[SE3-LT-1] Fissile Material

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Full Summary

These days the issue of fissile material has been studied very carefully, because it contains both of faces. There are four panelists are Will Tobey, Jhon Carison, Chaim Braun and Tom LaTourrette presents the each issues related with fissile material. The fissile material issues absolutely the one of most important topic among nuclear studies, because the fissile material is the energy source of nuclear power generation as well as the source of nuclear weapon. Therefore, they show what the right way for the future nuclear energy.

To begin with, John Carison of Lowy Institute addresses that potential risk of fissile material enrichment and reprocessing. We do not have general definition of fissile material. However, the fissile material usually means HEU (High Enrichment Uranium), which is 20 percent and more Uranium-235, and separated Plutonium which is separated from spent fuel by reprocessing mechanism. Nuclear weapon is made with using high enrichment Uranium or separated Plutonium. Existing and having of fissile material or produce them contains a proliferation risk. Also, it has terrorist risk.

The terrorist risk has been recognized by very long running the international program to minimize HEU in civilian programs, and more recently Nuclear Security Summit process which is launched by President Obama in 2009 and the second Nuclear Security Summit will be held in Seoul in 2012.

He focuses it is sufficient to minimize risk involving Plutonium separation. The fast breeding reactor has a breeding blanket which involves a lot of Plutonium. It means that it contains the high terrorism risk and proliferation risk. To enhance proliferation resistance, we should develop the advanced measurement technology. Also, the technical development is able to be a solution to prevent manufacturing Plutonium. In addition, he believes institutional measures are needed to address enrichment and plutonium recycling issues. Plutonium recycling and enrichment program have the proliferation risks. In the future, we must suggest the alternatives to national fissile material production programs. We need to rethink what NPT (Non-proliferation Treaty) means whether any regardless of proliferation risk or intend behind program. Iran cannot have enrichment, because Iran does not get the internationally

acceptance. In the longer term we need wholly national control program. Multilateral approaches should be developed, to provide energy security without the need for national fissile material production programs.

In conclusion, the fissile material problem is the hot problem in term of proliferation and the elimination of nuclear weapon. We need to look the new approach to eliminate proliferation risks and nuclear weapons.

He was told a follow question; what do you think that the pyro-processing offers kind of different level degree in terms of proliferation resistance compared with traditional processing? And, what is the prospective future technology? His answer is that I do not claim pyro-processing is the proliferation proof due to a time barrier among a lot of proliferation resistance barriers. Pyro-processing is clear and less proliferation risk compared with a liquid processing, however we should be operated by wholly national program.

The next speaker is Chaim Braun of Stanford University. Chaim Braun is working on an analysis of new nuclear power plant prospects in the Middle East, and the potential for nuclear proliferation from prospective nuclear plants in industrializing countries. Chaim Braun talks about the Uranium enrichment. The strategy of the Uranium enrichment is categorized as the development of national enrichment and the development of multilateral enrichment center.

To begin with, we explains some representative countries condition such as, Brazil Argentina, South Africa, South Korea, Iran, India, Pakistan, Saudi Arabia, Israel, USA, Russia, and China. South Africa is available for stationary nozzle enrichment system. South Korea is canceled and stopped. India has the five to six plutonium generation systems. Saudi Arabia does not have the enrichment system, but they are going to begin the enrichment program. Israel has little capacity on the enrichment program. Those situations are national enrichment program as reactivation program.

Another one is international enrichment program which is MESP (Multilateral Enrichment Sanctuary Project). First, ETC (Enrichment Technology Cooperation) is that USA, France, and British are participated and ETC supports the same technology to Urenco and Areva enrichment companies. They compete to each other. Second, Russia develop a national enrichment center, however it is not going commercially. Third, Germany insists that we establish the multilateral enrichment center, which is extra territorial status, controlled by IAEA. Evidently he prefers to the regional enrichment program rather than the national enrichment program.

Two tailed black box model is applied on the programs. The black box model is consisted with commercial market and technical part. The model looks very complex mechanism. It will be helpful us how we can develop enrichment program.

The third speaker is a moderator William H. Tobey who is working at Belfer center for science and international affairs, Harvard University. He says the fissile material is very broad topic and most important aspect in proliferation. Al-Qaeda attacked World Trade Center buildings and threatened a school and other companies. Al-Qaeda cannot be sure over attacks. Therefore, he briefly talks about strategies for non-proliferation. First is the changing attitude. We should internationally investigate more evidences. Second is learning from the past cases. Based on past cases, we analysis that how to get, who is involved, and how they do it. This matter is not past matter. It is the present security matter and in order to prevent the future. Third is making special security for physical security and personal security.

These days, the renewable energy has been an interesting study in the worldwide due to the exhaustion of oil. The representative renewable energies are the solar energy, wind energy, tides energy, geothermal energy and biomass energy. The renewable energy is the innovative energy. However, it is hard to say as the alternative energy right now, because those are showing the low energy efficiency as well as the high price in order to generate electricity. Therefore, the fissile material has been suggested as alternative energy source. Unfortunately, the fissile material takes the pros and cons. As we can easily recognize it is able to generate the big amount of energy, such as the power of one gram Uranium 235, which is fissile material, is equal to the nine oil drums and the three tons coal, whereas it is possible to be a source of a nuclear weapon. In this article, let us think how we can use the fissile material safely in terms of a technical method and a political method.

The representative fissile materials are Uranium and Plutonium. Uranium is existed in nature; however, Plutonium is come from the Uranium fission in the nuclear fuel. Therefore, Uranium and Plutonium separation from the spent fuel is prohibited to prevent weaponized. Hence the pyro-processing is suggested, because the pyro-processing method dose not separate Uranium and Plutonium from the spent fuel. It is safely said that the pyro-processing contains the proliferation resistance. To enhance proliferation resistance, we are able to think the integrated site system which is consisted with PWR (Pressured Water Reactor), Pyro-processing system, and Fast neutron reactor. It is required more specific and realistic study and it is possible to decrease proliferation.

Moreover, the enrichment system and pro-processing are required assured safety strategy. John Carison mentions we need wholly international control system and Chaim Braun insists two strategies the national system and the multilateral system. Both of two panelists are based

on international communication and cooperation. In this situation, IAEA (International Atomic Energy Agency) is located in important position. We have had the sort of partnerships and treaty. However, the activation of IAEA is more powerful and effective in order to make a successful cooperation. In addition, we need to keep the best human resource. Actually, the all negotiation and cooperation are conducted by human. We should train proper leader and manager by high quality training program. It is also planned and organized by wholly international agency like IAEA.

In conclusion, the worth of fissile material depends on how we use. If we use the fissile material peacefully, it should promise the future energy security. However, the opposite case gives us the darkness future. As I mentioned before, we need to not only develop the new innovative technology, but also communicate and collaborate with other countries for peaceful use. In addition, I emphasize the necessary of strong international agency to supervise and manage the whole of nuclear energy. Finally, I firmly believe that the fissile material will be clean and best energy source by our efforts.