

Nuclear Facility Low Altitude Threat and Defense Technology

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—Identification, Comparison and best practise sharing

With the rapid development of high and new technology, Low-altitude, Slow-speed and Small-sized Aircraft(Hereinafter to be referred as LSSA), represented by UAV, paraglider, hot air balloon and other light aircraft, are becoming more and more widely used. However, due to the fact that the corresponding regulations and technical measures still lag behind, the rapid development of LSSA brings lots of serious new challenges to nuclear security issues.

There are lots of concerns regarding the boundary of a facility's anti-aircraft capacity. So the first chapter of this paper discusses the potential consequence of different type of malicious acts with LSSA, such as technical investigation, illegal transportation, direct sabotage, public-opinion influence, uncontrolled falling, electromagnetic interference and intrusion assistance. This chapter also analyses the low-altitude threat situations based on the research above and sorts out the threat forms and protection strategies that different nuclear facilities should focus on accordingly.

The second chapter aims at introducing the regulatory system and legislation actions of Chinese central government concerning the "LSSA threat" of most valuable facilities, as well as the problems and solutions of corresponding law enforcement practices conducted by some local governments. In addition, the technical criterion framework under the exiting legal system for low-altitude defense of nuclear facilities compiled by the State Nuclear Security Technology Center (SNSTC) is also presented in this part of the paper.

In the third chapter, I elaborates the advantages and disadvantages of some available detecting technology, including radar, intelligent video, frequency spectrum surveillance, sonar, and TDOA. Sequentially, this chapter analyzes the pros and cons of available response(suppression) technology like laser, micro-wave, net capture, protocol decoding, navigation trick, and frequency disturbance. According to the analysis of various technical paths, this chapter puts forward a systematized solution that consists suitable detect and response technical measures. In addition, this chapter provides some details regarding how State Nuclear Security Technology Center (SNSTC) inspects and verifies these technical measures.

At present, there are some nuclear power plants in China that have already enhanced their capacity to prevent and mitigate low altitude threat. In fourth chapter, the author takes NPPs in Yangjiang, Ningde and Changjiang as three examples so as to introduce different experience and feedback in different stages, including operation, construction and preparation of LSSA defense practice. This chapter introduces a Symposium on Nuclear Facility Low-altitude Threat and Mitigation, which was jointly held by Chinese Nuclear Society, State Nuclear Security Technology Center(SNSTC), undertook by China Nuclear Power Engineering Co in 2019. Some consensus and achievements of the symposium are demonstrated in this chapter.

In last chapter, a conclusion as well as some expectations and proposals are put forward .

Gender

Male

State

China

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