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IMA Final Report - Conclusion



Press Conference on IMA Final Report held on 20 November at the foreign press club in Tokyo

Having been long involved in issues of Japanese and world-wide civil plutonium programs, CNIC felt it urgent to conduct an independent full scale impact assessment of MOX (mixed oxide of uranium and plutonium) use in LWRs and applied for a research grant at the Toyota Foundation in 1995. The proposal for the project, Comprehensive Social Impact Assessment on MOX Use in Light Water Reactors (IMA= International Mox Assessment), was approved by the foundation and started in November 1995 as a two-year project.

Now that the project period has reached the end, and the final report has been released in Tokyo on 20 November, we would like to present to the readers of Nuke Info Tokyo the Conclusion from the 300-page report.

-- by Jinzaburo Takagi

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- IMA Final Report: Conclusion

An international study group was organized with Jinzaburo Takagi and Mycle Schneider of WISE-Paris serving respectively as the Project Director and Assistant Director, and seven other people from Germany, U.K. and Japan who served as co-researchers. Experts from France, Germany, Japan, Russia, U.K. and U.S. also joined as advisors.

IMA Project Co-researchers:

Jinzaburo Takagi (Project Director, Citizens' Nuclear Information Center); Mycle Schneider (Project Assistant Director, WISE-Paris); Frank Barnaby; Ichiro Hokimoto (Kokugakuin University); Komei Hosokawa (Saga University) Chihiro Kamisawa (Citizens' Nuclear Information Center) B.Nishio (Citizens' Nuclear Information Center) Alexander Rossnagel (Kassel University) Michael Sailer (Oeko Institut)

Plutonium is essentially a man-made radioelement which occurs in nature only in very minor quantities in a handful of locations on this planet. Every uranium fuelled commercial size nuclear reactor (1,000MW) produces roughly 200 kg of plutonium per year. Initially, plutonium-239, the most important fissile isotope of plutonium with a half life of 24,000 years, had been produced in a sizable quantity to fabricate weapons of mass destruction, which showed its terrible efficiency at Nagasaki in 1945.

- One of the Most Toxic Elements Known to Man

Plutonium-239 is a well-known carcinogenic (cancer-causing) substance, but reactor grade plutonium, which consists of a combination of various isotopes of plutonium and is commonly used in civil plutonium programs, is eight to ten times more toxic by weight than pure plutonium-239.

One gram of reactor grade plutonium oxide corresponds to the cumulated annual limit of inhalation for as many as 40 million people.

This order of magnitude should be kept in mind when discussing plutonium production and stocks in the order of dozens of metric tons.

- FBR Abandoned-MOX Fuel Prompted

Beyond military uses, plutonium separation had been originally justified by the development of fast breeder reactors. However, fast breeder reactor programs have been abandoned entirely in the USA and Europe. The French government has acknowledged the failure of the program and shut down definitely the Western world's only industrial scale fast breeder reactor Superphenix. In Japan the Monju reactor has been shut down since a sodium fire devastated the plant in December 1995. There are no realistic perspectives for any significant future breeder program in Japan. As a consequence, MOX (uranium-plutonium mixed oxide fuel) is being prompted to absorb vast plutonium stocks arising as a consequence of earlier decisions on plutonium separation.

- Plutonium Stockpiles Still Growing

By year 2000 the US-Russian stockpile of separated weapons plutonium (outside weapons) will be roughly 160 tons. In addition, the civil plutonium stocks continue to rise, especially in Europe. In 1996, worldwide about 22 tons of plutonium were separated and only 8 tons were used as MOX and in FBR programs. The total stock was estimated by the IAEA to be about 160 tons at the end of 1996. The Japanese stockpile was about 16 tons at the end of 1995, according to the Japanese government, or roughly 10% of the world's stockpile, it will increase its share and reach 30 tons and 70 tons in 2000 and 2010 respectively, according to an estimate by the Group.

- Any Plutonium is Potential Primary Bomb Ingredient

There are various "qualities" of plutonium. However, the Group's analysis has clearly established that:

Plutonium of almost any isotopic composition, and in particular plutonium separated from spent fuel of any nuclear reactor currently operating in Japan, can be used for the manufacturing of a nuclear explosive device. Reactor grade plutonium in the form of oxide crystals in spherical shape has a critical mass of about 35 kg. The radius of this sphere would be about 9 cm, the size of a cantaloupe. The transformation of plutonium oxide into metal - a straightforward chemical process - reduces the critical mass to 13 kg which would be still reduced if a neutron reflector like natural uranium was used.

Persistent statements by the plutonium industry as to the inadequacy of reactor grade plutonium for the manufacturing of an explosive device are misleading and scientifically incorrect.

- Weapons Plutonium to MOX: A Countproductive Proposal

In a 900-MW(e) light-water reactor which can use MOX in a third of the core, about 170 kg of weapons plutonium could be absorbed a year. Besides the build-up of an entire plutonium alloy conversion and MOX fabrication infrastructure, it would take 30 of these reactors operating for at least 30 years to handle the 140 t of military plutonium to be removed from dismantled nuclear

weapons in the next ten years.

This activity would contribute to the dispersion of plutonium to a large number of facilities over a long time span and thus encourage nuclear proliferation rather than prevent it.

- Safeguards: Not up to the Challenge

Independent experts have calculated that, in the case of a large reprocessing plant (capacity of 800 tons of spent fuel per year), even if the error margin in the operator's computer calculation is as low as 1%, the minimum amount of diverted plutonium which could be detected with a probability of 95% and a false alarm probability of 5% is about 220 kg, enough to produce 6 to 10 crude nuclear bombs.

Problems of safeguarding of MOX fuel fabrication plants and fresh MOX fuel at reactor sites have been rated "high priority" by the IAEA as early as 1987. However, in 1994 it was disclosed that 70 kg of plutonium were held-up (stuck to surface) in remote-handling equipment at the Tokai Plutonium Fuel Production Facility.

It is chemically of no difficulty to extract plutonium from fresh MOX fuel. With the storage of fresh MOX fuel, the reactor sites thus become direct weapons use material storage sites. In 1996, the IAEA was confronted with the problem of the refusal by the operator of a German nuclear power plant of MOX fuel verification.

- Physical Protection: Defeatable

Detailed descriptions of current physical protection concepts are, for obvious security reasons, not in the public domain. However, independent experts have had a good insight into containment and surveillance systems and estimate that these systems can be defeated or circumvented. In particular the spectacular increase in plutonium and fresh MOX transports as well as MOX storage at reactor sites is of great security concern. The US Department of Energy suggests that a special protection system guarded with "deadly forces" be necessary for MOX irradiation of weapons plutonium in commercial reactors.

- Nuclear Terrorism: An Increasing Threat

Increasing availability of plutonium and the existence of highly trained terrorist organizations make the escalation to nuclear terrorism more likely than ever. Some of these organizations have shown an unprecedented level of cruelty and the use of means of mass destruction. There can be no doubt that some of these groups would be in a position to manufacture a crude nuclear device or to deliver a credible equivalent threat.

- Safety of MOX Fuel Production and Use Questionable

The industrial experience with MOX is very limited as compared to UO₂ fuel. The number of MOX assemblies used worldwide represents less than 0.2% of the total LWR fuel assemblies and even in Germany which, besides Japan, is the largest foreign reprocessing client of the French and English plutonium industries, the share does not exceed 4% (200 t of MOX against 5,000 t of UO₂ fuel).

Certain properties of MOX fuel can have a negative impact in the reactor use, in particular in case of certain transients:

- The melting point of MOX is lower by 20-40 C as compared to uranium fuel.

- The thermal conductivity of MOX fuel decreases systematically with increasing plutonium content.

- Reduction of neutron absorbing capacity of the control rods.

- Change of certain reactivity coefficients takes place, making a MOX-loaded reactor core more difficult to control under certain conditions.

- Power peaks are increased.

- The delayed neutron fraction is reduced, making the control more difficult.

- The neutron spectrum is hardened.

In general, MOX fuel lowers the safety margin of a light water reactor. In addition, there are considerable uncertainties in regard to safety-related aspects of MOX burning in light water reactors, particularly at large plutonium enrichment and high fuel burn-up.

- MOX would make severe accidents Even Worse

In case of a severe reactor accident with containment failure, the dose at a given distance would generally be 2.3 to 2.5 higher in the case of the MOX fuelled (a third of core loaded with MOX) reactor, implying that health effects of the radioactivity release would increase by the same factor. In other terms, the distance of various health impacts increases so that the actual increase in social impacts would be 3.2 to 4 times higher if social impact is assumed to be proportional to the affected area (since the area is proportional to the square of the distance).

- MOX Fuel Chain Introduces Risks at All Steps

The necessary manipulation of plutonium in all steps of the MOX fuel chain including reprocessing, fuel fabrication and handling of spent fuel makes each operation potentially more hazardous than in the case of the uranium fuel chain. Particularly, intensive radioactive discharges from a reprocessing plant cannot compare with other nuclear facilities and pose serious environmental and health risks.

- MOX Increases Fuel Costs Significantly

The Group's own economic analysis shows that the introduction of MOX to a third of core will raise the fuel costs of LWRs by a factor of about 2.5. There is no economic justification for the MOX use in light water reactors. Some cost overrun in Japan can be attributed mainly to high construction costs in Japan. While this disadvantage can be avoided by commissioning reprocessing and MOX fabrication to European companies, this would not result in net cost reduction since the long distance shipments of radioactive materials have a net negative economic effect.

- Cask Dry Storage Best Available Interim Storage Option

As far as technical conditions are concerned and if compared with wet pool type and can type storage systems, the cask storage is considered to be the best option for the direct storage strategy from the safety point of view, because it relies mostly on relatively simple and cheap passive safety features.

- Direct Fuel Disposal Preferable Option for an Optimum Backend Policy

The direct spent fuel storage option is the preferable path if compared to reprocessing for a large number of reasons, and in particular according to the following criteria:

- Waste volumes: The reprocessing path generates at least six times more waste than the direct disposal path, probably even significantly more.
- Radioactive discharges: Reprocessing facilities release very large quantities of liquid and gaseous discharges, the Direct Disposal option virtually none.
- Transports of radioactive materials: More than 200 waste shipments between Europe and Japan associated with the reprocessing option are expected to be carried out in the coming decade.
- Interim storage: Reprocessing is certainly not a credible path to combat insufficient interim storage capacity; technically it can be increased without difficulty.
- Waste heat management: The thermal output of spent MOX fuel is by a factor of two to more than three higher than that of UO₂ spent fuel.

- Severe Societal and Legal Implications of MOX Use

Currently, the citizens in Japan are virtually deprived of the rights and power to intervene effectively as an equal party in legal procedure and decision-making process in regard to nuclear issues and freedom of information is not guaranteed. Recent developments indicate that through the administration of local governments the public participation could perform an effective function. However, because commercial and security-related secrets possessed by the enterprise are always justified in regard to a plutonium program on the ground of "safety and security of the public" and thus contradict with any principle of public participation, a MOX program will always tend to contradict democratic, participatory and transparent decision-making processes.

- What if the Japanese Official Plutonium Long Term Plan Went Ahead? - A Security Scenario

If the Japanese Long Term Program on plutonium went ahead, around 90 plants including plutonium stocks and fuel fabrication plants would have to be protected. About 400 shipments of MOX fuel, may be 40% of them from Europe, would be needed. Roughly 30 to 60 shipments of HLW from Europe to Japan also have to be protected. The protection of the 90 plants would need about 5,400 security guards (15 guards in 4 shifts around the clock).

Reactive steps to a nuclear crisis have to be planned well ahead. Technical elite units like the Nuclear Emergency Search Team in the US have to be established. Additional police forces have to be trained in particular to deal with such a nuclear emergency.

If society uses plutonium, it will come under pressure to intensify security. If the threats beyond its control increase society has no choice. Its security measures will restrict civil liberties.

- Plutonium and MOX Transports - Security and Safety at Stake

The case of the planned MOX program for Fukushima I-3 illustrates well a typical case of transport scheme. Nuclear materials and wastes go several times back and forth between Europe and Japan. Even if one considers only one transport per type of shipment, the distance to be travelled by nuclear materials totals some 100,000 km or more than twice around the world: a nightmare for security officials and insurance companies

The Co-Researchers of the IMA-Project conclude that the disadvantages of the Plutonium-MOX path versus the Direct Fuel Disposal option are overwhelming whether on the level of industrial, economic, security, safety, waste management and societal implications. In other words, there is no reasonable justification or identifiable social benefit in the continuation of plutonium separation and the launch of a MOX fuel program for light water reactors.

The 1997 Right Livelihood Award to be Presented to Jinzaburo Takagi

-- Founded in 1980, the Right Livelihood Awards were introduced "to honour and support those offering practical and exemplary answers to the most urgent challenges facing us today." The idea came from Jakob von Uexkull, a Swedish-German philatelic expert, who sold his valuable postage stamps to provide the original endowment.

-- From the Right Livelihood Foundation Press Release

The Award recognises in Mycle Schneider (France) and Jinzaburo Takagi (Japan) a unique partnership in the struggle to rid humanity of the threat posed by the manufacture, transport, use and disposal of plutonium. They are honoured "for the scientific rigour of their research and the effectiveness of their dissemination of its results, which have served to alert the world to the unparalleled dangers of plutonium to human life, and empowered many to resist the misinformation and the secrecy whereby the plutonium industry imposes these dangers on the public."

Jinzaburo Takagi came to these issues as associate professor of nuclear chemistry at the Tokyo Metropolitan University (TMU). He was born in 1938, graduated in 1961 from the University of Tokyo and spent four and a half years working for the nuclear industry and

another 4 years for the nuclear institute at the University of Tokyo, winning the Asahi Science Encouragement Award in 1967, gaining his doctorate in 1969 and being Guest Scientist at the Max Planck Institute for Nuclear Physics in 1972-73. When he left TMU in 1975 to set up the non-profit Citizen's Nuclear Information Center (CNIC), he stepped off the ladder to top status within the nuclear elite. He has directed CNIC ever since, reporting on the results of their analytical and public education work through the CNIC publications including CNIC Monthly in Japanese and the bimonthly Nuke Info Tokyo in English. Takagi has written many books and innumerable articles on nuclear issues, environment protection and peace, with special emphasis on the fight against the nuclear threat as well as human rights.

Upon Receiving the Award

by Jinzaburo Takagi

Receiving the award is a particular honor for me because, firstly, I know that many highly respected people who have marked really excellent achievements have received the Award in the past; and secondly, I was nominated for the Award by Professor John Gofman, a 1992 RLA recipient, for whom I have the greatest respect as a scientist; and thirdly, I have the pleasure of sharing the Award with one of my dearest friends, Mycle Schneider.

Following news reports of my winning the award, I received a large number of letters, telegrams, phone calls, faxes, e-mail, flowers and so on from people all over Japan, mainly from people belonging to local grass roots groups. Many of the messages included not only congratulations but words of thanks. They are words of appreciation not just to me but rather to the RLA foundation and the Jury, since they feel that the Award is a great encouragement to them. They really share the honor with me. I believe that this is also an honor to the Foundation, because nothing can be more becoming to the Right Livelihood Award than such an acceptance by a large number of people with a commonly shared feeling

Last but not least, I would like to express my gratitude to all the staff members of CNIC for their dedicated hard work under adverse conditions.

Plan for Third High-Level Waste Shipment Announced

On October 2, Japan Nuclear Fuel Ltd. (JNFL) announced the shipment plan for the third batch of high-level glass logs from France. This plan calls for ocean transportation of 60 glass logs to Mutsu-Ogawara Port, between January and March 1998. The 60 logs would be placed in three shipping canisters, each containing 20 logs.

According to JNFL's permit application, the logs were made by COGEMA between the latter half of 1992 and the first half of 1995. Each weighs between 470 and 509 kg, has a heat output of 1.4-1.8 kW, and radioactive contents of $1.6\sim 2.5 \times 10^{14}$ Bq for total alpha radiation and $1.5\sim 2.1 \times 10^{16}$ Bq for total beta radiation. The trend is for slight increases in the upper limits of both heat rate and radioactivity from the first to the second, and from the second to the third shipments, which suggests that wastes with gradually higher concentrations of radioactivity will be coming back to Japan.

JNFL has released no information on the shipment, claiming that "negotiations are in progress."

Transport of Spent Fuel to Rokkasho Reprocessing Plant Postponed

On October 27, JNFL announced it has postponed the shipment of spent fuel to the under-construction Rokkasho Reprocessing Plant until March 1998.

Aomori Prefecture, which hosts the facility, has been asking the government to set up "Nuclear Fuel Cycle Council" for addressing safety concerns against the Rokkasho Reprocessing Plant as a condition to begin accepting spent fuel there. In response, the Ministry of International Trade and Industry (MITI), the Science and Technology Agency

(STA), and Aomori Prefecture held a preliminary meeting, at which they decided to provide a venue for discussions between the government and local community.

Furthermore, JNFL and Aomori Prefecture must sign a safety agreement to allow spent fuel shipments to the Rokkasho plant, but progress toward signing this agreement has come to a standstill in the wake of the fire and explosion at the Tokaimura reprocessing plant, and the problems at the languishing fast breeder Monju project. The future of Japan's entire nuclear fuel cycle plan has become increasingly uncertain, causing apprehension among both community residents and members of the pro-nuclear fuel cycle prefectural assembly concerning the plan.

Morio Kimura, Governor of Aomori Prefecture, has stated he will convene a deliberative meeting of all prefectural assembly members before signing the safety agreement. That meeting, however, is yet to be scheduled, making it possible that the spent fuel shipment to Rokkasho will be postponed even further.

There is also speculation among a group of people that the governor will use the issue of spent fuel shipments for political leverage in negotiating an extension of the Tohoku Shinkansen train line to Aomori City. Should that happen, signing of the safety agreement could be influenced by progress in the assembly's deliberations on next year's budget proposal. Whatever the case, concluding the safety agreement, which would give the green light for spent fuel shipment, must not be carried out arbitrarily by ignoring Aomori citizens' misgivings about the reprocessing plant.

-- by Masako Sawai

FBR Development Lost in Cloud

-- FBR Panel Report Continues to Advise Monju Resumption

The Science and Technology Agency's (STA) Fast Breeder Reactor (FBR) Advisory Panel released its preliminary report on 14 October. Formed in February 1997, the advisory panel has been discussing how FBR research and development should be carried out. The final report is expected to be completed and submitted to STA as early as late November, after accepting opinions from the general public on the report for a period of one month.

Although the final report is yet to be completed (how the opinions from the general public will be treated is unknown), the basic argument probably will not change. The following is the anticipated argument:

Under the current long-term nuclear development and utilization plan, the first demonstration reactor will be constructed within a few years after 2000, and commercialization will begin around 2030. According to the preliminary report, this tentative timetable will no longer be applied to Monju, which represents a drastic retreat from previous plans.

However, considering FBR as one of the important options in non fossil-fuel energy resources, the report suggests that the prototype FBR Monju resume operation with more weight placed on research rather than development. Breeding will no longer be considered the only purpose, and it is likely that Monju will be used as research reactor for incinerating plutonium.

The concrete plan for the construction of a demonstration reactor to follow the prototype, will be determined after examining the results of the Monju research. Depending on the future energy situation, STA will remain flexible in reaching a decision on whether or not to build the commercial reactor.

Reading the preliminary report, it seems that the only thing that has changed is the removal of the timetable for the development of Monju. Such progress may seem small compared to the decision to resume the operation of Monju itself, for which the only reason the report offers for justification is that otherwise the money and labor that was poured into the plan would be wasted. But this indicates that even AEC and the Advisory Panel cannot come up with any substantial reason to restart Monju.

The report also calls for the need to obtain agreements from the public and local residents,. However, nowhere does it give any suggestions as to how they should go about obtaining such agreements.

In addition to accepting opinions from the general public before submitting the final report, the panel also held a hearing where 20 people were selected by lottery to voice their opinions on the preliminary report. The hearing was held for about three hours in Tokyo, and each speaker was given five minutes for presentation. Many concerned citizens demanded AEC and the Advisory Panel extend the one month period set for submission of public opinions, and also offer similar three hour hearing sessions in other parts of Japan, however AEC never gave any response, and the opinion gathering closed on 7 November.

Many citizens, including residents of Fukui Prefecture where Monju is located, are completely against the resumption of Monju operation. Therefore, even if the contents of the final report turn out to be almost the same as the preliminary report, the outlook on when Monju will actually resume operation is likely to remain vague.

-- by Hideyuki Ban

Wither the Kyoto Conference?

Whether the COP3 (the Third Conference of the Parties to the U.N. Framework Convention on Climate Change) will succeed or not is still vague as I write this article in mid-November. Decisions which will be very important for the world's energy future may have been reached by time this article gets read by our international readers after the Conference has been concluded. We cannot expect too much from the Conference, with Japan acting as the host and chair country. We are watching the government's behavior as in promoting domestic discussions on COP3 and setting up its weak target for reducing CO₂ emission. The report of the Citizens' Conference on Sustainable Energy Future, co-organized by CNIC and Friends of the Earth Japan on 2 Dec., will be covered in the next issue. In this issue, we are going to give a brief explanation of CNIC's position concerning climate change, through a summary of my opinion paper which was presented at the 27 October hearing of the joint council on government's policy on global warming, which consists of nine advisory committees examining the government's climate change policy. (Mika Ohbayashi)

Climate change is one of the most serious environmental problems faced by the earth, and thus should be considered one of the most urgent issues. However, Japan's current argument on global warming is focused only on the percentage of CO₂ emissions to be cut down, neglecting the review of its basic energy policy. The recent report, "Japanese Government's Proposal on Target Numbers" was reflective of this attitude. The Ministry of International Trade and Industry (MITI) plans to revise, in order to realize this proposal, "Energy Consumption in 2010" in the "Long Term Energy Supply and Demand Outlook" and to keep the level at the 1996 level. However, as for nuclear power, the Ministry is determined to keep to the "Outlook" and hopes to increase the capacity to 70,500MW, which requires the construction of 20 more reactors.

Nuclear Power is very inefficient as an energy source. It can only recover 33% of energy put in and co-generation cannot be applied. If more nuclear reactors are built, it will raise the ratio of electricity in the overall power mix, since nuclear power produces only electricity. This leads to a greater consumption of energy. According to our research, the more the nuclear power and the greater the electricity ratio becomes, the more energy that will be lost. A plan to build a further 20 enormous nuclear facilities in the next 15 years would only increase energy demand in many fields, not reduce it. Furthermore, if more nuclear reactors are to be built, fossil-fuel plants will also be needed as a backup source in case of nuclear accidents and for regulating supply and demand. Nuclear power and coal-fired plants go together as a matter of necessity.

The government's nuclear power promotion plan is far from realistic. For plants that began operation in 1990's, it has taken about nine years on average from the granting of a licence to the beginning operation. Even if all plans that the government has are to be realized, less than ten of the proposed reactors will be in operation by 2010. It is also becoming increasingly difficult to find new locations for reactors as can be seen in places like Kushima, Miyazaki Prefecture and Maki, Niigata Prefecture where there has been strong local resistance.

The government's proposal is to reduce CO₂ emissions without reducing energy consumption. Therefore it says it has to increase power generation by nuclear power. Furthermore, it has not considered the real issue of reducing gas emissions, and tries to maintain current policies. However, what is really needed is to reduce energy consumption in order to reduce CO₂ emissions.

The introduction of renewable energy sources such as solar, wind, and biomass, as well as co-generation should be carried out immediately; not the promotion of nuclear power and fossil-fuel plants. Japan's energy policy is based on considering the needs of financial circles and not environmental concerns. A handful of bureaucrats coming up with certain numbers in a closed room without explaining to the population the reason for it is not the way energy policy decisions should be made. We urgently need a policy decision-making process that is clear and open to the public.

NEWS WATCH

AECL Asks PNC for Help in Disposal of Plutonium from Dismantled Nuclear Warheads

Power Reactor and Nuclear Fuel Development (PNC) and Atomic Energy of Canada, Ltd. (AECL) held a "professional meeting on the disposal of plutonium from dismantled nuclear weapons" on 14-15 October at PNC's Tokai office in Ibaraki Prefecture. AELC has a plan to burn MOX fuel made with plutonium taken from dismantled U.S. and Russian nuclear warheads in CANDU reactors. The professional meeting was arranged when AECL asked for technological help from PNC, which has experience in producing MOX fuel for the ATR Fugen. An officer from the Russian Ministry of Atomic Power (MINAT) was also present at the meeting.

The fact that PNC is likely to meet AELC's request is considered a big problem because it could be a deviation from Japan's principle of limiting nuclear power to "peaceful use."

Bidding Prices on Turkish Nuclear Power Plant Construction Made Public

The government-owned Turkish Electricity Generation and Transmission Corporation (TEAS) announced on October 16 the bidding prices for the construction of Akkuyu, the nation's first nuclear plant. The lowest price was tendered by Nuclear Power International (NPI), a joint venture between Siemens AG of Germany and Framatome et Compagnie of France, followed by a consortium that includes Atomic Energy of Canada Ltd.(AECL) and Hitachi of Japan. The highest price was bid by a consortium that includes Westinghouse Electric Corp. of U.S. and Mitsubishi Heavy Industries.

TEAS intends to conduct an assessment of these bids by April 1998, and sign a contract in June. It expects to begin operation of the first reactor in 2006. Meanwhile, the construction plan is expected to meet some hurdles, such as the problem of raising funds. Furthermore, it is still unclear as to whether these three groups will be able to meet the conditions presented by TEAS.

Asia Nuclear Safety Congress Meeting Held in Seoul

A meeting of the Asia Nuclear Safety Congress was held on 29-30 October in Seoul, the second such meeting following the first held in November last year in Tokyo at the proposal of Japan's Premier Ryutaro Hashimoto. The meeting was attended by 9 official member-countries: Japan, South Korea, China, Australia, Indonesia, Malaysia, Thailand, the Philippines, and Vietnam; plus 7 countries including the U.S., France and Germany which served as observers; and four international agencies including IAEA.

Although South Korea has proposed the establishment of a so-called ASIATOM, a decision was not reached because Japan and other countries were reluctant. A consensus was reached on other issues such as information exchange among nuclear safety regulating bodies, and quick reporting on accidents. The host country of the next meeting is yet to be decided.

PNC's Safety Inspection Finds 1,743 Problems

Power Reactor and Nuclear Fuel Development Corp. (PNC), notorious for its endless problems including accidents, sloppy waste management, and concealment of related information, published on October 24 an interim report of the complete safety inspection conducted at all of its facilities. According to the report, there were a total of 1,743 items found to be in some way problematical. Among them were 13 cases of clear illegality and 306 cases suspected of being illegal.

One case that was a clear violation of the law was the falsification of inspection records for transport casks used to carry plutonium returned from France. Although in-house inspection is required annually on all 133 casks to prevent problems such as leakage, it was found that the inspection was being conducted on only 40 casks and the records for the remainder were being falsified. It was also found that fuel holders that had not received design approval were being used in casks for carrying MOX fuel to the ATR Fugen. Further investigation is currently being carried out to

find out how many transporations took place without approved fuel holders.

The Interim report does not refer to the ATR Fugen and FBR Monju, as inspection work at these sites has been delayed. It is thus expected that more problems will be revealed when the full report becomes available.

Japan's Reactor Makers Welcome Decision to Lift Ban on U.S.-China Nuclear Agreement

During U.S.-China summit meeting held on October 29 in Washington, DC, a decision was taken to lift the ban on the bilateral agreement for peaceful use of nuclear power, which was signed in 1985 but had been frozen since then. The decision will make it possible for U.S. reactor manufacturers to export nuclear equipment to China. Japanese manufacturers welcome this move, hoping it will help them launch exports to China together with U.S. manufacturers.

-- by Baku Nishio

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