



보 도 자 료

더불어민주당 후쿠시마원전오염수해양투기저지총괄대책위원회
〈상임위원장 우원식/공동위원장 위성곤, 어기규, 정춘숙 / 간사 양이원영〉

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수신: 각 언론사 정치, 외교, 원전, 환경담당기자(산업부, 외교부, 환경부, 과기부, 해수부 등)

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[기자회견문]

후쿠시마 원전사고 기존 오염분석도, 폐로 계획 검증도 없는 IAEA 종합보고서, 모니터링과 독립과학자와의 기술토론을 다시 한번 제안합니다.

- 후쿠시마 원전사고로 인한 기존오염에 대한 분석없음
- 폐로계획에 대한 검증이 전혀 없어 오염수 해양투기가 언제까지 이루어질 지 알 수 없음
- 장기적 관점에 대한 영향평가 모델이 전혀 검토되지 않았음

더불어민주당 후쿠시마원전오염수해양투기대책위원회는 지난 7월 24일 국제원자력기구(IAEA)의 후쿠시마원전오염수 해양투기 검증과 관련한 3번째 질의를 보냈습니다. IAEA는 3번째 질문에 대한 답변을 지난 8월 25일 민주당에 보내왔고 오늘 이를 분석한 내용을 공개합니다.

IAEA의 답변은 여전히 부실합니다.

후쿠시마 원전은 정상원전 구역이 아닙니다. 2011년 폭발사고로 인한 사고지역입니다. 이미 다양한 방사성핵종으로 오염된 지역입니다. 하지만 IAEA는 후쿠시마 원전오염수 해양투기에 대한 검증과정에서 기존오염에 따른 위험성을 전혀 검토하지 않았습니다. 후쿠시마 원전오염수로 인해 추가되는 방사성물질 방류 모니터링을 하기 위해서는 이에 대한 기존오염평가가 우선되어야 하지만 IAEA는 이를 일본정부가 담당할 일이라고 회피했습니다.

후쿠시마 원전 폐로계획은 후쿠시마 원전오염수 해양투기의 양과 기간을 가늠할 수 있는 중요한 검증사항입니다. 하지만 IAEA는 이에 대한 검토가 전혀 없었으며 일본의 계획에 따른 오염수 방류만 검증했다는 말만 반복하고 있습니다. 사실상 후쿠시마 원전오염수 해양투기는 30년이 아니라 수백년 걸릴 수 있다는 방증입니다.

후쿠시마 원전오염수 해양투기로 인한 지역 해양생태계와 축적된 먹이사슬의 영향을 분석하기 위해서는 장기적인 관점을 고려한 시뮬레이션이 필요합니다. 하지만 구체적으로 어떤 프로그램을 이용해 평가했나는 질문에는 “비교적 단순하고 보수적인 모델(relatively simple and conservative models are applied in the REIA.)”을 사용했다고 답했습니다. 사실상 어떠한 검증이 있었는 지 확인조차 할 수 없는 무성의한 답변이었습니다.

국제적으로 환경영향평가, 원전안전 등에 적용되는 최인가용기술(BAT)에 대한 적용에 대한 질문에도 “처리기술의 선택과 성능을 평가요소가 아니었다(the choice of treatment technology and its performance was not a relevant factor for assessing compliance with the relevant international safety standards.)”며 고려조차 하지 않았다는 것을 다시 한번 확인했습니다.

동경전력의 방사성환경영향평가에는 개인피폭최대선량기준을 평가하는 부지경계를 정상원전과 달리 기존 부지경계에서 10Km 밖으로 확장하였습니다. 이러한 편법평가에 대해서도 IAEA는 “샘플이 10km 경계 내부(및 외부)에서 채취(From this it can be seen that samples are taken from within (and outside) the 10 km boundary)되고 있다”는 동문서답만 늘어놓으며 이러한 부당한 평가에 대한 답변은 내놓지 못했습니다.

오히려 IAEA는 민주당의 질의에 적반하장으로 후쿠시마 원전오염수는 ALPS시스템 등을 통해 삼중수소를 제외한 방사성물질을 제거한 ALPS 처리수라고 일본의 입장을 변호하고 있습니다.(Therefore, what Japan plans to discharge is the ALPS treated water and not the wastewater or contaminated water.)

ALPS 시스템을 거치고 나더라도 다종의 방사성핵종이 남아있는 것을 차치하더라도 IAEA의 주장대로 오염수가 처리수라면 더이상 해양환경을 오염시키지 않고 농업용수 등으로 활용되는 것이 상식일 것입니다. 후쿠시마 원전오염수는 여전히 방사성물질로 오염되어 해양에 투기되고 있는 오염수가 맞습니다.

더불어민주당은 부실한 IAEA의 답변에도 불구하고 국민의 걱정과 우려를 불식시키고 과학적 진실을 위해 다시 한번 IAEA에 공개 질문을 합니다. 부디 질문에 대한 회피보다는 과학적 진실에 기초한 답변을 요청합니다.

아울러 후쿠시마 원전 오염수 관련 국제원자력기구(IAEA) 모니터링 TF 소속 국제 독립과학자 그룹과의 공개 토론회도 다시 한번 제안합니다.

2023.9.25.

더불어민주당 후쿠시마원전오염수해양투기저지총괄대책위원회

<4차 질문>

첫째, 도쿄전력의 방사성환경영향평가(REIA)에 적용된 “비교적 단순하고 보수적인 모델”은 구체적으로 어떤 모델인가요? 후쿠시마 원전사고로 발생한 환경영향에 더해 추가적으로 발생하는 후쿠시마 오염수 방류에 따른 영향은 어떻게 분석하였습니까?

둘째, 장기적인 영향을 고려하는 사고원전의 오염수 배출에 대한 IAEA 국제기준은 무엇입니까?

셋째, 미국 등의 다른 원전운영국의 ALPS 시스템과 일본 ALPS 시스템의 성능상 비교는 이루어졌습니까? 최적의 대안, 기술을 검토해야한다면 이에 대한 평가도 이루어져야 하지 않습니까?

넷째, 후쿠시마 오염수 배출에 대해 최상의 기술(BAT) 등을 고려하지 않은 것으로 확인되었습니다. 추후 최상의 기술 적용 여부를 검증할 계획은 있습니까?

다섯째, 종합 방사능 모니터링 계획(CRMP) 수립시 후쿠시마 인근 지역에 대한 기존오염 평가가 진행된 것이 있습니까? 후쿠시마 원전사고에 대한 기존오염 평가 없는 원전오염수 방류 모니터링 계획은 문제가 없는 것입니까?

여섯째, IAEA가 독립적인 원전안전기구라면 후쿠시마 원전의 통제되지 않는 방사성 물질의 유출을 감시할 수 있어야 한다고 생각합니다. 이에 대한 입장은 무엇입니까?

일곱번째, 후쿠시마 지역사무소의 향후 운영목표, 계획, 예산 조달 방안은 무엇입니까? 일본의 지원으로 운영된다면 독립성이 유지될 수 있다고 판단하고 있습니까?

여덟번째, 후쿠시마 원전오염수 해양방출시 기준치 이상의 방사성물질이 검출될 경우 방출을 중단하도록 되어 있습니다. 이러한 모니터링 및 통제계획에 IAEA는 어떤 역할을 하고 있습니까? 일본 규제기관 외 공동감시가 가능한 상황입니까?

아홉번째, 후쿠시마 원전오염수 검증에 있어 관계된 인접국을 중심으로 공동 검증 모니터링단을 구성하는 것에 대한 입장은 무엇입니까?

열번째, 유엔해양법협약 205, 206조에 따르면 각국은 해양오염의 위험과 영향 감시를 위한 보고서를 작성하고 권위있는 국제기구에 제출할 수 있도록 되어 있습니다. 이 조항의 권위있는 국제기구는 IAEA가 유일하다고 생각합니까?

열한번째, IAEA 회원국이 맺은 사용후핵연료 관리 및 방사성 폐기물 관리의 안전에 관한 공동 협약에 따르면 방류(discharge)는 정상적인 운영 중에 규제 대상 원자력 시설에서 발생하는 액체 등을 규제기관 승인한도 내 합법적인 관행에 따라 계획되고 통제된 방식으로 환경으로 방출하는 것을 의미하고 있습니다. 하지만 후쿠시마 오염수는 정상적인 운영 원전에서 배출되는 것이 아님에도 IAEA와 일본은 방류(discharge)라고 사용하고 있음. 해당 협약에 따를 경우 후쿠시마 오염수는 방류가 아닌 투기(dumping)가 아닌가요?

열두번째, 일본의 방사능 모니터링 보고서 상 부지 경계 설정을 기존 부지경계 10km 밖으로 늘린 것이 정당한가요? 이러한 방식이 국제기준에 부합하는지, 각 원전 특성에 따라 작위적으로 범위를 조정하는 것이 타당한가요?

열세번째, IAEA는 ALPS 처리후 오염물의 환경방출만을 검토한것으로 보입니다. 이는 IAEA 방폐물관리 기본원칙으로 명시한 폐기물발생과 처분까지 관리단계별 상호의존성(interdependency) 요건을 의도적으로 무시한것으로 이해되는데 이에 대한 입장은 무엇입니까?

열네번째, IAEA 중간보고서내 프랑스분석기관에서 측정된 Pu 농도 분석결과에 대한 참여기관 간 논의결과는 무엇입니까?

열다섯번째, 일본이 제공한 시료 데이터에서 확인된 기준치를 14,000배 이상 초과하는 오염수를 재처리하는 방안은 무엇입니까?

마지막으로 IAEA 종합보고서 작성에 참여한 원전 오염수 관련 국제원자력기구(IAEA) 모니터링 TF 11명의 독립 전문가와의 국제 토론회를 제안합니다.

#참고 IAEA 3차 답변

Proposed Answers to new Questions from ROK Political Party

1. The IAEA conducted its review based on the data provided by the Japanese government and Tokyo Electric Power Company (TEPCO). Were you able to verify and authenticate the source and production of such data to support the reliability of the data? If so, please provide the source data and how the data were produced, explanation on how IAEA obtained the source data from TEPCO, and how IAEA verified whether the data are genuine and valid for your review and use.

Throughout the IAEA's safety review, Agency staff as well as independent external experts, who are all members of the IAEA Task Force established in 2021 by IAEA Director General, have conducted a range of technical activities including regular visits to the FDNPS and multiple technical missions to Japan focused specifically on the responsibilities and activities of TEPCO, METI, and NRA. The data used as part of the IAEA's safety review comes from multiple sources, including from TEPCO, as well as the IAEA's own observations and sampling activities. Furthermore, in some cases, the IAEA conducted independent validation of calculations or models.

These activities have provided the IAEA with the necessary insights and information to draw its conclusions that are included in the recent comprehensive report released on 4 July; namely that the approach and activities to the discharge of ALPS treated water taken by Japan are consistent with relevant international safety standards. However, the IAEA's work is just beginning. The ongoing review and monitoring activities will continue and will provide transparency and reassurance to the international community by continuously providing for the application of relevant international safety standards.

2. The release of Fukushima wastewater means the discharge of wastewater from high-level radioactive waste generated from the accident in a nuclear power plant into the ocean. It is expected to be followed by impacts crossing borders. The environmental impact assessment should be source-specific and site-specific. In your assessment to evaluate the impact this specific release of wastewater has on the marine environment, what programs and former cases were utilized specifically? Was a comprehensive radioactive safety evaluation applied in this case, engaging an impact study on close neighbors and future generations with a long-term perspective on the regional marine ecosystem and accumulated food chains possibly influenced by very long-lived and highly toxic radioactive nuclides including Pu, Np, Cm, I, etc., rather than merely looking at the discharge plan itself?

First of all it is important to clarify the use of the words in the review. The contaminated water stored in the tanks is treated to remove most of the radioactive content, except for tritium, which cannot be removed by the ALPS system, or any other industrial scale system (based on existing technology) given the volume of water and low tritium concentrations involved. Multiple steps are involved in the treatment process. Prior to being treated by the ALPS system, the contaminated water has caesium and strontium removed periodically through the KURION and SARRY systems; caesium and strontium account for most of the radioactivity from the contaminated water. Therefore, what Japan plans to discharge is the ALPS treated water and not the wastewater or contaminated water. The radioactive content of the ALPS treated water is far below the levels set in the international safety standards.

The IAEA has reviewed the approach taken by TEPCO in the radiological environmental impact assessment (REIA) to include the accumulation of radionuclides in the environment in the long term and the impact on people and the environment. The

REIA produced is compliant with the international safety standards and follows the assessment approach given in IAEA GSG-10 for protection of the public and the environment for discharges to the environment. For the assessment of the radiological impact of accumulation of radionuclides in seabed sediments, relatively simple and conservative models are applied in the REIA. The international safety standards considers all technical elements such as the impacts of radioactive material on the environment (marine or terrestrial), the long term accumulation (or lack there of) of radioactive materials in the environment, and how this impacts people in the vicinity as well as potential transboundary impacts. However, the approach taken ensures that the resulting annual doses over the period of the planned discharge are not underestimated. The estimated dose rates to the three marine representative animals and plants considered are more than 1 million times lower than the derived consideration reference levels set by ICRP.

Based on its review, the IAEA concluded that TEPCO's approach was consistent with the relevant international safety standards. These safety standards take into account the findings of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and the recommendations of international expert bodies such as the International Commission on Radiological Protection (ICRP). Furthermore, the IAEA has concluded that the controlled, gradual discharges of the treated water to the sea, as currently planned and assessed by TEPCO, would have a negligible radiological impact on people and the environment.

It should be further noted that the activity concentrations in the marine environment estimated in the REIA are very low compared to the available measured values in the region. It is expected that the results from the monitoring undertaken by TEPCO and within Japan's Comprehensive Radiation Monitoring Plan (CRMP) will not be statistically distinguishable from the 'background' values, at distances of a few kilometres from the FDNPS. Therefore, any measurable concentrations of tritium, or other radionuclides in the Asia Pacific region (or beyond) should not automatically be attributed to the discharged water from the FDNPS.

The REIA is not a static document and should be updated over time considering factors such as updates to models and simulations, changing environmental conditions (e.g., climate), the results of environmental monitoring, and changes in the habits of nearby populations. These and other technical elements will continue to be considered by the IAEA as part of its ongoing safety review.

3. Different alternatives are available to treat the wastewater from Fukushima, but none was actually looked into and planned. Have you considered any best available technology internationally used in the field of environmental impact study and nuclear power plant security?

Under the IAEA's safety review, the choice of treatment technology and its performance was not a relevant factor for assessing compliance with the relevant international safety standards. This is because TEPCO will conduct an analysis of all batches of ALPS treated water before a given batch is diluted and discharged; this work is independently verified by NRA. The analysis conducted by TEPCO must show that the radiological characteristics of the treated water meet the relevant regulatory requirements before it can be discharged; as supported by the REIA, these regulatory requirements ensure the safety of people and the environment. This is explained in detail in the IAEA's comprehensive report issued on 4 July. Therefore, given that every batch of treated water must undergo verification of its radiological content before it can be discharged, the performance of the ALPS treatment process is not a concern for the purposes of considering the safety of the discharges. If a batch of treated water does not meet the relevant regulatory requirements, then it would be treated further until it does meet those requirements.

4. In order to verify the safety of the Fukushima wastewater released into the ocean, the capability of the Advanced Liquid Processing System (ALPS) must be ensured in the first place. With the current information you describe in the IAEA report, we were not able to see whether basic verification has been conducted on the ALPS' adsorption capability, decontamination factor, operation procedures and pre-operational tests. In addition, detailed prescription of manuals for retreatment to the ALPS in the case of wastewater which does not meet the discharge criteria remain still not informed and unclear, leaving concerns for possible recontamination of radionuclides that may occur during the retreatment process. Does the IAEA have a plan to thoroughly review, analyze and verify the concerns mentioned above relating to processing wastewater in ALPS?

Please see the answer to question number three above.

5. A comprehensive radiation monitoring plan (CRMP) should include a relative analysis of a long-term, accumulated impact of leaked radioactive materials on the marine environment and ecosystem with a standard set of indicators. However, the comprehensive report of the IAEA merely monitors and evaluates a short-term discharge plan of the Fukushima wastewater within a limited area. It seems as a discharge plan review, not an environmental impact study. How was the TEPCO radiation monitoring plan incorporated into the environmental radiation impact study?

As part of the IAEA's safety review, the Government of Japan's CRMP was discussed and considered by the IAEA Task Force experts. Further information on this topic can be found in Section 3.5 of the IAEA's Comprehensive Report on the Safety Review of the ALPS-Treated Water at the Fukushima Daiichi Nuclear Power Station. In particular, the IAEA noted the vital importance of linking reviews of the environmental monitoring programme to the results of the REIA. This interaction between the REIA and the environmental monitoring programme will ensure that environmental monitoring is focussed on the most important radionuclides and exposure pathways contributing to the doses to the public.

6. The role of the IAEA is to monitor and prevent ill-intended transfer of radioactive materials. Currently, in the area in which the accident took place in the Fukushima nuclear power plant, uncontrolled radioactive materials are flowing out to the Fukushima sea and being transferred to other regions. What is the IAEA's response to this? What research did you have on the flow of radioactive materials into the ocean, and was the outcome addressed in this safety review?

The IAEA is an independent intergovernmental, science and technology-based organization, in the United Nations family, that serves as the global focal point for nuclear cooperation. Within the specific context of the IAEA's safety review of TEPCO's plan to discharge ALPS treated water, the IAEA's role is to establish or adopt safety standards and to provide for the application of these standards to a Member State's activities, upon request by that Member State. Nuclear safety is a national responsibility and as such, TEPCO, and the Government of Japan are responsible for responding to the aftermath of the accident at the Fukushima Daiichi Nuclear Power Station in 2011. Regarding the radiological aspect of the accident and the consequent release and its evaluation, please see the IAEA Fukushima Report published in 2015 available in our website. The IAEA can provide assistance in this regard, upon request, consistent with its statutory functions.

7. The Fukushima wastewater ocean discharge plan is inevitably linked to the decommissioning plan of the Fukushima Daiichi nuclear power plant, considering the constant generation of wastewater from the plant. The Japanese government developed a plan to discharge wastewater into the ocean spanning 30 years, but it was established on the presumption that the decommissioning would proceed as planned. Have you ever reviewed the decommissioning plan of TEPCO for the Fukushima Daiichi plant, and what was the basis of your view that the decommissioning plan is viable as previously planned?

The IAEA's safety review focused on the proposed discharge of ALPS treated water from the Fukushima Daiichi Nuclear Power Station and whether the associated activities by TEPCO, NRA, and the Government of Japan, are consistent with relevant international safety standards. TEPCO's decommissioning plan for FDNPS was not considered in detail as part of this safety review.

Upon request of the Japanese Government, the IAEA conducted a series of missions on the review of initiatives and challenges pertaining to the decommissioning of the Fukushima Daiichi Nuclear Power Station, in accordance with the Mid-and-Long-Term Roadmap towards the Decommissioning of the TEPCO HD Fukushima Daiichi Nuclear Power Station. Until now, the IAEA conducted 5 missions on this topic. The fifth International Peer Review of Japan's Mid-and-Long-Term Roadmap Towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station was conducted in 2021. Please see the reports available in our website.

8. The issue of releasing wastewater into the ocean is directly linked to the health of marine environment and humanity. Does the IAEA believe that it is the one and only organization capable of verifying nuclear safety? Further verification and evaluation should be performed with the World Health Organization and other international bodies to fully comply with the IAEA standards to address safety issues, including those raised by scientists and experts in Korea. And until we see a complete end of the second review, Japan must be urged to suspend its wastewater discharge. This should also be accepted by the IAEA. What is your position on this matter?

The relevant International Safety Standards are standards of safety for protection of health and minimization of danger to life and property, including such standards for labour conditions. These standards serve as a global reference for protecting people and the environment and contribute to a harmonized high level of safety worldwide. The international safety standards used in the review, comprise fundamental principles, radiation protection requirements and guidance for the protection of people and their environment and for the protection of workers, as follows:

The international Fundamental Safety Principles , which are jointly sponsored by the European Atomic Energy Community (Euratom), the Food and Agriculture Organization of the United Nations (FAO), the International Atomic Energy Agency (IAEA), the International Labour Organization (ILO), the International Maritime Organization (IMO), the OECD Nuclear Energy Agency (OECD/NEA), the Pan American Health Organization (PAHO), the United Nations Environment Programme (UNEP) and the World Health Organization (WHO);

The international Basic Safety Standards and requirements for radiation protection , which are jointly sponsored by Euratom, FAO, IAEA, ILO, OECD/NEA, PAHO), UNEP and the WHO; the international Safety Guides for the Protection of the Public and the Environment , which are jointly sponsored by UNEP and the IAEA; the international Safety Guides on the Regulatory Control of Radioactive Discharges to the Environment which are jointly sponsored by UNEP and the IAEA; the international Safety Guides on the Prospective Radiological Environmental Impact Assessment for Facilities and Activities , which are jointly sponsored by UNEP and the IAEA; and the international Safety Guides for Occupational Radiation Protection , which are jointly sponsored by ILO and IAEA.

In compliance with a statutory mandated function, the international safety standards are all established under the IAEA framework, and cosponsored in consultation and, where appropriate, in collaboration with the competent organs of the United Nations and with the specialized agencies concerned. Following a decision of the United Nations General Assembly (UNGA), the levels and effects of ionizing radiation are estimated by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR). The UNSCEAR estimates are informed yearly to UNGA and provide the scientific and

epistemological basis of the International Safety Standards used in this review

9. In the radioactivity monitoring report of TEPCO, the site boundary established to measure the amount of radionuclides was extended to beyond 10km, unlike usual cases with other nuclear power plants. It seems TEPCO chose a convenient way to meet the international standard of radiation dose rate less than 1mSv/hr as the Fukushima Daiichi site still shows high concentration of radioactive materials. In future accidents involving large-scale leakage of radioactive materials, will the IAEA continue to acknowledge and justify such maneuvered expansion of site boundaries?

The Government of Japan's Comprehensive Radiation Monitoring Plan (CRMP) can be found here: https://radioactivity.nra.go.jp/en/contents/17000/16273/24/274_20230412.pdf. The CRMP (Comprehensive Radiation Monitoring Plan) is a coordinated initiative undertaken by government agencies aimed at monitoring and managing radiation levels throughout the country, and includes TEPCO as a data provider.

Since March 2022, the CRMP has been revised to address ALPS treated water discharges, including sampling and analysis of seawater to different depths, sediment and marine biota (fish, shellfish and seaweed) and is separated into zones at varying distances from the FDNPS site which are: the sea area close to FDNPS; the coastal area; the off-shore area; and the outer sea area. From this it can be seen that samples are taken from within (and outside) the 10 km boundary.

Requirement 14 of GSR Part 3 on monitoring for verification of compliance states that "Registrants and licensees and employers shall conduct monitoring to verify compliance with the requirements for protection and safety." In addition, Paragraph 3.54 of GSG-8 states that "Such monitoring should provide sufficient information to determine whether the levels of public exposures comply with the dose limits and to demonstrate that protection and safety is optimized."

The IAEA has concluded that a clearly defined plan for enhanced environmental monitoring by TEPCO and the Government of Japan to address the discharges of ALPS treated water is in place.

10. What were the observations and comments made by the 11 independent experts on the Fukushima wastewater monitoring panel, and how were they incorporated into the comprehensive report.

The comprehensive report is the result of an IAEA review, prepared by the IAEA upon request of the Government of Japan in accordance to the IAEA Statutory Functions. The review is planned, managed, and implemented by the IAEA.

The IAEA was advised by internationally recognized experts from Member States, including from within the region, who form part of the Task Force under the authority of the IAEA Secretariat.

The entire Task Force reached consensus that the activities by TEPCO, NRA, and the Government of Japan, are consistent with relevant international safety standards. The IAEA then drafted the report taking into account all of the Task Force observations and comments, and all that had had been discussed and agreed in the last two years of the Task Force's work, including the conclusions reached in the 5 previous mission reports.