Axiology of Nuclear Energy

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Nuclear energy was born in World War II and it has grown within the regime of Cold War. When the Cold War came to the end around early 1990s, we who have benefited by the development of nuclear energy must have been challenged with a new tide of civilization change. Although it has not been so much closely questioned since then, such a new movement, that was submerging, abruptly manifested on September 11, 2001. Then, many of us realized that global circumstances, especially concerned with security, must have actually changed with the reordering of the world basic structures. This paper describes on the thoughts to reveal the cause and background of the event on September 11 with the linkage to nuclear energy development, or nuclear civilization in pursuit of the future regime of nuclear in harmonization with the global society in 21st century.

KEYWORDS: nuclear energy, axiology, dualism, peaceful use

I. Introduction

The development of nuclear power was launched and spurred in United States in early 1940's during the Second World War. Afterwards, it had been rigorously involved in the sci-tech antagonism between the two superpowers through the Cold War period. In the United States, who had disyoked the power of nuclear by devising atomic bombs, the President D. D. Eisenhower, the successor of H. S Truman, addressed on the “Atoms for Peace” at the United Nations General Assembly in 1953. This was a turning point from the period when the military use of nuclear was pressed to the new era where the civilian use of nuclear was carried out. This movement was inseparable with the International Atomic Energy Agency (IAEA), which was organized as the sentinel of the nuclear in 1957. Also, the regime for the peaceful use of the nuclear has been emblematically reinforced by the Nuclear Nonproliferation Treaty (NPT, 1968). Thus, owing to the incentive by Eisenhower, light water reactor technology has been matured and propagated as commercial nuclear power plants over the world. Meantime, if we revert to the root of the light water reactor technology, it apparently originated from the military use of nuclear power; that is, the technology for nuclear submarine was transformed into the civilian use. Namely, warfare was the cradle of the civilian, or peaceful, use of nuclear.

Such a situation is not just confined to the nuclear, rather, if we think over the human history, we should regard that science and technology have developed by keeping inseparable relation with warfare.

II. End of Cold War and Nuclear Energy

Since the end of the Cold War, we have encountered metamorphoses in the environment of nuclear energy research and development. The metamorphoses are prevailing more widely over the development process of civilization at the present time. We recognize a sort of dislocation has emerged on the basis of civilization. If it is actually the case, it possibly can induce more fundamental metamorphoses in “the whole edifice of our philosophy” implicating not only sci-tech fields but human sciences.

In the nuclear energy development, the accident at the Three Mile Island nuclear power station (TMI) in March 1979 is one of the worst that has occurred in a commercial nuclear power plant. It is an epoch-making event in the history of large-scale sci-tech. Thereafter, the chemical
accident at the factory of Union Carbide in Bhopal in India occurred in 1984, followed by the disaster of airplane crash of Japan Airline in 1985, the explosion of the space shuttle Challenger in 1986, and eventually the Chernobyl Accident in the same year. This is a series of large-scale sci-tech accidents to pose the dislocation. This series of incidents shadowed the confidence that the technologized society in developed countries had overcome the Oil Crises in 1970s. Furthermore, it devastated the public with the playsome mood boomed by the high-tech devotion in the early 1980’s. It began to evoke the people’s disturbance and suspicion on whether the large-scale sci-techs were forming the basis of their society in a manner that people could not see well. The relationship between human and the sci-tech entered into the 21st century with this issue unresolved. Thus, we can recognize the initial emerging of the dislocation at the later half of 1980s, which means the incipiency of the diremption between the human and sci-tech leading to the current situation. It is curious that this era coincided with the period when M. S. Gorbachev appeared in the political stage in the former Soviet Union who had pressed very strongly perestroika and glasnost. Although it was said that the Chernobyl Accident had accelerated such transformations in the political circumstances, more precise examinations will be needed to draw conclusion on it.

The era of the Cold War was a transition process from the modernized system to the post-modernization system. The president G. H. Bush, who appeared on the scene at the end of Cold War, addressed the formation of the Global Village, the sharing of information by use of Information Highway, and the creation of Global Market under the concept of “The New World Order” 

The terrorist attacks on September 11, 2001 symbolize the regime transition after the end of the Cold War. The incident horrified the world in various ways and forced for us to rethink the welfare of modern civilization, those who take enjoyment of the welfare with advancing it. The incident is attributed to al-Qaeda and the annihilative actions seemed to be justified. The issues involved, however, are not very simple, so that we must consider how we can resolve them to eradicate terrors. If we, who are going to evolutionally further the civilization, underestimate the issues, it will lead to being unprotected against creeping threats. Even if the threats are needless fears, we are actually confronted with the ongoing variegation of valuation in the beginning of 21st century. In such an axiological circumstance, we believe that it is worthwhile to rethink the significance of science-technology, especially the development and utilization of nuclear energy as a symbolic large-scale sci-tech.

Though the basic motivation of terrorist attacks might have been religious fundamentalism, the trends in globalism such as deregulation and liberalization of markets could facilitate them. Thus, the security barriers against attacks, that nations and organizations had usually kept, were lowered. Resultingly, the attacks were so easily and effectively achieved. The cheap labor employed in cost competitions due to market liberalization shook the basis of the security. The relation between terror and against-terror action such as war by a nation seems to be asymmetric. Is it really possible and meaningful to judge that one side has justice and the other does not. Such a black-and-white dualism may not resolve the complicated circumstance. At least, we should realize that the intention to bring a New Order about a decade ago has not brought about a real new order in the world, rather it may have invited another stage of disorder or chaos. The problem is that then what is the crucial approach to resolve the issues in which we are involved as a whole. The dualism will apparently reach a deadlock. Here we should remember that the science was modernized by discarding the idea of four classic Greek elements theory as the intellectual scrapheap. The four elements theory shares the root with the ancient dithesim, or black-and-white dualism. At least, we believe it is worthy to rethink the background of recent sci-tech development toward jumboizing. Here we can quote various categories of human sciences such as sociology, irenology, polemology, polisci, and science of religion. Hence, we think axiological
approach with pluralism basis should be effective for this problem.

IV. Method

On the above-mentioned understanding, we have organized a cooperative forum to cope with the issue we are confronted with. For the forum, we invite specialists for selected science fields and develop new knowledge by analyzing the aspects of current issues with drawing out pathways to the future.

1. Getting clues

Here we lists the clues to the question:
1) Background and motivation of terrorism: religion and politics behind;
2) Trends and aspects of nationalism: religious nationalism confronting secular nationalism, and its implication to the fluidization of technology;
3) Security vs. deregulation and market mechanism as potential cause to induce terror;
4) Mass media and terrorism;
6) From safety to security: design basis threat (DBT);
7) Homeland security and the impact of dirty bombs;
8) Nuclear developments in specific countries: axis of evil; and
9) Potential transition in mind of Japan’s “Peaceful or civil use of nuclear”.

These are items to be considered in the early stage of the forum. We are going into the next stage to figure out the map of future nuclear energy beyond 22nd century. Then, we will discuss on the uncharted potential of nuclear, namely, nuclear in the space and deep-sea, where we need to collaborate with knowledge of planetology and cosmology.

2. What have been deduced

We launched the forum in April, 2002 and had eight forums so far. The topics were: mega-death terror – its ideological background and technological aspects; the protection and security of nuclear power plants against terrorists; the concept of non-violence of Dalai Lama; the security and sci-tech of post-9.11 world; the visible advocacy of reforming energy policy; the national security and the reality and efficacy of Japan armed with nuclear. Here are summaries of the three selected topics.

1) Mega-death terror – its ideological background and technological aspects

We may have entered a world which was predicted in “Leviathan” by Hobbes, that is, men being always in the precincts of battle, or a multitude of battle done by a multitude of men. In this view, it is no longer meaningful to understand a war as an resolutive measure extended from diplomatic negotiations among nations. In this view, it is no longer meaningful to understand a war as an resolutive measure extended from diplomatic negotiations among nations. In fact, by the end of the Cold War, the war between nations terminated. In this century, we think it will enter the age where low intensity conflicts (LICs) will rampage. The LICs include terrorist attacks and regional conflicts. Then, the current national security regime may not work well against LICs. (Here is an allegory that an elephant can never crush an ant by foot.) At the same time, moral that has more or less controlled battles among nations will be no more effective in LICs. Namely, when the underlying concept and motivation of battles have changed, the sci-tech involvement will also change so that weapons for mass destruction (WMDs) can be used without hesitation. The WMDs include portable nuclear weapons such as suitcase or rucksack type nuclear bombs and radiological or dirty bombs. The incident caused by Aum Shinrikyo who used sarin for the mass murder in subways is well regarded as the forerunner of “mass destruction terror.” The consequence by the incident was more than thousands injuries and deaths. The implication of the Aum’s incidents is still underestimated by Japan’s political administration to have revealed its nature of forgiving of terrorists. The scale of the consequences by the terrorist attacks on September 11 surpassed that by Aum. If we consider the metamorphosis of the circumstance in the world and the impact of the modernized sci-tech on LICs, we are already confronted with the threats of mega-death terror. When terrorists regard terror as a politically effective measure, we do not have valid countermeasure nor language against it. Moreover, the collapse of the Cold War regime has fluidized the nuclear materials, handy nuclear weapons, and scientists and technicians involved in the related technologies.

2) Protection and security of nuclear power plants against terrorists

Usually, safety assurance of a nuclear facility has been accomplished by the concept of
designing it under the ideas of design basis accidents (DBAs) and defense-in-depth. This concept of safety has been independent of physical protection (PP). The physical protection consists of measures against the diversion and burglary of nuclear materials. Since the attacks on September 11, the safety assurance and the PP are no more simply independent. If we take account of the attack on a nuclear power plant, which could have been accomplished by a large airplane on Sept. 11, such external threats by terrorists should be included in the frame of facility protection. Hence, the concept of “design basis threat (DBT) has been elucidated. By the concept, we form a matrix of \{fluidization ways\} \times \{invasion pathways\}. Here the ways of the fluidization of nuclear are: burglary of nuclear bomb, diversion and/or burglary of nuclear materials, radioactive materials, and sabotage; while the invasion pathways are: intra-national, international by lands, sea, and air. On the matrix, each countermeasure must be developed. Thus, conventionally the PP covers only nuclear materials, but now it must cover also radioactive materials for medical and other scientific uses. According to such circumstances, USDOE and IAEA have already derived the baseline of DBTs. In particular, US government has newly established the Department of Homeland Security. Contrastingly, Japan’s incentive and related activity are not well visible. The nature of forgiving that has not been corrected even after the Aum incident is still solid here, although we are faced with a real nation that is well recognized to have committed terrorism.

3) Concept of non-violence of Dalai Lama

In a sense, the attacks on September 11 symbolize “terror backed by religion.” There are various terrorist attacks backed by religions over the world, that is, between Catholics and Protestants (Ireland vs. UK), Jewish and Arabic (Middle East), Islamic and Hindu (Kashmir), etc. Also in Sri-Lanka, there are battles between different sects of Buddhists. Then, what is the reason why there is no terrorist attack in Tibet where Tibetan Buddhists are so suppressed that Amnesty International often warned? Dalai Lama, who is the leader of Tibetan Buddhists and he expressed his deep regret to the President G. W. Bush very quickly after the incident on September 11\(^{18}\), has continuously been persisting never to commit to violence under any circumstances. The core of his idea is based on the love to the whole human, or to foster the mind of benevolence. He declared that “now the mutual dependency among individuals and nations (pratityasamutpada) is increasing so that there must be no other way but we develop what we call “universal responsibility.” Besides, he proposed “Peace establishment plan by five issues” at the EC Congress in 1987. By this proposal, he required to make Tibet as “Ahimsa region” for peace and environmental protection. The mind and idea shown by Dalai Lama can be shared with ones who want eagerly direct themselves to the way of peaceful coexistence of the whole human. His concept is based on the original thought in Tibet Buddhism, that is “the six passages in samsara.” Therefore, there is an overwhelming issue how the universality of the thought can be shared by those who believe monotheism.

V. Conclusion

It is a historical fact that the war or military development of the nuclear had cradled the civilian or peaceful use of the nuclear. Nuclear power stations as energy sources and nuclear weapons are just the both sides of the nuclear: right and shadow, or yin and yang. This cannot, however, be the right reason to abominate even the peaceful use of the nuclear for civilian energy source. Modern science originated from natural philosophy; and there is close relation between science and religion. We should be aware of that religions have been backing up battles and wars. Although there are people who think science is one thing and technology is one another, or sci-tech must be science “and” technology, they were bone in the same root. Not solely nuclear sci-tech but many sci-techs were born more or less in relation with competitions, battles, or wars and furthered by the animus to survive or win the struggles. For a fact, many technologies which enrich our life have come out from military use. For instance, they are nuclear energy, nylon, and information technology (IT). We should realize that military and civil uses are in principle inseparable, so that it is less meaningful to regard them in the sense of black-and-white dualism.

The axiological cognition with pluralism approach can further nuclear science and technology in the next stage for human future with discarding narrow regionalism or nationalism.

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