The 2nd version.

Materials for Briefing

October, 1999

Science and Technology Agency

Contents

I . Accident at the Conversion Building in Nuclear Fuel Processing Plant, JCO Co. Ltd.

1. Chronology of the Accident

September 30

Around 10:35 Area alarms sounded when uranium solution with enrichment of 18.8 % was fed into the precipitation tank (Refer to Appendix 4 and 5) in the conversion Building (Refer to Appendix 3) at Tokai Plant of JCO Co. Ltd. (Refer to Appendix 1 and 2).

11:19 The first report of the accident

- Three workers engaged were exposed to radiation, being carried to National Mito Hospital by an ambulance. They were then transferred to the National Institute of Radiological Sciences for treatment. (Later on, one of the workers was retransferred to the hospital in the University of Tokyo while another was retransferred to the Institute of the Medical Science of the University of Tokyo.)

Around 11:40 A maximum dose rate of 0.84mSv/h was measured in an area around the facility (normal value: about 0.2 μ Sv/h). (Refer to Appendix 6 and 7)

Around 15:00 Evacuation of residents living within a 350-meterrange from the facility was initiated.

Around 22:30 Public information; residents living within a 10-kilometer range from the facility were advised to stay indoors. (As precautionary measures. Although the dose rate was below the guide value, it was possible that the criticality condition was continuing.)

October 1

Around 02:30 An operation to drain cooling water from the precipitation tank was started to terminate criticality.

Around 04:00 The neutron dose rate at the site boundaries began to decrease.

Around 06:15 The cooling water draining operation (argon gas injection) ended.

Around 06:30 The neutron dose rate fell below the detection limit (Refer to Appendix 8)

Around 08:30 Boric acid water was injected into the precipitation tank.

09:20 The Nuclear Safety Commission confirmed that "the criticality had ended for the time being."

- It was confirmed that a total of 69 persons (JCO employees including the three workers, three fire fighters engaged in the rescue operation, and local residents) had been exposed to radiation (Refer to Appendix 9).
- Dose equivalent rate of monitoring posts in the vicinity of the plant decreased to the background level.

16:30 Call-off of the recommendation for the residents living within a 10 kilometer range from the facility to stay indoors was announced.

October 2

07:55 Shielding operations were carried out by using blocks and other materials since measurements at some measuring points near the site boundaries indicated higher radiation levels than normal values.

18:30 After confirming safety on the basis of analyses of various data, the advice for residents living within a 350 meter range from the facility to evacuate was removed.

2. Emergency Countermeasures (Refer to Appendix 10)

(1) Execution of the site investigation

After receiving the first report 30th September, the Science and Technology Agency (STA) established the Local Countermeasure Headquarters headed by the State Secretary for Science and Technology in Tokai Research Establishment of Japan Atomic Energy Research Institute(JAERI), dispatching its personnel to the headquarters. With the cooperation of JAERI, the Japan Nuclear Cycle Development Institute (JNC) and electric utility companies, receiving materials and equipment provided by these cooperators, STA collected information on the site situations and helped the plant operator take actions.

The Nuclear Safety Commission (NSC) convened the Emergency Technical Advisory Body and dispatched a group of experts including the Commission's members. The staff members of the ministries and agencies involved also assembled at the Local Headquarters.

Dose rates at the facility's boundaries and in the surrounding areas were surveyed through on-the-spot investigation using monitoring cars and measurements at monitoring posts.

Under the guidance of the experts from the Local Headquarters and with the support provided by related organizations, the plant operator drained water from the cooling water jacket of the precipitation tank where criticality occurred; and the plant operator injected boric acid water into the tank.

These operations caused 24 persons to be exposed to radiation.

(2) Government Accident Countermeasure Headquarters

The Government Accident Countermeasure Headquarters consisting of the Minister for Science and Technology as chief of the Headquarters and representatives from the ministries and agencies involved, met to discuss and decide such actions as sheltering.

(3) Government Task force for the Accident in the Tokai-mura Uranium Processing Plant

The Government Task force for the Accident headed by the Prime Minister was established. The Task force discussed and decided on measures to be taken by the

Government.

3. Causes of the Accident and Actions

(1) In the accident, the first criticality accident in Japan, uranium solution (about 16kgU) exceeding the specified quantity (2.4kgU) was being fed with methods against regulations during the uranium conversion process, when "criticality 'a chain reaction of uranium fission'" occurred. Explosion didn't occur.

(2) The cooling water around the precipitation tank (which reflected neutrons and thereby made it easier for nuclear fission to take place) was drained to bring the criticality reaction to an end. The cooling water was successfully drained, which caused the criticality reaction to terminate.

(3) After the criticality reaction was brought to an end, studies were conducted to determine the safety of agricultural products and whether or not local residents were exposed to radiation.

On October 2, Government Task force for the Accident in the Tokai-mura Uranium Processing Plant announced that the environment around the facility would not hinder leading usual life (Refer to Appendix 11).

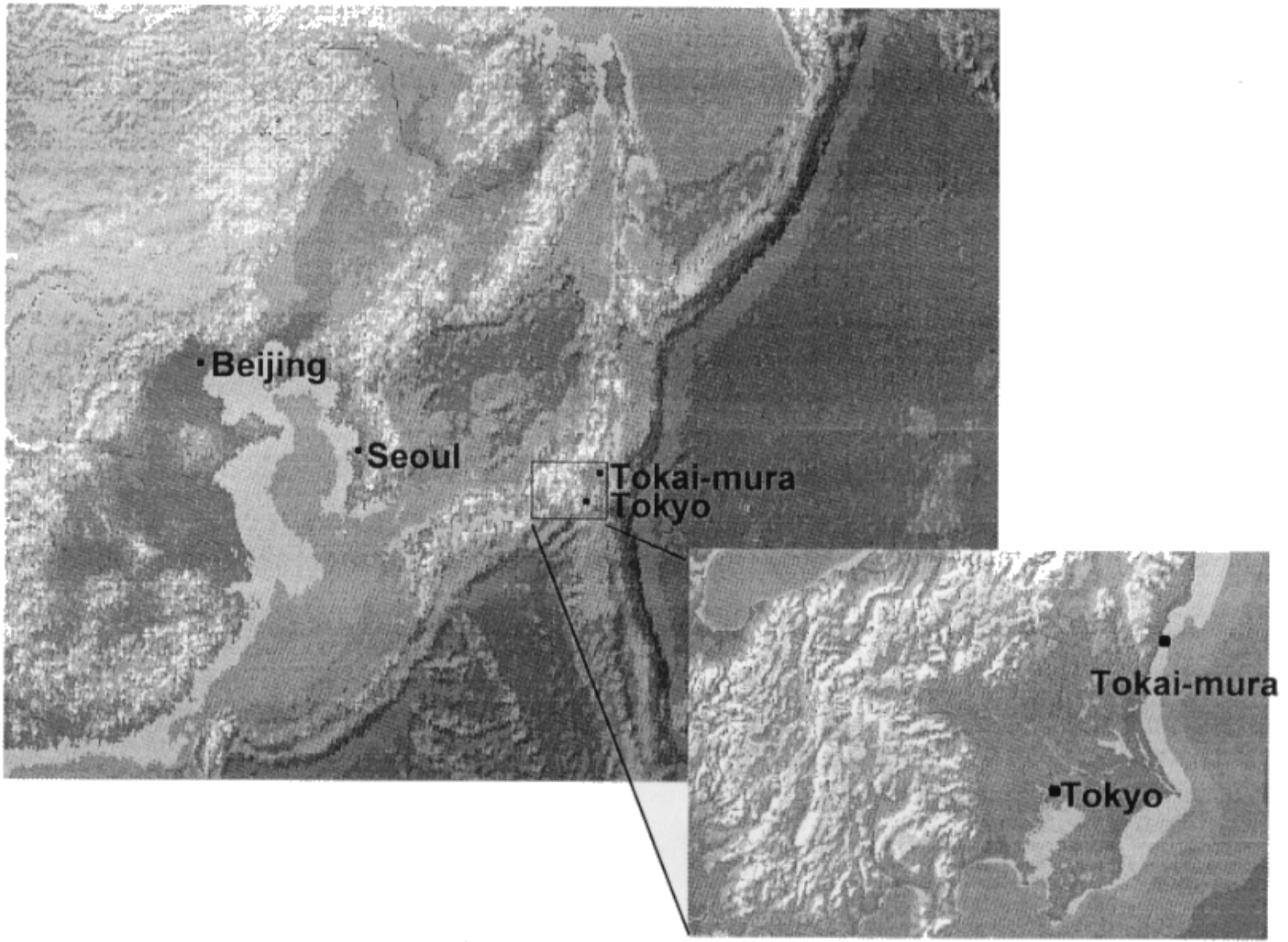
(4) With the local situation regaining stability, the on-the-spot inspection based on the Law on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors was conducted from October 3 on.

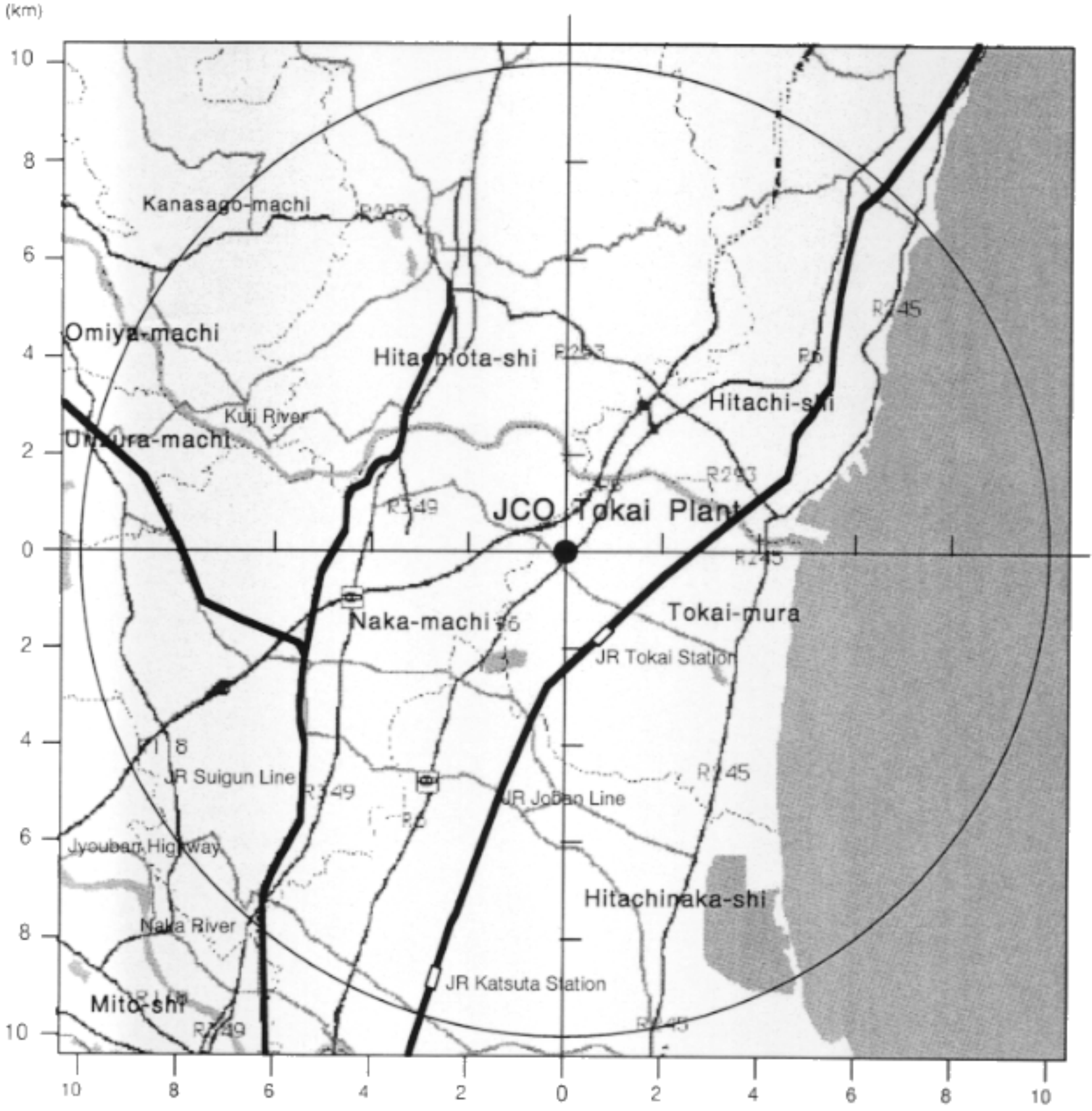
(5) On October 4, Government Task force for the Accident in the Tokai-mura Uranium Processing Plant decided the measures to be taken by the Government (Refer to Appendix 12).

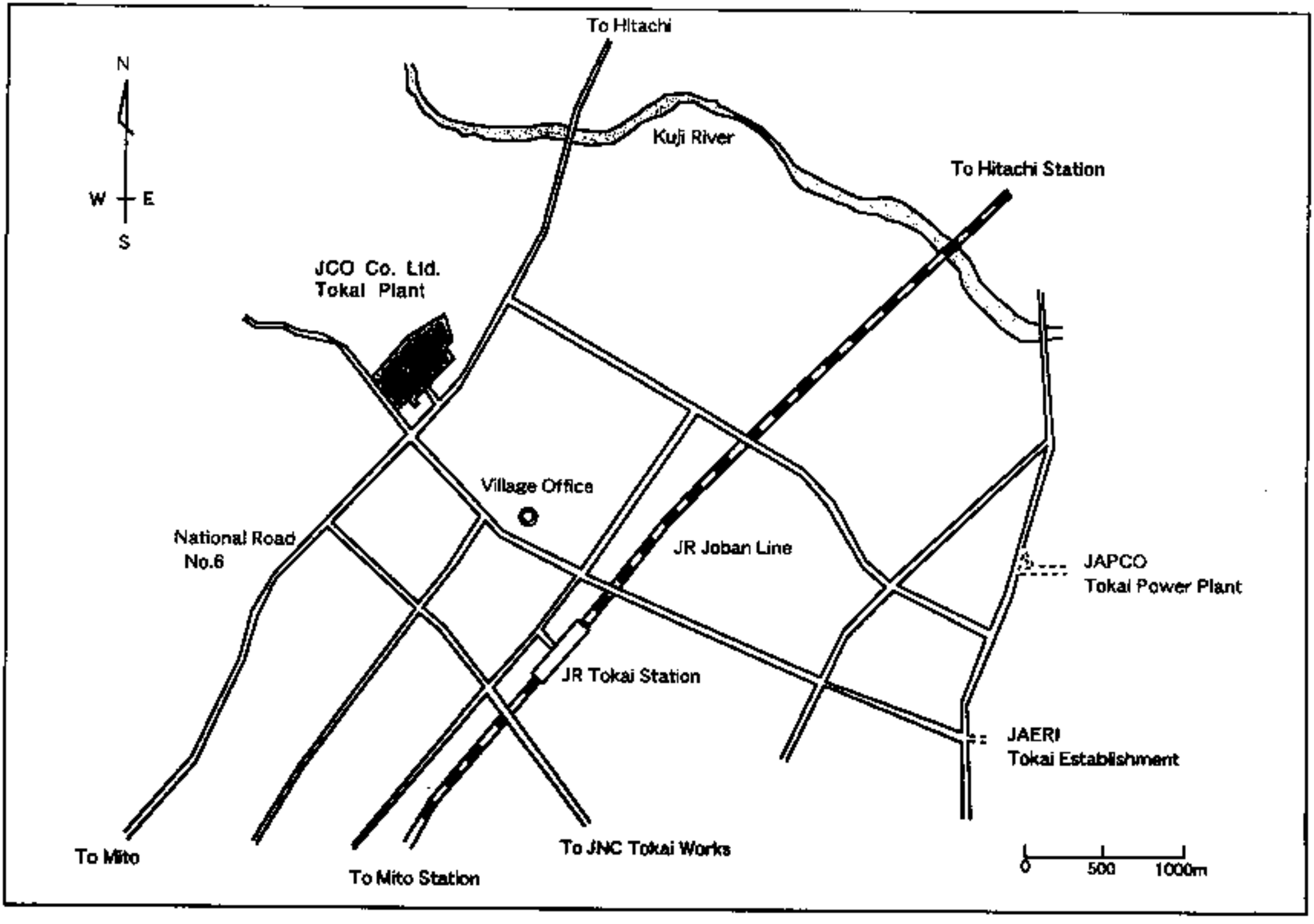
(6) NSC and STA will combine technological abilities of experts to clear up the causes of the accident and to take every possible measure to prevent similar accidents from occurring.

On October 7, NSC established the Accident Investigation Committee.

Site Location

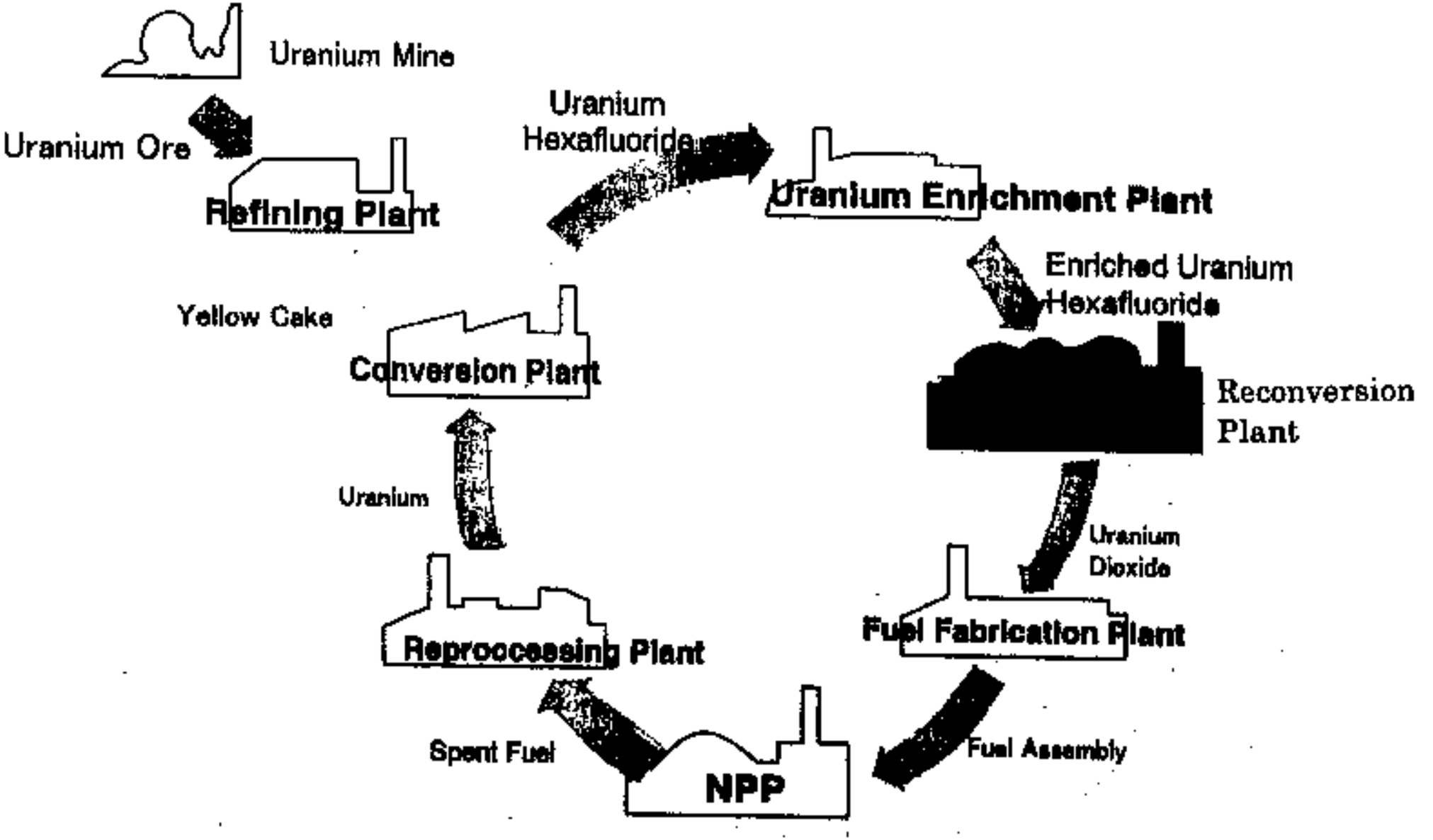



(km)
Kanasago-machi
Omiya-machi
Hitachiota-shi
Kuji River
Hitachi-shi
JCO Tokai Plant
Naka-machi
Tokai-mura
JR Tokai Station
JR Suigun Line
JR Joban Line
Jyouban Highway
Hitachinaka-shi
Naka River
JR Katsuta Station
Mito-shi
R349
R245
10
8
6
4
2
0

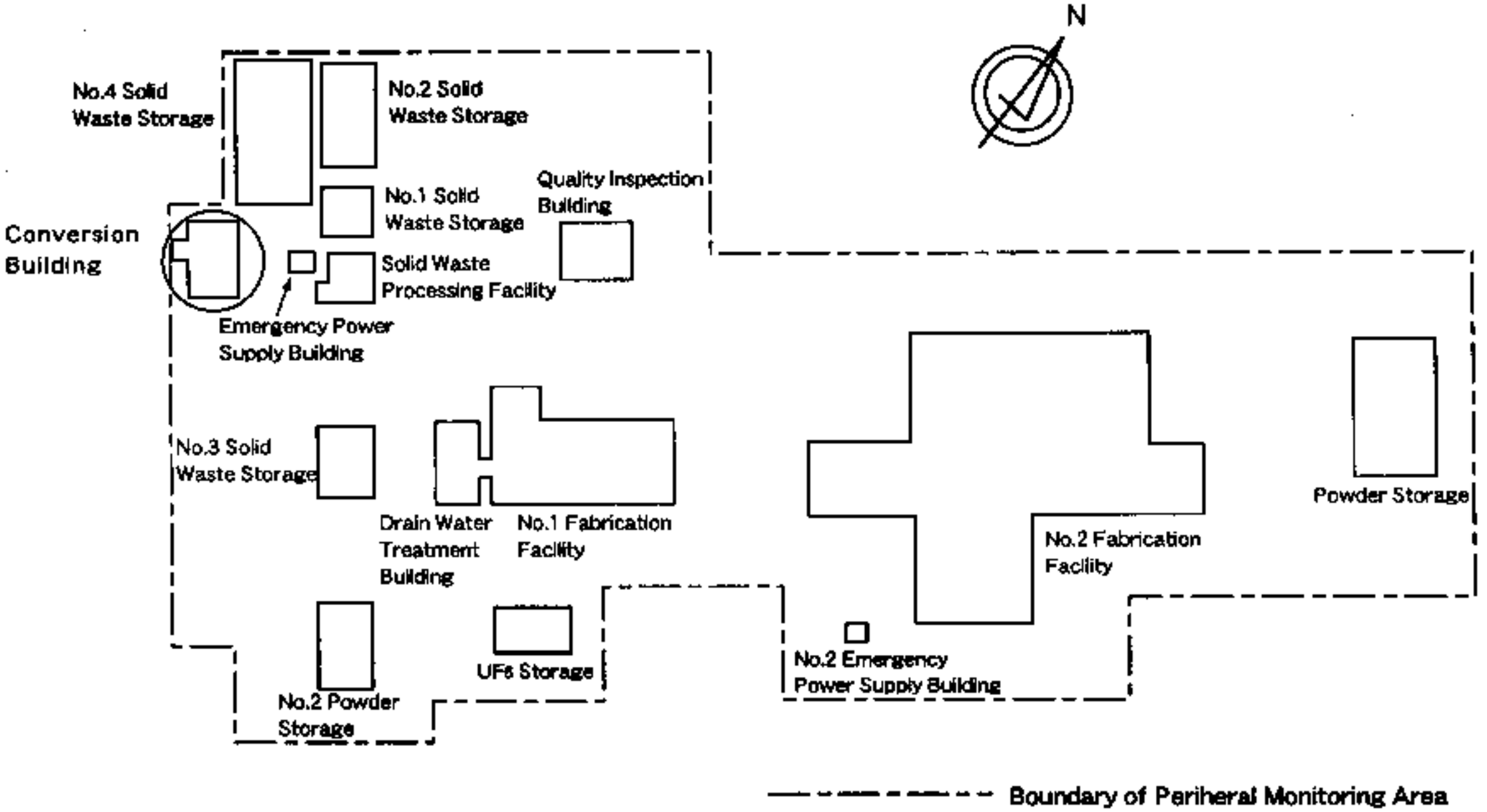


Location of JCO Tokai Plant

Nuclear Fuel Cycle



Appendix 2

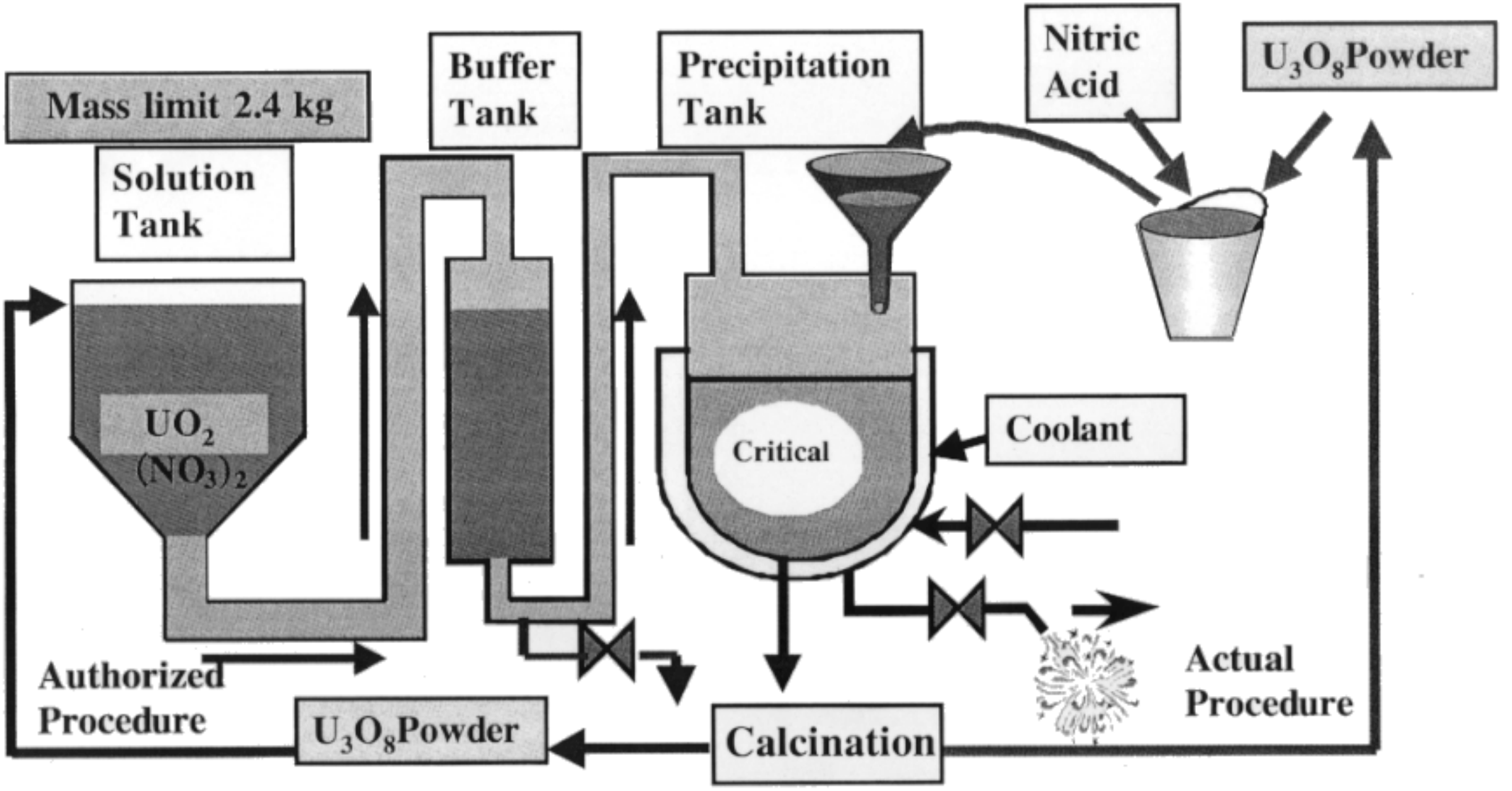


Building Layout

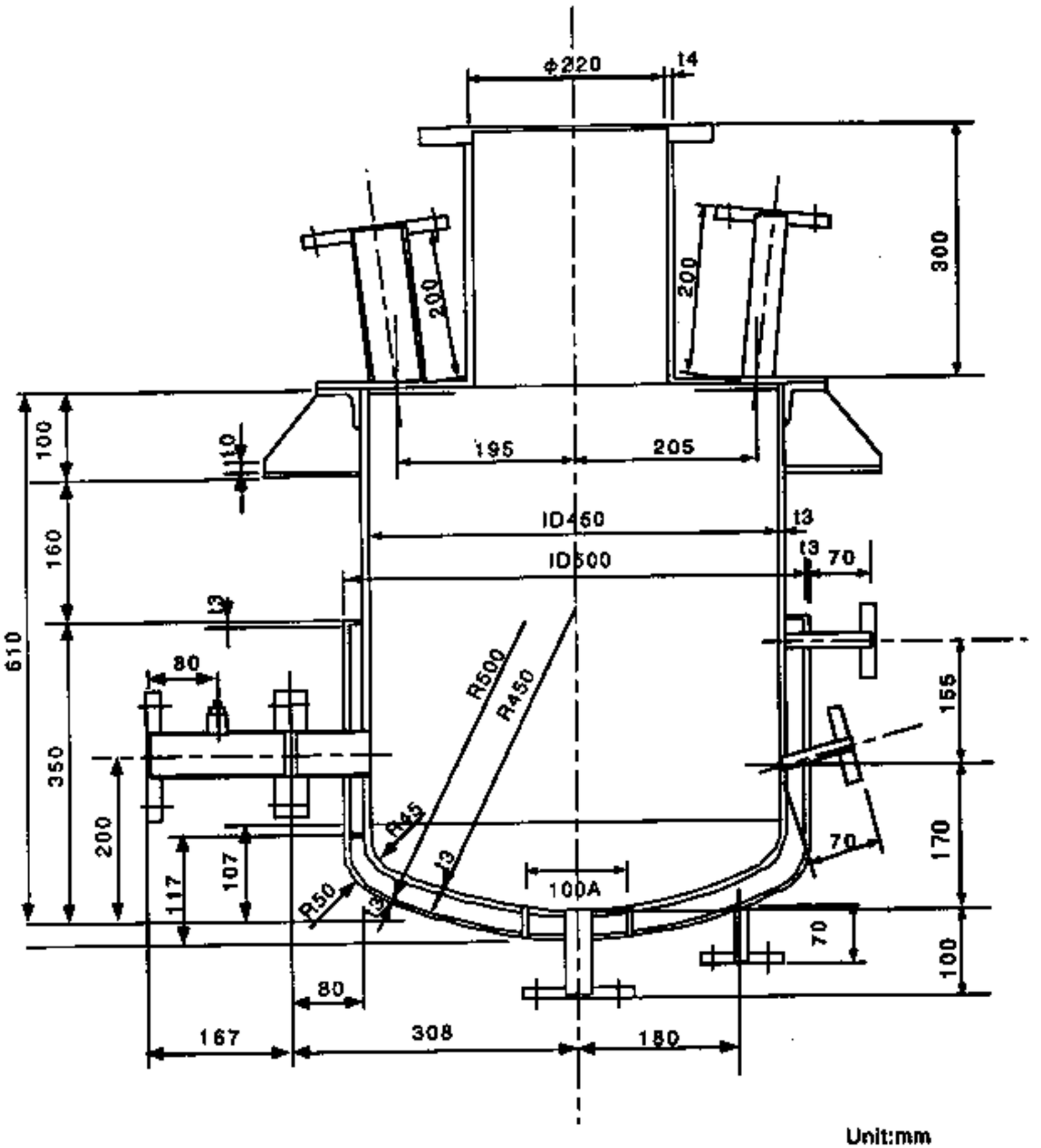
Appendix 3

Causes

- **By procedure violation, workers put 16kg Uranium, which exceeded mass limit of 2.4kg, into the precipitation tank directly by using bucket.**



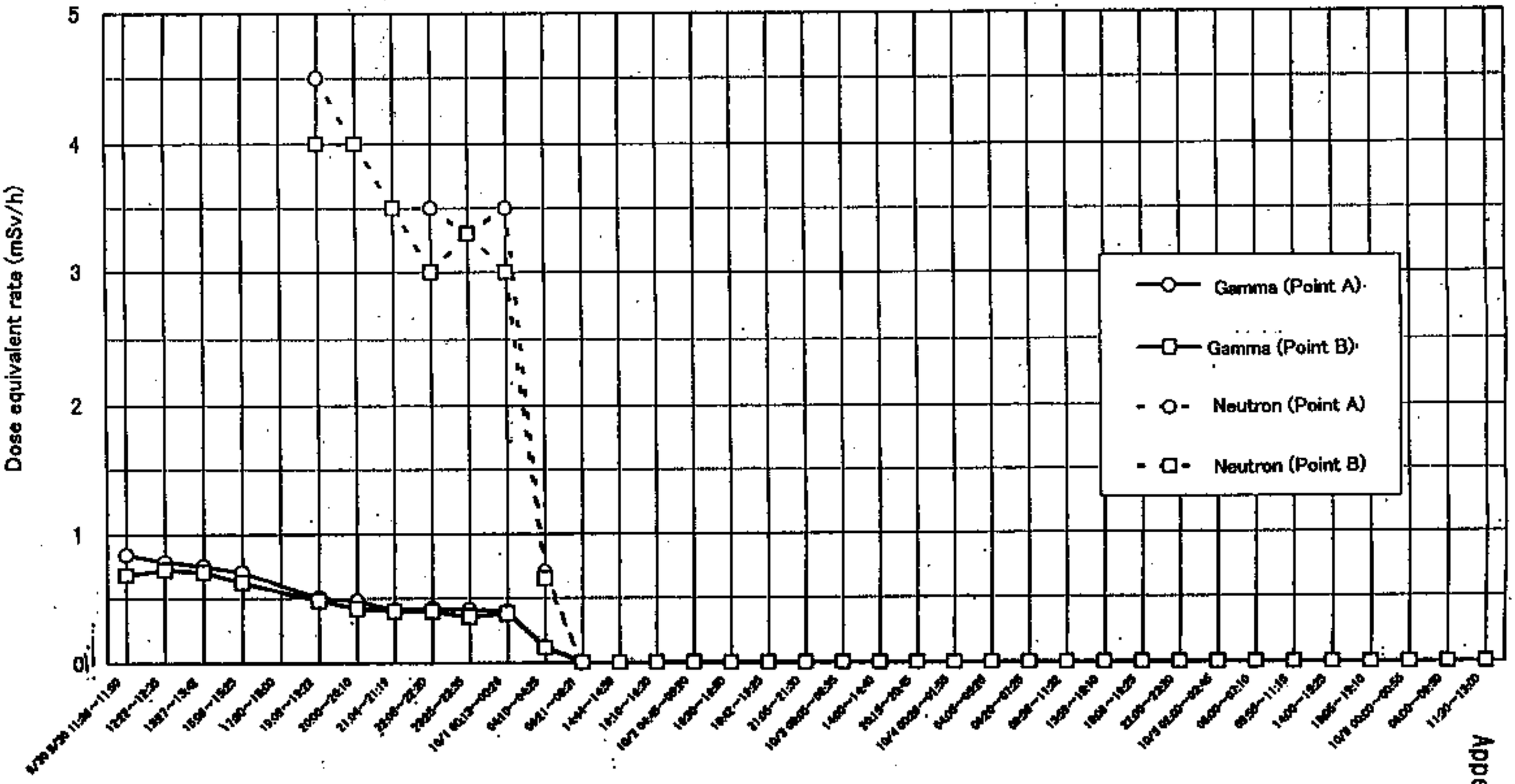
Appendix 4



Unit:mm

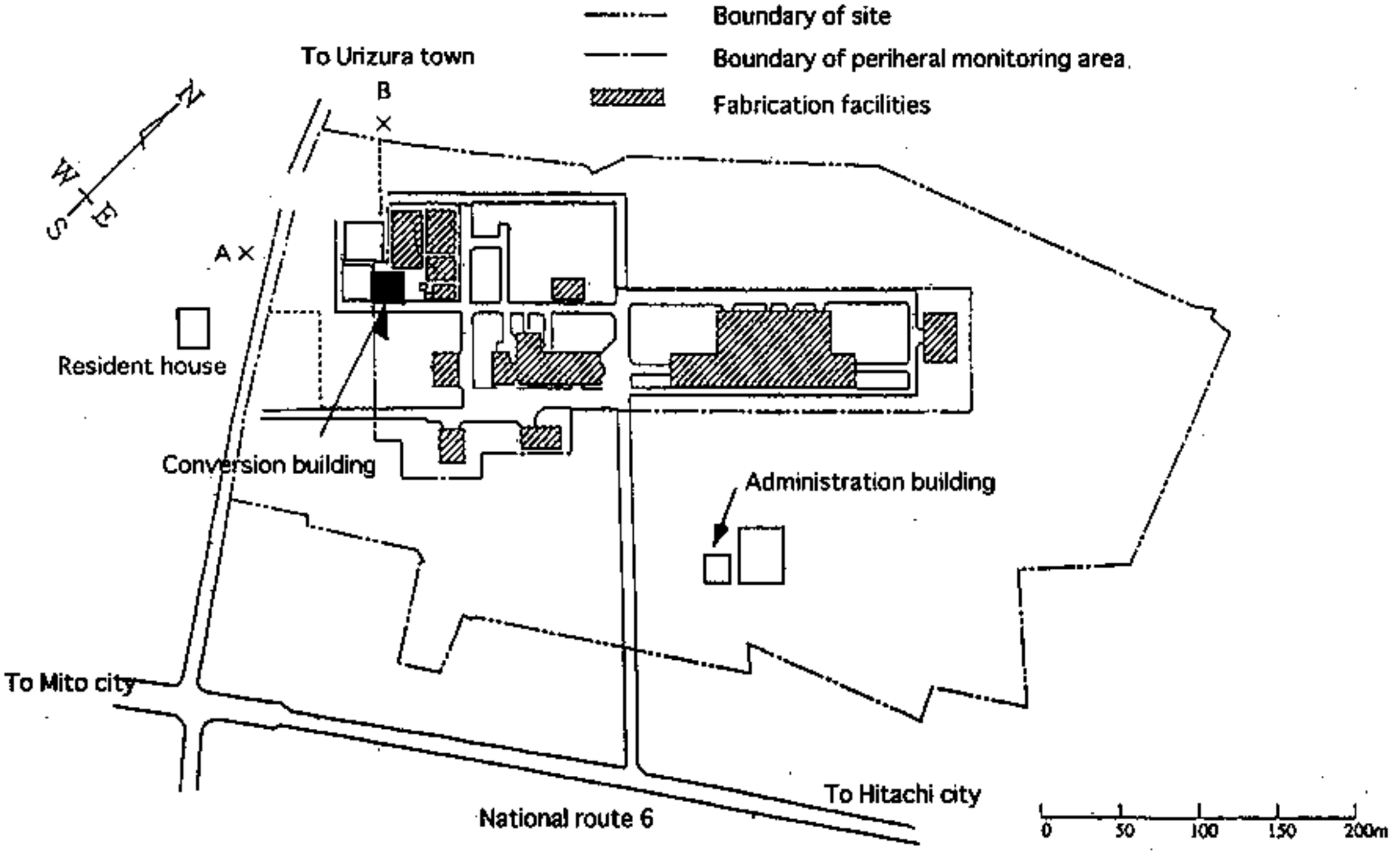
Precipitation Tank

Dose rate trend around JCO



Appendix 6

Periheral Monitoring Area in JCO Tokai Plant



	Measurment point														
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑫	⑬	⑭	⑮	⑯
Measurment time	Dose equivalent rate (mSv/h)														
9/30 10:36～11:50	0.048	0.19	0.6	0.84	0.48	0.68	0.28	0.017	0.0048	0.005	0.0073	0.005	0.026		
9/30 12:22～12:35	0.05	0.18	0.63	0.78	0.42	0.72	0.25	0.017	0.004	0.005	0.007	0.005	0.03	0.025	
9/30 13:27～13:42	0.058	0.18	0.6	0.75	0.4	0.7	0.23	0.017	0.0035	0.0048	0.0065	0.0045	0.025	0.025	
9/30 15:09～15:25	0.035	0.15	0.56	0.7	0.35	0.62	0.23	0.014	0.0034	0.0045	0.0058	0.0037	0.025		
9/30 17:30～18:00*	0.048*	0.27*			0.13*	Ponit of the 300m west from ⑤:0.0058, Naka restaurant:0.010							0.013*		
9/30 19:09～19:22	0.03	0.12	0.42	0.5	0.25	0.48	0.16	0.01	0.0018	0.0033	0.0045	0.003	0.017		0.035
	(0.35)	(1.1)	(3.5)	(4.5)	(2.0)	(4.0)	(1.5)	(0.13)	(0.015)	(0.025)	(0.040)	(0.030)	(0.15)		(0.40)
9/30 20:00～20:10	0.038	0.18	0.41	0.48	0.22	0.42	0.14	0.0085	0.0022	0.0027	0.0043	0.0024	0.018		0.028
	(0.4)	(1.5)	(3.0)	(4.0)	(2.0)	(4.0)	(1.5)	(0.11)	(0.020)	(0.025)	(0.035)	(0.030)	(0.18)		(0.40)
9/30 21:04～21:19	0.023	0.21	0.44	0.41	0.2	0.4	0.13	0.009	0.002	0.003	0.0035	0.0019	0.02		0.035
	(0.25)	(1.8)	(3.0)	(3.5)	(1.8)	(3.5)	(1.1)	(0.10)	(0.015)	(0.020)	(0.030)	(0.025)	(0.18)		(0.35)
9/30 22:08～22:20	0.025	0.2	0.41	0.42	0.2	0.4	0.13	0.0078	0.0018	0.0025	0.003	0.0017	0.014		0.025
	(0.25)	(1.8)	(3.0)	(3.5)	(1.8)	(3.0)	(1.5)	(0.10)	(0.015)	(0.020)	(0.025)	(0.020)	(0.15)		(0.30)
9/30 23:25～23:35	0.024	0.18	0.4	0.41	0.18	0.36	0.12	0.012	0.0015	0.0023	0.0034	0.002	0.013		0.024
	(0.27)	(1.3)	(3.0)	(3.3)	(1.7)	(3.3)	(1.1)	(0.11)	(0.015)	(0.020)	(0.030)	(0.023)	(0.13)		(0.28)
10/1 00:13～00:26	0.025	0.2	0.4	0.4	0.18	0.38	0.11	0.0075	0.0018	0.002	0.0033	0.002	0.013		0.025
	(0.15)	(1.8)	(3.0)	(3.5)	(2.0)	(3.0)	(1.1)	(0.11)	(0.015)	(0.018)	(0.035)	(0.024)	(0.18)		(0.35)
10/1 04:10～04:25	0.008	0.057	0.12	0.13	0.054	0.12	0.037	0.0029	<0.001	<0.001	0.0011	<0.001	0.004		0.0078
	(0.07)	(0.35)	(0.70)	(0.70)	(0.34)	(0.65)	(0.20)	(0.02)	(0.0035)	(0.0015)	(0.003)	(0.0025)	(0.03)		(0.07)
10/1 06:21～06:31	<0.001	0.0014	0.0034	0.0038	0.002	0.0038	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)		(<0.001)
10/1 14:44～14:58	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)		(<0.001)
10/1 16:10～16:30	–	<0.001	0.0013	0.0015	<0.00014	0.0041									
	–	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)									
10/2 04:45～05:20	<0.001	<0.001	<0.001	0.0018	<0.001	0.0023	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)		

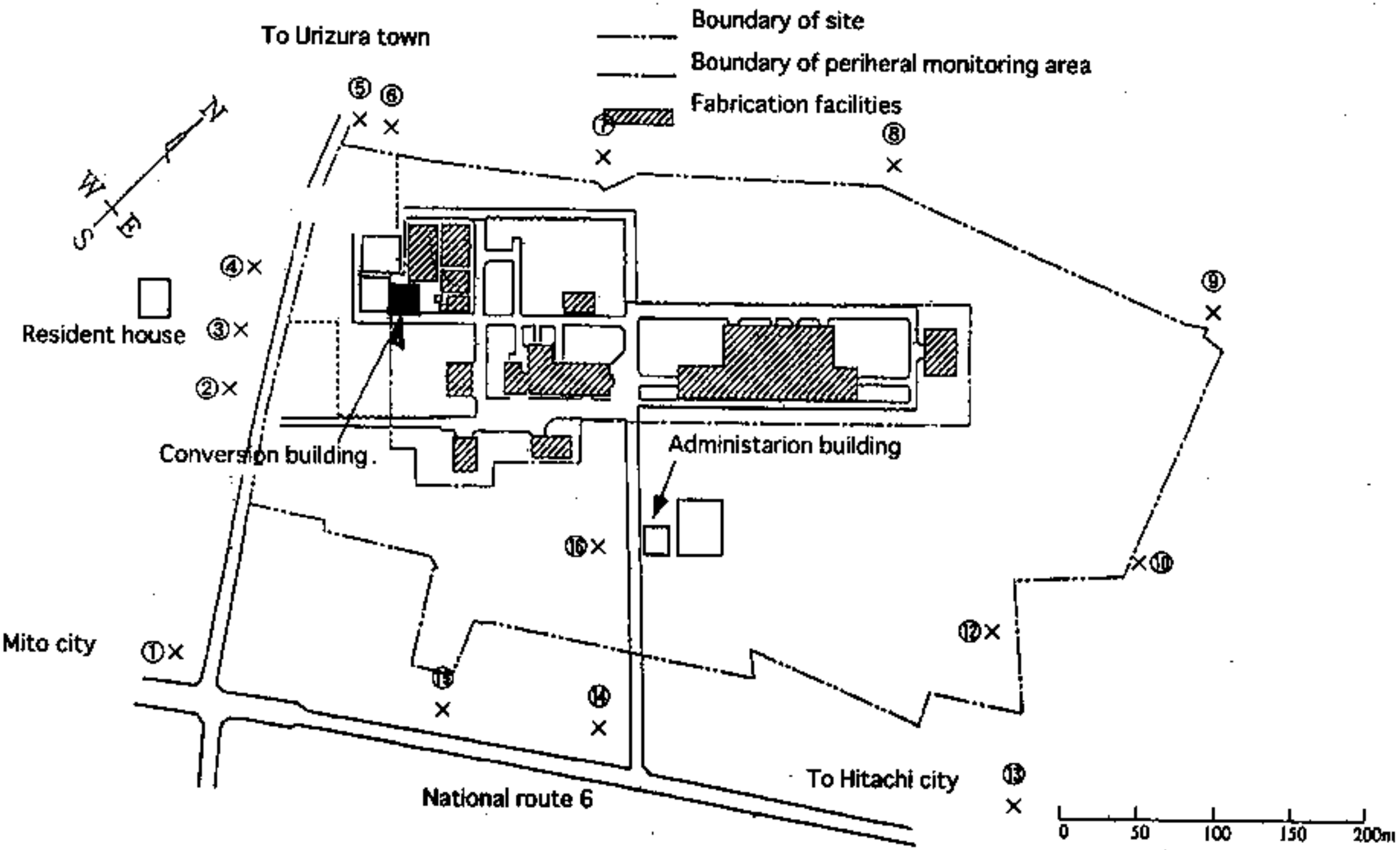
⑪: No measurement, ( ):Neutron dose , *: Measurement by JAERI

Appendix7

	Measurment point														
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑫	⑬	⑭	⑮	⑮
Measurment time	Dose equivalent rate (mSv/h)														
10/3 08:05～09:35	0.00006	0.00008	0.00015	0.00027	0.00019	0.00021	0.00012	0.00007	0.00005	0.00005	0.00004	0.00005	0.00004		
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)		
10/3 14:00～14:40	0.00006	0.00019	0.00025	0.00027	0.00013	0.00022	0.0001		0.00004				0.00004		
10/3 20:15～20:45	0.00007	0.00022	0.00029	0.00033	0.00014	0.00025	0.00011	0.00007	0.00005	0.00004	0.00004	0.00005	0.00004	0.00005	0.00006
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/4 00:26～01:55	0.00006	0.00019	0.00026	0.00033	0.00014	0.0002	0.00013	0.00007	0.00007	0.00004	0.00005	0.00005	0.00004	0.00005	0.00005
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/4 04:05～05:25	0.00006	0.00018	0.00025	0.00032	0.00012	0.00024	0.00012	0.00007	0.00005	0.00005	0.00005	0.00005	0.00004	0.00005	0.00006
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/4 06:20～07:25	0.00006	0.00018	0.00025	0.00031	0.00013	0.00021	0.00012	0.00006	0.00006	0.00006	0.00004	0.00005	0.00004	0.00006	0.00007
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/4 09:58～11:32	0.00006	0.00018	0.00024	0.00028	0.00012	0.00018	0.00012	0.00007	0.00007	0.00006	0.00006	0.00006	0.00004	0.00006	0.00006
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/4 13:59～15:10	0.00005	0.00018	0.00022	0.00025	0.00011	0.00017	0.00011	0.00006	0.00006	0.00005	0.00004	0.00006	0.00005	0.00005	0.00005
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/4 18:06～19:25	0.00006	0.00017	0.00023	0.00026	0.00011	0.00019	0.0001	0.00006	0.00006	0.00004	0.00005	0.00005	0.00004	0.00007	0.00007
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/4 22:00～23:20	0.00005	0.00015	0.00019	0.00021	0.00013	0.00015	0.00009	0.00005	0.00005	0.00004	0.00004	0.00005	0.00004	0.00005	0.00006
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/5 02:00～03:45	0.00005	0.0002	0.00024	0.00022	0.00012	0.00017	0.00009	0.00005	0.00005	0.00004	0.00005	0.00006	0.00005	0.00005	0.00005
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/5 06:00～07:10	0.00006	0.00011	0.00018	0.0002	0.0001	0.00016	0.00008	0.00005	0.00006	0.00006	0.00004	0.00005	0.00006	0.00006	0.00005
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/5 09:55～11:15	0.00005	0.00013	0.00019	0.00021	0.00011	0.00015	0.00008	0.00006	0.00006	0.00004	0.00004	0.00004	0.00004	0.00006	0.00006
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/5 14:00～15:25	0.00004	0.00012	0.00016	0.00019	0.00013	0.00016	0.00008	0.00006	0.00005	0.00004	0.00005	0.00004	0.00003	0.00004	0.00005
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/5 18:05～19:10	0.00006	0.00014	0.00018	0.0002	0.00011	0.00016	0.00009	0.00006	0.00005	0.00005	0.00005	0.00005	0.00004	0.00004	0.00005
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/6 00:00～00:55	0.00004	0.0001	0.00014	0.00018	0.00012	0.00012	0.00009	0.00007	0.00006	0.00004	0.00004	0.00004	0.00003	0.00004	0.00005
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/6 06:00～06:50	0.00005	0.00013	0.00016	0.00019	0.00012	0.00015	0.00009	0.00005	0.00006	0.00006	0.00005	0.00005	0.00004	0.00005	0.00005
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
10/6 11:30～13:00	0.00005	0.00006	0.00013	0.00015	0.00012	0.00012	0.00009	0.00005	0.00006	0.00005	0.00004	0.00005	0.00005	0.00006	0.00005
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)

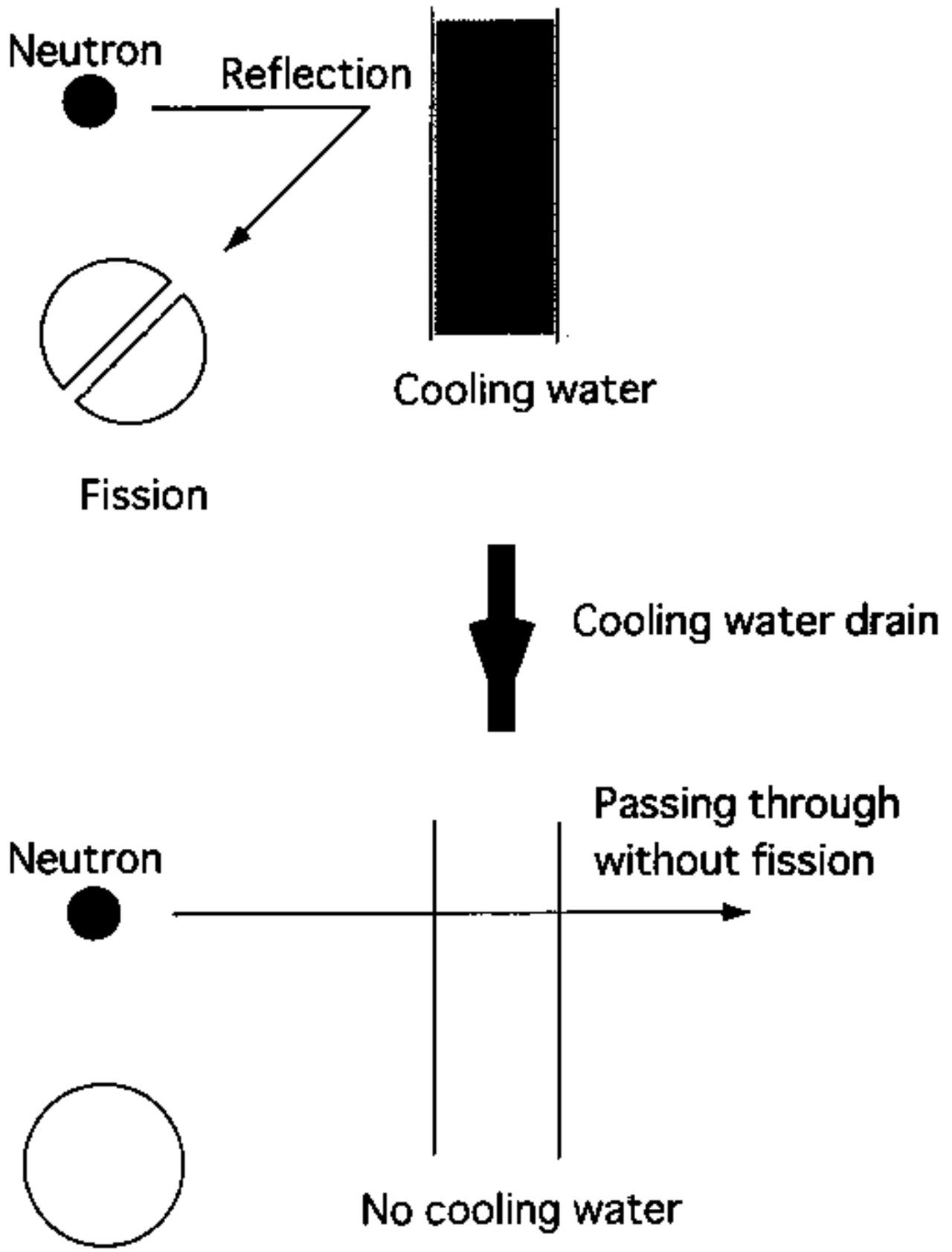
⑪: No measurement, ( ):Neutron dose

Periheral Monitoring Area in JCO Tokai Plant



Appendix 8

Effect of cooling water drain



Number of the Exposed Persons

JCO employees (including those from the associated companies)

・Employees who were exposed in the operation and carried to the National Institute of Radiological Sciences .....3 persons
(including one who was transferred to the hospital attached to the University of Tokyo on October 2 and another who was transferred to the hospital attached to the Institute of the Medical Science of the Univeraity of Tokyo on October 4)

・Persons considered to be exposed to neutron according to the results of the measurements by the whole-body counter .....56 persons

(24 persons who engaged in draining water from the cooling water jacket to mitigate criticality were exposed to radiation.)

Residents

・Among workers who were assembling scaffolding in a construction site near the western boundaries of the JCO, those considered to be exposed to neutron from the results of the measurements by the whole-body counter.....7 persons

Tokaimura fire fighters

・Persons engaged in carrying JCO employees (the three worker in the operation) to an hospital and considered to be exposed to neutron from the results of the measurements by the whole-body counter

..... 3 persons

Total: 69 persons

Actions by Ministries and Agencies in Connection with the Accident in the Uranium Fuel Processing Plant of JCO

National Police Agency

- Guiding of local residents in evacuation
- Enforcement and lifting of traffic control
- Patrol of the evacuated areas

Defense Agency

- Dispatch of 64 Self-Defense officials, 2 chemical protection vehicles, 7 decontamination vehicles from the Ground Self-Defense Force 101st Chemical Protection Corps (Omiya) to Katsuta Garrison. (withdrawal upon request)

Dispatch of 26 officials and 7 decontamination vehicles on October 3. Standing-by of 4 decontamination vehicles of the above vehicles at the MITO Red Cross Hospital, public health centers of Mito City and Omiya Township.

- Dispatch of 18 officials, a chemical protection vehicle, and a decontamination vehicle to Katsuta Garrison from the Chemical Protection Platoon of the First Division of the Ground Self-Defense Force (Nerima) (already withdrawn).
- Dispatch of 15 ambulances, 11 large buses, and 13 microbuses to Katsuta Garrison from the Ground, Maritime, and Air Self-Defense Forces (already withdrawn).
- Dispatch of 3 medical officers to Katsuta Garrison from the Self-Defense Force Central Hospital (Sanjuku) (already withdrawn).

Science and Technology Agency

- Establishment of emergency task forces (separately established by the Science and Technology

Agency(STA), Japan Atomic Energy Research Institute(JAERI), Japan Nuclear Cycle Development Institute (JNC), and National Institute of Radiological Sciences(NIRS))

·Establishment of emergency task force for taking emergency measures against the accident, with the Minister for the Science and Technology as chief

· Dispatch of experts (6 from the STA, 50 from the JAERI, and 60 from the JNC) to the site (local autonomies and JCO) and provision of technical advice

· Hospitalization of 3 patients exposed to radiation to the NIRS (One of them was transferred to the Hospital attached to the University of Tokyo)

· Opening of a counseling office for the residents at the site (the staff members consisting of personnel from the STA, the JAERI and the JNC)

· Provision of materials and equipment

· JAERI: Shields materials for neutron, protection materials and equipment, and a monitoring car, 3 evacuation buses, radiation measurement instruments, etc.

· JNC: 3 monitoring cars, emergency material transportation cars, 2 evacuation buses, a fire engine, radiation measurement instruments, etc.

· Monitoring, sampling, and analyses; supply of data to Ibaraki Prefecture, Tokaimura, and Hitachi-Naka City (JAERI, JNC)

· Whole-body detailed survey of those who are considered to be exposed to radiation (JNC)

· Dispatch of experts to the emergency task force for taking emergency measures against the accident (NIRS)

· Establishment of an emergency technical advisory body of the Nuclear Safety Commission (Nuclear Safety Commission)

Environment Agency

· Establishment of the "Environment Agency task force for taking measures against the Accident in the Tokaimura Uranium Fuel Processing Plant"

· Dispatching of Agency's personnel to the on-the-spot emergency task force

・Measurement of the environment around the site

National Land Agency

・Establishment of the "Information and Disaster Measures Office" in the Disaster Prevention Bureau

・Collection of information from the related ministries and agencies for feed back

・Dispatch of 4 staff members headed by the Director General's Office counselor to the on-the-spot task force.

・Assistance provided to the chief of the on-the-spot emergency task force concerning the implementation of the actions listed in the disaster prevention basic plan.

Ministry of Foreign Affairs

・Provision of information to other countries and international organizations.

・Collection of information on accident management from other countries and international organizations.

・Response to offer of cooperation in accident management from other countries and international organizations.

Ministry of Finance

・Establishment of an intra-ministry liaison meeting

Ministry of Education

・Establishment of the emergency task force for taking emergency disaster measures

・Request, made through Ibaraki Prefecture Board of Education, for temporarily closing on October 1 educational institutions including elementary and junior high schools located basically within a 10 km range from the location where the accident occurred.

・Dispatch of 2 doctors and 2 nurses from the hospital attached to the University of Tsukuba to Hitachi Health Center; medical examination of about 94 outpatients from the areas affected in

the attached hospital.

・Transferal of an exposed patient to the hospital attached the University of Tokyo from the NIRS (Hospitalized at 16:45, October 2)

・Decision of dispatch of 4 nurses (from the hospital attached to the School of Medicine of the University of Chiba) from October 8 to 15, following the request by the NIRS

・Dispatch of a doctor and 3 radiation engineers (from the Nuclear Medical Institute of the University of Hiroshima, etc.), following the request by Ibaraki Prefecture on October 2

・Health check of residents including school children and students living within a 350m range from the location where the accident occurred by Ibaraki Prefecture emergency task force for the accident. (October 2)

・In consideration of the problem of mental trauma (PTSD: post-traumatic stress disorder) from which children under an emergency or a disaster condition may suffer, the Ministry requested the Ibaraki Prefecture Board of Education to take into consideration mental care for children by utilizing a booklet titled "Mental Care for Children under an Emergency or a Disaster Condition (issued by the Ministry of Education, March, 1998)."

Ministry of Health and Welfare

Adequate measures to be taken to protect residents from effects of the accident including:

・Medical examination at the National Mito Hospital and others

・Personnel assistance to the health check activities of Ibaraki Prefecture is engaged in

・Securing of safety of tap water and food

・Enforcement of the Disaster Relief Act

Ministry of Agriculture, Forestry and Fisheries

・Establishment of the emergency task force for taking measures against the accident in the Tokai-mura uranium fuel processing plant

・Grasping of the reality of the agriculture, forestry and fisheries in the affected areas

• Cooperation in the sampling on agriculture, forestry and fisheries products in the affected areas and confirmation of safety

• Prevention of rumor damage to Ibaraki Prefecture's agriculture, forestry and fisheries products arising from groundless rumors

• Grasping of the impact of the accident this time on those engaged in agriculture, forestry and fisheries

Ministry of International Trade and Industry

• Dispatch of 3 staff members to the on-the-spot emergency task force at the site and other organizations

• Established the "Cooperation and Information Center for Tokaimura Nuclear Fuel Processing Plant Accident" to provide maximum possible cooperation regarding the accident and to best serve in providing information to those associated with nuclear power generation companies.

• Recommendation for the electric power companies and related organizations to offer cooperation. The electric power companies who received the Ministry's request provided monitoring cars and equipment and materials such as measurement instruments, following the request by the STA and the on-the-spot emergency task force at the site; at the same time, more than 670 employees from those companies assisted in monitoring the surrounding areas and measuring dose for residents; the related organizations sent a team of 20 personnel to the on-the-spot emergency task force at the site.

• Application of the Disaster Relief Loan by government-sponsored financial institutions for medium and small enterprise and opening of special consultation contacts (by government-sponsored financial institutions for medium and small enterprise and Ibaraki Prefecture Credit Guarantee Association) following the application of the Disaster Relief Act

• Recommendation of immediate examination and report whether procedure instructions are proper in the light of the safety regulations based on the Law on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors to electric power companies

Ministry of Transport

・Recommendation of traffic control within a 10 km range from the location of the facility to transportation enterprises following the advice for residents living these area to stay indoors.

・Recommendation of traffic controls Cancellation in the affected areas to transportation enterprises following the cancellation of the advice to stay indoors.

Maritime Safety Agency

・Notification of Ibaraki Prefecture's information to those engaged in maritime transport and fisheries.

・Monitoring and calling attention to ships by the patrol boats and helicopters.

・Establishment of "measures office of Ibaraki prefecture Tokaimura uranium fabrication facility accident" in the central office, "Emergency Task force of Ibaraki prefecture Tokaimura uranium fuel processing plant accident" in the Third District Maritime Safety Headquarters, and "Emergency Task force of Ibaraki prefecture Tokaimura uranium fabrication facility accident at the Site" in the Nakaminato Maritime Safety Department. (22:20, September 30)

Meteorological Agency

・Provision of weather information such as wind direction and speed from the Meteorological Agency, Tokyo District Meteorological Observatory, and Mito Regional Meteorological Observatory to the government disaster handling office, Ibaraki Prefecture, and the task force at the site.

・Dispatch of the Agency personnel to the task force at the site.

Ministry of Posts and Telecommunications

・Established emergency task forces for taking measures for the accident in the Ministry office and the Kanto Posts and Telecommunications Bureau on the day of the accident.

・Recommendation to the post offices to suspend operations, following the advice for residents

living within a 10 km range from the facility to stay indoors. (50 post offices, until evening October 1)

・Performed the following support measures through the communications operators under jurisdiction:

① To avoid congestion caused by calls made from all parts of the nation to confirm safety of the evacuees and to be able to address such calls, the disaster message dial system was put into operation throughout Ibaraki Prefecture beginning on October 1.

② To provide the evacuees with telephone services, temporary telephones were installed at the community center where the evacuees stayed.

③ In response to the request of the Government and local autonomies, portable telephones were loaned.

・Broadcasting enterprise under jurisdiction extended the broadcasting time, edited special programs, and took other adequate options beginning immediately after the occurrence of the accident.

・The postal enterprise put the following support measures into action:

① All the post offices in Ibaraki Prefecture pay up to 200,000 yen to an evacuee when the post office can identify him or her even if he or she does not bring the passbook, policy, or seal with him or her because of evacuation.

② The similar emergency measures are applied to postal money order, postal money transfer, pensions, government bonds, postal life insurance, etc.

Ministry of Labor

・Establishment of the task force at the Ibaraki Labor Standards Inspection Office

・Recommendation of emergence health check to 5 companies including JCO that had their workers in the Uranium Fuel Processing Plant of JCO Tokai works at the time of the occurrence of the accident by the chief of the Ibaraki Labor Standards Inspection Office.

・Recommendation of health check for those workers who were considered to have been exposed to enterprises located near the plant by the Ibaraki Labor Standards Inspection Office.

・Blood examination and medical consultation by six nearby hospitals of the Labor Welfare Corporation.

Ministry of Construction

・The central office of the Ministry and the Kanto Regional Construction Bureau were put on the alert to address the development of the situation.

・Analysis of quality of water of rivers and influent water channels

・Closing of roads and analysis of soil in green belts

・Recommendation for waste water treatment facilities to measure water quality

・Closing of national management parks

・Suspension of construction work for public buildings and facilities and advice to suspend construction work of private buildings and facilities

Fire Defense Agency

・Recommendation of public information activities for evacuation of local residents and for providing means of emergency transportation to the local autonomies and fire fighting.

・Request of radiation protection equipment and materials for Ibaraki prefecture to Fukushima prefecture.

・ Recommendation of continuation of public information activities for local residents and maintaining necessary emergency transportation system to the local autonomies and fire fighting, following the cancellation of the advice for indoor evacuation.

・Recommendation of arrangements for a first aid transportation for workers engaged in building sandbag shielding in JCO Co.'s Tokai works to the Prefecture and Tokaimura to establish.

Appendix 11

October 2, 1999

Announcement by the government task force

-For the accident in the uranium fuel processing plant in Tokai Mura (JCO), Sheltering of residents living within the 10Km range was released yesterday.
-After that, furthermore, radiation amounts and soils were measured in detail in the 350m range where an evacuation measure has been continued.
-Nuclear Safety Commission confirmed the safety in the area, because it is confirmed that all radiation levels returns to normal ranges after thorough analysis of the investigation results.
-Incidentally, based on judgment of experts, we, Government also judged that the residents within the 350m range can live normally without any trouble in the current situation and release of the evacuation measure of the residents does not cause any trouble, and informed this to Ibaragi prefecture and Tokai Mura.
-We hope the residents who had been put to inconvenience during their evacuation lives return to their usual lives as soon as possible.

Decision items by GOJ Task Force for the accident in a uranium fuel processing plant in Tokai Mura

October 4, 1999

GOJ Task Force

The GOJ task force decided that the following policies to be absolutely sure for future correspondence, based on that situation caused by the accident in uranium fuel processing plant in Tokai Mura returns to normal situation. Summarizing of whole policy will be performed by the Chief Cabinet (contents in the following brackets show supervision offices).

1 Thorough investigation on causes of the accident

(1) Construction of a thorough investigation system on the causes of the accident

-Setting up of an accident investigation committee including outside knowledgeable persons in Nuclear Safety Commission. (Nuclear Safety Commission)

-Setting up of an accident investigation task force. (Science and Technology Agency)

(2) Discovery on criminal liability. (National Police Agency)

(3) Investigation on problems in relation with the Industrial Safety Health Law (Ministry of Labor)

2 Correspondence to neighboring residents

(1) Health consultation including mental care of the residents. (Science and Technology Agency, Ministry of Health and Welfare, Ministry of Education, Science, Sports and Culture)

(2) Health management of exposed persons or others. (Science and Technology Agency, Ministry of Health and Welfare, Ministry of Labor)

(3) Positive informing of information such as monitoring results and investigation results of accident causes. (Science and Technology Agency)

(4) Financial support such as disaster restoration loan. (Ministry of International Trade and Industry, Ministry of Agriculture, Forestry, and Fisheries, Science and Technology Agency)

3 Temporary measures

(1) Isolation and decontamination of the accident caused place. (Science and

Technology Agency)

-Understanding of the situation of the accident caused place and shielding of radiation.

-Treatment of radioactive material such as the precipitation tank where the criticality accident occured

(2) Continuation of radiation monitoring in an area neighboring on the accident caused plant. (Science and Technology Agency, Ministry of International Trade and Industry, Environment Agency, Ministry of Construction)

-Continuation of radiation monitoring in a neighboring residential area, including setting up of high accuracy monitoring posts.

-Continuation of investigation for neighboring environment such as rivers.

(3)Measures for agricultural products. (Ministry of Agriculture, Forestry, and Fisheries, Ministry of Health and Welfare)

-Public information and guidance for related industries to prevent rumor damage.

-Understanding of the situation of effects on farmers.

(4) Continuation of necessary explanation and informing to international organizations and foreign countries such as International Atomic Energy Agency. (Ministry of Foreign Affairs, Science and Technology Agency)

4 Prevention of reoccurrence and emergency measures

(1) Emergency complete inspections of nuclear fuel manufacturing facilities. (Science and Technology Agency, Ministry of Labor)

-Recommendation of inspections for criticality control in nuclear fuel manufacturing facilities.

-Implementation of on-the-spot inspections, and publication of the results.

-Recommendation of necessary measures based on the inspection results.

-Implementation of necessary guidance in an aspect of the Industrial Safety Health Law

(2) Instruction of investigation of manuals related to nuclear plants. (Ministry of International Trade and Industry, Science and Technology Agency)

(3) Setting up of an involved ministry and agency meeting for risk management, of which chairman is a cabinet risk management officer, for summarizing these measures for the accident and responding to future similar accidents. (Cabinet Secretariat, involved ministries and agencies)

(4) Reinforcement of disaster corresponding system including development and maintenance of materials and equipment parts. (Science and Technology Agency, Ministry of Labor, National Police Agency, Fire Defense Agency, Defense Agency, Ministry of International Trade and Industry)

Facilities subject to comprehensive safety check

①Uranium fuel fabrication facilities

Japan Nuclear Fuel Co. Limited (Yokosuka)

Mitubishi Nuclear Fuel Co. Limited (Tokai)

Nuclear Fuel Industries Limited, Tokai Works

Nuclear Fuel Industries Limited, Kumatori Works

Japan Nuclear Fuel Limited, Rokkasho Enrichment Facility

Japan Nuclear Cycle Development Institute, Nigyo-toge Environmental Engineering Center, Enrichment Facility

②Reprocessing facilities

Japan Nuclear Cycle Development Institute, Tokai work, Reprocessing Facility

Japan Nuclear Fuel Limited, Rokkasho Reprocessing Facility

③Facilities using nuclear fuel, corresponding to Article 16-2

Nippon Nuclear Fuel Development Co. Limited, NFD hot laboratory (Oarai)

Nuclear Development Co. (Tokai)

High Energy Accelerator Research Organization (Tsukuba)

Nuclear Material Control Center (Tokai)

Tohoku University, Institute for Materials Research, Irradiation Experimental Facility (Sendai)

National Institute of Radiological Sciences (Chiba)

Japan Atomic Energy Research Institute, Tokai Research Establishment (Tokai)

Japan Atomic Energy Research Institute, Oarai Research Establishment (Oarai)

Japan Nuclear Cycle Development Institute, Tokai Works (Tokai)

Japan Nuclear Cycle Development Institute, Oarai Engineering Center (Oarai)

Japan Nuclear Cycle Development Institute, Nigyo-toge Environmental Engineering Center (Kamisaibara)

Nuclear Fuel Industries Limited, Tokai Works

The Law for the Regulations of Nuclear Source Material, Nuclear Fuel Material and Reactors

Article 16-2

Such nuclear fuel material specified by cabinet order as provided for in paragraph 1, Article 55-2 and paragraph 1, Article 56-3, of the Law shall be nuclear fuel material coming under any one of the following items:

(i) Plutonium, its compounds and material containing one or more of these materials with plutonium not smaller than one gram in quantity (with the exception of sealed one).

(ii) Spent fuel showing a level of 3.7 tera-Bq or more.

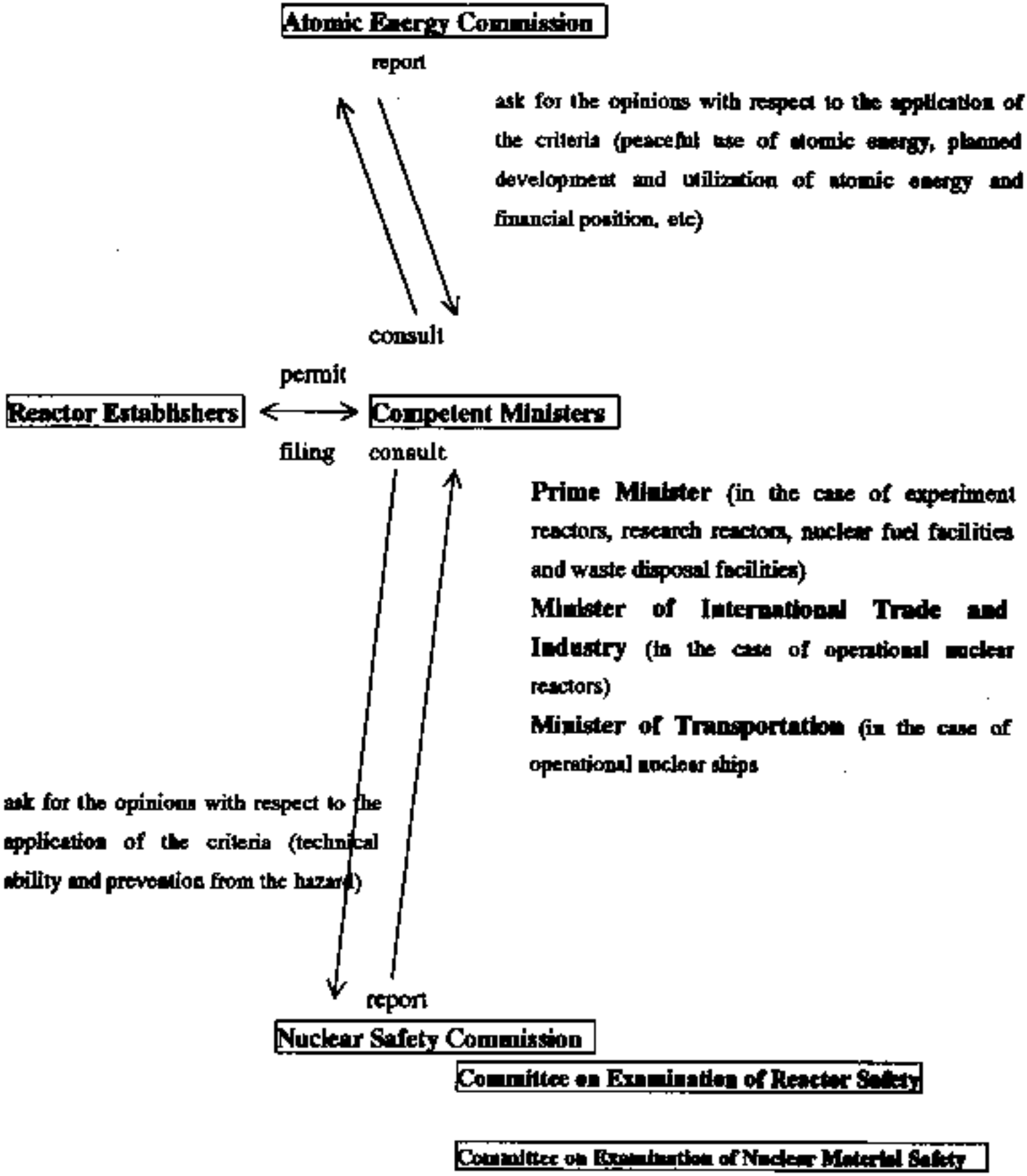
(iii)Uranium hexafluoride with uranium not smaller than one ton in quantity.

(iv)Uranium, its compounds and materials containing one or more of these materials with uranium not smaller than three tons in quantity (provided that it is in a liquid state).

(Necessity for protection measures concerning the use of nuclear fuel material)

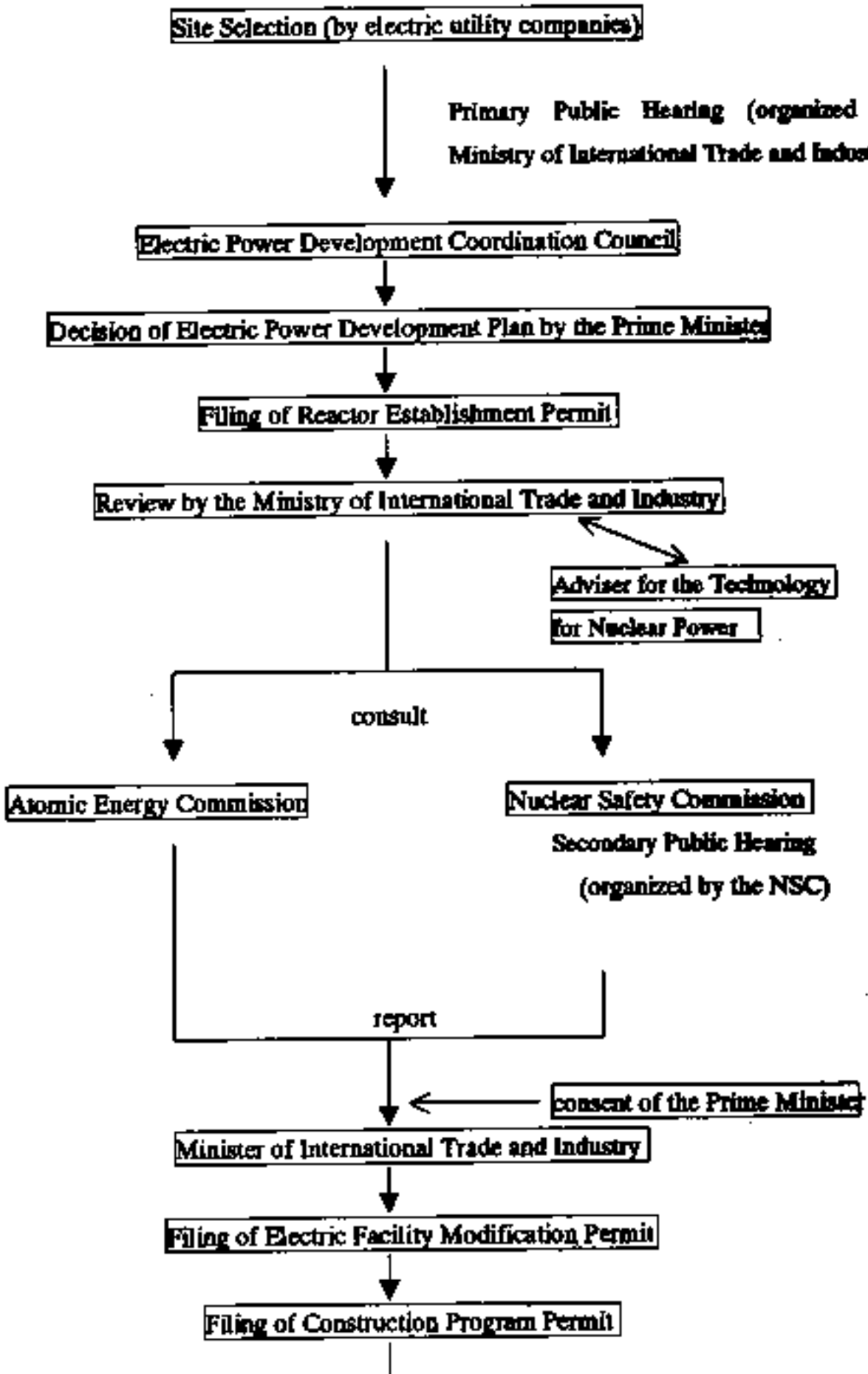
II. Outline of the Safety Regulations for Nuclear Facilities, etc

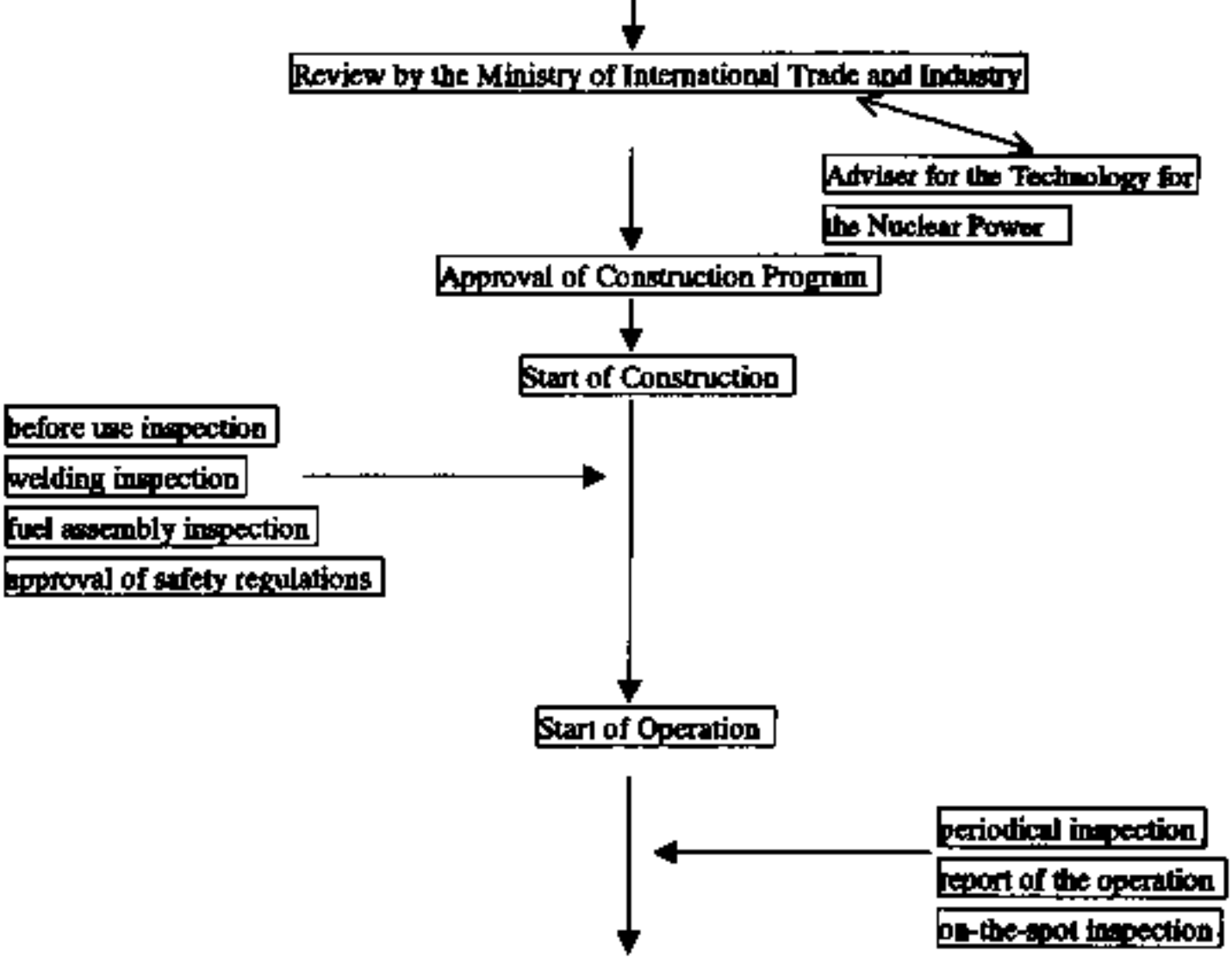
1. Safety Review for Nuclear Facilities



2. Safety Regulation for Nuclear Power Plants

[Procedures from Site Selection to Operation of Nuclear Power Plant]




Review by the Ministry of International Trade and Industry
Adviser for the Technology for the Nuclear Power
Approval of Construction Program
Start of Construction
before use inspection
welding inspection
fuel assembly inspection
approval of safety regulations
Start of Operation
periodical inspection
report of the operation
on-the-spot inspection

3. Safety regulation for nuclear fuel facilities

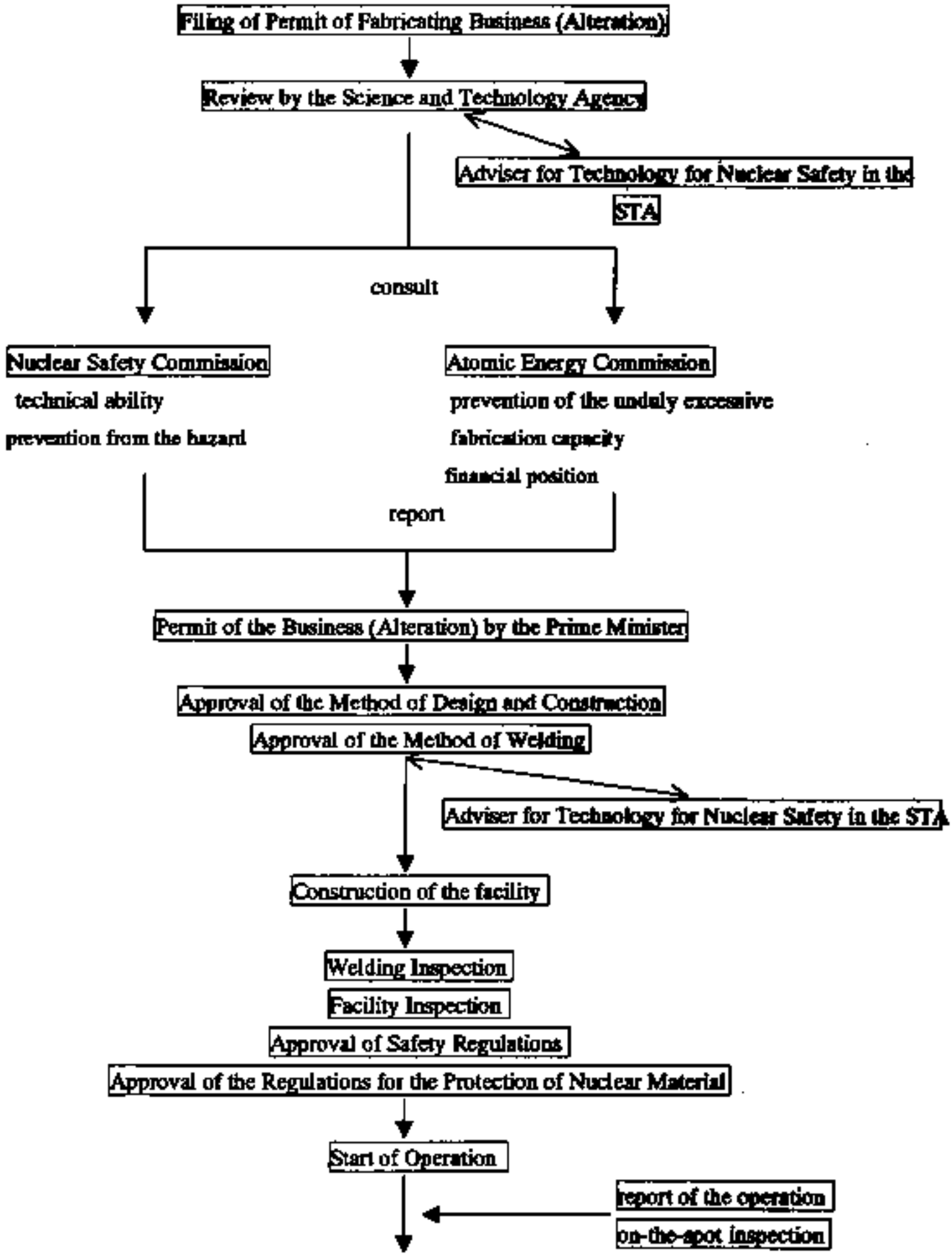
(1) Regulation system in the Law for the Regulations of Nuclear Source Materials, Nuclear Fuel Materials and Reactors

	Milling and refining	Fabrication	Reprocessing	Use of nuclear fuel materials	Use of nuclear source materials
Stage before construction	-Designation of business Investigation and review by Nuclear Safety Commission and Atomic Energy Commission	-Permission of business Investigation and review by Nuclear Safety Commission and Atomic Energy Commission	-Designation of business (except for JAERI and JNC) -Sanction of installation (JAERI and JNC) Investigation and review by Nuclear Safety Commission and Atomic Energy Commission (only designation)	-Permission of use	-Notice of usage
Stage of construction		-Sanction of design and construction methods -Sanction of welding methods -Facility inspection	-Sanction of design and construction methods -Sanction of welding methods -Before-use inspection	-Facility inspection (only related facilities to Government Ordinance, Article 16-2)	

		-Welding inspection	-Welding inspection	-Welding inspection (only related facilities to Government Ordinance, Article 16-2)	
	-Sanction of safety regulations	-Sanction of safety regulations	-Sanction of safety regulations	-Sanction of safety regulations (only relation to government ordinance, Article 16-2)	
		-Notice of selection of chief technician of nuclear fuel	-Notice of selection of chief technician of nuclear fuel		
Stage of operation	-Notice for starting of business	-Notice for starting of business	-Notice for starting of business (except for JAERI and JNC)		
			-Notice of business plan		
			-Periodical inspection		
	-Preparation of reports	-Preparation of reports	-Preparation of reports	-Preparation of reports	-Preparation of reports
	-Measures in relation to disposal	-Safety controlled measures	-Safety controlled measures	-Observance of technical standards	-Observance of technical standards
	-Report	-Report	-Report	-Report	-Report
	-On-the-spot inspection	-On-the-spot inspection	-On-the-spot inspection	-On-the-spot inspection	-On-the-spot inspection

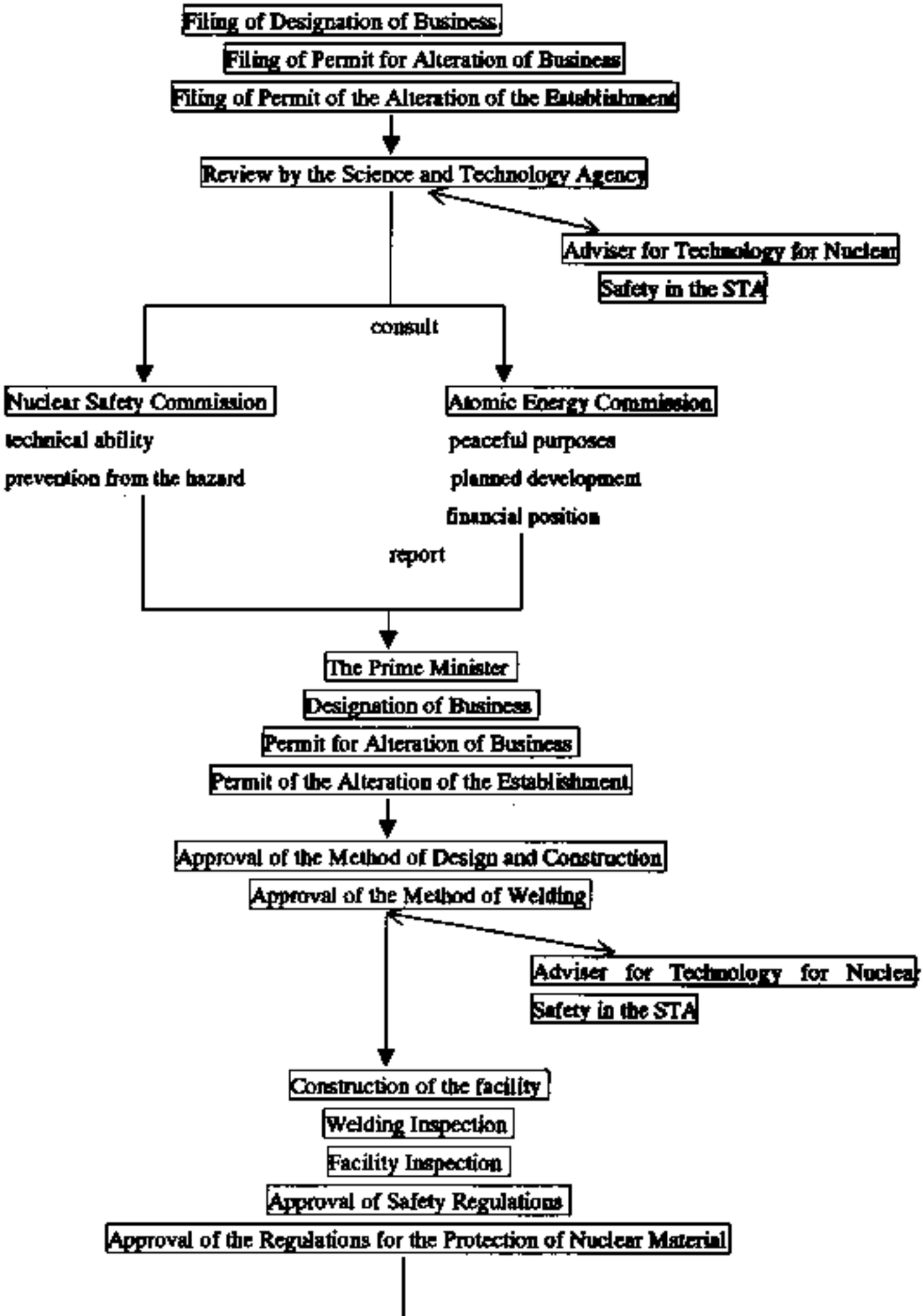
(2) Nuclear Fuel Fabrication Facility

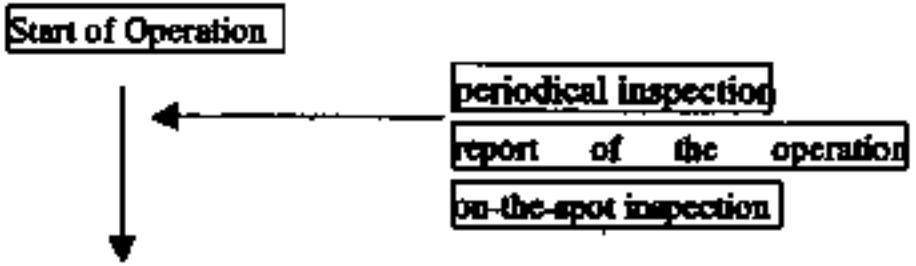
[Procedures from Filing of the Business to Operation]



(3)Reprocessing Facility

[Procedures from Filing of the Business to Operation]




Start of Operation
periodical inspection
report of the operation
on-the-spot inspection

(Reference)

Contents of license application for fabrication business (extract)

October 1994

Japan Nuclear Fuel Conversion, Inc

Table 6-1 Nuclear limit values for UF_6 cylinder (P. 44)

(No.1 Fabrication Facility, No.2 fabrication facility building, UF_6 storage building)

Nuclear limit values

Cylinder	Enrichment	H/U	Mass limit values
30-inch cylinder	less than 5%	less than 0.088	less than 1,539 kg U
12-inch cylinder	less than 5%	less than 0.088	less than 141 kg U
8-inch cylinder	less than 5%	less than 0.088	less than 78.2 kg U

Table 6-2 Nuclear limit values for UF_6 cylinder

(Conversion Facility)

Nuclear limit values

Cylinder	Enrichment	H/U	Mass limit values
8-inch cylinder	less than 12.5%	less than 0.088	less than 78.2 kg U
5-inch cylinder	less than 20%	less than 0.088	less than 16.86 kg U

Table 7 Mass limit values in Conversion Facility

Nuclear limit values

Enrichment	H/U	Mass limit values
less than 5%	No limitation	less than 16 kg U
5-10%		less than 6.0 kg U
10-12%		less than 4.7 kg U
12-16%		less than 3.2 kg U
16-20%		less than 2.4 kg U
20-30%		less than 1.4 kg U
30-50%		less than 0.78 kg U

Table 8 Volume limit values in Conversion examination Facility

Nuclear limit values

Enrichment	H/U	Volume limit values
less than 20%	No limitation	less than 9.5 l