Improvement of regulatory process for import and export of radioactive sources through digital transformation

P Srikongpan¹, P Nakkaw¹ and A Chaiwat¹

¹ Nuclear and Radiation Database Administration Section, Nuclear and Radiation Licensing Division, Office of Atoms for Peace, Thailand

E-mail: piyawan.s@oap.go.th

Abstract. Radioactive sources have various utilization in many fields in Thailand including medical, industrial, research and education. Thailand’s regulatory body, Office of Atoms for Peace (OAP) has been regulating the imports and exports of radioactive sources under the Atomic Energy for Peace Act, B.E. 2504 (1961) and Nuclear Energy for Peace Act, B.E. 2559 (2016) through the licensing process and customs declaration process. Under these processes, licensees must report their imports and exports by submitting confirmation documents to the OAP within 15 days. To improve these processes, the OAP and Thai Customs have collaborated through a government and government partnership (G2G), in July 2016, to initiate electronic data sharing in a digital format called License Per Invoice (LPI), which includes all the necessary information for verification of import and export, such as radioactivity, port number, and Harmonized System Code (HS Code). This study has shown significant data of time-consuming reducing on paperwork process spent 30.32 days turn into 6.95 minutes by LPI/NSW system. The new process enhances information accuracy, integrity, security, as well as increasing regulation efficiency, reducing the amount of paper work, and facilitate all stakeholders greatly for import and export of radioactive sources in Thailand.

1. Introduction

In keeping with the mandate International Atomic Energy Agency (IAEA) provides the guidance as Guidance on the Import and Export of Radioactive Sources published in the document state that “Each State should establish procedures for the authorization and control of exports and imports radioactive sources. These procedures should cover by the state authorization (regulatory body, import and export authority) and submitted by the import and export facility” [1].

The regulatory body in Thailand is known as the Office of Atoms for Peace (OAP), which has been strengthening the regulatory control of sources in many activities involving radioactive manufacturing, radiation processing, radiation application (medical, industrial, research etc.), import and export of radioactive sources and radioactive waste management under the Atomic Energy for Peace Act, B.E. 2504 (1961) and Nuclear Energy for Peace Act, B.E. 2559 (2016) [2,3]. State by the act, the importer and exporter radioactive sources are required to obtain import and export license by submitting applications to OAP (section 19 and 36) before shipments and goods declaration. Through the act, “section 88. a license holder under section 19 who possesses radioactive material and a license holder under section 36 who possesses nuclear material shall submit a report showing the quantity of radioactive material or nuclear material in possession, as the case may be, to the Secretary General in
accordance with the rules, procedures, conditions, and periods of time prescribed by the Secretary General”, that intend to submit confirmation documents to the OAP, as illustrated in figure 1, before all of radiation shipment has been transported from worldwide to Thailand, at first the import and export facilities have to submit requiring an import and export license to OAP. Later on, OAP takes several days, but not more than 45 days for the licensing process [4]. After the licensees has acquired the import and export radiation licenses, they need to spend a few days to prepare the import and export customs entry forms with radiation license detail and shipment detail as owner detail, radioactivity, type of packing, port number, airway bill, and Harmonized System Code (HS Code) for the customs declaration process by the Thai Customs Department at the port their shipment arrives [5, 6]. Then, Thai customs checks the information on the entry document carefully and stamp a logo on the document to signify that it was verified. After that, licensees shall gather documentation from the declaration process and complete confirmation document for submitting to OAP within 15 days after the customs declaration. Finally, OAP collects import and export confirmation data, which use as a primary resource for security recheck of radiation transportation.

Completion of these processes requires much time up to several days from end to end by paperwork which OAP has recognized the weakness of these process. Therefore, OAP tries to remodel regulation report data on import and export radioactive by using digital transformation by collaborating with considerable number of Thai government partners. In this study, we focus on the opportunity to use digital technologies that can reduce the time of confirmation paper submitting, enhance the accuracy of data on import and export radioactive among stakeholders, and strengthen the regulation processes through data sharing format License Per Invoice (LPI).

**Figure 1.** Process of import and export radioactive source by paper work.

2. The Impact of Thailand National Single Window (NSW) to Import and Export of Radioactive

How to implement the electronic system for tracking the movement of radioactive sources all around the world? Cooperating with all relevant clusters is the best solution on the issue. From that point the interagency collaboration for sharing significant electronic data of import and export declaration between government agencies (G2G) [7] had begun, which called as Thailand National Single Window (NSW) that system linked through one systemic platform. The NSW has been established since 2011. The main objective of reformation the import and export processes are to enhance the regulation process of goods under their control. Several Thailand authorities listed as followed: Department of Industrial work, Department of Fisheries, Food and Drug Administration and Department of Livestock Development have joined/participated in the NSW system for achieving the same goal. The modular of data sharing has gradually been constructed by government partnership on homogeneity digital format through the NSW platform is shown in figure 2. At the beginning, the NSW system is required importers
to report essential description on their own service system or on the governance web service, depended on leverage of license authority. Next, information regarding to license or permit would be encrypted and forwarded directly, then automatic-responded massages would be initiated and circulated/sent between authorities (OAP and Thai Customs).

After the system in operation for years, the outcome of the system benefit to both competence authorities and licensees. Feedbacks from contributed stakeholders of this process is rather positive. From the licensee perspectives, reducing steps of import and export declaration, resulting in less paperwork with less time consuming. Efficiency of regulation is built-up with real-time tracking on import and export sources. The system is allowed the regulatory body to monitor throughout a particular shipment of radioactive sources. The NSW has now become a user-friendly tool helping the declaration on radioactive sources with the Thai Customs [8].

![NSW System among relevant parties.](image)

**Figure 2.** NSW System among relevant parties.

### 3. The Powerful of License Per Invoice (LPI)

G2G is a network of two or more government agencies, departments or organizations formed a cooperation with specific purposes via prominent data sharing/exchanging, to support e-government. Since 2016 the implementation of import and export sharing data between the OAP and the Thai Customs had initiated through NSW system called License Per Invoice (LPI), which merge License data from the authority and invoice detail of the customs under the data transfer format engagement and type of responding messages commit by all Thai authority partners. LPI is a robust implement for interchange import and export data along with radiation license description. The digital LPI form was created to carry a significant information base on corroborate and reliable data, so LPI turn out to helping shortly transfer data without using a paper and reinforce regulation procedures.

The figure 3 represents overall the LPI mechanism work, by the time that radioactive sources are ready to be shipped or loaded, the import and export facilities chosen the license no. and each item to fill in significant data, including the serial number of radioactive sources, radioactive source in Harmonized System Code (HS Code), radioactive activity, package type of radioactive material, unit of those items, air way-bill detail and selected port for loading via OAP website afterward submitted. After submitted the system will generate LPI: shown LPI number and specific detail per items. On the other hand, LPI data are interchanged with computer procedure directly thru NSW data exchange platform. The Thai Customs system in order to verify correct data (restricted goods permit) and repercussion will show in a few minutes by system notification (accepted or rejected) [9]. The import and export facilities have to use an LPI number as the reference in the continually customs declaration process substitute for
the license paper. Likewise, OAP be presented with LPI data in a database that including practically necessary detail for regulation propose of import and export radioactive sources, thus would be obviously benefit of digital transformation. Instead of 15 days preparation and paper submitting to transfer import and export confirmation document, but digital system has high potential to swapping the data in a couple minutes.

4. The Regulator and the Licensees Benefits
In Thailand, radioactive sources have been used in various applications, including medical, industrial, research, education and security purposes. Mostly rational materials have been imported from either Europe, United State of America, Canada or Japan. The regulator has to implement import and export process along the guidance of the IAEA. Some radionuclides, especially radionuclides in category one, such as U-235, U-238, Co-60, Cs-137 or Ir-192 etc., should to be restrictedly controlled. During past three years, the number of the importing of radioactive sources have been gradually raised from 2,864 to 3,720 items per year [10]. Hence, responsibility of authorization and control of radioactive sources by the regulatory body strongly increases with high demand on radiation uses. Previously, the import and export facilities had to prepare a lot of paperwork to finish end to end shipment taking many days for declaration processes and verification with authority. With the LPI/NSW, the whole process is aimed to efficiently shorten down the time spending on complicated works.

In this research, the comparison between on paperwork system and data transfers via the LPI/NSW system, which references to time spent on licensee submitting import and export confirmation documents to OAP. Confirmation documents from January to June 2016 were gathered and analysed. Then, the data log from July to December 2016 were used for after LPI/NSW launched. The data comparison is shown in table 1. The time consumed on paperwork system showed that 38.5% of facilities could submit document within 15 days (under required by the act), but the rest of licensees could not summit documents on time make up 61.5%. On the other hand, the time spent on LPI/NSW system sharing, import and export data on the digital network is dramatically shortened to minutes to transfer import and export detail form licensee to OAP and cross-check by Thai Customs. The data collection with the online system presents time spent between 4 to 12 minutes per report and average time accounts for 6.95 minutes. Consequently, the tangible benefit of the licensees is declining about the time consuming on import and export activities, particularly in import and export confirmation documents to the regulatory body; they can manage time and planning for document submission without the need to wait for government agency office hours causes this system open as 24 hours 7 days a week. At the same time,
the regulatory body has received accurately verified data (date of import and export, port number, origin country, activity, package type and so on) through a linking system, which is very helpful for strengthened the regulation on radioactive sources capitalization. Moreover, the system full-fill safety controls on import and export radioactive sources as established in the legal framework of Thailand.

Table 1. The time spent on paperwork system and LPI/NSW system.

| Import and export report to OAPa | The time spent on paperwork system (days) | Number of frequency (times) | Percent (%) |
|----------------------------------|------------------------------------------|-----------------------------|-------------|
| 1-15                             | 77                                       | 38.50%                      |
| 16-30                            | 78                                       | 39.00%                      |
| 31-45                            | 19                                       | 9.50%                       |
| 46-60                            | 18                                       | 9.00%                       |
| 61-75                            | 1                                        | 0.50%                       |
| 106-120                          | 3                                        | 1.50%                       |
| 406-420                          | 4                                        | 2.00%                       |
| **Average time (days) = 30.32**  |                                          |                             |             |

| Data transfers through LPI/NSWb  | The time spent on LPI/NSW system (min) | Number of frequency (times) | Percent (%) |
|----------------------------------|----------------------------------------|-----------------------------|-------------|
| 4-5                              | 31                                     | 15.50%                      |
| 5-6                              | 35                                     | 17.50%                      |
| 6-7                              | 40                                     | 20.00%                      |
| 7-8                              | 40                                     | 20.00%                      |
| 8-9                              | 22                                     | 11.00%                      |
| 10-11                            | 16                                     | 8.00%                       |
| 11-12                            | 16                                     | 8.00%                       |
| **Average time (min) = 6.95**    |                                          |                             |             |

a 200 import and export items report between January to June 2016.
b 200 import and export items report between July to December 2016.

5. Conclusions

The digital transformation has grown rapidly to enhance the framework in many organizations. At the same time, The Thailand authority (OAP and Thai Customs) brings up the great opportunity of technology power and IT have been supporting their workability. In this study the comparison collection data of both processes showing a significant time reduction and accurate information verification by digitize process. In particular, OAP has solved inadequacy delay information and a lot of spending time on document preparation using the LPI format through the NSW system. The change to digital procedures is obviously useful. In addition, there are great quantities on regulatory processes need to be lifted up essentially by digital transformation.

References

[1] International Atomic Energy Agency 2012 Guidance on the Import and Export of Radioactive Sources (Vienna) p 3
[2] Nuclear Energy for Peace Act B.E. 2559 (2016)
[3] Regulation of the Thai Atomic Energy Commission on Reporting of activity of Radioactive Sources B.E. 2554 (2011)
[4] Thailand Government Channel People Mannaul: License for Import – Export Radioactive Material Retrieved from https://info.go.th/#!/th/ListOrganization/1804
[5] Thai Customs Customs Declaration for Import and export Retrieved from http://www.customs.go.th/cont_strc_simple.php?xleft_menu=menu_business_160421_02_160421_01_160914_01&ini_menu=menu_business_160421_02&ini_content=business_1604
Thai Customs Tariff e-Service Retrieved from http://tariffeservice.customs.go.th
[7] Thailand National Single Window 2010 Background of Thailand National Single Window
Retrieved from http://www.thainsw.net/INSW/index.jsp?nswLang=E
[8] Office of the National Economic and Social Development Board 2018 International Logistics
Performance Index (LPI) 2018 (Bangkok) p 5
[9] Thailand National Single Window NSW e-Form Restricted Goods Permit Version 1.10 Retrieved
from https://dga.or.th/upload/download/file_aface5c98c0e03db3e7a5ea96c7f603c.pdf
[10] Office of Atoms for Peace License Report Annoucements Retrieved from
http://www.oap.go.th/information/announcements