

Analyzing the NTI Nuclear Security Index and Deriving its Implications

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1. Introduction

Nuclear Threat Initiative (NTI), an organization of U.S. non-governmental think-tank of dealing with the security issues on nuclear, biological and chemical materials, etc. has been evaluating and publishing nuclear security index for about 170 countries around the world since 2012.

The NTI Nuclear Security Index was firstly published in 2012 right before the hosting second Seoul Nuclear Security Summit aimed at strengthening the global nuclear material security architecture. Since then, NTI has released the results of its evaluation of the national nuclear security index every two years.

These results enable each country's efforts for strengthening its nuclear security measure to be more effective. Also, it can help countries recognize their own nuclear security capabilities and prioritize areas that need to be supplemented.

The publication of the first and second reports was conducted by the NTI through consultation with nuclear security experts. The NTI Index for first and second report assesses the contribution of 32 countries with one kilogram or more of weapons-usable nuclear materials toward improved global nuclear materials security conditions, using five categories: (a) Quantities and Sites, (b) Security and Control Measures, (c) Global Norms, (d) Domestic Commitments and Capacity, and (e) Risk Environment. An additional 144 countries, with less than one kilogram of weapons-usable nuclear materials or none at all, were assessed on the last three of these categories.

After that, the third report published in 2016 was evaluated by dividing two parts, illegal transfer of nuclear material (theft ranking) and sabotage of nuclear facilities.

Countries has raised questions about how to assess NTI's nuclear security index, setting the scope, and the process of producing comprehensive results. However, as the results of the nuclear security index are being released worldwide via NTI website and other media, it has been carefully recognized among countries.

2. Outcomes of NTI Nuclear Security Index

2.1 2012 NTI Nuclear Security Index

2012 was the year when the second Seoul Nuclear Security Summit was held. So, NTI drew a big attention by announcing the results of its first nuclear security index before the summit.

At that time, NTI published the results for 32 countries with more than one kilogram of weapons-usable nuclear materials and with less than one kilogram of weapons-usable nuclear materials or none at all.

As a result of the first assessment, NTI mentioned the overall status of each country's nuclear security implementation, increased vulnerability of insider threat, tardy efforts for removing and repatriating the inventory of weapons-grade HEU and Pu, as well as the, and the amended CPPPM and ICSANT ratification, etc.

South Korea was included in a country with less than one kilogram of weapons-usable nuclear materials or none at all, and was ranked the joint top 10 among the 144 nations as an Asian country. In particular, we ranked the top 1 for (d) Domestic Commitments and Capacity, which evaluates domestic regulations capability on nuclear security and the operation of independent regulation system.

2.2 2014 NTI Nuclear Security Index

In January 2014, NTI published the second nuclear security index evaluation. The announcement was also published prior to the third Dutch Nuclear Security Summit, making it a supportive reference to figure out each country's nuclear security level.

NTI also provided similar questions to each country in advance for the second report and completed the analysis based on data that were submitted by each country. NTI has obtained and accumulated the latest nuclear security information from each country every two years to evaluate each country's nuclear security index.

Like the first result, South Korea was evaluated in a country with less than one kilogram of weapons-usable nuclear materials or none at all. We ranked joint 12th with 82 out of 100 points, which the ranking was tied by many countries similar to the first result.

2.3 2016 NTI Nuclear Security Index

In January 2016, the results of the third nuclear security index were different from previous results, taking into account two factors: illegal transfer of nuclear material (theft ranking) and sabotage of nuclear facilities in each country.

The third nuclear security index was evaluated in 24 countries with more than 1kg of weapons-grade nuclear material, 152 countries with less than 1 kg of weapons-grade nuclear material or none at all for theft factor, and 45 countries with nuclear facilities for sabotage factor.

[Evaluation factors for illegal nuclear material transfer (theft ranking)]

- Countries with more than 1kg of weapons-grade nuclear material: ①Quantities and Sites (Quantities of nuclear materials, Material production /elimination trends), ②Security and Control Measures (On-site physical protection, Control and accounting procedures, Insider threat prevention, Physical security during transport, Response capabilities, Cybersecurity), ③Global Norms(International legal commitments, Voluntary commitments, International assurances), ④Domestic Commitments and Capacity (Domestic nuclear materials security legislation, Independent regulatory agency), ⑤Risk Environment (Political stability, Effective governance, Groups interested in illicitly acquiring materials, etc.)
- Countries with less than 1 kg of weapons-grade nuclear material or none at all: Considering the ③, ④, ⑤ of above factors

[Evaluation factors for sabotage of nuclear]

①Number of Sites, ②Security and Control Measures (On-site physical protection, Control and accounting procedures, Insider threat prevention, Response capabilities, Cybersecurity), ③Global Norms (International legal commitments, Voluntary commitments, International assurances), ④Domestic Commitments and Capacity (Domestic nuclear security legislation, Independent regulatory agency), ⑤Risk Environment (Political stability, Effective governance, Groups interested in illicitly acquiring materials, etc.)

South Korea ranked joint fifth on the illegal transfer of nuclear materials (theft ranking). We received the highest score among Asian countries and ranked the top 1 for ③Global Norms and ④Domestic Commitments and Capacity factors. However, the index related to the sabotage of nuclear facilities was rated joint 11th.

Finland, Australia, Canada, the United Kingdom, the United States, France, the Netherlands, and Germany ranked above South Korea for sabotage factor.

South Korea was considered relatively under-valued due to ①initial stage of applying the potential levels of radiological consequences in sabotage, ②relatively low recognition of insider threat, ③operationally initial phases of cybersecurity regulations, etc.

3. The process of 2018 NTI Nuclear Security Index Survey

NTI also sent to South Korea a questionnaire for evaluating the fourth nuclear security index in 2018 and the Nuclear Security Team of Nuclear Safety and Security Commission(NSSC) and the KINAC have prepared and submitted answers to the relevant questions.

NTI requested the specific detailed questions based on past surveys. In addition to the existing questionnaire, major further requests can be summarized as follows:

1. Whether or not the nuclear security regulation defines nuclear security responsibilities and accountabilities in facilities
2. Whether or not performance-based programs are required for nuclear security regulation
3. Do domestic regulations require the access control measures entering certain areas (protected/inner areas or vital areas)?
4. Do domestic regulations specify that security and other personnel with access to protection areas are subject to the following checks: regular vetting, drug testing, background checks, psychological or mental fitness tests?
5. Whether physical protection exercise is carried out regularly to response with the cope with the event of nuclear security-related accidents
6. Whether to implement cybersecurity measures at nuclear facilities
7. Whether or not the domestic regulations require the potential levels of radiological consequences of sabotage

4. What NTI Nuclear Security Index emphasizes

NTI noted that although various measures for strengthening nuclear security were proposed following the Nuclear Security Summit from 2010 to 2016, the practical progress in each country has been slow. Thus, through the evaluating these NGO-level nuclear security index, they are urging for recognition and visible progress on strengthening nuclear security.

Generally, NTI has recommended maintaining legal and institutional architecture for countries that do not properly have their nuclear security system. It also urges countries to take concrete action against the growing cyber security threat in nuclear facilities.

In addition, it has been urging for substantial progress on various outcomes from the nuclear security summit. For example, it was recommended that 1) reduce, clean out the stocks of weapons-usable nuclear materials, 2) bolster the international legal foundation regarding nuclear security, 3) strengthen international peer review related nuclear security, 4) encourage the effort to establish the security standards and best practice through IAEA, and 5) define a path to sustain momentum and high-level attention after nuclear security summit ending, etc.

5. Conclusion

South Korea ranked among the top countries in terms of the NTI Nuclear Security Index, which has been published since 2012.

The index related to the illegal transfer of nuclear material (theft ranking) is highly regarded in the parts of Global Norms and Domestic Commitments/Capacity.

However, there was a relatively low ranking of the sabotage-related index at nuclear facilities.

The reasons were judged that it was necessary to do maturity of performance-based regulations, applying the potential levels of radiological consequences in sabotage, and practical operation/management of responding insider threat, etc.

The direction of current nuclear security regulations is planned to be carried out in these points. And it will be also the top priority in assessing nuclear security index in next outcome.

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