

June 17, 2011

Nuclear and Industrial Safety Agency

**Regarding the Report to the Nuclear Safety Commission on the
Assessment Results Related to Implementing Measures to Reduce
the Concentration of Radioactive Materials Inside the Reactor
Building of Unit 2 at Fukushima Dai-ichi Nuclear Power Station,
Tokyo Electric Power Co. Inc.**

This is to inform the public that Nuclear and Industrial Safety Agency (NISA) has reported to the Nuclear Safety Commission the results (Attached paper 1) of an assessment of the report submitted by Tokyo Electric Power Co. Inc. related to Article 67 paragraph 1 of the Act on the Regulation of Nuclear Source Materials, Nuclear Fuel Materials and Reactors.

The Nuclear Safety Commission was also requested to advise NISA regarding this assessment, and NISA has received such technical advice in today's Commission meeting as seen in Attached paper 2.

Furthermore, we are performing SPEEDI estimations in order to assess the environmental impact of the spread of radioactive material in ventilating the reactor building. The results can be found at:

http://www.nisa.meti.go.jp/earthquake/speedi/speedi_index.html

Attachment: Regarding Assessment of Report Related to the Implementation of Measures to Reduce the Concentration of Radioactive Materials Inside the Reactor Building of Unit 2 at Fukushima Dai-ichi Nuclear Power Station, Tokyo Electric Power Co. Inc.

Attached paper 1: Regarding Improvements to the Working Condition of Unit 2 Reactor Building in Fukushima Dai-ichi Nuclear Power Station (Request for Consideration)

Attached paper 2: Technical Advice on “Regarding Improvements to the
Working Condition of Unit 2 Reactor Building in Fukushima
Dai-ichi Nuclear Power Station” (Response)

http://www.nsc.go.jp/anzen/shidai/genan2011/genan044/siryo_ex.pdf

(The Nuclear Safety Commission’s website in Japanese)

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Regarding Assessment of Report Related to the Implementation of
Measures to Reduce the Concentration of Radioactive Materials
Inside the Reactor Building of Unit 2 at Fukushima Dai-ichi Nuclear
Power Station, Tokyo Electric Power Co. Inc.

June 17, 2011

Nuclear and Industrial Safety Agency

1. Background

In order to execute the calibration of water-level gauge for the Reactor Pressure Vessel (RPV), it is necessary to improve the working environment of the reactor building. Accordingly, Tokyo Electric Power Co. Inc. (TEPCO) plans to ventilate the inside of the building by opening the double doors.

Since an environmental impact will arise by the dispersion of radioactive materials from the reactor building when this action is conducted, the Nuclear and Industrial Safety Agency (NISA) requested TEPCO to report about this impact pursuant to Article 64 of the Nuclear Regulation Act.

2. NISA's Assessment with respect to TEPCO's report

NISA confirmed and assessed the following points about the report submitted by TEPCO regarding the necessity of ventilating the reactor building of Unit 2 at Fukushima Dai-ichi Nuclear Power Station (NPS), and the evaluation of the impact on the surrounding environment, etc.

(1) Assessment regarding the operation details, the operation plan, and the necessity related to the ventilating operation of the reactor building, considering whether there are alternative means:

✓ TEPCO's purposes for ventilating the reactor building are:

- ① installation and calibration of a water-level gauge of the RPV, and
- ② installation of piping for nitrogen injection into the Primary Containment Vessel (PCV).

NISA confirmed that these operations are the measures (Measures 9 and 11) indicated in the TEPCO's "Roadmap towards Restoration from the Accident at Fukushima Dai-ichi Nuclear Power Station."

✓ Based on the experience of Unit 1, NISA confirmed that the measures to be undertaken would decrease the air flow directed into the reactor building such that the dust lying on the floor, etc. is not disturbed

when the double doors are opened.

- ✓ To improve the environment inside the reactor building, NISA confirmed that, in addition to controlling the occurrence of steam from the spent fuel pool due to the installation of fuel pool recirculation cooling equipment, TEPCO is making efforts to reduce the concentration of the dust inside the building's atmosphere using the ambient air filtration system similar to its actions for Unit 1. Moreover, as the method to improve the environment, NISA confirmed that TEPCO selected opening the double doors as the practically possible method after considering alternative means, such as an emergency gas processing system and an installation of a temporary dehumidification system.

(2) Assessment of impact on the surrounding environment including the amount of released radioactive materials and the dispersion predictions

Similar to when double doors were opened at reactor building of Unit 1, NISA cross-checked the TEPCO's evaluation results by using SPEEDI (for more details, please refer to the attachment).

Furthermore, NISA confirmed that the maximum concentration of radioactive materials obtained from the dispersion predicted results by SPEEDI is sufficiently lower than the legal concentration limit, and that the dose at the spot where the maximum exposure is predicted is sufficiently low compared to 1mSV, the public dose limit.

(3) Monitoring method for evaluating the impact of the release of radioactive materials on the surrounding environment

Similar to when the double doors of reactor building at the Unit 1 were opened, NISA confirmed that TEPCO planned to additionally observe the dose rate and the concentration of radioactive materials at an on-site spot downwind from the double doors upon opening and 5 spots three to five km off-site in addition to the 8 on-site monitoring posts.

(4) Method of managing exposure of workers during the construction after the ventilating, etc.

NISA confirmed that TEPCO set up the operational standard for the full-face mask applicable to the operations inside the reactor building, and planned to undertake operations after submitting application for emergency radiation work in compliance with the notification from the Labor Standard Bureau, Ministry of Health, Labour and Welfare. Moreover, NISA also confirmed that TEPCO had a plan not to exceed the expected dose by the operational times and shields based on the dose map for inside the reactor building.

Furthermore, NISA confirmed that after March 11, if the accumulated

dose exceeded 100mSV, the workers should be examined by the whole body counter, as well as if total dose of the internal and the external exceeds 170mSV, those workers should not be allowed to be engaged in radiation work, in addition, if the face contamination was identified, those workers should be considered to be examined by the whole body counter.

Taking all the above into consideration, NISA assessed that TEPCO's undertaking of ventilating inside the reactor building by opening the double doors of Unit 2 reactor building at Fukushima Dai-ichi NPS, should be no adverse effect on the environment, and the impact after opening the double doors and implementing ventilation would be even lower than the present evaluation.

3. TEPCO's future action

It is valid that TEPCO plans to undertake the following items when the door is opened:

- at opening the double doors of Unit 2 reactor building at Fukushima Dai-ichi NPS, to implement the operation in consideration of the impact on the surrounding community and to inform to relevant organizations in advance and
- after opening the double doors, to implement monitoring appropriately and to inform the results to relevant organizations and the public promptly.

Environmental Assessment of Reactor Building of TEPCO Fukushima Dai-ichi Unit2 with ventilation

		allowable limit by regulations	The present conditions	In case of double door opened (TEPCO reported base)	Result of assessment by SPEEDI
The atmospheric concentration of breath air for radiation worker(Bq/cm ³)	I-131	1.0×10^{-3}	7.4×10^{-3} (as of 13 June)	(Accessible level with full face mask)	—
	Cs-134	2.0×10^{-3}	1.0×10^{-2} (as of 13 June)	(Accessible level with full face mask)	—
	Cs-137	3.0×10^{-3}	1.0×10^{-2} (as of 13 June)	(Accessible level with full face mask)	—
The atmospheric concentration outside environmental monitoring area (Bq/cm ³)	I-131	5.0×10^{-6}	Less than Detection limit (As of 14 June) (on the site boundary (West gate))	1.2×10^{-6} (on the site boundary)	2.46×10^{-6} (Max. value in site)
	Cs-134	2.0×10^{-5}	3.4×10^{-6} (As of 14 June) (on the site boundary (West gate))	1.6×10^{-6} (on the site boundary)	4.64×10^{-6} (Max. value in site)
	Cs-137	3.0×10^{-5}	3.8×10^{-6} (As of 14 June) (on the site boundary (West gate))	1.6×10^{-6} (on the site boundary)	4.64×10^{-6} (Max. value in site)
The annual public dose(mSv)		1.0	—	1.3×10^{-3}	2.77×10^{-3}

※Precondition for evaluation of released activity

ventilation rate: 8,100m³/hr

ventilation time: 8.0hr

height of releasing point: 29.9m grand high (at operation floor)

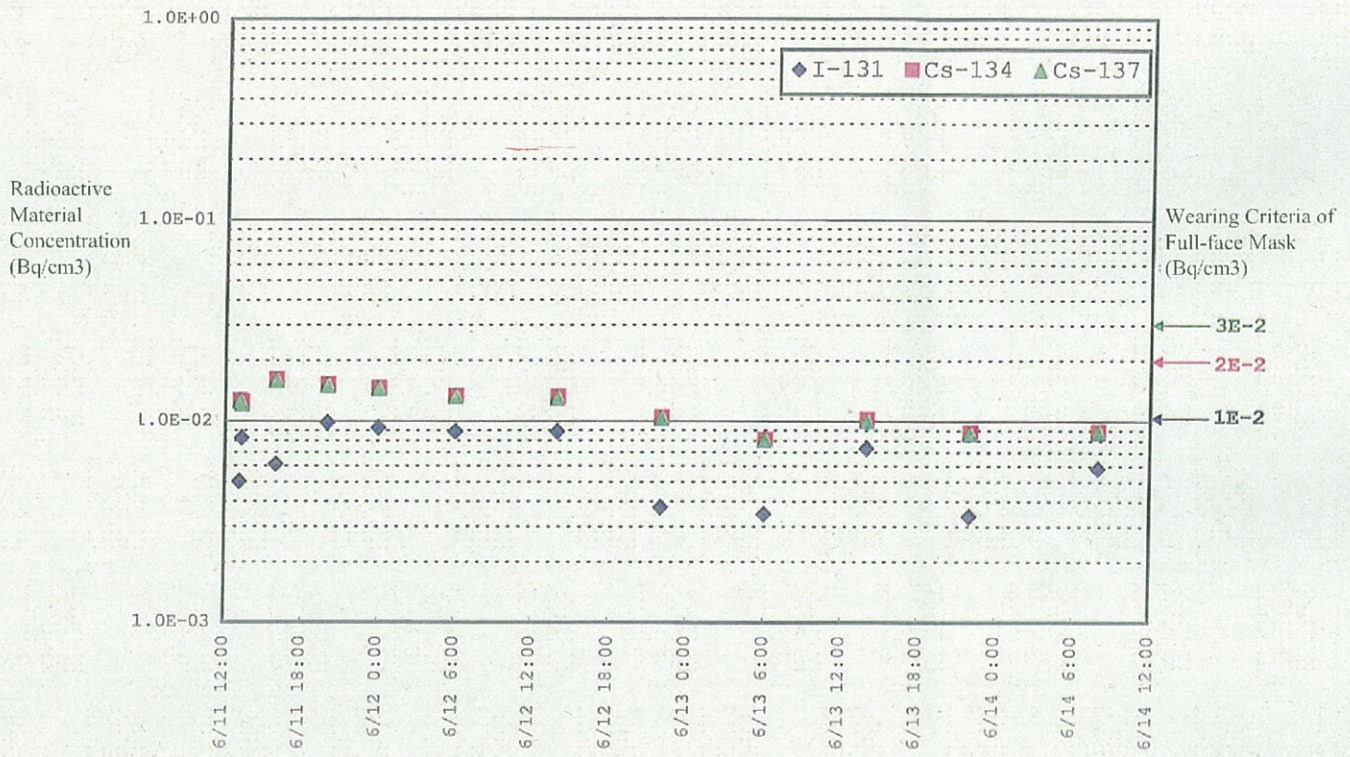
Climatic condition: direction E、velocity 1.0m/s、stability of atmosphere F (very hard condition to diffuse for release material (conservative condition provided))

evaluation mesh: 200m × 200m (Neighborhood to NPP)、1km × 1km

Quantity of radioactive materials to be released by this door opening

	release by ventilation of reactor building (as of 13 June) (assumption)	(reference) release by ventilation of Unit 1 reactor building (assumption)
I-131	4.8×10^8 Bq	2.46×10^8 Bq
Cs-134	6.5×10^8 Bq	1.24×10^8 Bq
Cs-137	6.5×10^8 Bq	1.3×10^8 Bq
Total	1.78×10^9 Bq	5.0×10^8 Bq

Fukushima Dai-ichi Nuclear Power Station Unit 2
Atmospheric Concentration Trend of Radioactive Materials in the Reactor Building



Effective Dose due to External Exposure

外部被ばくによる実効線量

日時 = 2011/06/16 09:00 - 2011/06/17 09:00 の積算値

↑ 気象データ = 任意気象

Fukushima Dai-ichi Unit 2 Narrow Area

福島第1 2号炉 狭域図

核種名 = 全核種

対象年齢 = 成人

Nuclide=All
Age of target=Adult

Release point

放出地点 : 141°02'08" - 37°25'18"

領域 Area : 23km × 23km

【凡例】 Legend

実効線量等値線 (mSv) Contour of effective dose(mSv)

1 = 1.00×10^{-5}
2 = 5.00×10^{-6}
3 = 1.00×10^{-6}
4 = 5.00×10^{-7}
5 = 1.00×10^{-7}

最大線量 = 1.79×10^{-5} mSv Max. Dose

放出地点から (-1.1, 0.2) km (*印)

Distance from the release point(marked as *)

計算モデル名 = PRWDA21 Calc. model

使用モデル名 = 通常モデル Used model=Normal

【計算条件】 Calculation condition

計算メッシュ幅 水平方向 = 0.25 km

放出高 = 29.9m Mesh width:
燃焼度 = 20000 MWD/MTU horizontal=0.25Km

原子炉停止時刻 = 2011/03/11 14:47

放出開始時刻 = 2011/06/16 09:00

放出モード = 変動放出

放出核種・放出率(積算) : Bq/h (Bq)

希ガス : 0.00×10^0 (0.00×10^0)

ヨウ素 : 0.00×10^0 (0.00×10^0)

I 131 : 6.00×10^7 (4.80×10^8)

Cs 134 : 8.13×10^7 (6.50×10^8)

Cs 137 : 8.13×10^7 (6.50×10^8)

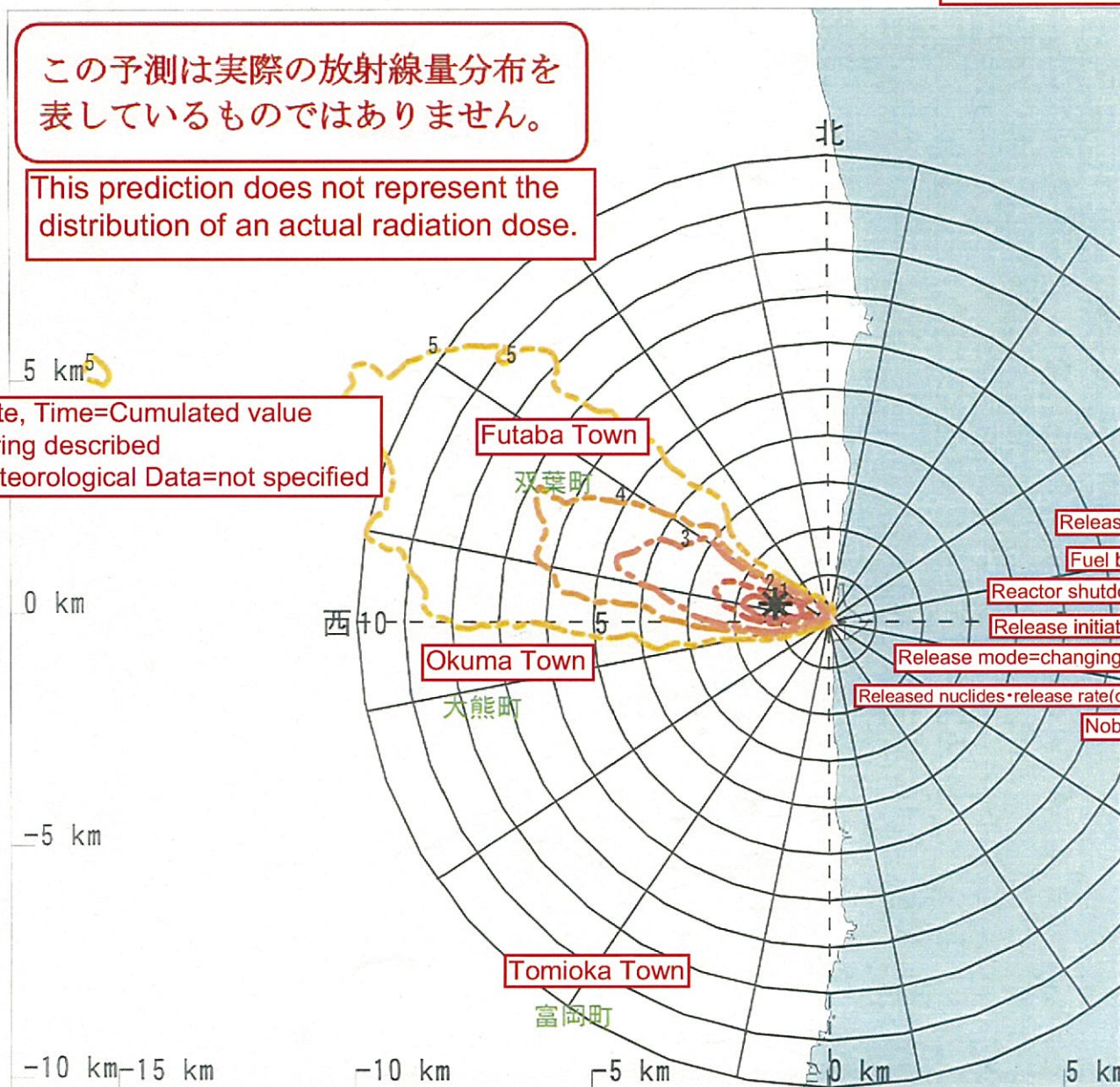
風向 : 東 Direction: East

風速 : 1.0 m/s Velocity

この予測は実際の放射線量分布を表しているものではありません。

This prediction does not represent the distribution of an actual radiation dose.

Date, Time=Cumulated value during described Meteorological Data=not specified



Effective Dose due to Internal Exposure

内部被ばく実効線量

日時 = 2011/06/16 09:00 - 2011/06/17 09:00 の積算値

気象データ = 任意気象

Fukushima Dai-ichi Unit 2 Narrow Area

福島第1 2号炉 狭域図

核種名 = I 131

対象年齢 = 成人

Nuclide=I 131
Age of target=Adult

Release point

放出地点 : 141°02'08" - 37°25'18"

領域 Area : 23km × 23km

【凡例】 【Legend】

線量等値線 (mSv) Contour of effective dose(mSv)

1 = 1.00×10^{-4}
2 = 5.00×10^{-5}
3 = 1.00×10^{-5}
4 = 5.00×10^{-6}
5 = 1.00×10^{-6}

最大線量 = 4.23×10^{-4} mSv Max. Dose

放出地点から (-0.8, 0.2) km (*印)

Distance from the release point(marked as *)

計算モデル名 = PRWDA21 Calc. model

使用モデル名 = 通常モデル Used model=Normal

【計算条件】 【Calculation condition】

計算メッシュ幅 水平方向 = 0.25 km

放出高 = 29.9m Mesh width:
燃焼度 = 20000 MWD/MTU horizontal=0.25Km

Release height

Fuel burn-up

Reactor shutdown time

Release initiation time

Release mode=changing release

Released nuclides*release rate(cumulated)

Noble gases

Iodine

原子炉停止時刻 = 2011/03/11 14:47
放出開始時刻 = 2011/06/16 09:00
放出モード = 変動放出
放出核種・放出率(積算) : Bq/h (Bq)
希ガス : 0.00×10^0 (0.00×10^0)
ヨウ素 : 0.00×10^0 (0.00×10^0)
I 131 : 6.00×10^7 (4.80×10^8)
Cs 134 : 8.13×10^7 (6.50×10^8)
Cs 137 : 8.13×10^7 (6.50×10^8)

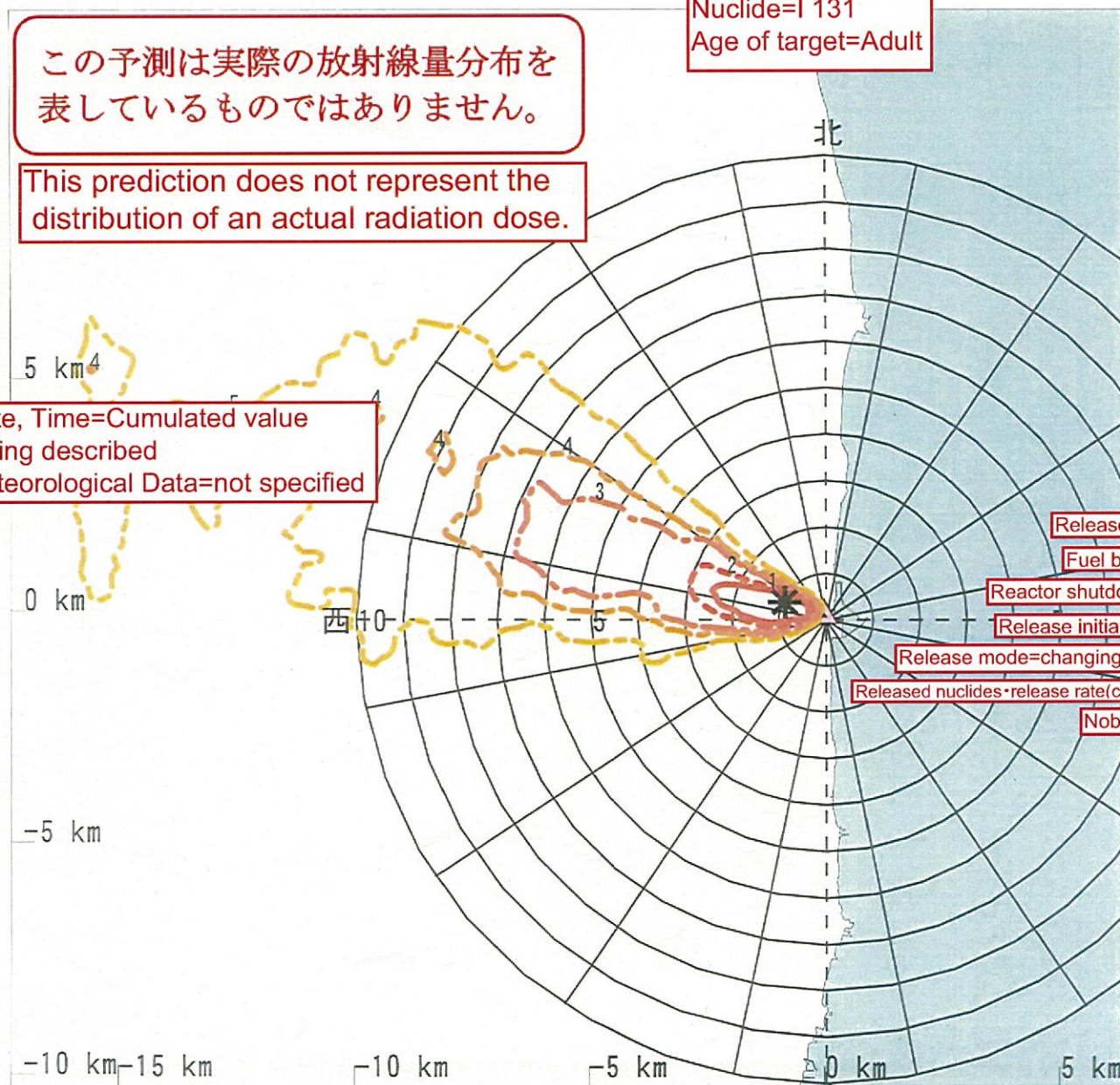
風向 : 東 Direction:East

風速 : 1.0 m/s Velocity

この予測は実際の放射線量分布を表しているものではありません。

This prediction does not represent the distribution of an actual radiation dose.

Date, Time=Cumulated value during described
Meteorological Data=not specified



Effective Dose due to Internal Exposure

内部被ばく実効線量

日時= 2011/06/16 09:00 - 2011/06/17 09:00 の積算値

気象データ = 任意気象

Fukushima Dai-ichi Unit 2 Narrow Area

福島第1 2号炉 狭域図

核種名 = Cs 134

対象年齢 = 成人

Nuclide=Cs134
Age of target=Adult

Release point

放出地点 : 141°02'08" - 37°25'18"

領域 Area : 23km × 23km

【凡例】 【Legend】

線量等値線 (mSv) Contour of effective dose(mSv)

1 = 5.00×10^{-4}

2 = 1.00×10^{-4}

3 = 5.00×10^{-5}

4 = 1.00×10^{-5}

5 = 5.00×10^{-6}

最大線量 = 7.88×10^{-4} mSv Max. Dose

放出地点から (-1.1, 0.2) km (*EJ)

Distance from the release point(marked as *)

計算モデル名 = PRWDA21 Calc. model

使用モデル名 = 通常モデル Used model=Normal

【計算条件】 【Calculation condition】

計算メッシュ幅 水平方向 = 0.25 km

放出高 = 29.9m

Mesh width:
horizontal=0.25Km

燃料燃度 = 20000 MWD/MTU

原子炉停止時刻 = 2011/03/11 14:47

放出開始時刻 = 2011/06/16 09:00

放出モード = 変動放出

放出核種・放出率(積算) : Bq/h (Bq)

希ガス : 0.00×10^0 (0.00×10^0)

ヨウ素 : 0.00×10^0 (0.00×10^0)

I 131 : 6.00×10^7 (4.80×10^8)

Cs 134 : 8.13×10^7 (6.50×10^8)

Cs 137 : 8.13×10^7 (6.50×10^8)

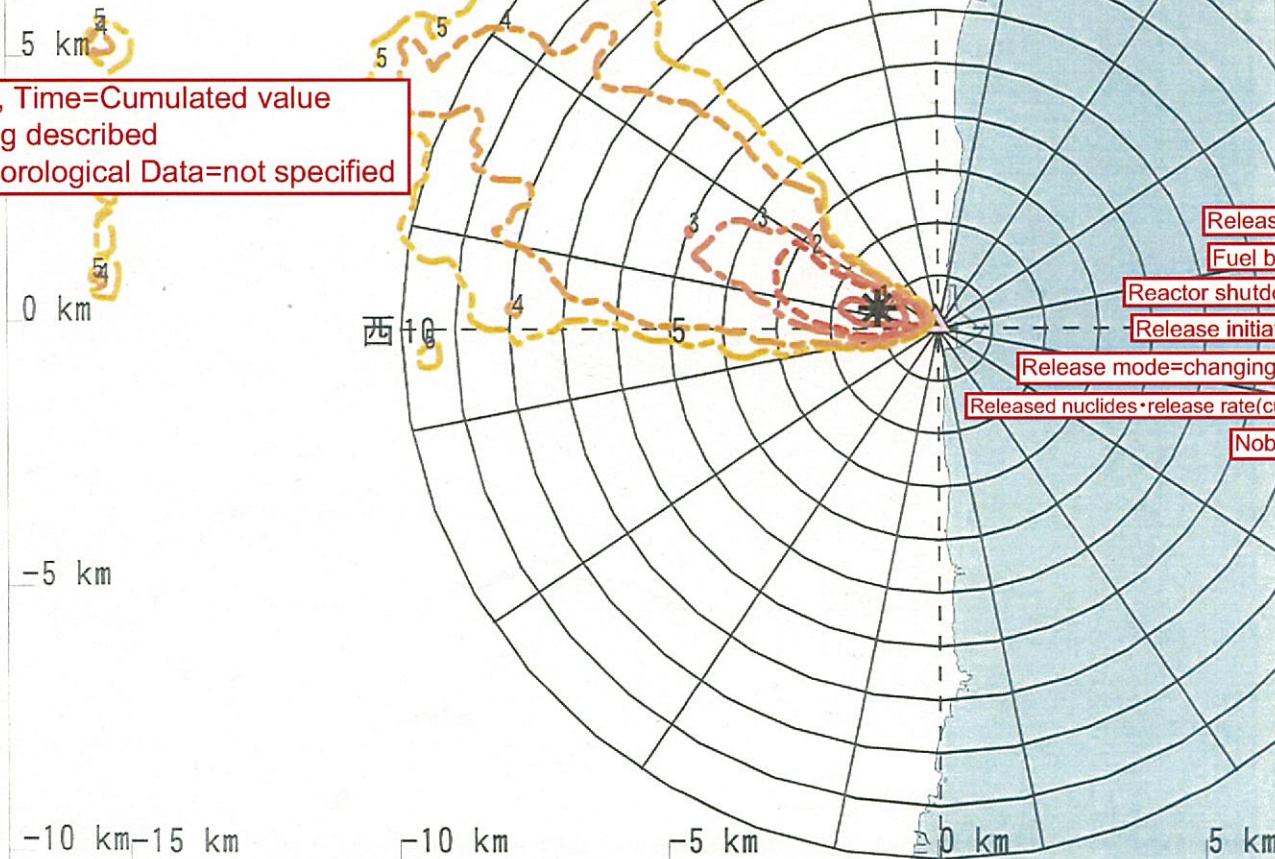
風向 : 東 Direction:East

風速 : 1.0 m/s Velocity

この予測は実際の放射線量分布を表しているものではありません。

This prediction does not represent the distribution of an actual radiation dose.

Date, Time=Cumulated value during described
Meteorological Data=not specified



保安院0615

Effective Dose due to Internal Exposure

内部被ばく実効線量

日時 = 2011/06/16 09:00 - 2011/06/17 09:00 の積算値

↑ 気象データ = 任意気象

この予測は実際の放射線量分布を表しているものではありません。

This prediction does not represent the distribution of an actual radiation dose.

Date, Time=Cumulated value during described
Meteorological Data=not specified

Fukushima Dai-ichi Unit 2 Narrow Area

福島第1 2号炉 狭域図

核種名 = Cs 137

対象年齢 = 成人

Nuclide=Cs137
Age of target=Adult

Release point

放出地点 : 141°02'08" - 37°25'18"

領域 Area : 23km × 23km

【凡例】 【Legend】

線量等値線 (mSv) Contour of effective dose(mSv)

1 = 1.00×10^{-3}

2 = 5.00×10^{-4}

3 = 1.00×10^{-4}

4 = 5.00×10^{-5}

5 = 1.00×10^{-5}

最大線量 = 1.54×10^{-3} mSv Max. Dose

放出地点から (-1.1, 0.2) km (*印)

Distance from the release point(marked as *)

計算モデル名 = PRWDA21 Calc. model

使用モデル名 = 通常モデル Used model=Normal

【計算条件】 【Calculation condition】

計算メッシュ幅 水平方向 = 0.25 km

放出高 = 29.9m Mesh width:
horizontal=0.25Km

燃料燃度 = 20000 MWD/MTU

原子炉停止時刻 = 2011/03/11 14:47

放出開始時刻 = 2011/06/16 09:00

放出モード = 変動放出

放出核種・放出率(積算) : Bq/h (Bq)

希ガス : 0.00×10^0 (0.00×10^0)

ヨウ素 : 0.00×10^0 (0.00×10^0)

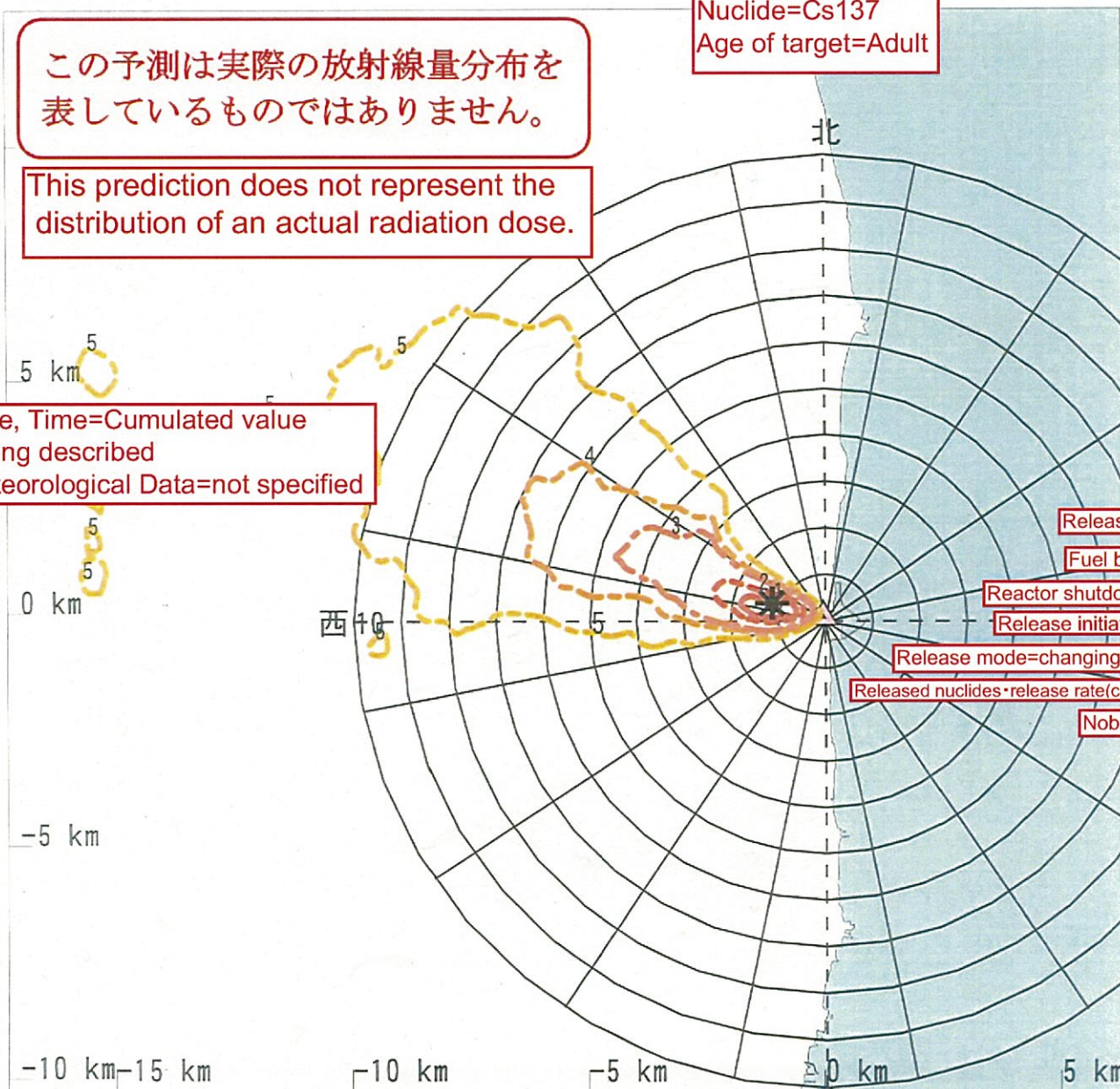
I 131 : 6.00×10^7 (4.80×10^8)

Cs 134 : 8.13×10^7 (6.50×10^8)

Cs 137 : 8.13×10^7 (6.50×10^8)

風向 : 東 Direction:East

風速 : 1.0 m/s Velocity



(Attached paper 1)

To: Nuclear Safety Commission

Regarding Improvement of Working Environment Inside the Reactor
Building of Unit 2 at Fukushima Dai-ichi Nuclear Power Station, Tokyo
Electric Power Co. Inc.
(Request for Consideration)

June 17, 2011

Secretariat of the Nuclear Emergency Response Headquarters

Tokyo Electric Power Co. Inc. (TEPCO) is planning to enter the reactor building of Unit 2, Fukushima Dai-ichi Nuclear Power Station in order to calibrate the water level gauge of the Reactor Pressure Vessel and to carry out construction works to connect the nitrogen injection facility to the Primary Containment Vessel, etc. Therefore, TEPCO is planning to ventilate the inside of the building by opening the double doors, for the purpose of improving the working environment on the 1st floor of the reactor building, which does not satisfy the conditions for enabling work wearing a full-face mask because of the high humidity, etc.

When the double doors are opened, it is anticipated that airborne radioactive materials existing inside the building will be diffused to the outdoor environment. Since it is necessary to assess the impact in advance, TEPCO was requested by the Nuclear and Industrial Safety Agency (NISA) to submit a report, pursuant to Article 67 of the Nuclear Regulation Act, on June 8, 2011.

TEPCO submitted the report and the NISA assessed the content as attached. The Secretariat of the Nuclear Emergency Response Headquarters requests your commission to provide advice on the assessment.

別紙 2

原子力災害対策本部 御中

平成23年6月17日

原子力安全委員会

「東京電力株式会社福島第一原子力発電所第2号機の原子炉建屋内の
作業環境改善について」に関する助言（回答）

平成23年6月17日付で助言依頼のありました標記の件については、以下の点についても踏まえた上で、提示された評価の内容で差支えありません。

○本作業は、事故の収束に必要な工事を行うために必要なものであり、全体として見れば、放射性物質の環境への放出量の低減に資すると認められること。

なお、以下の事項にご留意ください。

○本作業を行うにあたっては、周囲の作業者に周知し、被ばく線量の低減に努めるとともに、環境への影響に充分留意すること。

○今後も引き続き周辺環境のモニタリングを行い実際の影響を確認し、原子力安全委員会に適宜報告すること。

○2号機の原子炉建屋及びタービン建屋の地下には高濃度のヨウ素が溶け込んだ汚染水が大量に存在しているため、建物内の作業者の被ばくを低減するよう、ヨウ素の揮発を抑制すること。

以上