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Remarks on Various Problems of Social Crisis

— In the Case of the Nuclear Power Plant Accidents, and Chernobyl Syndrome —

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社会的危機問題に関する若干の考察

— 東海村原発事故とチェリノブイリ症候群 —

丸 山 久美子

1999年9月30日、日本の東海村で原子炉溶解事故が人為的ミスによって発生した。日本で初めての大型事故のため、世界中がこの問題に関心を示し、1986年に発生した未曾有のウクライナのチェリノブイリ原発事故が亡霊のようによみがえり、各国の反応は過敏で週刊誌「Newsweek」は東海村原子炉事故発生から二週間後に「The Next Chernobyl」の特集記事を掲載し、今日もなお多くの不安要因を含むチェリノブイリの問題を取り上げ、チェリノブイリの方向から風が吹く度に頭痛や吐き気に悩まされる放射能恐怖（Radio-Phobia）或いは、チェリノブイリ症候群が増加していると報道した。実際に近傍の住民はガンに冒され、生まれてくる子供の半数は正常児ではなく、なんらかの疾患を持って生まれ、この地方の小学校の児童の三分の一は毎日病気であると言われていいる。この問題は単に放射能による環境汚染ではなく、エイズに次いで人類の近未来における不安材料を提供している。磨耗した原子炉を修復する経済的余裕の無いロシア、ウクライナの困窮は世界的な規模の社会不安を喚起する。日本は原子炉を環境汚染とは無縁の形で増産しているが、東海村のような事故を契機に出来るだけ人為的ミスの起こらないような対策を政府は県命に模索している。インターネットが世界を隈無く走り、電力を原子力に頼らなければならない人類一般は原子炉事故によって被る多くの危機的な状況にもっと多くの注意深い視線を送るべきであろう。

1: Introduction

In most part of the world, the chance of the nuclear power plant accidents is now seen as too great. Reactor orders and set-ups have declined markedly since 1980s. We remembered the accident of Chernobyl at Ukraine near Russia.

The problem where is the next Chernobyl is very serious and give us a deep anxiety in the

Key words; Chernobyl Syndrome, Environmental Pollution, Tokaimura's critical Accident of NPP, Social Unrest, INES.

worldwide. Some countries, including Germany and Sweden, plants to shut down their plants altogether. This is hardly reassuring, especially after Japan's serious accident at the end of September in 1999.

That is, there were happend the critical accident of nuclear power plant in Tokaimura near Tokyo at September 30, 1999, died two persons and almost 66 persons were bombed.

It was very serious level 5 in the International Event Scale (INES) ever been before at Japan. In this connection, INES has the estimating points from level 0 to level 7. Chernobyl accident had have most serious level 7. Level 7 means serious accident and level 4 also accident inside of the plants, and has not the risk to outside. Upper level 5 have the serious risk to outside of plants. So we can see how the accident of Chernobyl in 1986 was dangerous, and most serious problem. We say it can't happen again. But if we could see what goes on in some old nuclear plants, we would not be so sure. After Japan's serious accident, some editors of newsweek visited once-secret plants behind the old Iron Curtain. Now, let us listen for their talking for a while. They, visitors to Sosnovy-Bor, a distant suburb of St. Petersburg, can not say they are not warned. The town hall boasts a digital Geiger counter, displaying local radiation levels in large red letters. That is because Sosnovy-Bor's only industry is the Leningard Nuclear Power Plant (LNPP), with its four massive reactors. When they visited the plant early this 1999, it looked like an abandoned construction site. Rusting cranes loomed like mutant insects over piles of building rails, seemingly abandoned. They supposed to be used to revamp the plant's safety systems, an overhaul originally scheduled for completion by the end of this year. But that has been postponed until 2001. If the ruble crisis goes on, it seems pretty clear it would not be done even by then. The LNPP is a Chernobyl-type power station, only much more dangerous. If Chernobyl had happened here, many of the 4 million people of St. Petersburg would have been hit with a massive dose of radiation. Outsiders can enter the plant only with permission from Russia's nuclear-regulatory agency, Minatom, which rarely grants it. At the time of this 1999, only three of the four reactors were in operation, one was due to be shut down permanently because of a 1992 leak of radioactive iodine and inert gases. Visitors to the LNPP remove their shoes and don plastic booties and protective over-clothing, but this seems intended mainly for the amusement of the staff. In the Block 2 Reactor Containment Room, for instance, many employees do not wear any protective gear at all or even decimators, the device that measures radiation. officials at LNPP are touchy about suggestions that their plant could become another Chernobyl, and say a meltdown an not happen here. What they call the human factor is really very important, they can not underestimate this. It is what they depend on. It is referring to the

important of worker morale in maintaining good safety practices. Yet plant workers routinely get their government paychecks as much as six months late. And during the past two years, critics of the plant have discovered that at least three LNPP employees were heroin addicts.

One of them died of an overdose last winter, the others were sent to rehab. Russian environmentalists claim at least one addict had access to the vital control room of the facility, and others to radioactive-waste-storage facilities. Deputy chief safety engineer confirmed the heroin cases, but insisted that none of them had a critical position.

In Japanese Tokaimura's case, manufacturing sector is built on precision and discipline, well-paid workers casually broke every rule in the book, and two of them will probably pay with their lives. By mixing a huge amount of highly enriched uranium in buckets, they set off a "criticality event", an out-of-control chain reaction that forced authorities to order 300,000 nearby residents indoors. Tokaimura leak was serious, and other nuclear accidents have become dangerously commonplace. Japan reported yet another leak in this time, with South Korea made news with a spill that 22 nuclear workers to low-level radiation. International Atomic Energy Agency says that there were 508 unclear incidents between 1993 and 1998 October alone, an averages of more than one for each other of the world's 434 operating nuclear power plants.

2: The Nuclear Power Plants as environmental pollution.

Behind the mishaps is a simple face. Nuclear-power generation is well into its middle age. At plants around the globe, pipes, vats and controls have worn down dangerously, vastly increasing the chances of mishaps, both minor and major. Industry executives insist that unclear power in Asian, Western Europe and the United States remains safe. But the public is no longer buying it. In general speaking, many European countries are serious that the risk is unacceptable too high. Nuclear-reactor orders and start-ups ranged from 20 to 40 per year in the 1980s; in 1997 there were just two new orders, and five start-ups in worldwide.

In 1998, construction began on only four new nuclear reactors, in China, Taiwan and Japan. And output from U.S. nuclear plants has declined dramatically in recent years with tough new regulations. There seem to be no real future for the nuclear industry. It is clear nuclear power is on its way out. Yet that is easier said than done. Some 16% of the world's power now comes down nuclear plants. One third of Europe's electric production is generated by nuclear power. In some countries, the figure is far higher; France gets about three quarters of its power from nukes. That kind of dependence makes it impossible fro governments to simply turn off the

juice. But it is not the state of the plants in France, America or even Japan that keeps nuclear experts awake at night. It is what is going on in the former Soviet Union. Of the 58 Soviet-era reactors still functioning, 15 of them are RBMK-type reactors which are graphite-cooled and usually designed to produce weapons-grade plutonium as well as electric energy, identical Chernobyl. Although the Chernobyl explosion was results of human error, a decision by plant operators to run a disastrously risky test that had never been tried before, the design of the plant was major factor. RBMK reators have a tendency to get hotter when something goes wrong in the reactor core. Western plants are usually water-cooled, and tend to lose heat during an accident, making them easier bring under control.

Table 1: Nuclear Power in other Countries.

[The numbers of reactors in operation (N: Frequency) and nuclear share of electricity generated (E: %)].

Countries	N	E	A (Area of the worlds map)
1. U. S. A.	104	19	(NA)
2. France	58	76	(EU)
3. Japan	53	36	(A)
4. U. K.	35	27	(EU)
5. Russia	29	13	(ME)
6. Germany	20	28	(EU)
7. Ukraine	16	45	(ME)
8. S. Korea	15	41	(A)
9. Canada	14	12	(NA)
10. Sweden	12	46	(EU)
11. India	10	3	(A)
12. Spain	9	32	(EU)
13. Belgium	7	55	(EU)
14. Bulgaria	6	42	(EU)
15. Switzerland	5	41	(EU)
16. Slovak	5	44	(EU)

Note: Small countries, area of Europe countries, big power. Europe has more than half of the world's reactors.

Czech. R.: 4/21 (EU), Hungary: 4/36 (EU), Finland: 4/27 (EU), China: 3/1 (A), Argentina: 2/10 (SA), Lithuania.: 2/77 (EU), S. Africa: 2/7 (SA), Mexico: 2/5 (SA), Brazil: 1/1 (SA), Kazakhstan: 1/2 (ME), Pakistan: 1/1 (A), Rome: 1/10 (EU), Slovenia: 1/38 (ME), Armenia: 1/25 (ME), Netherlands: 1/4 (EU),

Notes: (A) EU=Europe, A=Asia, NA=North America, SA=South America, ME=Middle West, SA=South Africa.

(B) Soviet-designed reactors lack a rounded containment structure that limits the release of radiation in the event of a nuclear accident.

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(C) Officials have established chiefly multiple levels of serious nuclear events as following.

- 1 : 1957, Serious accident, Mayak, Russia: off-site radioactive release.
- 2 : 1979, accident with off-site risk, Three Miles Island, Pakistan: severely damaged reactor core.
- 3 : 1980, Accident without significant off-site risk, St-Laurnt, France: damaged to reactor core.
- 4 : major accident, Cherrnoby, Ukraine: Widespread disaster.
- 5 : 1989, serous incident, Vandellos, Spain: fire damage to plant.
- 6 : 1994, serious accident, Monjyu, Japan, damaged reactor core.
- 7 : 1999, serious accident, Tokaimura, Japan, Off-site radioactive release.

The West is worried enough about these aging plants to have ponied up at least 2 billion dollars so far to improve safety and training. But most experts agree that the only way to really make them safe is to shut them down. The U.S. department of Energy has compiled a secret list of the world's seven most dangerous plants, all are in the former Soviet bloc. Many Soviet-designed reactors pose significant safety risks because of inherent design deficiencies, deteriorating economies, political turmoil and weak regulatory oversight. As a class, these reactors, continue to experience serious incidents, raising the specter of another accidents akin to Chernobyl. Also, Soviet-designed reactors lack a rounded containment structure that limits the release of radiation in the event of a nuclear accident. Anyway, one hospital in Siberia has not had a normal birth in two years. At a local school, a third of students are sick each day.

3: The Chernobyl disaster and radio-phobia.

The people live near the old nuclear power plants are already living with the disastrous effects of radiation poisoning. Just ask the residents of Chelyabinsk, in the Ural Mountains of Western with nuclear facilities, but the most notorious is the Mayak Production Association, a reprocessing plant located about 50 miles outside of Chelyabinsk, near a town called Novogorny. In 1957, there was a mysterious explosion of the highly toxic radioactive isotope strontium-90 at Mayak, which injured 450 residents and workers. Since then, there have been half a dozen fatal incidents, including a 1967 explosion of cesium-137, a highly dangerous isotope, that spewed radioactive particles over a large area. People who live this small city, Novogorny, still draws its drinking water from Karachai Lake, where the complex dumps its radioactive waste. There is 15 times the limit of strontium-90 in the soil, 38 times the limit of cesium-137, 10 times the plutonium limit. But the authorities do not believe that when the wind blows, people

here all get headaches. They say it is just radio-phobia. Russian authorities have plenty to hide. A medical doctor in a village near mayak, says nearly every member of his family has some chronic medical problem; his youngest granddaughter was born with only six fingers. We do not have concrete statistics to prove it. But, he said he was born in 1939 and there used to be 50 people in the village his age, and now no more than 10 are left, and most of them are oncological cases. At the Novogorny hospital, the medical doctor, who would only give his name as Yuri, says there has not been a single normal birth there in two years, and he fears retaliation from officials for talking about this problem. in a population of 10,000, they have 30 or 40 new cases of cancer every days.

At the local school, chronic illness are so common that a third of this 230 students are out sick any given day, researchers from Mayak or LNPP in their midst, but their own aging unclear plants skill have plenty of problems of their own. At Britain's Sellafield nuclear-power site, a complex of eight reactors and two reprocessing plants, there were 27 level 1 and 2 incidents in 1998 and 1999, compared with just 32 worldwide in 1997. Three workers there were fired September in 1999 for allegedly falsifying safety checks on plutonium. Sellafield is home to the world's first commercial nuclear reactor, opened 1956 by then youthful Queen Elizabeth II, the facility was designed to run for 25 years. It is now pushing 43, and still going.

Britain, meanwhile, has become the first European country to actually decommission a reactor, the Dounreay plant near Thurso on Scotland's northern coast. The cleanup and shutdown process will take up to 100 years and cost 740 million dollars. Authorities acted after acknowledging that waste-storage units were leaking after finding mysterious hot particles on local beaches earlier this year. The sandlike particles are radioactive enough to blister someone who sat on them, and dangerous enough to kill a child who swallowed them. Officials say they do not know how they escaped the plant. That is one of the big problems with nuclear energy, there is a lot of that even the experts do not know. There is an almost allergic reaction to radioactive, it is the fear of the unknown. When asked if another Chernobyl could happen, a proponenter of the industry hedges that safety has improved throughout the world. But, there are no guarantees, and there is absolutely no reason for complacency. They have to do their best and cross their fingers. For the people living near Mayak, Sellafield, Sosnovy-Bor or anywhere else on earth, really crossed fingers are hardly enough.

4: Survey of social unrest problems between Irish and Japanese University Students.

The survey was conducted at the end of November in 1999 in Ireland in Japan about the attitudes toward social unrest and crisis among University students. In Ireland the subjects were 88 male and 89 female University of College Dublin (Departments of Sociology, Social policy and Statistics students in autumn semester. The mean of their ages was 20.66 old. The students were asked their opinions and briefs in the questionnaire and brought it with themselves to the research office. In Japan, the subjects were 201 male and 173 female undergraduate students at Sophia University (Roman Catholic), Aoyama Gakuin University, Seigakuin University (Protestant) majoring in liberal arts course such as psychology, sociology, and politics and economics. The mean value of their age was 20.27 old. The teachers collected the completed questionnaires.

Table 2 and Fig. 1 show the results of these students responses. We can see the Dublin's University students had not have an unrest attitudes toward Nuclear Power Plant more than Japanese one. It seemed that Japanese students had an experience of crisis of distortion of Nuclear power plant in the end of September, 1999, and had terrible anxiety of its event. But, in the Ireland Dublin's students had not such experiences of crisis, because they have not any nuclear power plants in their country. These response seems to be as the common sense in the worldwide.

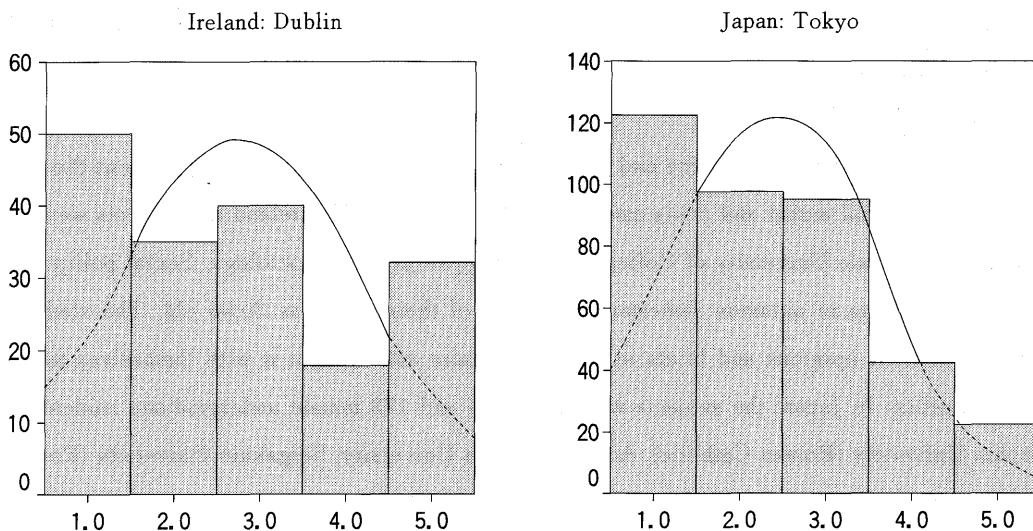
Table 2: Nuclear Power Plant.

In the following list which of the items do you consider to be a real problem for your countries? Please exclude consideration of whether you are involved in the problem or not.

Comparison of unrest of nuclear power plants between Ireland and Japanese University Students.

	Dublin	Tokyo
1	48.6	58.6
2	22.6	24.4
3	28.8	16.9
	N=177	N=374
	M=2.77 SD=1.45	M=2.3 SD=1.2
	V=52.35	V=52.17

Fig. 1: Frequency distribution of social unrest toward nuclear power plants



- Scale points: 1: I believe this is a real problem.
 2: I believe this is a problem.
 3: Neither
 4: I believe this is not a problem.
 5: I believe this is not a problem at all.

5: Consideration.

On the subject 'the next Chernobyl', we should be discuss more. The sudden split-up the Soviet-Union left the newly independent Kazakhstan, Belours, and Ukraine with 2400 nuclear warheads and 360 intercontinental ballistic missiles on their hands. Taurus negotiation led to agreement that these countries would destroy their strategic weapon's or ship them to Russia to be dismantled. However, soon Ukraine balked, demanding money for the uranium or platinum in the warheads. Others hemmed and hewed. The US was slow delivering promised funds to speed the process. As the results, the task of shipping and dismantling has barely begun. According to the Russian newspaper, IZEESTIA, facilities and maintenance at the Ukrainian missile silos are so poor that another Chernobyl is looming. Workers are exposed to twice the allowable levels of radiation, and security systems have been broken at twenty weapons sites. meanwhile the Ukrainian minister of the environment has charged that Russia, which is supposed to service and maintain the Ukrainian warheads, has refused to do so until Ukraine admits that they are Russian property, which the Ukrainians refuse to do. These giant unclear-tipped Intercon-

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tinental Ballistic Missiles (ICBMs) thus remain targeted at the US. In Kazakhstan, some may be aimed toward China as well. It is not even clear any longer who has or has not cracked their control codes, and therefore which country is capable of firing them independently. Anyway, many of our most serious environmental problems from air pollution to toxic waste are by products of the old, industrial methods of creating wealth. By the contrast, the new system, with its substitution of knowledge for material resources, its dispersal, rather than concentration, of production, its increasing energy efficiency, and its potential for dramatic advances in recycling technologies, holds out the hope of combining ecological sanity with economic advance. Will the advanced economics wind up making ecological welfare payments to the Brazils and Indias of the world to deter them from destroying rain forests, jungles, or other environmental resources? What about natural disasters in a newly networked world economy? We have another social unrest only nuclear power plants but serious matters, drug-related crime, cloning human beings, AIDS, terrorism, transplanting organs in humans, increasing use of genetic engineering, and so on. Human beings faced on the crisis really as to their curiosities, knowledge, and other brilliantly clear intellectual abilities. To assume that such social events will happen anywhere in the worldwide, we will live dramatically different global order diverse and risk-filled, and we know that the somethings of power toward human being is hidden shift in the relationships between violence, wealth and knowledge as societies speed toward their collision with tomorrow. It is dangerous for global environmental pollution in the future.

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