

*NRA presentation*

## **C4 Occupational Radiation Protection**

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2<sup>nd</sup> IAEA Regulatory Review Mission on ALPS Treated Water Handling  
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\* This presentation is modified not to include the IAEA's current perspectives as the IAEA's review is still on-going.



# 1. Regulation

➤ The NRA requires TEPCO to take measures for ORP such as area controlling, managing and recording dose, etc.

- NRA Ordinance for Fukushima Daiichi NPS
  - Article 9 Limit on Access to Controlled Area
  - Article 10 Measures for Dose
- NRA Notification for Fukushima Daiichi NPS
  - Article 5 Dose Limits for Radiation Workers
- Specific Regulatory Requirements(\*)
  - II .12. Management of workers' exposure dose

Effective dose:  
100 mSv per 5 years and 50 mSv per year  
Lens of eye:  
100 mSv per the 5 years and 50 mSv per year  
Skin:  
500 mSv per year

(\*) Items required for Measures which should be taken at TEPCO's Fukushima Daiichi NPS in line with the Designation as the Specified Nuclear Facility

➤ According to Reactor Regulation Act, TEPCO establishes the "Implementation plan" (not "Operational safety programme") for Fukushima Daiichi NPS to manage the installations and operations of facilities integrally. The Chapter III of Implementation plan covers operational safety measures including radiation protection.

★(Note) For specific descriptions of each article, please refer to the reference material list of relevant laws and regulations which the NRA submitted to IAEA in Feb. 2022 for last mission.



# 1. Regulation

①

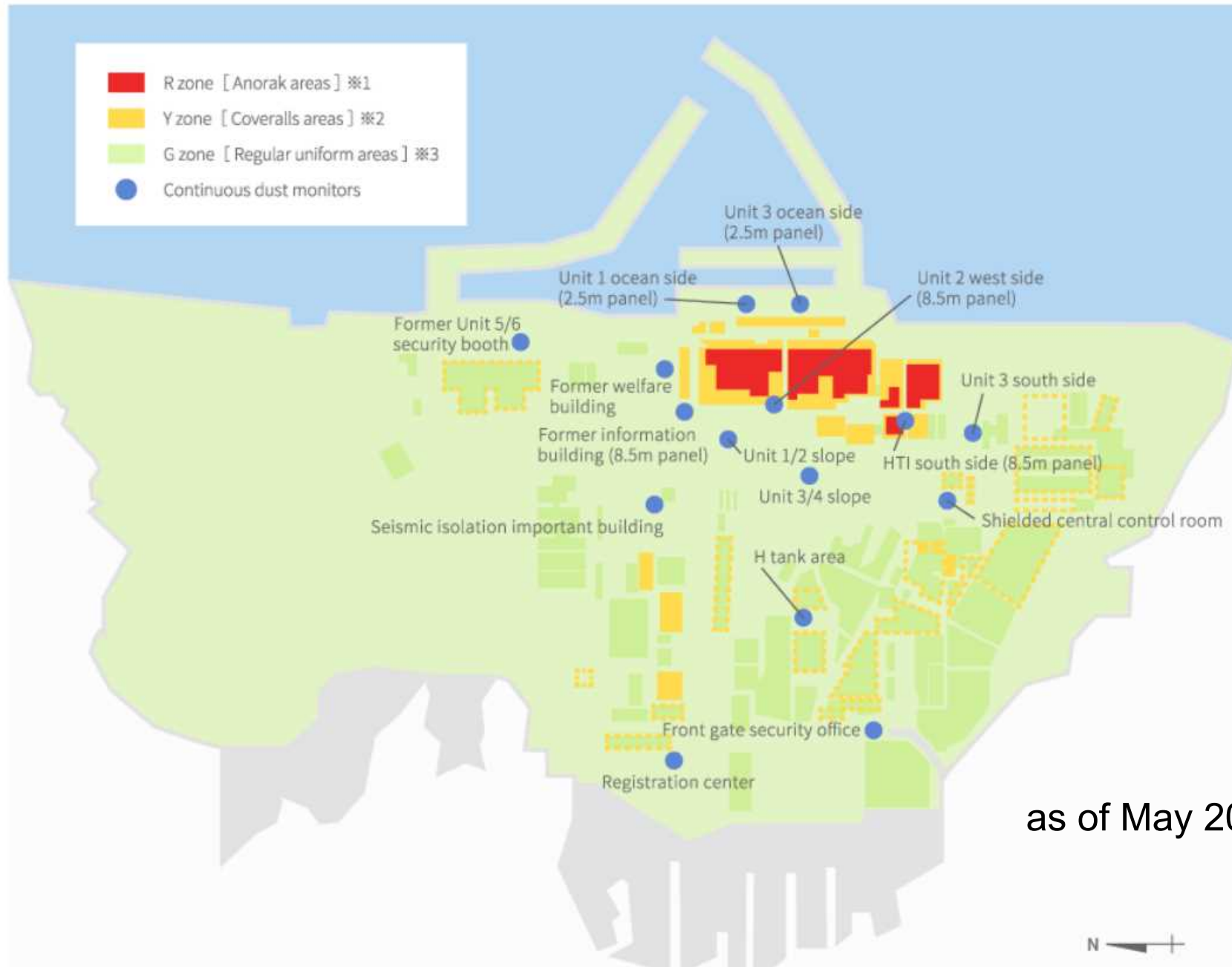
- The NRA examines whether the regulatory requirements as shown on P.2 are satisfied, and then approves the Implementation plan.
- Also, the NRA checks whether TEPCO's activities comply to the approved Implementation plan by daily operational inspections.

②

- Measures such as zoning of activity area or wearing radiation protection equipment are established in the Implementation Plan.
- Activities relevant to the discharge of ALPS treated water are conducted in Green-zone, where the contamination level is the lowest. Therefore, a general dust mask is only needed to be worn.









# Reference: Zoning (Area control) in Fukushima Daiichi NPS





# Reference: Clothing in each zone

R zone [Anorak areas]	Y zone [Coveralls areas]	G zone [Regular uniform areas]
Full-face mask 	Full-face mask or half-face mask (*1 *2) 	Disposable dust mask 
Anorak worn over coveralls 	Coveralls 	Regular uniform 

- General working wears and dust masks are used in most part of the site (G zone: over 95%)



## 2. Monitoring Requirements

### 2. a.

- The NRA establishes Dose limits for radiation workers. (please refer to P.2)
- Based on the approved Implementation Plan, TEPCO controls the dose of workers by means of recording levels, reporting levels and investigation levels.

### 2. b.

- The NRA requires TEPCO to record data such as ambient dose rate of controlled area, dose of radiation workers (including lens of eye and skin), etc., and keep the data for certain period depending on the sort of information.
  - NRA Ordinance for Fukushima Daiichi NPS
    - Article 3, Paragraph (1), (v) Radiation control record, (a)~(l)

#### Example:

Sort of data	Storage period
ambient dose rates	10 years
dose for workers	at least 5 years of until the worker quit



## 2. Monitoring Requirements

### 2. c. ①

- CHIYODA Technol Corporation, which provide IMS to TEPCO, is certified by “Japan Accreditation Board” based on ISO/IEC 17025.

### 2. c. ②

- Considering the suggestion of IRRS in 2016, the NRA revised the ordinance to ensure the reliability of individual monitoring service.
- Specifically, NRA Ordinance for quality control requires that monitoring equipment shall be calibrated or verified by the method that can be traced to the standard of metrology.

### 2.d.

- Ambient dose rate of workplace where workers enter for activity of ALPS treated water discharge is around 1  $\mu\text{Sv/h}$  level\* and  $\alpha$  or  $\beta$  contamination is not a dominant factor of exposure. Therefore, the situation does not require special management for the lens of eyes, skin or extremities.

(\* ) Survey map of the overall site: <https://www.tepco.co.jp/decommission/data/surveymap/pdf/2022/f1-sv2-20221223-j.pdf>



### 3. Optimization

- Based on the **Regulatory Requirement\***, the NRA examines the TEPCO's Implementation Plan whether they establishes target values or special arrangement for protection when the activities at relatively high radiation place are planned.
- In case of ALPS treated water discharge-related activities, the NRA confirmed that this kind of high exposure is not assumed through the examination of the Implementation Plan.
- Furthermore, the NRA continuously confirms by daily operational inspections that TEPCO takes measures for optimization of occupational radiation protection based on the approved Implementation Plan such as planning of daily work or decontamination of workplace.

(\*) "considering workability of radiation workers under the current exposure condition, dose rate of the workers' entry area and exposure dose associated with their work shall be reduced as low as reasonably achievable, by taking necessary radiation protection measures, such as providing shield, deployment of equipment, remote control, prevention of radioactive material leaks, ventilation and decontamination, etc."





## 4. Contractors

- “Radiation workers”, which are subject to the regulation of radiation protection, are defined that “operators of a nuclear reactor or workers for transportation, storage, disposal, decontamination, etc., of nuclear fuel material or material contaminated by nuclear fuel, who enter controlled area” and therefore contractors are included in this definition.
- The NRA receives reports from TEPCO about records of dose of Radiation workers including contractors\*. Also the NRA ensures by the daily operational inspections that TEPCO conforms to the Radiation protection programme established in the Implementation Plan including for contractors .

(\*) Exposure level of radiation workers including contractors are also shown in TEPCO’s HP in each month.  
<https://www.tepco.co.jp/en/hd/decommission/progress/environment/index-e.html>



## 5. National Dose Registry

5. a.
- “Radiation Effects Association (Registry Center)” is designated to be the registry institution of dose records of radiation workers by METI Notification in 2009.
  - In case of radiation workers for Fukushima Daiichi NPS, the dose records are also delivered to the Association as stipulated in **the NRA Ordinance\***.  
(\* ) NRA Ordinance for Fukushima Daiichi NPS Article 3, Paragraph (4)
5. b.
- Dose of radiation workers under normal situation and in case of emergency works are required to be included.