



プレス発表

平成23年3月23日
原子力安全委員会

緊急時迅速放射能影響予測ネットワークシステム（SPEEDI）の試算について

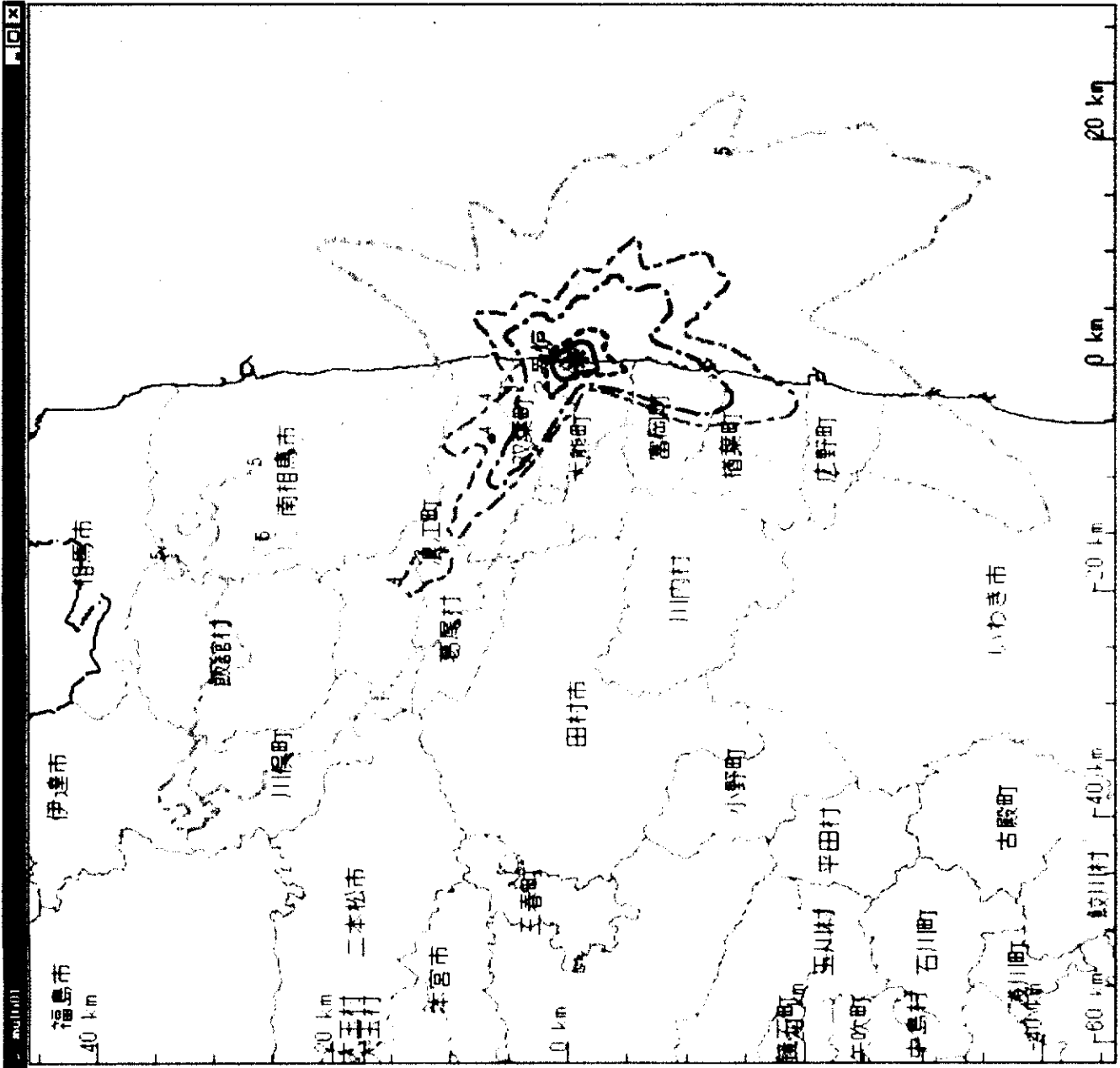
【経緯】

原子力安全委員会では、3月16日より、緊急時迅速放射能影響予測ネットワークシステム（SPEEDI）による試算のために、試算に必要な放出源情報の推定に向けた検討をまいりました。3月20日から陸向きの風向となったため、大気中の放射性核種の濃度が測定でき、限定的ながら放出源情報を推定できたことから、本システムの試算を行うことが可能となりました。

これをもとに試算した結果は、別紙のとおりです。

【評価】

- 本試算は、福島第一原子力発電所の事故発生後、連続して一日中屋外で過ごすという保守的な条件を仮定して、甲状腺の被ばく線量を試算したものです。
- ただし、屋内では屋外と比べて4分の1から10分の1に放射線の影響を低減させることができます。
- 本試算は、限定的な情報しか得られていない状況下で試算されたものであり、今後、この試算の精度を高めるために、モニタリング結果を充実させていくことが必要です。



内部被ばく臓器等価線量

日時 = 2011/03/12 06:00 -
2011/03/24 00:00 の積算値

領域 : 92km X 92km
核種名 = ヨウ素合計
対象年齢 = 1歳児
臓器名 = 甲状腺

【凡例】
線量等値線 (mSv)

- 1= 10000
- 2= 5000
- 3= 1000
- 4= 500
- 5= 100

(評価)

本試算は、福島第一原子力発電所の事故発生後、連続して一日中屋外で過ごすという保守的な条件を仮定して、甲状腺の被ばく線量を試算した

SPEEDI(緊急時迅速放射能影響予測)ネットワークシステムは、原子力施設から大量の放射性物質が放出されたり、あるいは、そのおそれがあるという緊急時に、周辺環境における放射性物質の大量放出による放射線量や被ばく線量などを、放出源情報、気象条件および地形データをもとに迅速に予測するシステムです。

国・地方公共団体は、SPEEDIネットワークシステムが予測した情報により、周辺住民のための防護対策の検討を迅速に進めることができます。

The SPEEDI network system started on January 2005 using more precise prediction model.

This brochure introduces the concept of the SPEEDI network system to the general public as well as parties concerned with nuclear emergency preparedness to deepen understanding.



Nuclear Safety Technology Center

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West Japan Liaison Office

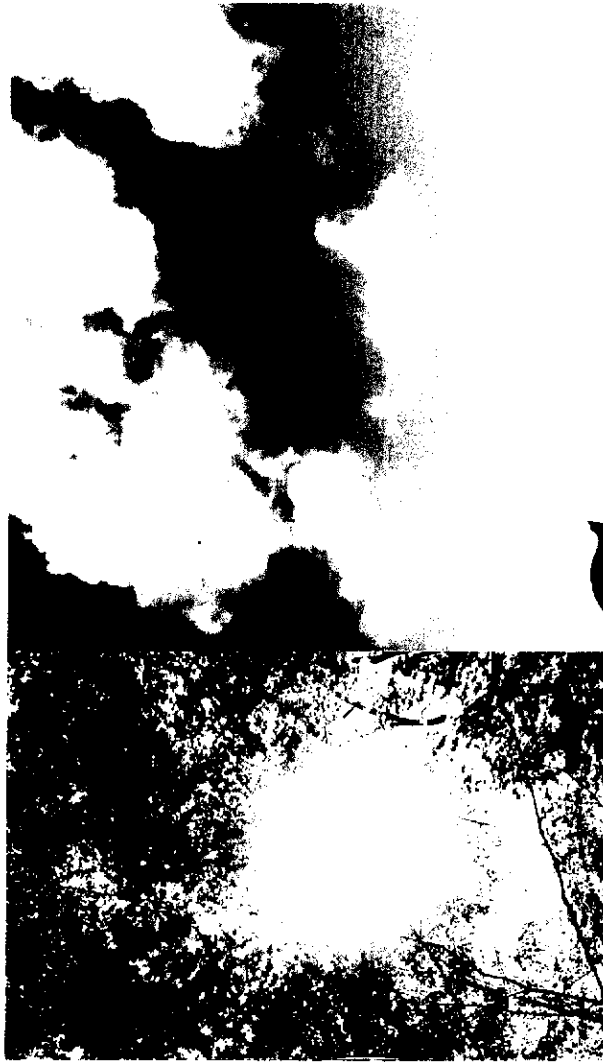
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Emergency Preparedness Technology Center (EPTC)

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SPEEDI

System for Prediction of Environmental
Emergency Dose Information



Ministry of Education, Culture, Sports,
Science and Technology

SPEEDI is a system for speedy prediction of environmental dose during nuclear emergencies.

In the nuclear event on its possibility caused by massive release of radioactive materials from nuclear facilities, the SPEEDI (System for Prediction of Environmental Dose Information) network system, using source term information from the nuclear facility and data on meteorological conditions as well as topographic data, is able to speedy predict the atmospheric concentration of radioactive materials and exposure dose in the surrounding areas.

The information predicted by the SPEEDI network system will be used by national and local government make an action plan to decrease exposure for residents of surrounding areas.

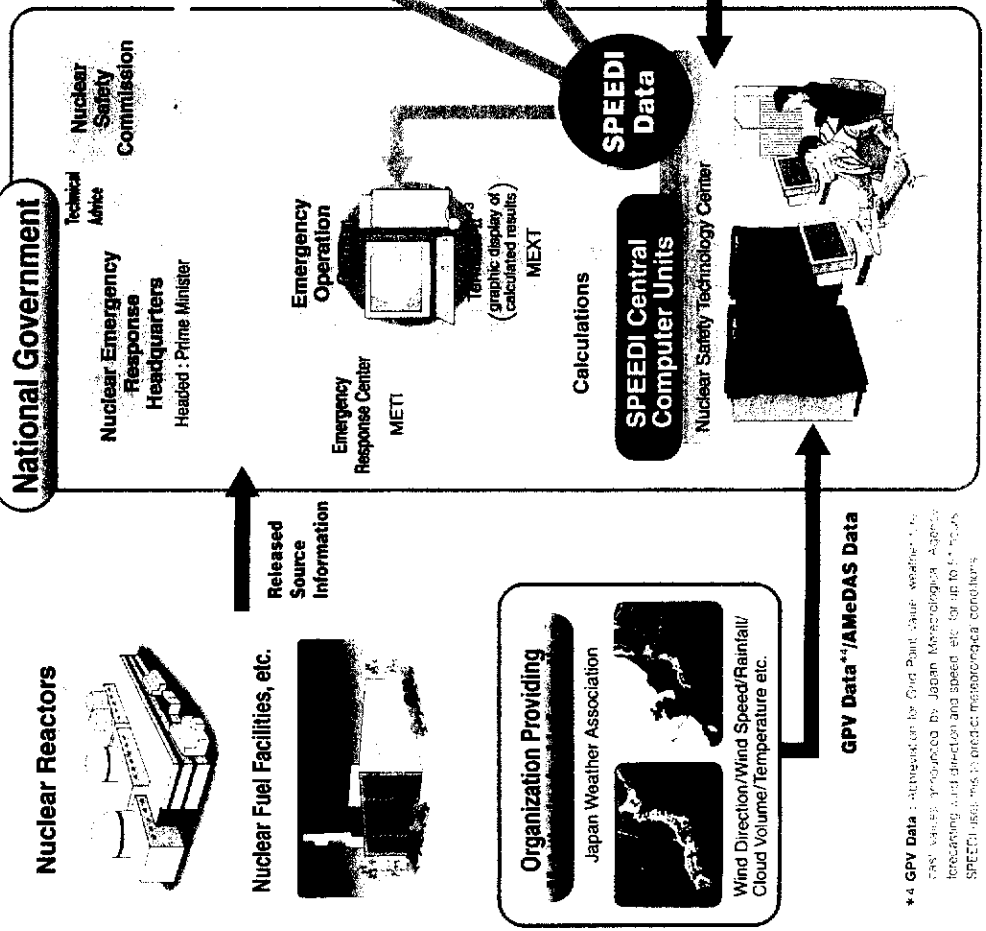
Twenty-two off-site centers are located throughout Japan

Off-Site Centers

Joint Council of Nuclear Emergency Response

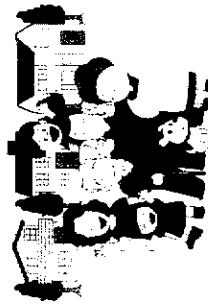


Terminal II*3
(graphic display of calculated results)



Local Residents

Instruction Direction



(Note)

- *1 **SPEEDI Central Computer Units** : Computer facilities at Nuclear Safety Technology Center, Emergency Operation Center and Calculations and processing of predicted data of the SPEEDI network system.
- *2 **Terminal I (terminal for collection of observation data)** : Work stations installed at the local government, emergency response information from the local government system and meteorological data received from the SPEEDI network system, calculations and outputs of the data to the SPEEDI network system, etc. units of the SPEEDI network system.
- *3 **Terminal II (terminal for graphic display of calculated results)** : Work stations of personal computers installed at local governments and other emergency centers to receive and to display in graphical form the predictive calculation and outputs from the SPEEDI central computer units of the SPEEDI network system.

** **GPV Data** : Information for Grid Point Value weather forecast values produced by Japan Meteorological Agency forecasting wind direction and speed, etc. for up to 14 days. SPEEDI uses meteorological conditions.

*METI: Ministry of Economy, Trade and Industry
*MEXT: Ministry of Education, Culture, Sports, Science and Technology

The SPEEDI network system links National and Local government by an exclusive line.

The SPEEDI network system, centering on the SPEEDI central computer units established at the Nuclear Safety Technology Center, links MEXT, the Nuclear Safety Commission, METI, off-site centers, local governments and the Japan Weather Association by an exclusive line.

The SPEEDI central computer units regularly collect meteorological and environmental radiation data from monitoring stations, etc. of local governments, and GPV and AMeDAS data from the Japan Weather Association, to prepare for emergencies.

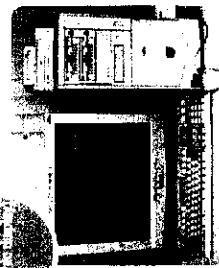
Data Communication Network of the SPEEDI



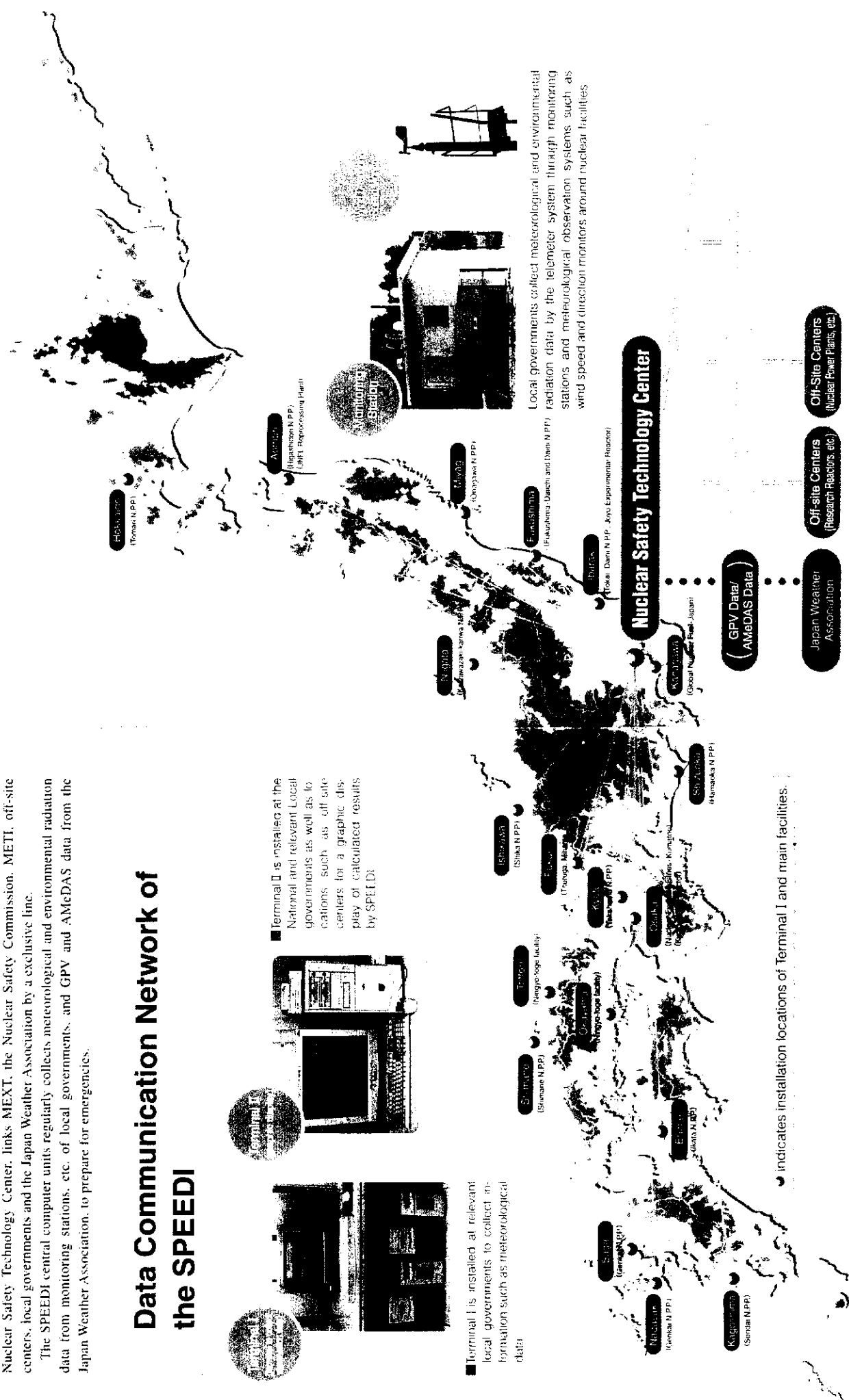
Terminal I is installed at relevant local governments to collect information such as meteorological data



Terminal II is installed at the National and relevant Local governments as well as to centers for a graphic display of calculated results by SPEEDI



Local governments collect meteorological and environmental radiation data by the telemeter system through monitoring stations and meteorological observation systems such as wind speed and direction monitors around nuclear facilities



•METI (Ministry of Economy, Trade and Industry)
•MEXT (Ministry of Education, Culture, Sports, Science and Technology)

The SPEEDI system prepares for emergency predictions through routine collection of data.

The SPEEDI network system is composed of routine information processing and emergency information processing.

In normal, meteorological and environmental radiation data are routinely collected through the network into the SPEEDI central computer units to prepare for emergencies.

In emergency, using meteorological and topographical data for the area around the nuclear facility, wind direction and speed are calculated to predict atmospheric concentration of radioactive materials and exposure dose, etc.



Preparation of Meteorological Prediction Data for the Region around the Nuclear Facility

Meteorological prediction data that take into account the topography around the nuclear facility are prepared using collected meteorological (GPV) data and topographic (altitude, land utilization) data.

Data Used by SPEEDI

Items	Contents	Input Methods	Use
Meteorological information	Wind direction, wind speed, atmospheric stability, insolation, net-radiation GPV Data (wind speed, atmospheric pressure, temperature, specific humidity, rainfall, cloud volume) AMeDAS Data (wind direction, wind speed, rainfall)	On-line input from local governments On-line input from Japan Weather Association	Calculations for local meteorological predictions Calculations for wind field predictions Calculations for concentration predictions Calculations for dose predictions
Released Source information	Site and facility name, start of release, release duration, radionuclide name and release rate.	Manual input	Calculations for concentration predictions Calculations for dose predictions
Geographic information	Place name, coastline, rivers, roads, railroads, longitude and latitude coordinates, etc.		Design for graphic display
Social environment information	Population distribution, schools, hospitals, evacuation centers, etc.		Design for graphic display
Site information	Site name, facility name, longitude, latitude, exhaust stacks height above sea level, reactor type		Release point information for calculations of concentration predictions
Dose conversion factor	Radionuclide-specific dose conversion factors for effective dose, etc.	Automatic search of the data base	Calculations for dose predictions
Radionuclide composition ratio	Bare gas and rodlike fuel rod composition ratio, etc. by reactor type and burn up		Estimations of environmental composition ratio of rare gas, iodine isotopes, etc.
Topographical information	Map of numerical data at 50m and 250m land utilization data		Calculations for local weather predictions Calculations for wind field predictions Calculations for concentration predictions Calculations for dose predictions

Stored Data

Collection of Meteorological and Environmental Radiation Data

Meteorological data and environmental radiation data from the telemeter system of the local governments, and GPV data and AMeDAS data from the Japan Weather Association are collected in the SPEEDI central computer units through the communication network.

Routine Processing

Prediction of Wind Field

Meteorological data and topographical data are used to calculate the wind field (wind direction/speed) around the nuclear facility.

Prediction of Concentration and Dose

The concentration of radioactive materials in the atmosphere and exposure dose, etc. are calculated through information such as wind direction and speed, calculations, and volume of radioactive materials released from the nuclear facility.

Graphic Transmission and Display

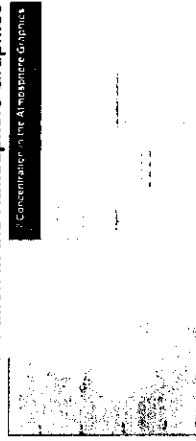
Calculated results are depicted in easy-to-understand graphical form (refer to graphic displays below), and are provided to the central government, relevant local governments and other parties concerned.

- Wind field (see preparation in the Atmosphere Concentration Display)
- Exposure Dose (see Atmospheric Radiation Exposure Dose)
- Internal Exposure Dose (see Internal Exposure Dose)
- External Exposure Dose (see External Exposure Dose)

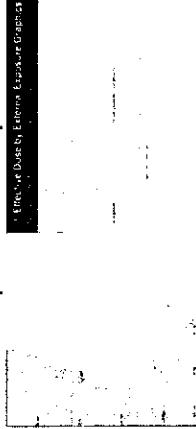
Wind Field Graphics



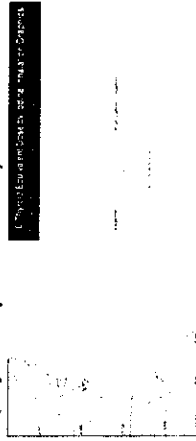
Concentration in the Atmosphere Graphics



External Exposure Dose Graphics



Internal Exposure Dose Graphics (Thyroid Equivalent Dose)



(tentative translation)

PRESS RELEASE

March 23, 2011

NSC

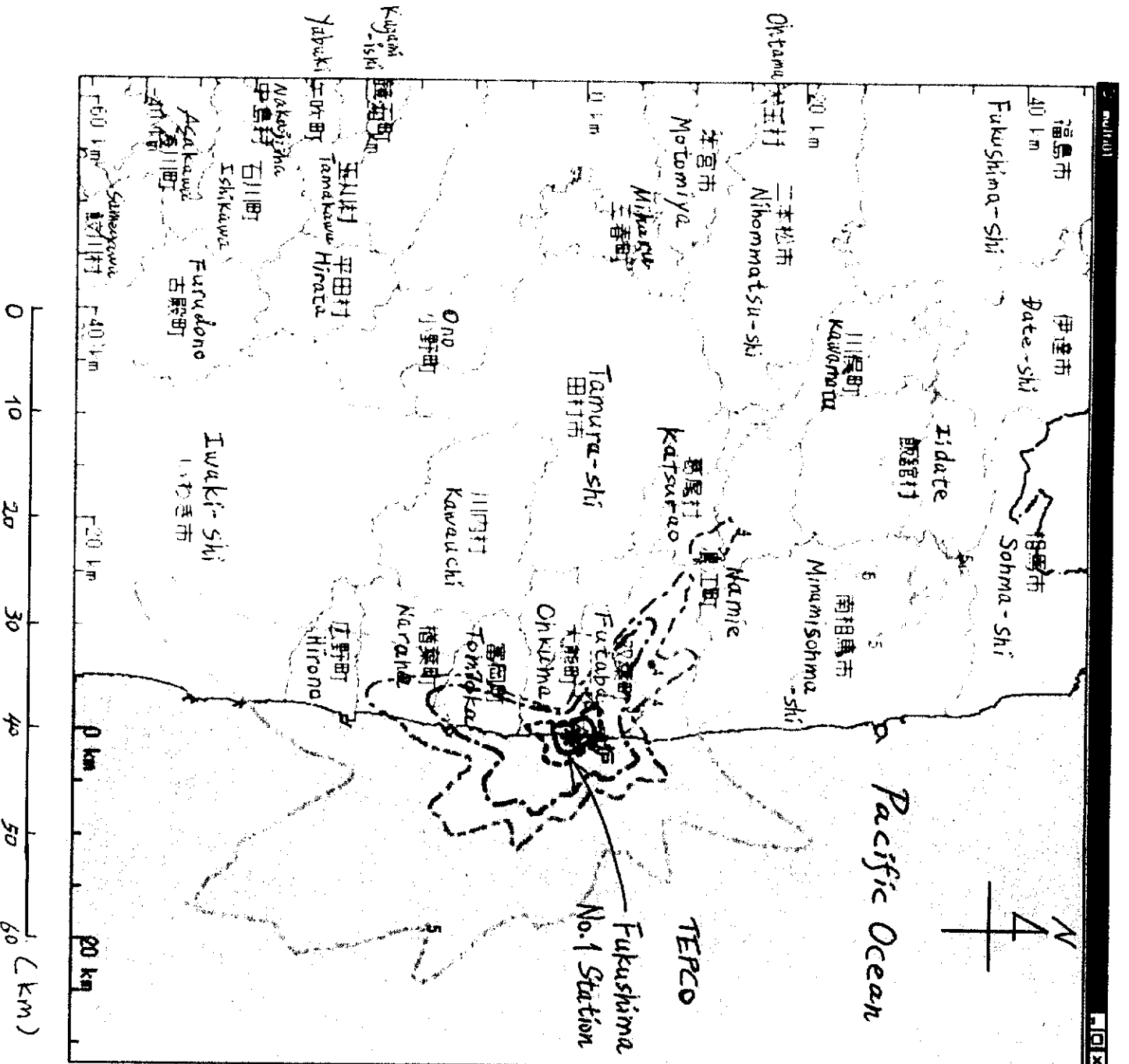
A trial calculation using the System for Predicting Environmental Emergency Dose Information (SPEEDI) network system

On March 16, 2011, Nuclear Safety Commission (NSC) made trial calculation of radioactive materials emitted from TEPCO Fukushima #1 Station that is requisite for predicting dose of radioactive materials in the environment, since we don't have actual information measured emitted radio nuclides.

On March 20, the wind direction around the nuclear power station shifted toward the land direction made possible to measure dust sampling of radio nuclides (iodines), so we could estimate radioactive materials emitted from nuclear power station. It let us possible to calculate tentatively by using SPEEDI.

[note]

- Not measured value of source information.
- This is an estimation of thyroid equivalent dose accumulated on the conservative side conditions, for example being one year old infant, outside between 2011/03/12 06:00-2011/03/24 00:00 (JST), etc.
- In case of staying indoors, the equivalent dose would be reduced at rate of 1/4 - 1/10
- further more it is needed to upgrade measured data in order to improve quality of calculation



Estimated equivalent dose at a thyroid
 Date: March 12 6am - March 24 0am
 Area: 92km X 92km
 Nuclide: Iodine (total)
 Age: 1 year old
 Organ: thyroid

- (mSv)
- 1 = 10000
 - 2 = 5000
 - 3 = 1000
 - 4 = 500
 - 5 = 100