

Introduction to the Notice of NSSC for Fire Protection in NPPs

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1. Introduction

Fire Hazard and Fire Safe shutdown analysis which is used to evaluate the fire safety in nuclear power plant should sufficiently provide assurance to achieve fire safety goal of nuclear power plant, because fire could be developed to severe accident such as core damage. For this purpose, PWR standard review plan chapter 10.6 was suggested as Nuclear Safety and Security Commission (NSSC) Notice Requirement in this study. The above mentioned revision was introduced to NSSC Notice 2013-11, (Regulation on Establishment and Implementation of Fire Protection Program) [1], 2012-22, (Technical Standards for fire Hazard Analysis) [2], to enhance the level of fire hazard and fire safe shutdown analysis in domestic nuclear power plant and improve the fire protection regulation.

2. Regulation on Establishment and Implementation of Fire Protection Program

In this section Regulation on Establishment and Implementation of Fire Protection are described. NSSC Notice 2013-11 includes Authority and responsibility of the organizations, education and training program, procedures for fire prevention, procedures for fire-fighting, procedures for quality assurance.

2.1 Authority and responsibility of the organizations

The articles(1~6) consist of Purpose, Scope of Application, Definitions, Guidelines for Fire Protection Implementation Program, Authority and responsibility of the organization and Organization and mission of plant fire brigade. The important revisions of these articles are the principle of fire protection program, fire-fighting provision-related organizations of emergency response, responsibility of licensee for fire protection and requirement for plant fire brigade.

2.2 Education and training program

The seventh and eighth articles are the education and training for plant fire brigade. To enhance the education, its make to increase in education time for the new brigade member and to mandatory the education for the practice and life-safety. Also, the revision of training is to tighten the coordination with the other fire brigades.

2.3 Procedures for fire prevention

The articles of 9 to 12 are the functional performance of fire protection system, management of fire-safety,

complementary measures, management of fire hazard analysis report. Fire watcher system shall be established to control maintenance and modification activities (welding, flame cutting, brazing and soldering operations) that necessitate the use of an ignitions source or that may themselves create an ignitions source.

2.4 Procedures for fire-fighting

The articles of 13 to 17 are the establishment of fire response plan, establishment of fire-fighting strategy, fire-abnormal operation procedure (F-AOP), coordination with the other fire brigades, preparation of fire accident report. Fig. 1 shows the revision for procedures for fire-fighting.

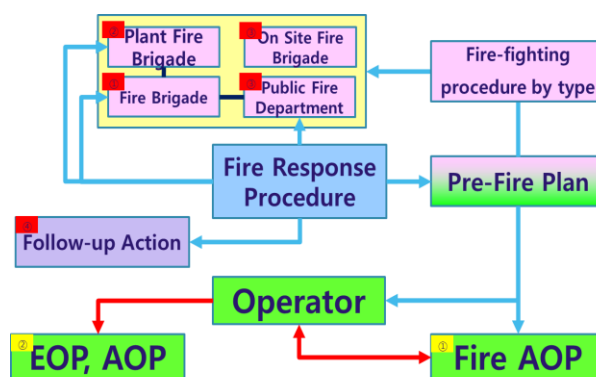


Fig.1. Procedures for fire-fighting

2.5 Procedures for Quality assurance

The eighteenth article is the verity of present condition of implementation. The implementation of Fire Protection Program should be confirmed. Any modification of design in reactor facilities, change in operation method and maintenance are an item to be confirmed.

3. Technical Standards for Fire Hazard Analysis

In this section Technical Standards for Fire Hazard Analysis are described. The NSSC Notice 2012-22 includes general provisions, Design Standard of Fire Protection for Nuclear Reactor Facilities, Performance Standard of Post-fire Safe Shutdown, the Method of Fire Hazard Analysis.

3.1 General provisions

The articles of 1 to 4 are Purpose, Scope of Application, Standard of fire protection system and Definitions. The revised NSSC Notice 2012-22 refer to

technical standard(Reg. Guide 1.189[3], RCC- I [4], CAN/CSA N-293[5]) by the various types for domestic nuclear power plant.

3.2 Design Standard of Fire Protection for Nuclear Reactor Facilities

Table I : The articles of 5 to 17

5	Application of design	12	Standard for fire extinguishers
6	Design standard of fire-provention	13	Standard for auxiliary fire-fighting system
7	Construction and operation for on multiple-reactor sites	14	Fire protection compartmentalization
8	Design of fire protection system	15	Passage of egress and access
9	Standard for fire detection and alarm	16	Design of ventilation and air conditioning system
10	Standard for fire water storage and supply system	17	Standard for drain system
11	Installation of fire suppression system by area		

3.3 Performance Standard of Post-fire Safe Shutdown

Table II : The articles of 18 to 23

18	Limited fire damage	21	Separation standard for inside of reactor containment
19	Separation standard for outside of reactor containment	22	Alternative or dedicated shutdown SSC
20	Separation standard of main control room	23	Protection of associated circuits of concern

3.4 The Method of Fire Hazard Analysis

Table III: The articles of 24 to 33

24	Guidelines for fire hazard analysis report	29	Fire detection and suppression system
25	Fire hazard analysis	30	Post-fire safe shutdown analysis
26	Establishment of fire protection area	31	Category of design basis fire
27	Types and quantities of combustible materials	32	Capabilities of reactor safe shutdown, residual heat removal and prevention of radioactive releases
28	Fire risk assessment	33	Due date of reconsideration

This paper introduces to NSSC Notice 2013-11, (Regulation on Establishment and Implementation of Fire Protection Program) [1], 2012-22, (Technical Standards for fire Hazard Analysis) [2], to enhance the level of fire hazard and fire safe shutdown analysis in domestic nuclear power plant and improve the fire protection regulation; Also, it will considerably contribute to enhancement of regulatory safety review capability related to fire protection.

REFERENCES

- [1] Notice of the Nuclear Safety and Security Commission No. 2013-11 (reaction.31), Regulation on Establishment and Implementation of Fire Protection Program, NSSC, 2014.
 [2] Notice of the Nuclear Safety and Security Commission No. 2012-22 (reaction.32), Technical Standards for Fire Hazard Analysis, NSSC, 2014
 [3] Regulatory Guide 1.189, Fire Protection for Nuclear Power Plants, United States Nuclear Regulatory Commission, 2009
 [4] RCC- I , Design and construction Rules for Fire Protection in PWR Nuclear Power Plants, AFCEN, 1982
 [5] CAN/CSA-N293, Fire Protection for CANDU Nuclear Power Plants, Canadian Standards Association, 1987

3. Conclusions