAK::MV-04	TRAK::MVp-04

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Describing Claims of TRAK				
Diagram ID	Package	Name	TRAK View	Governing Specification
208	Claims Against 7 - Architecture Viewpoints Requirements	MV-04 Claims Against ISO/IEC/IEEE 42010:2011 Section 7 - Architecture Viewpoints e)	TRAK::MV-04	TRAK::MVp-04

Table 4-8 - Models – Describing the Claims of Conformance of TRAK

Describing Claims of a TRAK-Conforming Architecture Description				
Diagram ID	Package	Name	TRAK View	Governing Specification
222	Claims Against 5 - Architecture Description Requirements	MV-04 A TRAK-Conforming Architecture Description Meets...	TRAK::MV-04	TRAK::MVp-04
220	Claims Against 5.2 Architecture Description Identification and Overview	MV-04 TRAK-Conforming AD Claims Against 5.2 Architecture Description Identification and Overview Requirements	TRAK::MV-04	TRAK::MVp-04
221	Claims Against 5.3 Identification of Stakeholders and Concerns	MV-04 TRAK-Conforming AD Claims Against 5.3 Identification of Stakeholders and Concerns	TRAK::MV-04	TRAK::MVp-04
223	Claims Against 5.4 Architecture Viewpoints	MV-04 TRAK-Conforming AD Claims Against 5.4 Architecture Viewpoints Requirements	TRAK::MV-04	TRAK::MVp-04
230	Claims Against 5.5 Architecture Views	MV-04 TRAK-Conforming AD Claims Against Section 5.5 Architecture Views - Requirements a)	TRAK::MV-04	TRAK::MVp-04
228	Claims Against 5.5 Architecture Views	MV-04 TRAK-Conforming AD Claims Against Section	TRAK::MV-04	TRAK::MVp-04

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Describing Claims of a TRAK-Conforming Architecture Description				
Diagram ID	Package	Name	TRAK View	Governing Specification
		5.5 Architecture Views - Requirements b) and c)		
231	Claims Against 5.5 Architecture Views	MV-04 TRAK-Conforming AD Claims Against Section 5.5 Architecture Views - Requirements d)	TRAK::MV-04	TRAK::MVp-04
234	Claims Against 5.6 Architecture models	MV-04 TRAK-Conforming AD Claims Against Section 5.6 Architecture Models	TRAK::MV-04	TRAK::MVp-04
275	Claims Against 5.7 Architecture Relations	MV-04 TRAK-Conforming AD Claims Against 5.7.2 Correspondences Requirements	TRAK::MV-04	TRAK::MVp-04
236	Claims Against 5.7 Architecture Relations	MV-04 TRAK-Conforming AD Claims Against Section 5.7.1 Consistency Within an Architecture Description Requirements	TRAK::MV-04	TRAK::MVp-04
276	Claims Against 5.7 Architecture Relations	MV-04 TRAK-Conforming AD Claims Against Section 5.7.3 Correspondence Rules Requirements	TRAK::MV-04	TRAK::MVp-04
232	Claims Against 5.8 Architecture Rationale	MV-04 TRAK-Conforming AD Claims Against 5.8.1 Architecture Rationale-Recording	TRAK::MV-04	TRAK::MVp-04
233	Claims Against 5.8 Architecture Rationale	MV-04 TRAK-Conforming AD Claims Against 5.8.2 Decision Recording	TRAK::MV-04	TRAK::MVp-04

Table 4-9 - Models – Describing the Claims of Conformance of a TRAK_Conforming Architecture Description

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Describing the Task Findings				
Diagram ID	Package	Name	TRAK View	Governing Specification
235	Task Findings	MV-02 Ability to Use a Metamodel as a Model Kind Needs to be Stated Generally in ISO/IEC/IEEE 42010:2011	TRAK::MV-02	TRAK::MVp-02
258	Task Findings	MV-02 Findings - 5.6 Architecture Models	TRAK::MV-02	TRAK::MVp-02
237	Task Findings	MV-02 Findings - Complicated Chains of References / Traces e.g. 5.7.3 Correspondence Rules	TRAK::MV-02	TRAK::MVp-02
251	Task Findings	MV-02 Findings - ISO/IEC/IEEE 42010 Conceptual Model / Figures	TRAK::MV-02	TRAK::MVp-02
248	Task Findings	MV-02 Findings - Relating to the Use of TRAK	TRAK::MV-02	TRAK::MVp-02
262	Task Findings	MV-02 Task Findings - 5.2 Architecture Description	TRAK::MV-02	TRAK::MVp-02
257	Task Findings	MV-02 Task Findings - 5.3 Identification of Stakeholders & Concerns	TRAK::MV-02	TRAK::MVp-02
261	Task Findings	MV-02 Task Findings - 5.7 Architecture Relations	TRAK::MV-02	TRAK::MVp-02
259	Task Findings	MV-02 Task Findings - 5.8 Architecture Rationale	TRAK::MV-02	TRAK::MVp-02
260	Task Findings	MV-02 Task Findings - 6.1 Architecture Frameworks	TRAK::MV-02	TRAK::MVp-02
225	Task Findings	MV-02 Task Findings - 7 Architecture Viewpoints	TRAK::MV-02	TRAK::MVp-02
318	Task Findings	MV-02 Task Findings - TRAK Content	TRAK::MV-02	TRAK::MVp-02
239	Task Findings	MV-02 The Requirement for an Architecture Framework Consistency with the Conceptual Model in 4.2	TRAK::MV-02	TRAK::MVp-02

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Describing the Task Findings				
Diagram ID	Package	Name	TRAK View	Governing Specification
243	Task Findings	MV-04 ISO 42010 Architecture Description Reqs Not Automatically Complied with	TRAK::MV-04	TRAK::MVp-04

Table 4-10 - Models – Describing the Task Findings

Describing the Repository Structure				
Diagram ID	Package	Name	TRAK View	Governing Specification
6	6 Architecture Frameworks & Architecture Description Languages	6 Architecture Frameworks & Architecture Description Languages (Non-TRAK)	-- Not a TRAK view --	UML Package Diagram
	Evidence	Evidence Folder Contents (Non-TRAK)	-- Not a TRAK view --	UML Package Diagram
5	ISO/IEC/IEEE 42010:2011	ISO/IEC/IEEE 42010:2011 (Non TRAK)	-- Not a TRAK view --	UML Package Diagram
316	Management	TRAK AD Contents (Non TRAK)	-- Not a TRAK view --	UML Class Diagram
256	Management	Architecture Description Navigation / 'Map' [Non- TRAK]	-- Not a TRAK view --	UML Package Diagram
14	Standard	Standards - Taxonomy (Non-TRAK)	-- Not a TRAK view --	UML Class Diagram
13	Standard	Library - Standards (Non- TRAK)	-- Not a TRAK view --	UML Package Diagram

Table 4-11 - Models – Describing the Repository Structure

5 ARCHITECTURE RELATIONS

5.1 Consistency

No known consistency errors or inconsistencies have been identified.

5.2 Correspondences

Correspondences are identified using tuples i.e. entity – relationship – entity each part of which uses an Architecture Description Element from the TRAK Metamodel [Ref.6] in accordance with the requirements of the governing TRAK viewpoint in Table 4-1

Every TRAK Architecture Description Element in the Architecture Description is part of a tuple permitted by the TRAK metamodel. They are all part of a correspondence. This has been checked with the aid of the MDG for TRAK plugin for the Sparx Systems Enterprise Architect UML modelling tool.

Each correspondence is identified in accordance with requirements of TRAK Section 10 – Bye Laws [Ref.4]. The identification includes the TRAK metamodel element type and a name. Since a UML modelling tool has been used the tuples are implemented using the UML as graphic blocks and connectors from the UML profile implemented by the modelling tool.

Every TRAK Architecture Description Element that represents an entity in a tuple is declared as part of a correspondence on its respective TRAK view i.e. MV-02, MV-04, MV-03, SV-01 in accordance with the governing viewpoint requirements.

5.3 Correspondence Rules

With reference to the TRAK specifications the following rules have been adhered to:-

- consistency rules for the TRAK MVp-02, MVp-03, MVp-04 and SVp-01 viewpoints (TRAK Viewpoints – Section 2)
- TRAK Bye Laws for Architecture Views and Architecture Descriptions (TRAK - Section 10) [Ref.4]

6 ARCHITECTURE DESCRIPTION LANGUAGES

The architecture description uses an implementation of TRAK based on UML 2.4.1 [Ref.8] (by virtue of the use of the Sparx Systems Enterprise Architect UML modelling tool).

7 TOOLS & IMPLEMENTATION

The following tools were used in the production of the architecture description:-

- Sparx Systems Enterprise Architect, Ultimate Edition, Build 1215. This produced the graphical views and is used to organise the content and export is a a linked set of web pages. [Ref.9]
- MDG for TRAK. This was used to implement the set of architecture description elements and provide predefined searches to aid quality checking and produce tabular output in this document and the compliance matrix .[Ref.10]
- MySQL Workbench 6.2.5 build 397 [Ref.11] . This was used to produce tabular content, particularly where there was HTML-formatted or XML-formatted content which otherwise interfered with the export of intermediate CSV products.
- Microsoft Excel for the Mac [Ref.13] / Open Office 4.1.1 build 9775 [Ref.12] . Used to produce a tabular presentation of the requirements of the standard linked to the arguments made and the evidence supporting those arguments – a form of compliance matrix.

8 FINDINGS

8.1 The Conformance Assessment Process

Constructing an assessment of conformance with a requirement using a set of graphical blocks and connectors is quite different from the more traditional document-based approach as often used in industries such as rail, aerospace and defence:-

- it is much easier to structure an argument based on small 'atomic' statements than is possible using a purely text-based approach. This arises because the argument element fragments are visible as a structure and also partly from the constraints in the amount of text that can be placed or is sensible to place in a single element so that it is visible. It is also aided by re-use of sets of argument elements (about there are pitfalls).
- sets of argument elements and evidence elements can be re-used. Often an item of evidence will support several arguments and thence the claim of conformance against several requirements. It is then simple to re-use the evidence elements. Re-using argument elements has, however, to be done with care because the context of the argument being made might mean that any part arguments ('Argument has part Argument') is not true. This occurs where the set of part arguments doesn't represent the whole of the (parent) argument. It seems to be less of a problem if the TRAK metamodel tuple 'Argument supports Argument' is used.
- In order to aid the compliance assessment process a more traditional form of compliance matrix [Ref.14] was prepared by querying the underlying database holding the architecture description (following the path through the TRAK metamodel 'Evidence *supports* Argument *supports* Claim about Requirement'.) This was useful in providing visibility in a single place for the purpose of consistency checking of structure and content. Spreadsheets are much more limited when it comes to presenting multiple paths / relationships and the time spent merging and splitting cells to illustrate this is a significant overhead. Although it is easy to check for quality / consistency errors using SQL it is hard to construct a query where the depth of the structure is varied, for example, because in some places arguments have part arguments (which might themselves have part arguments) whereas elsewhere this isn't the case.
- The definition of new attributes or of allowed values would make the process easier. Modelling the standard requires TRAK Requirement elements capable of representing textual requirements and also informative text. In particular the compliance level attribute in the 23rd May 2015 version of the TRAK metamodel had no value to represent a purely informative item of text such as a note or a heading (only the values 'Unknown', 'Not Specified', 'Desirable – Freedom', 'Commitment – Mandatory' were allowed). Similarly the ability to add a short identifier to an

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

argument, evidence and claim would help refer to these elements. As the individual requirement statements in the standard only have a section number to identify them a it was found necessary to provide some means of ordering the statements in the printed order i.e. a 'sequence identifier' is needed.

8.2 The ISO/IEC/IEEE 42010:2011 Standard

There are requirement management layout and style aspects which made the assessment harder.

- The standard only has identifiers or numbers for sections. As each section contains many atomic requirements it is hard to refer to a specific statement.
- There are some requirements that are not bounded because they contain a subjective rather than an objective measure, for example '*An architecture description shall identify the concerns considered fundamental to the architecture of the system-of-interest*'. Since this is a mandatory requirement it makes it difficult to verify compliance. Not all concerns will be fundamental to the system of interest because it depends on the stakeholder and where they fit into the context and at what level or scope with respect to the system of interest. Equally it might be that some concerns become more significant only after investigation.
- Cross-referencing between sections whilst convenient for the brevity of the standard makes the compliance matrix trace more complicated. For section 6.1 Architecture Frameworks mandates sections 5.3 (Architecture Description : Identification of Stakeholders and Concerns), 5.7 (Architecture Description : Architecture Relations) , the conceptual model in section 4.1.
- the conceptual model in 4.2 embodies or illustrates many of the textual requirements and therefore in applying it as a requirement even for consistency the mechanism for supporting compliance assessment inevitably involves a lot of duplication if a compliance matrix is used. If cross references are used in a compliance matrix it becomes harder to assess and liable to error. This is an area where using an architecture description element and relations makes this easy to construct (in TRAK it uses the Evidence *supports* Argument, Argument *supports* Claim, Claim *about* Requirement set of tuples) by re-using architecture description elements.
- The figures that describe the ISO conceptual model in 4.2 are within a part of the standard that is defined under section 2 (Conformance) as not containing any requirements. In section 6.1 (Architecture Frameworks) there is a requirement to establish consistency with this conceptual model. The structure of the model is therefore a requirement for an architecture framework which contradicts the statement of conformance.

Trying to '*establish its consistency with the provisions of the conceptual model in 4.2*' is quite hard:

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

- the model contains concepts, relationships and specifies cardinalities. If interpreted literally this would require a comparison against each concept, each relationship and proof of the cardinalities being met.
- the conceptual model in section 4.2, however, doesn't itself include Architecture Framework as a concept and is therefore silent on whether and what relationships there might be between Architecture Framework, Architecture Description, Architecture Viewpoint etc. The conceptual model for an architecture framework, Figure 5 is in section 4.5 which isn't a requirement for consistency for an architecture framework. There are also some implications which need to be explicit e.g. if an architecture framework has one or more Architecture Viewpoints (Figure 5) and an Architecture Description has one or more Architecture Viewpoints then what is the relationship between Architecture Description and Architecture Framework? In the previous issue of the standard an Architecture Description could contain one or more Architecture Viewpoints.

8.3 Conformance of TRAK

The claims of compliance of TRAK against the requirements for an architecture framework in section 6.1 of the standard appear to be justified.

8.4 Conformance of a TRAK-Compliant Architecture Description

If an architecture description conforms with TRAK it will meet almost all of the requirements for an architecture description in section 5 of the standard.

There are four mandatory requirements which might require additional content in a TRAK-conforming architecture description:-

- 5.3 Identification of Stakeholders and Concerns.
 - *'An architecture description shall identify the system stakeholders having concerns considered fundamental to the architecture of the system-of-interest.'* The use of the term 'fundamental' makes it subjective and therefore unrealistic to expect every architecture description to identify the stakeholders that have fundamental or most important concerns relating to the systems of interest. In practice this is impossible to verify because the architect cannot guarantee to have identified all the stakeholders.
 - Similarly the same problem exists for *'An architecture description shall identify the concerns considered fundamental to the architecture of the system-of-interest.'* The concerns are probably also those of the stakeholders not the object of their concern i.e.

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

the system-of-interest. The stakeholders are likely to belong to a different system of interest for example, the organisation producing the product.

- *The following concerns shall be considered and when applicable, identified in the architecture description: the purposes of the system; the suitability of the architecture for achieving the system's purposes; the feasibility of constructing and deploying the system; the potential risks and impacts of the system to its stakeholders throughout its life cycle; maintainability and evolvability of the system.* This might require additional work but the use of 'when applicable' provides an argument for not including these concerns.
- 5.7.1 Consistency within an architecture descriptions.
 - The TRAK Conformance requirements do not require a conforming architecture description to identify any known inconsistencies. Problems with an architecture description may be located / highlighted and described using the TRAK Concern metamodel element.

8.5 Observations Against Defined Architecture Description Elements

Observations have been made in the process of the analysis of the international standard against which claims are made and also the TRAK documents used as sources of evidence to support the arguments and claims of compliance.

These observations have been captured within the architecture description itself using the TRAK Concern metamodel element using the 'Concern *about* Architecture Description Element' tuple which is defined in every TRAK viewpoint and can therefore appear in any TRAK view.

Table 8-1 presents the observations together with the subjects of the observations. This has been extracted by query from the underlying database.

All of the Concern elements have been listed for completeness and therefore the concerns that the architecture description addresses are included as well. These are therefore not observations as such.

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
5	Architecture Framework	TRAK Claims to Meet ISO/IEC/IEEE 42010:2011	TRAK claims to meet ISO/IEC/IEEE 42010:2011 but the claims have not been assessed and verified by an independent assessor and therefore remain unproven / not accepted.	Standard	ISO/IEC/IEEE42010:2011 Systems and Software Engineering - Architecture Description
				Document	TRAK, Enterprise Architecture Framework, TRAK vs ISO/IEC/IEEE 42010
				Standard	TRAK, Enterprise Architecture Framework
135	Architecture	The Standard in 6.1 e) requires an architecture framework to include correspondence rules as per 5.7 but 5.7 states requirements for an architecture description	The Standard in 6.1 e) requires an architecture framework to include correspondence rules as per 5.7 but 5.7 states requirements for an architecture description, not an architecture framework.	Requirement	6.1 e) An architecture framework shall include: e) any correspondence rules (per 5.7).
				Requirement	5.7.1 Consistency within an architecture description
				Requirement	5.7.2 Correspondences
				Requirement	5.7.3 Correspondence rules

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
1759	Architecture	TRAK deliberately doesn't require an architecture description to do this.	TRAK doesn't require an architecture description to consider and identify the specific concerns specified in 5.3 of ISO/IEC/IEEE 42010:2011:- <i><i>- the purposes of the system;</i> <i>- the suitability of the architecture for achieving the system</i> <i></i>They may be considered but it depends on the architect and purpose of the architecture description task.</i>	Requirement	The following concerns shall be considered and when applicable, identified in the architecture description: - the purposes of the system;...
1761	Architecture	It is unrealistic to expect every architecture description to identify the stakeholders that have fundamental or most important concerns relating to the systems of interest.	It is un unrealistic to expect every architecture description to identify the stakeholders that have <u>fundamental or most important concerns</u> relating to the systems of interest. In practice an architecture description for the system of interest will evolve from a set of smaller architecture descriptions. Whether the most fundamental concerns are identified	Requirement	An architecture description shall identify the system stakeholders having concerns considered fundamental to the architecture of the system-of-interest.
				Requirement	An architecture description shall identify the concerns considered fundamental to the architecture of the system-of-interest.

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
			depends as much on the task sponsor and the defined scope as it does the architects involved. It is impossible therefore for every architecture description to guarantee to include the fundamental concerns. If they don't then the risk of failure increases but a standard cannot mandate the identification of these concerns any more than it could mandate forming a set of complete and consistent requirements. This should probably be the subject of an aim or a principle not a mandatory requirement. It probably needs to be written to be more of a 'SMART' requirement i.e. identify stakeholders and their concerns NOT include 'fundamental' or 'most important' since these qualifiers are subjective, context-dependent and almost impossible to verify against as a result.		

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
1779	Architecture	Conceptual Model of an Architecture Description Defines Viewpoints as Mandatory Part of AD whereas section 7 allows them to be within an architecture framework	The conceptual model of an architecture description in Figure 2 within section 4.2 defines the viewpoints as part of the AD whereas the text within section 7 allows them to be within the architecture framework (as library viewpoints) rather than within the AD itself. This inconsistency needs to be resolved perhaps by optional participation on the relationship in the model.	Requirement	An architecture description shall include each architecture viewpoint used therein.
				Requirement	An architecture viewpoint could be defined as a part of an architecture description (Clause 5), as a part of an architecture framework (Clause 6) or individually using the requirements of this Clause. A library viewpoint is an architecture viewpoint ...
1868	Architecture	The requirement is met at the architecture description level not at the individual view level because it is more efficient for the architecture description to refer to a defined issue of the TRAK viewpoints specification once rather than for every individ	The requirement is met at the architecture description level not at the individual view level because it is more efficient for the architecture description to refer to a defined issue of the TRAK viewpoints specification once rather than for every individual view. ISO/IEC/IEEE 42010:2011 defines a view as being part of an architecture description so it ought to allow	Requirement	Each architecture view shall include: b) identification of its governing viewpoint;

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
			the architecture description to refer to the defining viewpoint(s) not just restrict this to each individual view.		
1868	Architecture	The requirement is met at the architecture description level not at the individual view level because it is more efficient for the architecture description to refer to a defined issue of the TRAK viewpoints specification once rather than for every individ	The requirement is met at the architecture description level not at the individual view level because it is more efficient for the architecture description to refer to a defined issue of the TRAK viewpoints specification once rather than for every individual view. ISO/IEC/IEEE 42010:2011 defines a view as being part of an architecture description so it ought to allow the architecture description to refer to the defining viewpoint(s) not just restrict this to each individual view.	Claim	A TRAK-conforming architecture description meets the requirement to identify the governing viewpoint(s) used within the architecture description.
1872	Architecture Description	To what extent does a TRAK-compliant architecture description comply with ISO/IEC/IEEE 42010:2011?	To what extent does a TRAK-compliant architecture description comply with ISO/IEC/IEEE 42010:2011? Although TRAK has been deliberately designed to	Standard	ISO/IEC/IEEE42010:2011 Systems and Software Engineering - Architecture Description

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
			meet ISO/IEC/IEEE 42010 there are requirements in the standard that affect architecture descriptions. As far as is possible the intent is that in conforming to TRAK an architecture description will automatically comply with the international standard. An initial comparison was done at the Final Committee Draft version of the current (2011) standard but there is a concern that there might be one or more requirements that are not fully met or not within the scope of an architecture framework like TRAK to specify and therefore some additional work might be needed by an architect of a TRAK-compliant architecture description in order to comply. Until a detailed line by line comparison is made the amount of this possible work is unquantified and the degree of compliance of the AD is	Document	TRAK, Enterprise Architecture Framework, TRAK vs ISO/IEC/IEEE 42010

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
			therefore uncertain.		
1935	Architecture	The requirement should allow the use of library viewpoints rather than assume that viewpoints are always within the architecture description itself. If the viewpoints are elsewhere or part of an architecture framework there is no requirement for the archi	The requirement should allow the use of library viewpoints rather than assume that viewpoints are always within the architecture description itself. If the viewpoints are elsewhere or part of an architecture framework there is no requirement for the architecture description itself to include the rationale for the viewpoint(s).	Requirement	An architecture description shall include a rationale for each architecture viewpoint included for use per 5.4 in terms of its stakeholders, concerns, model kinds, notations and methods.
1946	Architecture	This depends on the concerns against which the scope of the architecture description task is undertaken - it may not be applicable in all cases.	This depends on the concerns against which the scope of the architecture description task is undertaken - it may not be applicable in all cases. Not all cases / concerns will relate to choices and therefore the need to document the decision-making process relating to the options is not always applicable. The	Requirement	An architecture description should provide evidence of the consideration of alternatives and the rationale for the choices made.

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
			requirement should perhaps be prefixed or qualified with an 'if statement'?		
1958	Architecture	It is not for an organisation-independent architecture framework like TRAK to enforce requirements on company policy - this is independent of the particular framework used.	It is not for an organisation-independent architecture framework like TRAK to enforce requirements on company policy - this is independent of the particular framework used.	Requirement	It is not practical to record every architecture decision about a systemCriteria to consider are
1966	Architecture	The ability of a metamodel to satisfy the requirement for a model kind is a key statement which needs to be placed in a more global part of the standard .	The ability of a metamodel to satisfy the requirement for a model kind is a key statement which needs to be placed in a more global part of the standard . It materially affects the basis for any claim of compliance. Sometimes it is directly referred to but it also applies to other requirements in the standard where there are no references to this statement and it is	Requirement	An architecture viewpoint shall specify: d) for each model kind identified in c), the languages, notations, conventions, modelling techniques, analytical methods and/or other operations to be used on models of this kind;

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
			left to the reader to remember having seen it.	Requirement	Each architecture view shall include: c) architecture models that address all of the concerns framed by its governing viewpoint and cover the whole system from that viewpoint;
				Requirement	5.6 Architecture Models
				Claim	A TRAK-conforming architecture description meets the requirement for an architecture view to consist of one or more architecture models.
1967	Architecture	If the architecture view that presents the model has version identification there is no need for the model itself to include this as well because the view represents a snapshot of the representation of the architecture at a defined point	If the architecture view that presents the model has version identification there is no need for the model itself to include this as well because the view represents a snapshot of the representation of the architecture at a defined point in time.	Requirement	Each architecture model shall include version identification as specified by the organization and/or project.
				Claim	A TRAK-conforming architecture description meets the requirement to include version identification for each view (comprising one or more models).

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
		in time.			
1983	Architecture	Complicated requirement trace - 5.7.3 to 7 to 5.7.1	There is a relatively long requirement trace from 5.7.3 to part of section 7 and back to 5.7.1 owing to the cross-referencing within the text. Consideration should be made to simplifying this either through duplication so that all the relevant text is kept within each section or having a list of statements in a central section which contains text that is referred to several times. Perhaps each major part (Architecture Framework, Architecture Viewpoint, Architecture Description should be entirely self-contained.	Requirement	5.7.1 Consistency within an architecture description
				Requirement	NOTE 1 A correspondence rule applying to an architecture description could originate in the architecture description, in a viewpoint (see Clause 7) or in an architecture framework or architecture description language (see Clause 6).
				Requirement	An architecture viewpoint should include information on architecting techniques used to create, interpret or analyze a view governed by this viewpoint, such as: correspondence rules, criteria and methods for checking consistency (see 5.7.1) and ...

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
2047	Architecture Framework	Compliance of an Architecture Description with TRAK does not (may not) Automatically Provide Full Compliance for an Architecture Description Against ISO/IEC/IEEE 42010:2011.	There are some requirements for architecture descriptions in ISO/IEC/IEEE 42010:2011 which are not automatically met in full by complying with TRAK.	Requirement	An architecture description shall identify the concerns considered fundamental to the architecture of the system-of-interest.
				Requirement	The following concerns shall be considered and when applicable, identified in the architecture description: - the purposes of the system;...
				Requirement	When recording decisions, the following should be considered: - the decision is uniquely identified; - the decision is stated; - the decision is linked to the system concerns to which it pertains; - the owner of the decision is identified;
				Claim	A TRAK-Conforming Architecture Description may fail to identify any known inconsistencies.

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
				Requirement	An architecture description shall record any known inconsistencies across its architecture models and its views. NOTE While consistent architecture descriptions are to be preferred, it is sometimes infeasible or impractical to resolve all inconsistencies
2131	Architecture	Consistency in Identifying 'Concern'	System Concern in Figure 1 of ISO/IEC/IEEE 42010:2011 is simply 'Concern' in Figure 2? Concern is part of an association class between System and Stakeholder in Figure 1 whereas in Figure 2 it has no relationship with System.	Requirement	Figure 1 - Context of Architecture Description - System Concern
2139	Architecture	Multiplicities Differ for Architecture Description vs Architecture in Figures 1 and 2	In Figure 1 the multiplicities are:- <ul style="list-style-type: none">0..* Architecture Description1..* Architecture whereas in Figure 2 they are:- <ul style="list-style-type: none">1	Requirement	Figure 1 - Context of Architecture Description - Architecture

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
			Architecture Description I Architecture 	Requirement	Figure 2 Conceptual Model of an Architecture Description = Architecture Description
2342	Architecture	Figures in 4.2 Not Defined as Requirement But Become Requirements for Architecture Framework Through Application via 6.1	Section 2 of the standard defines requirements being within sections 5, 6 and 7. The Figures within section 4.2 become requirements, however, for an architecture framework because of the requirement in 6.1 'An architecture framework shall establish its consistency with the provisions of the conceptual model in 4.2.' and the application of the Figures as the parameters / metric for the mandatory requirement.	Requirement	An architecture framework shall establish its consistency with the provisions of the conceptual model in 4.2. NOTE The above requirement can be met through a metamodel, a mapping of framework constructs to the model in 4.2, a text narrative, or in some o
				Requirement	2 - Conformance
				Requirement	Figure 2 Conceptual Model of an Architecture Description

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
2356	Architecture Framework	TRAK Doesn't Have a Relationship to Describe this Situation	The case where the conceptual model is applied / referenced by a requirement cannot be described using the current set of allowed relationships for a requirement (governs, traces to, has part). Further analysis is needed to assess whether a new relationship is needed and what is best used and whether this is a commonly encountered situation (ie. does the need exist?)	Requirement	An architecture framework shall establish its consistency with the provisions of the conceptual model in 4.2. NOTE The above requirement can be met through a metamodel, a mapping of framework constructs to the model in 4.2, a text narrative, or in some o
				Standard	TRAK. Enterprise Architecture Framework. Metamodel
				Requirement	Figure 2 Conceptual Model of an Architecture Description
				Requirement	Figure 1 - Context of Architecture Description
				Requirement	Figure 3 - Conceptual Model of AD Elements & Correspondences
				Requirement	Figure 4 - Architecture Decisions and Rationale

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
2761	Architecture	6.1 e) Requires an Architecture Framework to include any correspondence rules and refers to 5.7.3 which Requires the Architecture Description to Include the Correspondence Rules.	6.1 e) Requires an Architecture Framework to include any correspondence rules and refers to 5.7 (but because the originating requirement is concerned with correspondence rules it is assumed to refer to 5.7.3) which Requires the Architecture Description to Include the Correspondence Rules. If the architecture framework identifies correspondence rules and the architecture description conforms to the architecture framework there is no point in duplicating the correspondence rules. This problem arises from the way in which the standard has been structured where a common requirement is placed or phrased. A suggestion would be to make common requirements agnostic and then have separate requirements applying the common requirements as needed.	Requirement	6.1 e) An architecture framework shall include: e) any correspondence rules (per 5.7).
				Requirement	An architecture description shall include each correspondence rule applying to it.

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

Concern ID	Scope	Concern Name	Concern Description	Stereotype	Object of Concern
2768	Architecture	The Conceptual Model in 4.2 does not include Architecture Framework nor define how the other concepts relate to an Architecture Framework	The conceptual model in 4.2 i.e. Figures 1 to 4 inclusive do not define an Architecture Framework nor define how one relates to the concepts identified in these Figures so it is a little odd for the text to require an architecture framework to establish its consistency with the concepts when the standard doesn't itself define it in the figures being applied.	Requirement	An architecture framework shall establish its consistency with the provisions of the conceptual model in 4.2. NOTE The above requirement can be met through a metamodel, a mapping of framework constructs to the model in 4.2, a text narrative, or in some o
				Requirement	Figure 2 Conceptual Model of an Architecture Description
				Requirement	Figure 1 - Context of Architecture Description
				Requirement	Figure 3 - Conceptual Model of AD Elements & Correspondences
				Requirement	Figure 4 - Architecture Decisions and Rationale

Table 8-1: Contents of TRAK::Concern Architecture Description Elements

9 DECISIONS AND RECOMMENDATIONS

9.1 Decisions

The following decisions were made:-

- addition of a 'N/A' value to the 'compliance level' attribute of the TRAK Requirement metamodel element
- addition of a 'sequence identifier' attribute to the TRAK Requirement metamodel element
- addition of identifier attributes to Claim, Argument and Evidence TRAK Requirement metamodel elements
- addition of 'Architecture Task *has part* Architecture Task' to the TRAK Metamodel to be included in the definition of the TRAK MVP-02 Architecture Description Design Record viewpoint.

As a result of this the TRAK metamodel specification was updated – latest version is 23rd July 2015. A request to modify the definition of the MVP-02 viewpoint has been made. [Ref.15]

9.2 Recommendations

The following recommendations are made as a result of this assessment:-

- requirement identifiers should be added to requirements in the standard in order to make it easier to discuss and reference an atomic requirement in the standard.
- the conceptual model should include Architecture Framework and define the relationships between Architecture Framework and the other concepts.
- it would help to include examples or suggestions of ways in which consistency with the conceptual model may be demonstrated to provide a better steer to the expectations with respect to content and detail required in any supporting arguments and evidence. This would save time for both the organisations preparing the supporting documentation and those assessing the claims of conformance with the standard.

10 REFERENCES

- [Ref.1] ISO/IEC/IEEE 42010:2011 Systems and Software Engineering — Architecture Description
- [Ref.2] TRAK00013 TRAK.. Architecture Description. Conformance Assessment – ISO/IEC/IEEE 42010:2011
[http://trak.sourceforge.net/TRAK vs ISO_42010_AD/index.htm](http://trak.sourceforge.net/TRAK_vs_ISO_42010_AD/index.htm)
- [Ref.3] TRAK00010. TRAK. Enterprise Architecture Framework. TRAK vs ISO/IEC 42010. 6th February 2013.
- [Ref.4] TRAK00004. TRAK Enterprise Architecture Framework. <http://sf.net/p/trak> .5th February 2013
- [Ref.5] TRAK00001. TRAK Enterprise Architecture Framework. Viewpoints. <http://sf.net/p/trakviewpoints>.
14th June 2015
- [Ref.6] TRAK00002. TRAK, Enterprise Architecture Framework. Metamodel. <http://sf.net/p/trakmetamodel>
23rd July 2015
- [Ref.7] TRAK00005. TRAK. Implementation. Architecture Description Elements.
<http://sf.net/p/trak/files/Implement%20TRAK/>
- [Ref.8] OMG Unified Modelling Language (OMG UML). Superstructure. Version 2.4.1. August 2011
- [Ref.9] Sparx Systems Enterprise Architect UML Modelling Tool.
- [Ref.10] MDG for TRAK. <http://sf.net/p/mdgfortrak>
- [Ref.11] MySQL Workbench. <https://www.mysql.com/products/workbench/>
- [Ref.12] Apache Open Office. <http://www.openoffice.org/product/index.html>
- [Ref.13] Microsoft Excel for Mac 2011. https://en.wikipedia.org/wiki/Microsoft_Office_for_Mac_2011
- [Ref.14] TRAK00014. TRAK.. Compliance Matrix. Conformance Assessment – ISO/IEC/IEEE 42010:2011
[http://sourceforge.net/projects/trak/files/ISO 42010/TRAK_vs_ISO42010_compliance.ods](http://sourceforge.net/projects/trak/files/ISO_42010/TRAK_vs_ISO42010_compliance.ods)
- [Ref.15] trakviewpoints Project on Sourceforge. Feature Request #24. <https://sf.net/p/trakviewpoints/feature-requests-viewpoints/24/>

Uncontrolled When Printed
Master at <http://sf.net/p/trak/files/ISO 42010/>

BACK COVER