ISO 9001에 기초한 TL 9000 품질경영시스템 요건 : R 2.5 와 R 3.0

(TL 9000 Quality Management System Reguirements based on ISO 9001 : Release 2.5 and Release 3.0)

최 성 운*

요 지

본 연구는 ISO 9001 : 1994에 기초한 TL 9000 요건 : R 2.5 추가요구사항과 문서화 영향에 대해 언급하고 6가지 LCM 모델을 제시한다. 끝으로 ISO 9001 : 2000에 기초한 TL 9000 요건 : R 3.0 추가요구사항을 R 2.5의 대비표로 소개한다.

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1. 서 론

1.1 Goals

· Foster quality management systems that effectively and efficiently protect the integrity and use of telecommunications products : hardware, software, and services,

· Establish and maintain a common set of quality management system requirements,

· Reduce the number of telecommunications quality management system standards,

· Define effective cost and performance-based measurements to guide implementation,

· Drive continual improvement,

· Enhance customer-supplier relationships, and

· Leverage industry conformity assessment processes.

1.2 Benefits

· Continual improvement of service to subscribers,

· Enhanced relationships between the organization and its customers,

· Standardization of quality management system requirements,

· Efficient management of external audits and site visits,

· Uniform measurements,

· Overall cost reduction and increased competitiveness,

· Enhanced management and improvement of the organization's performance, and

· Industry benchmarks for TL 9000 measurements.

1.3 Customer Communication

· Shared Expectations Team

· Quality Review Meetings   - Organization's Location
                             - Customer Site view

· Customized Reports

· Program Reviews

1.4 Structure

TL 9000 is structured in layers

· International Standard ISO 9001:2000,

· Common TL 9000 Requirements,

· Hardware, Software, and Services Specific Quality Management System Requirements,

· Common TL 9000 Measurements, and

· Hardware, Software, and Services Specific Quality Management System Measurements.
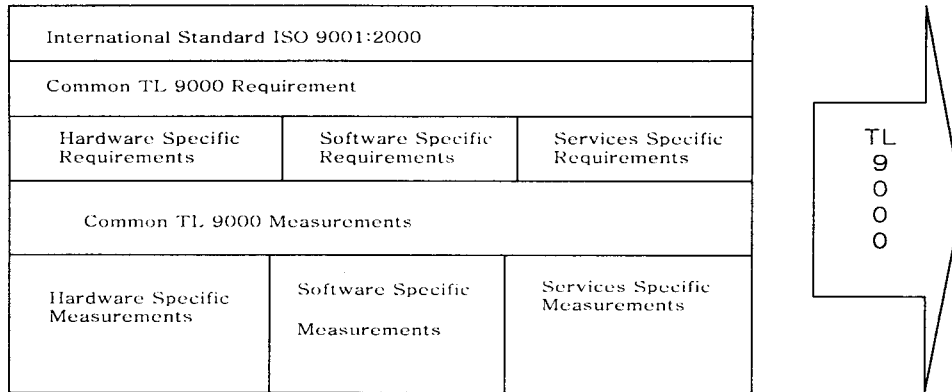
International Standard ISO 9001:2000		
Common TL 9000 Requirement		
Hardware Specific Requirements	Software Specific Requirements	Services Specific Requirements
Common TL 9000 Measurements		
Hardware Specific Measurements	Software Specific Measurements	Services Specific Measurements

TL 9000

Figure 1.

1.5 Structure of Sections

Code	Description	Example
C	Common(H, S, and V)	5.2.C.1
HS	Hardware & Software	7.1.HS.1
SV	Software & Services	(none)
H	Hardware Only	7.3.2.H.1
S	Software Only	7.1.S.1
V	Services Only	7.3.3.V.1

1.6 Terminology

The supply-chain terminology used is shown as follows:
supplier ------- > organization ----- > customer

1.7 TL 9000 Notation

TL 9000-HW	R2.5/R2.5
TL 9000-SW	R2.5/R2.5
TL 9000-SC	R2.5/R2.5
TL 9000-HW,SW	R2.5/R2.5
TL 9000-HW,SC	R2.5/R2.5
TL 9000-SW,SC	R2.5/R2.5
TL 9000-HW,SW,SC	R2.5/R2.5

1.8 Work Group

· Requirements Work Group
· Oversight Work Group

- Business Excellence Acceleration Model(BEAM) Work Group
- Governance Work Group
- Marketing and Communications (Marcom) Work Group
- Measurements Work Group
- Supply Chain Work Group
- Training Work Group

2. TL 9000 요건 : R.2.5

2.1 Summary of Adders

	C	HS	HV	H	S	V	Total
4.1	1				1		1
4.2	5					0	6
4.3					7		–
4.4	8			6	1	2	23
4.5							1
4.6	1						1
4.7							–
4.8		2		2			4
4.9			3	1	2	2	8
4.10			2	2	1		5
4.11				1			1
4.12							–
4.13	1						1
4.14							–
4.15	2			1			5
4.16					2		–
4.17							–
4.18	6						6
4.19	5	3		1			11
4.20	1				2		1
(4.21)	7			1		1	9
Total	37	5	5	15	16	5	83

2.2 Need of Adders

- Weak on quality improvement/costs
- Weak on customer-supplier relationships
- Customer only sees certificate;no levels
- Too much supplier discretion

· No cost-based metrics/benchmarking

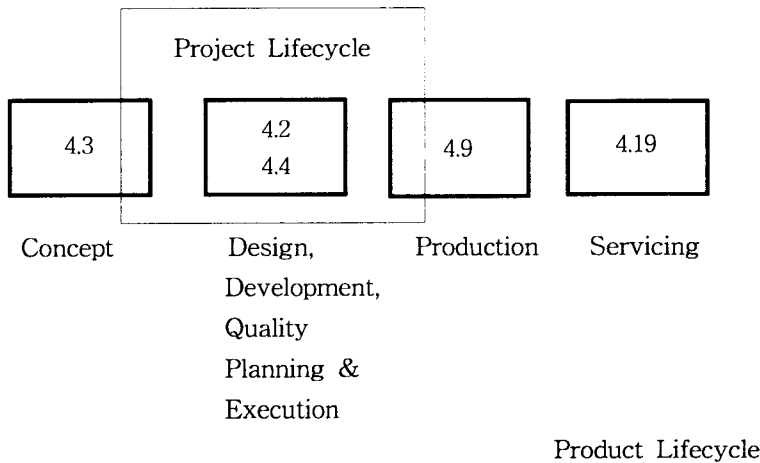· Does not encourage whole-business registrations

2.3 Documentation Impacts

· New procedures or revised/enhanced procedures : 24

· New methods (a means by which an activity is accomplished which is not necessarily documented) : 15

· New or revised / enhanced plans (programs) : 11

· New records : 6

2.4 LCM (Life Cycle Model)

· 정의 : A LCM is a representation of a high level framework that integrates business processes to care for a product throughout its entire life.

· 종류

1) Product Life Cycle in ISO 9001 Terms

Project Lifecycle

| 4.3 | 4.2 4.4 | 4.9 | 4.19 |

Concept   Design,   Production   Servicing

Development,

Quality

Planning &

Execution

Product Lifecycle

| Document Control 4.5 | | Product ID & Traceability 4.8 |

Support Process

2) Example of a Life Cycle Process (Activities added to Phases)

□ Conception

Generate options

Evaluate options

Select options

Feasibility

ID/validate requirements

□ **Develop Product**

Build prototype(s)

Define production

Testing

Establish marketing strategy

Sales

Establish service requirements

□ **Produce Product**

Create production facility

Design acceptance testing

Develop distribution

Delivery

Pilot run planned and performed

Control plans developed

Tooling and gage design

□ **Operations**

How user will learn to use product

Monitor performance

Take Action

Create operations organizations

□ **Support**

Deploy process for servicing and customer support

Establish customer contact capability

Spares, hot lines, etc. in place

□ **End of life**

Plan how to notify customers

Plan management of ongoing commitments(sell, buy-back)

Establish disposal process

3) Example of a Life Cycle Process (Tasks added to Activities)

□ **Conception**

Generate Options

Conduct focus groups

Analyze customer feedback

Conduct technology review

□ **Development**

Build prototype(s)

Design reviews

Evaluate performance

□ **Production**

Create production facility

Determine personnel needs

Design facility

Determine training needs

□ **Operations**

Monitor performance

Take action

Metrics

Analysis (who, when)

□ **Support**

Deploy customer support

Determine function

Determine demand

Size work group

Determine training needs
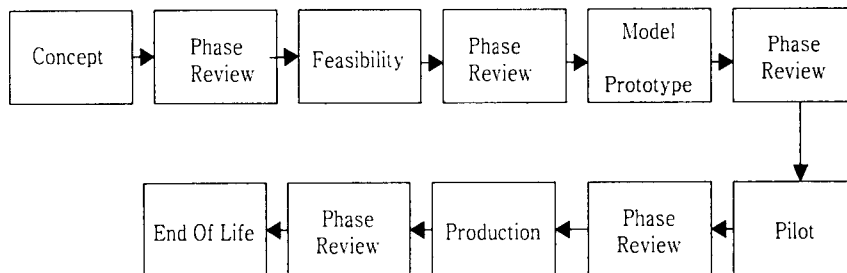
□ **End of Life**

Plan how to notify customers

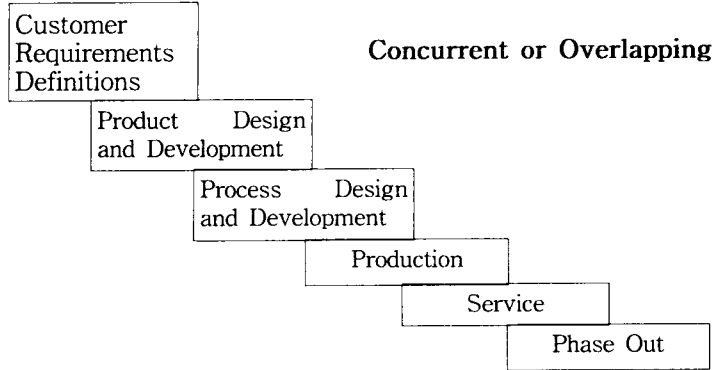Establish how to notify

Establish when to notify

Determine options

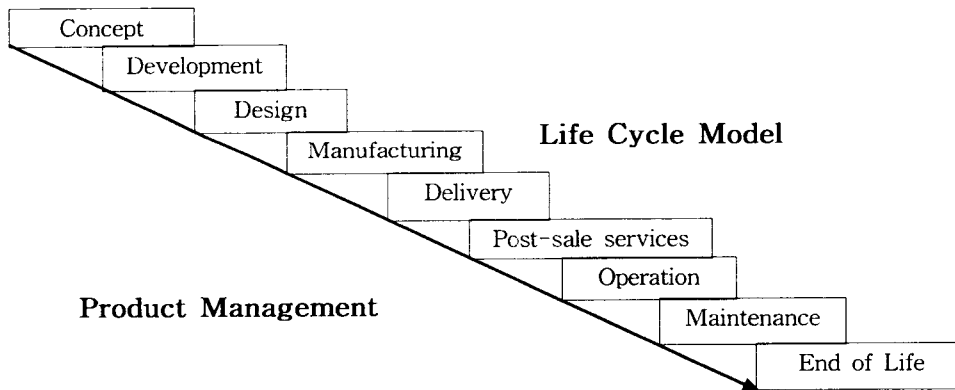## 4) Simple Product Life Cycle Models

Phase Gate or Sequential

```
┌─────────┐   ┌─────────┐   ┌───────────┐   ┌─────────┐   ┌───────────┐   ┌─────────┐
│ Concept │ → │  Phase  │ → │Feasibility│ → │  Phase  │ → │   Model   │ → │  Phase  │
│         │   │ Review  │   │           │   │ Review  │   │ Prototype │   │ Review  │
└─────────┘   └─────────┘   └───────────┘   └─────────┘   └───────────┘   └─────────┘
                                                                                │
                                                                                ▼
┌───────────┐   ┌─────────┐   ┌────────────┐   ┌─────────┐   ┌─────────┐
│End Of Life│ ← │  Phase  │ ← │ Production │ ← │  Phase  │ ← │  Pilot  │
│           │   │ Review  │   │            │   │ Review  │   │         │
└───────────┘   └─────────┘   └────────────┘   └─────────┘   └─────────┘
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5) Simple Product Life Cycle

Customer Requirements Definitions

Concurrent or Overlapping

Product   Design and Development

Process   Design and Development

Production

Service

Phase Out

6) Product Realization Phases

83 Requirements Adders embedded into ISO 9001 to cover all Product Realization Phases:

Concept

Development

Design

Manufacturing   **Life Cycle Model**

Delivery

Post-sale services

Operation

Product Management   Maintenance

End of Life

2.5 Requirements Origin

· ISO 9001	· ISO 12207
· GR-1202	· QUEST FORUM
· GR-1252	· ISO 9000-3
· TR-179	· ISO 9004-2

3. TL 9000 요건 : R 3.0

TL 9000 Requirements Handbook Rel. 3.0 Transition from 2.5

Release 2.5	Release 3
4.1.1.C.1	5.4.2.C.1
4.1.1 C-NOTE A	5.4.2C. 1-NOTE 1
4.2.2.C.1	7.1.C.1
4.2.S.1	7.1.S.3
4.2.3.C.1	5.4.2.C.2
4.2.3.C.2	5.4.2.C.1
4.2.3.C.3	5.4.2.C.3
4.2.3.C.4	7.1.C.3
4.3.2 C-NOTE B	7.2.2.C-NOTE 1
4.3.2 C-NOTE C	7.2. C-NOTE 2
4.4.1 V-NOTE D	DELETED
4.4.1.C.1	7.3.1.C.2
4.4.2.C.1	7.3.1.C.1
4.4.2 C-NOTE E	7.3.1.C.1-NOTE 1
4.4.2 C-NOTE F	7.3.1.C.1-NOTE 2
4.4.2.C.3	7.3.1.C.3
4.4.2 C-NOTE G	7.3.1.C.3-NOTE 1
4.4.2.C.3	7.1.C.4
4.4.2.S.1	7.1.S.1
4.4.2.S.2	7.1.S.2
4.4.2.S.3	7.3.1.S.1
4.4.2.S.4	7.3.1.S.
4.4.3 C-NOTE H	7.3.1.C.2-NOTE 1
4.4.4.C.1	7.3.2.C.1
4.4.4.C.2	7.3.2.C.2
4.4.4.H.1	7.3.2.H.1
4.4.4.S.1	7.3.2.S.1
4.4.4.S.2	7.3.2.S.2
4.4.5.S.1	7.3.3.S.1
4.4.5.V.1	7.3.3.V.1
4.4.7 C-NOTE I	DELETED
4.4.8 HV-NOTE J	DELETED
4.4.8 C-NOTE K	7.3.6.C-NOTE 1
4.4.8.H.1	8.2.4.H.1
4.4.8.H.2	8.2.4.H.2
4.4.8 H-NOTE L	8.2.4.H.2-NOTE 1
4.4.8.H.3	8.2.4.H.3
4.4.9.C.1	7.3.7.C.1
4.4.9.C.2	7.3.7.C.2
4.4.9.H.1	DELETED
4.4.9.H.2	7.3.7.H.1
.4.9 H-NOTE M	7.3.7.H.1

Release 2.5	Release 3
4.4.9.V.1	7.5.1.V.2
4.5.1.S.1	4.2.3.V.1
4.6.1 C-NOTE N	DELETED
4.6.1.C.1	7.4.1.C.1
4.6.1 C-NOTE O	7.4.1.C.1-NOTE 1
4.8.H.1	7.5.3.H.1
4.8.H.2	7.5.3.H.2
4.8 HS.1	7.1.HS.1
4.8 HS NOTE P	7.1.HS.1-NOTE 1
4.8.HS.2	7.5.3.HS.1
4.9.H.1	DELETED
4.9.HV.1	7.5.2.HV.1
4.9.HV.2	6.2.2.HV.1
4.9.HV.3	DELETED
4.9.S.1	7.5.1.S.3
4.9.S.2	7.3.6.S.1
4.9.V.1	7.5.1.V.1
4.9.V.2	7.1.V.1
4.10.1 C-NOTE Q	DELETED
4.10.1.HV.1	8.2.4.HV.1
4.10.1.S.1	8.2.4.S.1
4.10.4.H.1	8.2.4.H.4
4.10.4.H.2	7.5.5.HS.1
4.10.4 H-NOTE R	7.5.5.HS.1-NOTE 1
4.10.5.HV.1	8.2.4.HV.2
4.11.2.H.1	7.6.H.1
4.13.2.C.1	8.4.C.1
4.14.1 C-NOTE S	8.5.1.C-NOTE 1
4.14.2 C-NOTE T	8.5.2.C-NOTE 1
4.14.2 C-NOTE U	8.5.2..C-NOTE 2
4.15.1.C.1	6.4.C.1
4.15.1.C.2	7.5.5.C.1
4.15.2.S.1	7.5.5.S.1
4.15.3.H.1	7.5.5.H.1
4.15.6.S.1	7.5.1.S.2
4.18.C.1	6.2.2.C.1
4.18.C.2	6.2.2.C.2
4.18.C.3	6.2.2.C.3
4.18.C.4	6.2.2.C.4
4.18.C.5	6.2.2.C.5
4.18.C.6	6.2.2.C.6

Release 2.5	Release 3
4.19.C.1	7.5.1.C.1
4.19.C.2	7.5.1.C.2
4.19.C.3	7.2.3.C.1
4.19.C.4	7.2.3.C.2
4.19.C.5	7.2.3.C.3
4.19.H.1	7.2.3.H.1
4.19.HS.1	7.5.1.HS.1
4.19.HS.2	7.3.7.HS.1
4.19.HS.3	7.5.1.HS.2
4.19.S.1	7.5.1.S.1
4.19.S.2	8.5.2.S.1
4.20.1.C.1	8.2.3.C.1
4.21.1.C.1	8.5.1.C.1

Release 2.5	Release 3
4.21.1 C-NOTE V	8.5.1.C-NOTE 2
4.21.1.C.2	8.5.1.C.2
4.21.1.C.3	5.5.3.C.1
4.21.2.C.1	5.2.C.1
4.21.2.C.2	5.2.C.2
4.21.2 NOTE W	5.2.C.2-NOTE 1
4.21.3.C.1	8.2.1.C.1
4.21.3.H.1	8.4.H.1 7.2.3.C.4
4.21.3.V.1	8.4.V.1
4.21.4.C.1	7.1.C.2
4.21.4 C-NOTE X	7.1.C.2-NOTE 1
NEW	7.2.3.2.2-NOTE 1

3.2 개정 규격전환요구

Requirements의 경우 : 1년 이내 : 2002. 2. 27까지

Measurements 의 경우 : 6개월 이내 : 2001. 8. 27까지

3.3 Phase 7 : Requirements

Phase 8 : Measurements

3.4 Reference

ISO Q 10011-1-94	ISO 8402:1994
ISO Q10011-2-94	ISO 9001:1994
ISO Q10011-3-94	ISO 9000-3:1997
GR-1202-CORE	ISO / IEC 12207
GR-1252-CORE	

4. 결 론

1) ISO 9001:1994에 기초한 TL 9000 요건 : R.2.5 추가요구사항과 문서화 영향

2) 6가지 LCM 모델

3) ISO 9001:2000에 기초한 TL 9000 요건 : R3.0 추가요구사항과 R2.5대비

[참고문헌]

1. QUEST FORUM, TL 9000 Quality System Requirements, Book One, Relesse 2.5, 1999.

2. QUEST FORUM, TL 9000 Quality Management System Requirements Handbook, Release 3.0, 2001.

3. http :// www. questforum. org/