



## IAEA Delivers Final Report on Decommissioning Efforts at Fukushima Daiichi



IAEA experts visiting TEPCO's Fukushima Daiichi Nuclear Power Station on 27 November 2013 looked at the fuel assembly removal process in Reactor Unit 4. Last week, TEPCO began moving nuclear fuel assemblies from Reactor Unit 4 to the Common Spent Fuel Pool. (Photo: G. Webb/IAEA)

The International Atomic Energy Agency (IAEA) delivered a [report](http://domain.com/newscenter/focus/fukushima/final_report120214.pdf) ([http://domain.com/newscenter/focus/fukushima/final\\_report120214.pdf](http://domain.com/newscenter/focus/fukushima/final_report120214.pdf)) on 12 February 2014 to the government of Japan describing the findings of a two-part review of the nation's efforts to plan and implement the decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station (NPS).

At Japan's request, the IAEA organized two expert teams to provide an independent review of Japan's *Mid-and-Long-Term Roadmap towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station Units 1-4*. The first team visited Japan from 15 to 22 April 2013 and the second from 25 November to 4 December 2013.

"Japan has established a good foundation to improve its strategy and to allocate the necessary resources to conduct the safe decommissioning of Fukushima Daiichi," said team leader Juan Carlos Lentijo, IAEA Director of Nuclear Fuel Cycle and Waste Technology. "The situation, however, remains very complex, and there will continue to be challenging issues that must be resolved to ensure the plant's long-term stability."

The expert teams examined a wide variety of issues relating to decommissioning the power plant, including Tokyo Electric Power Company's (TEPCO's) efforts to remove fuel assemblies from Reactor Unit 4's Spent Fuel Pool and to manage the growing volume of contaminated water at the site.

The teams held extensive discussions with senior officials from the Ministry of Economy, Trade and Industry (METI) and TEPCO. The teams also visited the nuclear accident site twice to gain first-hand information on the conditions at the power plant and the progress made toward decommissioning the facility.

The team also examined Japan's efforts to monitor radiation condition in the marine environment, including seawater, sediments and biota, which were further discussed with officials of the Nuclear Regulation Authority (NRA).

"The team was impressed by the comprehensive monitoring system in place in Japan, both for seawater and for the products in the food chain.

Additionally, the team observed that Japan introduced limits for food controls based on the international standard level. This systematic approach, together with the distribution restrictions by relevant local governments, ensures the safety of the marine fishery products in the market," Lentijo said.

The report acknowledges Japan's progress towards preparing Fukushima Daiichi NPS for decommissioning and offers technical and policy advice on a range of issues, including fuel removal efforts, contaminated water management, and waste storage.

As for the growing amounts of contaminated water at the site, the report advises that TEPCO should bolster its efforts to treat this water and then examine all options for its further management, including the possibility of resuming controlled discharges in compliance with authorized limits. To pursue this option, TEPCO should prepare appropriate safety and environmental impact assessments and submit them for regulatory review. In this context, the report also stresses that the NRA should further enhance the seawater monitoring programme by coordinating interlaboratory comparisons to ensure good harmonization of the environmental data.

Japan's request for the decommissioning missions came in the context of the *IAEA Action Plan on Nuclear Safety*, endorsed by all IAEA Member States in September 2011. The *Action Plan* defines a programme of work to strengthen the global nuclear safety framework, and it encourages the use of peer review missions to take full advantage of worldwide experience.

-- by Greg Webb, IAEA Office of Public Information and Communication

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mostly due to global fallout in the 1960s from atmospheric nuclear weapon tests and not necessarily attributed to the Fukushima accident. Generally, the concentrations of Pu-isotopes or Sr-90 or tritium have been found extremely low.

Sediments: Caesium has some affinity to be adsorbed by suspended particulate matter in the water column and is therefore partly accumulated in the sediment. Contamination of sediments depends mainly of the type of the sediment and is therefore highly variable. Re-suspension and mixing of sediments will decrease the initial activity in surface layer in the future, but the sediment will act as a certain source to the water column in the future.

Marine biota: Focus on measurements is given to commercial species and species that have recorded more than 50 Bq/kg (fresh weight) in combined Cs-134 and Cs-137. Japan adopted a limit of 100 Bq/kg in combined Cs-134 and Cs-137 for food products in 2012, which also applies for marine fishery products, to keep public dose below the international standard level (1mSv/year, the Codex Alimentarius, <http://www.codexalimentarius.org/codex-home/en/>). Accordingly, the comprehensive monitoring system has been developed by Japan, both for seawater and for the products in the food chain. Additionally, Japan has introduced limits for food controls that are based on the international standard level. This systematic approach, together with the distribution restrictions by relevant local governments, ensures the safety of the marine fishery products in the market. In the Fukushima prefecture, from 2011 to December 2013, 15,144 samples of marine fishery products were analysed. 2,016 of them had levels of more than 100 Bq/kg. The portion of levels of more than 100 Bq/kg dropped from 57.7 % (average value for period from April to June 2011) to 1.7 % in December 2013. In other prefectures since 2011 to December 2013, 21,606 samples of marine fishery products were analysed. 174 of them had levels of more than 100 Bq/kg of combined Cs-134 and Cs-137. The portion of levels of more than 100 Bq/kg in these prefectures dropped from 4.7% (average value for period from March to June 2011) to 0.1% in December 2013<sup>6</sup>.

## Acknowledgements

### Acknowledgement 18:

*A comprehensive "Sea Area Monitoring Plan" was established with a detailed description of sampling positions, including depth distribution, frequency of sampling, detection limit of the analysis to be performed, and indication of the responsible entity. The plan is kept flexible in space and time for reaction on special events when additional inputs to the marine environment can occur or would be expected. The Plan will ensure a comprehensive overview of the environmental situation in the marine environment and the data will provide sufficient background for dose assessments for radiation exposure from marine pathways.*

*The analytical centres visited by the IAEA team are accredited according to ISO 17025 and should therefore produce reliable, and thus comparable, data. The marine monitoring results are made public nationwide and internationally by means of information dissemination to international organizations and nuclear regulatory bodies, as well as by websites of the monitoring organizations in a prompt way.*

<sup>6</sup> Data covering period up to December 2013 were provided after the mission.

**Events and highlights on the progress related to  
recovery operations at Fukushima Daiichi NPS  
March, 2014**

**Section 1: Executive summary**

(1) The fact sheet uploaded in the link below is a summary of the current situation  
[http://www.kantei.go.jp/foreign/96\\_abe/decisions/2014/pdf/140221factsheet.pdf](http://www.kantei.go.jp/foreign/96_abe/decisions/2014/pdf/140221factsheet.pdf)

(2) Information update from the previous fact sheet

The following information was updated from the previous fact sheet: 1) important events that happened after October 2013 were added and 2) examples of “preventive and multi-layered” measures that were additionally adopted in December 2013.

(3) The link of the previous fact sheet

The previous fact sheet is available online

<http://www.iaea.org/newscenter/news/2014/fukushima-october-factsheet.pdf>

**Section 2: Current conditions and forecast onsite**

**2.1: Relevant information pertaining to issues related to the recovery (including spent fuel and fuel debris management)**

(1) New Information

(i) Newly added topics (in the past three months)

Newly added topics in the past three months are as follows. For additional details of these issues, please refer to the “related information” section.

- NRA’s Action to TEPCO’s Fuel Removal from Unit 4, <Vol. 4>(Nuclear Regulation Authority (NRA))(February 14, 2014)

<http://www.nsr.go.jp/english/newsrelease/data/20140214.pdf>

- Decommissioning of Units 5 and 6 at Fukushima Daiichi Nuclear Power Station (Tokyo Electric Power Company (TEPCO)) (January 31, 2014)

[http://www.tepco.co.jp/en/announcements/2014/1233973\\_5932.html](http://www.tepco.co.jp/en/announcements/2014/1233973_5932.html)

- Nuclear Emergency Response Headquarters decided Preventive and Multi-layered Measures for Decommissioning and Contaminated Water Management (Ministry of Economy, Trade and Industry (METI))(December 20, 2013)

[http://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20131226\\_001.pdf](http://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20131226_001.pdf)

- The results of the investigation and examining on the unidentified and unsolved matters of the Fukushima Nuclear Accident (TEPCO)(December 13, 2013)

[http://www.tepco.co.jp/en/press/corp-com/release/2013/1233101\\_5130.html](http://www.tepco.co.jp/en/press/corp-com/release/2013/1233101_5130.html)

also applied to production fields or activities related to the collection or distribution of food. In summary, systems are in place to prevent food and agricultural products with caesium radionuclide levels in excess of Japan's legal limits from entering the supply chain, and these systems continue to be implemented.

Based on the information that has been made available, the Joint FAO / IAEA Division understands that the measures taken to monitor and rapidly respond to any issues in the food system regarding radionuclide contamination are appropriate, and that the food supply chain in Japan is safely under control.

#### **Reporting on hilgendorf saucord (a type of fish) restrictions implemented in late February**

On 28 February 2014, Japan provided the IAEA with an information update, stating that they have taken actions in response to a sample of hilgendorf saucord (a type of fish) caught offshore in the Fukushima region that was monitored and found to exceed national criteria for distribution to markets.

- [http://www.iaea.org/newscenter/news/2014/infcirc\\_mofa280214.pdf](http://www.iaea.org/newscenter/news/2014/infcirc_mofa280214.pdf)

The sample that exceeded the Japanese criteria had a combined  $^{137}\text{Cs}$ ,  $^{134}\text{Cs}$  specific activity of 112.266 Bq/kg. Based on this survey, the distribution of all the hilgendorf saucord that were caught on 27 February 2014 was suspended (total amount of approximately 13.2 kg). Any of the hilgendorf saucord caught in the same survey will never be provided to the market. The experts at the IAEA consider that compared to the normal results reported for the fish in the area, this specific measurement appears to be an exception. Most of the fish monitored generally have levels less than 100 Bq/kg.

The Agency considered that this situation demonstrated the capability of the monitoring programme in Japan to detect food that exceeds national criteria, and to take appropriate measures in response. The Agency considered that this information provided good assurance on the quality of the management and the safety of the food supply chain.

#### **Japan request for an Integrated Regulatory Review Service mission**

The IAEA has received a request for conducting an Integrated Regulatory Review Service (IRRS) mission in Japan to be scheduled for late 2015, and the Agency is currently working with NRA to prepare for the upcoming IRRS, including the self-assessment of the governmental and regulatory nuclear and radiation safety infrastructure, which is a pre-requisite for an IRRS mission. The first activity, covering the IRRS process and the IAEA self-assessment methodology is planned for May 2014.

水産物の放射性物質の検査に係る報告書  
(平成 23 年 3 月～平成 26 年 3 月)

平成 26 年 5 月

**水産庁**

#### 4-3-2 IAEAによる食品モニタリングの評価

国際原子力機関（IAEA）は、日本の要請により「東京電力(株)福島第一原子力発電所1～4号機の廃止措置に向けた中長期ロードマップ」 [43]に基づく取組についてのレビューの調査団を平成25年（2013年）に2回派遣した [44; 45]。第2回の調査団は、平成25年（2013年）11月25日から12月4日にかけて派遣され、中長期ロードマップに基づく取組に関してレビューを行った。第2回レビュー報告書において、食品の放射性物質の基準値の設定及び海水及び流通する食品の包括的なモニタリング及び出荷制限等の措置が、市場に流通する海産物の安全性を確保していると評価されている（図57）。

また、平成25年（2013年）12月よりホームページでの掲載が開始された福島第一原発関連事項に係る包括的情報の中で、食品の安全についてIAEAは、「セシウムの法定基準値を超えた食料及び農産物が供給網に入ることを防ぐ仕組みが導入されており、また、食料の放射能汚染に関するいかなる事項に対しても、適切にモニタリング及び迅速な対応が取られており、食料供給網は安全に管理されている」と評価している [46]。

図57 IAEAによるレビュー [45]

<p style="text-align: center;"><b>IAEA報告書より抜粋</b></p> <p>（仮訳） 日本は2012年に、国民が受ける放射線量を国際基準レベル（1ミリシーベルト/年、Codex食品規格、<a href="http://www.codexalimentarius.org/codex-home/en/">http://www.codexalimentarius.org/codex-home/en/</a>）より少なくするため、食品の上限値（海産物にも適用される）としてセシウム134・137の合計で100ベクレルを採用した。これに応じ、日本は、海水及びフード・チェーンの食品について、包括的なモニタリングシステムを構築している。加えて、日本は国際基準に基づいた食品管理の基準値を導入している。この体系的なアプローチと、関係する地方自治体による出荷制限が、市場に流通する海産物の安全性を確保している。</p>		<p>福島第一原子力発電所周辺における海水モニタリングを視察するIAEA専門家 （提供） IAEA/ David Osborn</p>
		<p>廃炉ミッションを終えたIAEA調査団による記者会見の様子 （記者会見映像） <a href="http://www.youtube.com/watch?v=zklb9HAI-vE">http://www.youtube.com/watch?v=zklb9HAI-vE</a></p>