

Research on the Applications of Computer Security Zone for Vital Digital Assets

Yeeun Byun*, Inkyung Kim, and Kookhei Kwon

Korea Institute of Nuclear Nonproliferation and Control, 1534, Yuseongdae-ro, Yuseong-gu, Dajeon, Republic of Korea

*hibye@kinac.re.kr

1. Introduction

As cyber threats to nuclear facilities are increasing, cyber security for nuclear facilities are getting strengthened at home and abroad. In R.O.K, Korea Institute of Nuclear Nonproliferation and Control (KINAC) regulate nuclear facilities to strengthen cyber security. In this paper, after introducing concepts of critical digital assets (CDA) which are current object of regulation, vital digital assets (VDA) and zone, we discuss how the concept of zone could be applied when prepare a scheme for regulating VDA.

2. Concepts of Vital Digital Assets

2.1 Critical Digital Assets

According to Regulatory Standard “Security for Computer and Information System of Nuclear Facilities(KINAC/RS-015)”[1], licensees should identify CDA which performs or are relied upon for SSEP functions (Safety-related and Important-to-Safety, Security, Emergency Preparedness)

2.2 Vital Digital Assets

This concept is defined in the research and development and this covers digital assets that could cause nuclear accidents through failure to mitigate after initiating event.

3. Applications of Zone for preparing a scheme for regulating VDA

In this section, we will show the concepts of computer security zone stated in technical guidance of IAEA and how this could be applied for this research and developments.

3.1 Concept of Computer Security Zone

According to Technical Guidance “Computer Security of Instrumentation and Control Systems at Nuclear Facilities”[2], the security zone concept covers the logical and/or physical grouping of computer based systems that share common security requirements.

In the Draft Technical Guidance “Computer Security Techniques for Nuclear Facilities”[3], the application examples are introduced as below, and this application model could be applied differently depending on the situation of nuclear facilities.

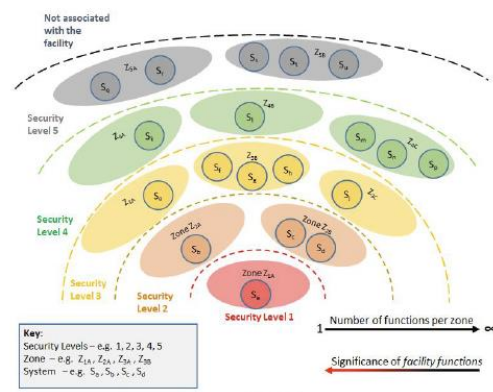


Fig. 1. Application Model of Computer Security Zone.

3.2 Applications of Computer Security Zone for VDA

Currently, the concept of computer security zone is not applied to the domestic regulation system and for the defense-in-depth the concept of computer security level is applied. In order to prepare a scheme for regulating VDA, a model applying the concept of computer security zone was developed.

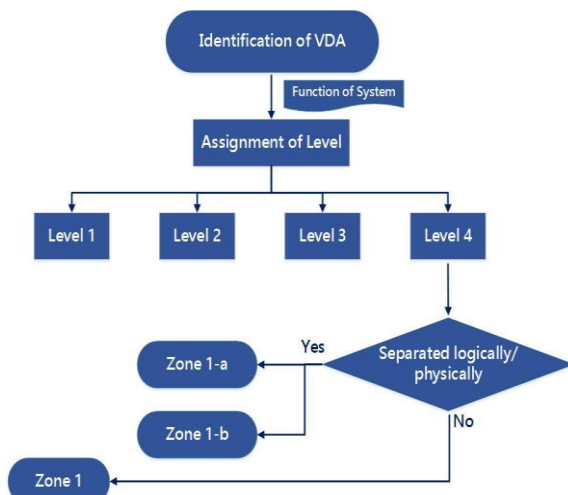


Fig. 2. Model for prepare a scheme for regulating VDA.

After identifying VDA, computer security levels could be assigned as function of each systems and suppose some system is assigned level 4(more important than level 1). Then whether it is separated logically/physically could assign computer security zone. If it is separated, the zone would be separated even they have same level, and if not, they would be assigned same zone.

4. Conclusion

There are many things to consider when develop a model to apply the concept of computer security zone, such as boundary of zone or internal communication. Now that we have identified VDA, we have only considered what model could be applied to prepare a scheme for regulating VDA. In addition, there may

be other ways to develop a scheme, and further research will be needed. Through such research, it can be said that it will be effective in the regulation of CDA.

ACKNOWLEDGEMENT

This work was supported by the Nuclear Safety Research Program through the Korea Foundation Of Nuclear Safety (KoFONS), using the financial granted by the Nuclear Safety and Security Commission (NSSC), Republic of Korea. (No. 1605007)

REFERENCES

- [1] KINAC, "Regulatory Standard – Security for Computer and Information System of Nuclear Facilities", 2015.
- [2] IAEA, "Computer Security of Instrumentation and Control Systems at Nuclear Facilities-Technical Guidance", IAEA Nuclear Security Series No. 33-T, 2018.
- [3] IAEA, "Computer Security Techniques for Nuclear Facilities-Draft Technical Guidance", IAEA Nuclear Security Series, 2017.