

Development of the mailbox system for OLR

Jung-Soo Kim, Won Woo Na, Il-Jin Park, Gil Hoon Ahn, Gyung-Sik Min

National Nuclear Management and Control Agency - Korea Institute of Nuclear Safety

P.O. Box 114, Yuseong Daejeon, 305-600 Korea

1. Introduction

A mailbox system under Integrated Safeguard (IS) is an important tool. Especially, at OLR, introducing the mailbox system was the reason that, on the spot, there would be not satisfied with the re-verification requirement for spent fuel being transferred to difficult-to-access conditions, where spent fuel has been previously verified and remained under successful C/S measure. Under IS, IAEA requires operators' declarations with mailbox. In general, two mailbox concepts was considered; traditional mailbox concept and non-traditional mailbox concept. The former applied to verify flow of material into or out of the facility. And it used the idea of randomly sampling inspection times to verify a stratum of material. The latter used with containment/surveillance and improved the verification characteristics of a C/S system. Otherwise, in case of Japan, IAEA had decided to introduce SNRI(Short Notice Random Inspection) at LEU fuel fabrication plants. SNRI was a part of the strengthening measure of safeguards under the conventional safeguards agreement. The SNRI has introduced to one fuel fabrication plant(GNF-J) since 1998 as a trial mode. Since the SNRI was carried out without any significant problem, the IAEA requested to expand the SNRI regime to all other fuel fabrication facilities. The SNRI has been operating to all fabrication facilities since 2000. In practically, Mitsubishi Nuclear Fuel(MNF) has been operating the mailbox system since 2000. The mailbox system was an important tool to come up with SNRI. So, IAEA installed a mailbox system at fuel fabrication facilities during 1999. The facility operators have been required to input transaction data such as "Birth", "Death" and "Ship" for UF₆, UO₂ powder and fuel assembly, before a fixed time at each day. In the end of 2001, Japanese gov. had installed a new transmission system instead of IAEA's system. The system is connected with IAEA and NMCC by telephone line. And then, inputted data has become to the IAEA office via NMCC since 2002[1]. According as Japanese case, the mailbox system was developed by NNCA for adapting for transfer campaign at OLR. Sec. 2 described the IAEA requirement for mailbox system. Sec. 3 represented the characteristics of the developing mailbox system and the developing system would coincidence with the requirement. Sec. 4 described the conclusion.

2. Requirement for Mailbox system

Under IS, IAEA requires Unannounced Inspections based on operators' mailbox declaration. The Mailbox information will be included all activities of transfer campaign. These activities include the bundle verification within the Spent Fuel Storage Bay(SFSB); loading the basket with the verified bundle; transferring the basket from the Basket Loading Area to the Dry Storage Area; performing the Dry Storage Fingerprint and finally the completion of the transfer campaign processing at the site. For satisfying the requirement in the above mention, the mailbox information of operator's declarations would be selected as following; Section A is "Long Term Plan for dry storage transfer campaign". Section B is "7-day advance notice for dry canister loading". Section C is "24-hour advance notice for canister loading". Section D is "24-hour post-notice for basket transferring". Section E is "After closing one canister". Long term's information described all information of campaign period, including all holiday in schedule. Fig. 1 shows the table of Sec. A. In Fig. 1, it described the draft schedule according to a batch like a canister and the amount of nuclear materials subject to transfer. Advance declaration's information included the weekly and daily declaration of spent fuel transfer activities according to a batch like a basket. Post declaration's information represented the daily declaration after working in order to check the daily activities. And IAEA compared the monthly ICR with post declaration information and checked whether diversion would be occurred or not. Also, the mailbox system should have an encrypted e-mail system. The mailbox system was developed by reflecting IAEA's(server) and operator's(client) requirement. In case of IAEA requirement, there were Non-repudiation, Trusted Time-Stamp, Uniqueness, Unalterable and Secure. Otherwise, in case of Operator requirement, there were Non-counterfeitable, Reviewable, Secure and Acknowledgement.

3. Development for Mailbox system

For satisfying the requirement in the above mention, the items within the table was selected. Shipper Facility, Shipper MBA code, Receiver Facility, Receiver MBA Code, Revision number and period were a common factor at five tables. Table 1 shows the contents of each type of the table.

