

ISO 9001:2015 Quality Management System (QMS) for Nuclear Nonproliferation and Security Training Program

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1. Introduction

The international community is facing growing threats of terrorism. To respond for this, major countries around the world begun to focus more strongly on nuclear security, including an effort to enhance human resources development and nuclear security and nonproliferation culture. These have been encouraged by the Nuclear Security Summit process that took place from 2010 to 2016.

As a result, many resources have been spent to establish Center of Excellence (COEs), and Korean government established KINAC/INSA (Korea Institute of Nuclear Nonproliferation and Control/International nuclear Nonproliferation and Security Academy) as a COE of ROK in 2014. The most common function of COEs including KINAC/INSA is to develop and provide training programs to promote human resources development in order to strengthen a State's nuclear security and nonproliferation systems.

In the last few years, KINAC/INSA has been not only developing international and domestic training courses but also more focused on enhancing these training courses to be high quality, effective and sustainable based on Quality Management System (QMS).

KINAC/INSA achieved the latest International Organization for Standardization's Quality Management Systems (ISO 9001:2015) and this paper describes the achievement process and effectiveness of ISO 9001:2015.

2. Necessity of ISO 9001:2015 certification for COE

According to the IAEA Nuclear Security Series No. 20 "Objective and Essential Elements of a State's Nuclear Security Regime", a nuclear security regime ensures that three important stakeholders (each competent authority, authorized person and other organizations with nuclear security responsibilities) contribute to the sustainability of the regime by developing, implementing, and maintaining appropriate and effective integrated management systems including QMS (ESSENTIAL ELEMENT 12: Sustaining a nuclear security regime 3.12.) [1].

There are many different approaches to develop and implement QMS, however, the International Organization for Standardization (ISO) 9000 family is the world's best-known quality management standard for companies and organizations of any size.

In particular, the requirements of ISO 9001:2015 focus on overall quality management including education and training. The greatest advantage of ISO 9001:2015 certification is that it presents methods and procedures for improving service quality through analysis of customer needs and expectations. Therefore, it can help COEs to develop high quality, effective and sustainable training programs that support the implementation of international recommendations, and national regulations for nuclear nonproliferation and security.

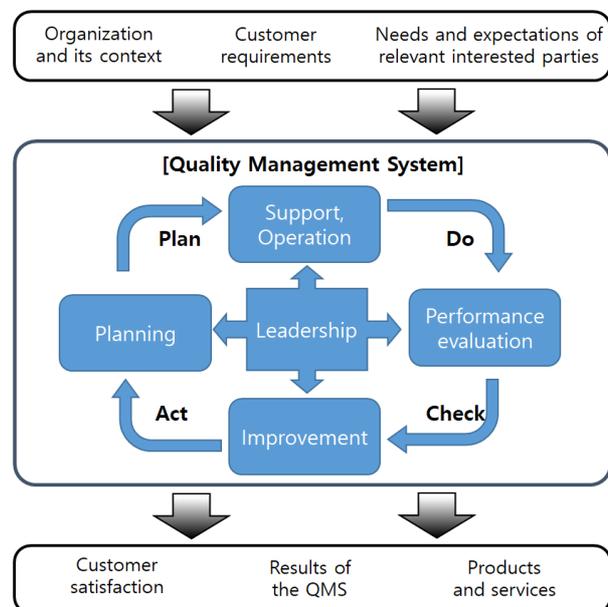


Figure 1. Representation of the structure of ISO in PDCA(Plan, Do, Check, Act) cycle [2]

3. KINAC/INSA's ISO 9001:2015 Certification

3.1 ISO 9001:2015 Certification introduction

ISO 9001:2015 Quality Management System provides requirements in a total of 7 areas. Therefore, if the COE wants to achieve certification, it must establish a QMS that reflects the all requirements of ISO 9001:2015.

When all preparation for certification are complete, certification body conducts two steps audit. The purpose of the step 1 is to determine whether the COE is ready to meet the criteria specified in ISO 9001:2015 requirements. And in the step 2, auditor conducts onsite

inspection to ensure the COE's QMS compliance with the requirements of ISO 9001:2015.

4. Context of the organization (including 4.1 ~ 4.4 requirements)
5. Leadership (including 5.1 ~ 5.3 requirements)
6. Planning (including 6.1 ~ 6.2 requirements)
7. Support (including 7.1 ~ 7.5 requirements)
8. Operation (including 8.1 ~ 8.7 requirements)
9. Performance evaluation (including 9.1 ~ 9.3 requirements)
10. Improvement (including 10.1 ~ 10.3 requirements)

Table 1. Requirements of ISO 9001:2015

The certification period lasts three years and surveillance audits must be conducted 1 ~ 2 times every year. Three years later, recertification audit needs to be conducted to maintain certification. Otherwise, the COE will lose ISO 9001:2015's certification.



Figure 2. Overall certification process [3]

3.2 KINAC/INSA's ISO 9001:2015 Certification

KINAC/INSA's achievement process of ISO 9001:2015 certification is as follows.

DATE	PROCESS
'16.7.~12.	Consultancy Meeting (16 times)
'16.10.	Certification Application
'16.11.	Certification Audit
'16.11.	Achieving Certification
'17.4.	1st Serveillance Audit
'17.10.	2nd Serveillance Audit
'17.11.	Internal Audit
'18.5.	3rd Serveillance Audit
'18.10.	Internal Audit
'18.11.	4th Serveillance Audit
'19.5.	5th Serveillance Audit
'19.9.	Internal Audit
'19.10.	Recertification Audit
'19.11.	Achieving Recertification
'20.9.	6th Serveillance Audit

Table 2. KINAC/INSA ISO 9001:2015 Certification Journey

In June 2016, KINA/INSA formed a T/F team to prepare for ISO certification. The T/F team included internal staff and external advisor with ISO consulting experience, and held total 16 times consultancy meeting over six months for achieving certification.

Through consultancy meeting, QMS of KINAC/INSA was established and a total of 31 processes were developed in seven areas to meet the requirements of ISO 9001:2015.

In November 2016, KINA/INSA requested certification audit of ISO 9001:2015 certification to the Korean Standards Association (KSA). KSA's auditor conducted onsite inspection to ensure that KINAC/INSA's QMS and all processes were complied with all requirements of ISO 9001:2015.

Finally, KINAC/INSA achieved ISO 9001:2015 certification (scope of certification: providing education and training in the field of nuclear nonproliferation and security). In addition, to maintain certification, KINAC/INSA has been not only conducting an internal audit but also requesting a surveillance audit to KSA twice a year since 2017.

Three years later in November 2019, KINA/INSA requested recertification audit of ISO 9001:2015 to KSA and achieved KSA's certification again. Through recertification audit, it has been re-confirmed that all processes have been operated based on QMS and fulfilled all requirements of ISO 9001:2015 [4].

A. Management Support	
PA01	Policy management process
PA02	Organization & job assignment management process
PA03	Internal audit process
PA04	Management review process
PA05	Human resources development process
PA06	Data analysis & operation process
PA07	Corrective action management process
PA08	Resource management process
PA09	Human resources management process
B. Document Record	
PB01	Quality document management process
PB02	Document & information management process
PB03	Records management process
PB04	Knowledge management process
PB05	Quality planning management process
C. Customer Management	
PC01	Customer requirements management process
PC02	Customer information management process
D. Supply Management	
PD01	Supplier management process
PD02	Procurement management process
PD03	Educational facility & equipment management process
PD04	Expandables management process
E. Operation Management	
PE01	Education management process
PE02	Instructor management process
PE03	Traceability management process
PE04	Storage facility management process
F. Quality Management	
PF01	Inspection management process
PF02	Nonconformity output management process
G. Environment Management	
PG 01	Legal management process
PG 02	Communication management process
PG 03	Risk management process
PG 04	Monitoring and measurement management process
PG 05	Working environment management process

Table 3. List of all Processes developed by KINAC/INSA for maintaining ISO 9001:2015



Figure 3. KINAC/INSA's ISO 9001:2015 Certificate of Approval

4. Conclusions

With the recent intensifying competition among COEs in Korea, China, Japan, and neighboring countries, each COE is constantly trying to find its own differentiated policies to strengthen its competitiveness.

ISO 9001:2015 certification could be a core competence of KINAC/INSA, which is distinct feature from neighboring countries' COEs. Above all else, the greatest advantages of ISO 9001:2015 certification are that COE can not only improve education and training course's quality based on analysis of customer needs and expectations but also provide high quality education and training courses met QMS.

KINAC/INSA will ensure the reliability of training courses based on ISO 9001:2015 certification and continue to improve training courses through standardized work procedures.

REFERENCES

- [1] IAEA Nuclear Security Series No. 20 "Objective and Essential Elements of a State's Nuclear Security Regime"
- [2] ISO 9001:2015 Quality Management Systems - Requirements, ISO, 2015
- [3] ISO 29990:2010 Implementation handbook, WINS, 2016
- [4] Operation and Infrastructure Improvement of International Nuclear Nonproliferation and Security Academy in 2019, KINAC, 2020