



GUIDELINES FOR THE PREPARATION OF A RADIATION PROTECTION PROGRAM FOR TENORM ACTIVITIES



Lembaga Perlesenan Tenaga Atom
Kementerian Sains, Teknologi dan Inovasi
Batu 24, Jalan Dengkil, 43800 Dengkil
Selangor Darul Ehsan

Tel: 03-89225888
Fax: 03-89223685 / 03-89254578
Web Site: <http://www.aelb.gov.my>

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SCOPE OF GUIDELINES

This guide is provided for reference to those that will prepare the radiation protection program (program) related to TENORM activities in respect to oil and gas facilities, mineral processing, tin slag and others established by the AELB.

In preparing the program, the licensee shall among others:

- i. Prepare the program in Bahasa Malaysia and other languages considered necessary for its own use.
- ii. Use a format that is simple and easy to use.
- iii. Have a special page titled "DECLARATION" where the OBTL and RPO are required to sign every time changes are made to the program.
- iv. Explain in more detail in Part 7 in respect of procedures to handle contingency situations.
- v. Review and update the program from time to time when necessary or when directed by the AELB.

ACRONYMS

Abbreviated words used in this guide have the following meanings:

- a. AELB is an abbreviation for Atomic Energy Licensing Board.
- b. OBTL is a Person Responsible for the License.
- c. RPO (TENORM) is the Radiation Protection Officer for TENORM activity.
- d. RS (TENORM) is the radiation protection supervisor for TENORM activity.
- e. P (TENORM) is the operator of TENORM activity.
- f. IMDG is the abbreviation for International Maritime Dangerous Goods.
- g. TENORM is the abbreviation for Technologically Enhanced Naturally Occurring Radioactive Materials "

GLOSSARY

- a. TENORM waste means waste sludge, radioactive scale, tin slag, gypsum, iron oxide and the others prescribed by the AELB.
- b. Contaminated materials means pipes, vessels and other equipment contaminated with TENORM.
- c. Managing contaminated areas and handling of contaminated materials including decontamination works.

DECLARATION

I certify that this radiation protection program was prepared based on the guidelines of the AELB, and is responsible for implementing them in accordance with what is prescribed in this program. Failure to comply and implement such program may allow prosecution to be made against me under the Atomic Energy Licensing Act 1984 (Act 304).

OBTL	OBTL	OBTL
Signature:	(signature)	(signature)
Name:		
Position:		
Date:		

RPO	RPO	RPO	RPO	RPO
Signature:	(signature)	(signature)	(signature)	(signature)
Name:				
Position:				
Date:				

PART 1

RADIATION PROTECTION MANAGEMENT STRUCTURE

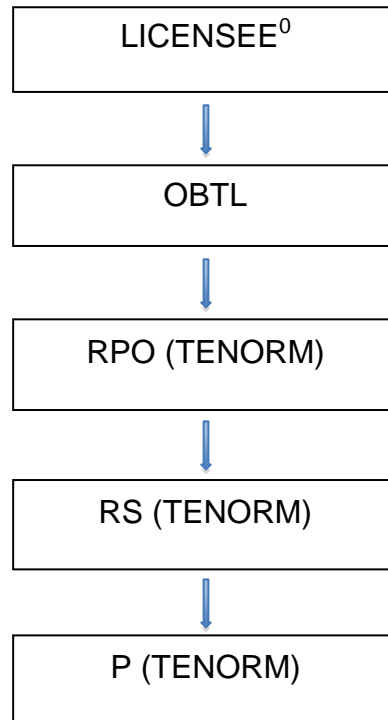
1.1 Definitions

In the radiation protection management structure (see e.g. in **Figure 1.1** below) that shall be implemented:

1. OBTL is the Person Responsible for the License appointed from among members of the Board of Directors of the Company or any person appointed by the Board of Directors of the management company.
2. RPO (TENORM) is a technically competent person appointed by the licensee and approved by the AELB in writing, to supervise the implementation of appropriate radiation protection regulations, plans and procedures, including radiation protection program.
3. RS (TENORM) is the Supervisor of Radiation Protection and is someone who has the technical competence appointed by the licensee and approved in writing by the AELB to help a RPO (TENORM) oversees the implementation of appropriate radiation protection regulations, plans and procedures including radiation protection program.
4. P (TENORM) is an employee who is accredited in writing by the AELB to perform radiation work under the supervision of a RPO (TENORM) or RS (TENORM).
5. Radiation workers, include RPO (TENORM), RS (TENORM) and P (TENORM).

Figure 1.1 – Company’s radiation protection management structure

⁰ Please state company/agency/organization’s name.



PART 2

RESPONSIBILITY

2.1 Responsibility of Licensee

1. Appoints OBTL from members of the Board of Directors.
2. Ensure that only OBTL and RPO (TENORM) deal with the Atomic Energy Licensing Board (AELB).
3. Ensure that all activities involving ionizing radiation complies with the Act 304 and subsidiary legislation made thereunder.

2.2 Responsibilities OBTL

1. Carry out all matters related to the AELB.
2. Provide the infrastructure (including finance and training) required by RPO (TENORM).
3. Nominate to the AELB, a worker of the company, which meets all conditions required by the AELB, to be accredited as a RPO (TENORM).
4. Explain to the RPO (TENORM) the responsibility of a RPO (TENORM).
5. Ensure the radiation protection programme adopted is in accordance with the instructions, and the requirements of the AELB are subsequently complied with and implemented.
6. Ensure that all medical examinations are carried out by Registered Medical Practitioner approved only by the AELB.
7. Prepare, update and keep all forms of records as directed by the AELB.
8. Ensure that all activities involving ionizing radiation comply with the Act 304 and subsidiary legislation made thereunder.

2.3 Responsibility of RPO (TENORM)

1. Prepare and update the radiation protection program whenever necessary or when directed by the AELB.
2. Provide emergency planning and preparedness program, report any radiological emergency to the AELB, carry out investigation

about the incident as well as taking corrective action to prevent its recurrence.

3. Identify and analyze radiological hazards at the place of work, the environment and waste disposal sites for TENORM.
4. Implement programs on maintenance of pipeline and equipment containing radioactive scale, and plan appropriate methods for the disposal of TENORM waste.
5. Arrange medical surveillance program for radiation workers.
6. Identify the types and levels of radiation protection training for radiation workers.
7. Classify and label the work area according to Radiation Protection Regulations (Basic Safety Standards) 1988.
8. Provide work procedures for TENORM and its wastes as a guide for the P (TENORM) including work procedures in the normal and abnormal operations.
9. Prepare and implement dose monitoring program for radiation workers, the work area and the environment.
10. Ensure that radiation protection equipment are in a good state and is always used by the employee.
11. Ensure that the transportation of TENORM and its waste is carried out in accordance with Radiation Protection Regulations (Transport) 1989.
12. Ensure that the recruitment and dismissal of radiation workers comply with the procedures established by the AELB.
13. Ensure that any disposal of TENORM waste to be carried out, received prior approval of the AELB.
14. Supervise the following work:
 - a. high-risk work, such as planned exposure.
 - b. maintenance of pipes and equipment containing radioactive scale.
 - c. handling of contaminated areas and materials.
 - d. transportation of TENORM and its wastes.
 - e. control and rescue operations during emergency.
15. Inspect, keep and update the following records:

- a. medical records of radiation workers [(LPTA/BM/5) (section A)].
- b. radiation exposure records of workers [(LPTA/BM/5) (section B)].
- c. radiation detectors calibration records.
- d. external radiation levels records.
- e. hiring and dismissal of radiation workers records.
- f. storage records.
- g. TENORM waste disposal records.
- h. TENORM waste treatment records.
- i. transportation of TENORM and its wastes records .
- j. radiation accidents records.
- k. Records on radiological and environmental monitoring reports of licensee.
- l. other records required by the AELB from time to time.

2.4 Responsibility of RS (TENORM)

1. Assume the duties and responsibilities of the RPO (TENORM) during his absence (for holiday, undergoing courses or is outside the country) as well as reporting all matters that happens to the RPO (TENORM) upon the RPO's (TENORM) return to work.
2. Assists the RPO (TENORM) in implementing radiation protection activities in compliance with the Act 304 and subsidiary legislation made thereunder.

2.5 Responsibility of P (TENORM)

1. Comply with all instructions, procedures and regulations issued by the RPO (TENORM) or RS (TENORM) to control exposure to ionizing radiation.
2. Perform maintenance on pipes and equipment containing radioactive scales, and handling contaminated areas and materials according to the procedures determined by the RPO (TENORM) or RS (TENORM) to avoid any unnecessary exposure to himself or to his colleagues.
3. Use personnel monitoring devices, and any equipment as provided and directed by the licensee, to restrict such possible exposure.
4. Immediately report to the RPO (TENORM) or RS (TENORM) of damage or loss of any radiation protective equipment, such as radiation film badges, radiation detectors and so forth.

5. Shall not interfere, move, alter or remove any safety devices or other equipment given for his protection or protection of others unless authorized to do so.
6. Immediately report all incidents of accidental radiation exposure to the RPO (TENORM) or RS (TENORM).
7. In exceptional circumstances, P (TENORM) will take necessary measures in accordance with established procedures, and immediately notify the RPO (TENORM) or RS (TENORM) about the situation.
8. Immediately report her pregnancy (for women workers) to the RPO (TENORM) or RS (TENORM) and registered medical practitioner.

PART 3

RADIATION WORKERS TRAINING PROGRAM

1. The licensee shall conduct either internal or external training/courses on radiation protection to new radiation workers as pre-employment training/courses. Among others such training/courses, will emphasize the following:
 - a. explain the function of Act 304 and subsidiary legislation made thereunder.
 - b. responsibility as radiation workers.
 - c. health risks involved in their work as radiation workers.
 - d. preventive measures to be taken.
 - e. safe and effective work methods in TENORM activities, including dose limiting system.
 - f. explanation on the dangers of TENORM and its wastes.
 - g. methods of classifying control, supervise and clean areas.
 - h. plans and procedures for normal operation.
 - i. plans and procedures in the event of radiation incident/ accident.
 - j. remedial actions after radiation incident/accident.
 - k. emergency training.
 - l. maintenance procedures for pipelines and equipment containing radioactive scales, as well as handling contaminated areas and materials.
2. Radiation protection awareness training/courses (refresher course) for all radiation workers shall be held by the licensee as in-house or outside¹. Such training/course shall be carried out at least once in three years.
3. In-house training programs provided by the licensee shall be submitted to the AELB to be audited.

¹ Training/courses shall be conducted by training centres accredited by the AELB.

PART 4

OPERATIONAL LIMITS FOR RADIATION WORKERS

1. Operational limits for personnel is set for 10 mSv per year, so that the annual dose limit of 50 mSv per year is not exceeded.
2. For cases where this limit is exceeded, the licensee shall notify the AELB according to the unexpected procedure described in Part 7.

PART 5

PROCEDURES FOR THE SURVEILLANCE, HANDLING AND KEEPING OF RELATED RECORDS

NO.	TYPES OF RECORDS	SURVEILLANCE, HANDLING AND KEEPING OF RECORDS	REFERENCES [Note: please state the reference number of the file and location of storage]
1.	License	<ol style="list-style-type: none"> 1. OBTL or RPO (TENORM) shall ensure all activities performed are related to the class and purpose of the license only. 2. License shall be kept as long as it is valid and its copy shall be displayed. 	
2.	Medical record of radiation workers LPTA/BM/5 (<i>Section A</i>) [Note: this record is confidential to all those unrelated]	<ol style="list-style-type: none"> 1. For the purpose of LPTA/BM/5 (<i>Section A</i>) record, examination consists of: <ol style="list-style-type: none"> a. Pre-employment medical examination (for workers who work in supervised or controlled areas). b. General health surveillance. c. A periodic review of health (at least twice a year for workers in controlled areas and once every 5 years for workers in supervised area). d. Special medical examination (performed with immediate effect for workers that received 	

NO.	TYPES OF RECORDS	SURVEILLANCE, HANDLING AND KEEPING OF RECORDS	REFERENCES [Note: please state the reference number of the file and location of storage]
		<p>doses exceeding the limits set).</p> <p>e. Medical examination upon termination or retirement.</p> <p>2. Medical examination for the purpose of LPTA/BM/5 (Section A) record, shall be carried out by medical practitioner approved by AELB only.</p> <p>3. Records shall be kept by the licensee as long as the workers are still employed by the related licensee.</p> <p>4. When workers ceased working as radiation workers or retire, these records shall be kept by the licensee (for 30 years) or sent to the AELB for keeping or as reference.</p> <p>5. When licensee employs new workers who were once radiation workers, the licensee shall obtain the medical records of the workers from their previous employers or the AELB (if the records were submitted by the previous employers).</p> <p>6. When the licensee ceases operations, all medical records of radiation workers shall be</p>	

NO.	TYPES OF RECORDS	SURVEILLANCE, HANDLING AND KEEPING OF RECORDS	REFERENCES [Note: please state the reference number of the file and location of storage]
		transferred to the AELB for keeping or as reference.	
3.	Exposure records of radiation workers LPTA/BM/5 (Section B) <i>[Note: these records are confidential to those unrelated]</i>	<ol style="list-style-type: none"> 1. For the purposes of LPTA/BM/5 (Part B) record, all radiation workers are provided with film or TLD badges to be worn during operations. Pocket dosimeter² shall be added by the licensee when required. 2. RPO (TENORM) shall record the dose received by every radiation workers every month or subject to the approval of the AELB. 3. Results of workers' monitoring and the status of their radiation exposure shall be communicated by the RPO (TENORM) to the workers not later than 14 days from the date the results were received. 4. Doses received by workers during normal operation, special planned exposure, accidental exposure and emergency shall be recorded in the same record book. 5. OBTL is responsible to report to the AELB if the annual dose is exceeded, 	

² Pocket dosimeter reading shall be recorded daily and it will give early warning should there be excessive exposure.

NO.	TYPES OF RECORDS	SURVEILLANCE, HANDLING AND KEEPING OF RECORDS	REFERENCES [Note: please state the reference number of the file and location of storage]
		<p>and he shall provide show cause within 21 days from the date the show cause letter was issued by the AELB.</p> <p>6. Evaluation of exposure dose for the purpose LPTA/BM/5 (Section B) record shall be carried out by agency recognized by AELB (please specify).</p> <p>7. The licensee shall keep records as long as the workers are still employed by the licensee.</p> <p>8. When the workers ceased working as radiation workers or retire, these records shall be kept by the licensees (for 30 years) or sent to the AELB for keeping or as reference.</p> <p>9. When licensee employs new workers who were once radiation workers, the licensees shall obtain the exposure records of the radiation workers from their previous employers or the AELB (if the records were submitted by the previous employers).</p> <p>10. When the licensee ceases operations, all radiation exposure records of radiation workers shall be</p>	

NO.	TYPES OF RECORDS	SURVEILLANCE, HANDLING AND KEEPING OF RECORDS	REFERENCES [Note: please state the reference number of the file and location of storage]
		submitted to the AELB for keeping or as reference.	
4.	Record of OBTL changes and recruitment/termination of radiation worker	1. Permission shall be obtained from the AELB at least 14 days before any changes in OBTL, and recruitment/termination of RPO (TENORM), RS (TENORM) or P (TENORM).	
5.	Radiation Detector calibration record	<ol style="list-style-type: none"> 1. The licensee shall have at least 2 units of radiation detector for each premise. 2. The radiation detectors shall be calibrated at least once a year or if problems arise, in respect of the equipment (<i>please state</i>). 3. Each new equipment shall be calibrated before use. 	
6.	Records of external radiation levels and Report of Radiological and Environmental Monitoring	<ol style="list-style-type: none"> 1. Monitoring of external radiation levels shall be carried out in supervised and controlled areas. 2. This monitoring includes evaluation of external radiation level at the radiation work area, levels of radioactive contamination in that area, and assessment of radiological risk associated with accident or emergency situation. 3. Monitoring of external 	

NO.	TYPES OF RECORDS	SURVEILLANCE, HANDLING AND KEEPING OF RECORDS	REFERENCES [Note: please state the reference number of the file and location of storage]
		<p>radiation levels during periodic³ and specific⁴ maintenance shall be carried out using monitoring equipment approved by the AELB.</p> <p>4. Surveillance of area using film badge or TLD chips shall be carried out each month and the records kept for area dose assessment.</p> <p>5. Surveillance of work areas using survey meter shall also be carried out before, during and after the works on TENORM waste management. (Transportation, disposal, treatment of TENORM waste, maintenance of pipelines and equipment containing radioactive scale etc.).</p> <p>6. Record on levels of external radiation is submitted to the AELB monthly or as prescribed to the AELB.</p> <p>7. Record of external radiation levels, among others include:</p>	

³ Periodic monitoring are monitoring carried out periodically including during normal maintenance.

⁴ Specific monitoring are monitoring carried out during maintenance involving radiation incidences such as breakage of confinement.

NO.	TYPES OF RECORDS	SURVEILLANCE, HANDLING AND KEEPING OF RECORDS	REFERENCES [Note: please state the reference number of the file and location of storage]
		<ul style="list-style-type: none"> a. Date and time of measurement. b. Sketch of the working area, i.e. control, supervise and clean areas. c. Location of work. d. Type, model and date of calibration of radiation detection equipment. e. Readings of external radiation levels outside of the work area. <p>8. For work on TENORM waste treatment, environmental monitoring shall be carried out as follows:</p> <ul style="list-style-type: none"> a. Air particulate – analyzed for U-238 and Th-232 contents. b. Effluent - analyzed for Ra-226 and Ra-228 contents. c. Soil – analyzed for the contents of Ra-226, Ra-228, U-238 and Th-232. d. Sludge - analyzed for the content of U-238, Th-232, Ra-226 and Ra-228. 	

NO.	TYPES OF RECORDS	SURVEILLANCE, HANDLING AND KEEPING OF RECORDS	REFERENCES [Note: please state the reference number of the file and location of storage]
		<p>e. Ground water - analyze the content of Ra-226 and Ra-228.</p> <p>Before, during and after the treatment process. These samples shall be analyzed by laboratories of TENORM consultants recognized by AELB (please state). Radiological and environmental monitoring reports shall be submitted to the AELB within 14 days after the results were obtained.</p>	
7.	TENORM Waste Treatment record	<ol style="list-style-type: none"> 1. The quantity of TENORM waste to be treated is recorded. 2. The quantity of solid waste generated after TENORM waste treatment process is recorded and will be managed by the original owner. 	
8.	TENORM waste disposal record (Note: refer to Part 6)	<ol style="list-style-type: none"> 1. The quantity of TENORM waste disposed at the disposal site is recorded. 2. The location of disposal site is stated. 	
9.	Transportation record [Note: refer to Part 6]	Any transportation of TENORM and its wastes shall be reported to the AELB at least 14 days before such activity is carried out.	

NO.	TYPES OF RECORDS	SURVEILLANCE, HANDLING AND KEEPING OF RECORDS	REFERENCES [Note: please state the reference number of the file and location of storage]
10.	Radiation incidences/accidents records <i>[Note: refer to Part 7]</i>	All radiation incidents/accidents involving TENORM and its wastes, for example transportation, fire or theft shall be recorded.	
11.	Storage record	Inventories of TENORM, TENORM waste and contaminated materials are recorded.	
12.	Other records required by AELB from time to time	Licensee shall prepare other records required by the AELB from time to time.	

PART 6⁵

PROCEDURES IN THE HANDLING OF TENORM WASTES

NO.	HANDLING	BEFORE HANDLING	DURING HANDLING	AFTER HANDLING
1.	TENORM waste treatment process	<ol style="list-style-type: none"> 1. RPO (TENORM) shall ensure all work instructions related to the handling of TENORM waste was given to P (TENORM). 2. RPO (TENORM) shall ensure the survey meters are in good conditions with valid calibration for use by P (TENORM). 3. RPO (TENORM) shall ensure that barriers and radiation hazard warning signage are installed in areas where work related to TENORM waste is carried out. 4. P (TENORM) working 	<ol style="list-style-type: none"> 1. Only P (TENORM) assigned to deal with TENORM waste is allowed into the supervised and the controlled areas during work. 2. All radiation workers working with TENORM waste MUST wear radiation protective clothing (e.g. coveralls, safety boots, gloves and breathing apparatus) and personnel monitoring equipment (such as film badges or TLD) at all time when working with the materials. 3. Eating, drinking and smoking are strictly 	<ol style="list-style-type: none"> 1. Radiation workers shall report to the RPO (TENORM) that work involving TENORM waste is completed. 2. Safety clothing of workers and tools/equipment used are monitored for contamination before leaving the work area. 3. P (TENORM) shall ensure that the work area has been monitored for contamination using radiation detectors, and that there is no contamination of the said area.

⁵ This part shall be prepared according to the format given. Please prepare according to the appropriate activity at the company's premise. Its content must be easily understood by the radiation workers.

NO.	HANDLING	BEFORE HANDLING	DURING HANDLING	AFTER HANDLING
		<p>during that time shall ensure that:</p> <ul style="list-style-type: none"> a. They wear film badge or TLD. b. Radiation detectors such as survey meters are calibrated and the batteries are in good condition. 	<p>prohibited in the work areas.</p>	
2.	<p>Maintenance⁶ of pipes and equipment containing radioactive scales and the decontamination of contaminated materials</p>	<ul style="list-style-type: none"> 1. Film badge or TLD shall be provided to all radiation workers involved. 2. Waterproof safety clothing such as coveralls, safety boots, gloves and breathing apparatus shall also be provided to workers involved. 3. Safety equipment especially radiation detectors and detectors to monitor 	<ul style="list-style-type: none"> 1. The external radiation levels and surface contamination shall always be monitored to ensure no contamination. 2. Only authorized W(TENORM) are allowed into the supervised and controlled areas during work. 3. TENORM waste found on equipment must be collected and sent for 	<ul style="list-style-type: none"> 1. Workers safety clothing and tools/equipment used are monitored for contamination before taken out of the work area. 2. P (TENORM) shall ensure that the work area has been monitored for contamination using radiation detectors, and that there is no contamination of the said area. 3. Equipment

⁶ If relevant

NO.	HANDLING	BEFORE HANDLING	DURING HANDLING	AFTER HANDLING
		<p>contaminated air particles are functioning well.</p>	<p>analysis of its radioactive content and radioactivity.</p> <p>4. Eating, drinking and smoking are strictly prohibited in the work areas.</p>	<p>and their related components shall be monitored for external radiation and surface contamination to ensure that they are not contaminated.</p> <p>4. All radiation monitoring equipment such as film badges or TLD and radiation detectors are return to their original places.</p> <p>5. Make sure a report is made to the RPO (TENORM) or RS (TENORM) upon completion of maintenance work.</p> <p>6. RPO (TENORM) shall send all film badges or TLD for analysis every month.</p> <p>7. Maintenance report shall be prepared. It shall contain</p>

NO.	HANDLING	BEFORE HANDLING	DURING HANDLING	AFTER HANDLING
				information on the decontamination and maintenance, quantity of radioactive scales accumulated and proposed duration of subsequent maintenance.
3.	Storage/ Disposal Sites ⁷	<ol style="list-style-type: none"> 1. Licensee shall obtain prior approval from the AELB on designated storage/disposal site locations. 2. To obtain such approval licensee must submit the Radiological Impact Assessment (RIA) report, as contained in the Guide LEM/TEK/30 sem. 2, September 1996. 	<ol style="list-style-type: none"> 1. Entrance into the storage/disposal sites is limited to OBTL, RPO, RS or P (TENORM) only. 2. Radiation sign, notice and radiation hazard warning shall be posted on fences/barrier or at the entrance of the storage/disposal site according to the format determined by the AELB. 3. Radiological and environmental monitoring as well surveillance of 	<ol style="list-style-type: none"> 1. Monitoring of environmental samples (such as water, soil, air) and the external radiation level shall be carried out to ensure that work at the TENORM waste disposal site does not cause environmental contamination.

⁷ if relevant

NO.	HANDLING	BEFORE HANDLING	DURING HANDLING	AFTER HANDLING
			external radiation levels are conducted every month/subject to the approval of the AELB, and the report shall be sent to the AELB.	
4.	Transportation of TENORM and its wastes	<ol style="list-style-type: none"> 1. TENORM and its wastes is packed in AELB's approved package(s)⁸ and labeled. 2. The quantity of wastes and external radiation levels are recorded. 3. Radiation workers involved are provided with personal monitoring equipment (e.g. film badges or TLDs). 	<p><u>By road</u></p> <ol style="list-style-type: none"> 1. All related documents must be with the RPO (TENORM) or RS (TENORM) during transportation. 2. RPO (TENORM) or RS (TENORM) must always accompany the package(s) during transportation. 3. All those involved during transportation, including RPO (TENORM) or RS (TENORM), driver and his assistance 	<ol style="list-style-type: none"> 1. Vehicles and equipment used in the transportation shall be decontaminated before taken out (if applicable). 2. Contamination monitoring on workers involved shall be carried out to ensure that they are free from contamination. 3. Workers involved are required to wash their hands and faces before leaving.

⁸ E.g. drum and polypropylene beg

NO.	HANDLING	BEFORE HANDLING	DURING HANDLING	AFTER HANDLING
			<p>must wear film badge or TLD, and pocket dosimeter.</p> <p>4. Passengers, other than the driver's assistant is not allowed in the vehicle during transportation.</p> <p>5. Radiation detectors, barriers, warning signs and radiation hazard notice must be brought along during transportation.</p> <p>6. Radiation level at any work location shall not exceed 0.02 mSv/h. The radiation level on the outer wall of the vehicle shall not exceed 2 mSv/h and shall not exceed 0.1 mSv/h at a distance of 2 meters from the exterior wall of the vehicle.</p> <p>7. Radiation</p>	

NO.	HANDLING	BEFORE HANDLING	DURING HANDLING	AFTER HANDLING
			<p>stickers shall be displayed on the outside of each sidewall and rear wall of the vehicle.</p> <p><u>By sea or river vessel</u></p> <p>1. In addition to the requirements of regulations on Radiation Protection (Transport) 1989, the requirements of latest edition of the IMDG shall also be met.</p>	

PART 7⁹

PROCEDURES IN UNEXPECTED CIRCUMSTANCES

NO.	INCIDENT	BEFORE INCIDENT	DURING INCIDENT	AFTER INCIDENT
1.	Radiation Incident/Accident ¹⁰	-	<ol style="list-style-type: none"> 1. RPO (TENORM) shall report the incident to the AELB within 24 hours. 2. Radiation detectors shall be used to measure the radiation levels of the area. 3. Radiation hazard warning sign shall be placed near the incident site and monitored to prevent any unauthorized entrance to the site. 	<ol style="list-style-type: none"> 1. Affected workers shall be given medical examination. 2. Reports shall be made to the AELB of workers suspected of receiving doses exceeding 50 mSv/year. Chromosomal aberration analysis shall also be carried out on workers suspected of receiving doses exceeding 100 mSv/year. 3. Licensee shall conduct incident investigations to determine the causes of the incidence. 4. Written report of the incident shall be submitted to the AELB within 30 days of the accident. Information provided in this

⁹ This part shall be prepared according to the format given. Please prepare according to the appropriate activity at the company's premise. Its content must be easily understood by the radiation workers.

¹⁰ Examples: operational limit is exceeded.

NO.	INCIDENT	BEFORE INCIDENT	DURING INCIDENT	AFTER INCIDENT
				<p>report shall, among others, consist of:</p> <ul style="list-style-type: none"> a. Details of the licensee, time, date and place of incident. b. How this incident happened. c. About the substance involved, including the type, quantity, chemical and physical form (if applicable). d. Evaluation of individual dose and a description of how exposure occurs (if applicable). e. Initial environmental impact assessment (if applicable). f. Actions taken and to be done to overcome

NO.	INCIDENT	BEFORE INCIDENT	DURING INCIDENT	AFTER INCIDENT
				<p>the risk that might arise from the incident.</p> <p>g. Procedures or measures taken or will be done to prevent such incident from recurring.</p> <p>h. Other information deemed necessary.</p>
2.	Loss or stolen pipes or equipment containing radioactive scales ¹¹	-	-	<p>1. Is reported to the following:</p> <ul style="list-style-type: none"> a. Police b. OBTL, RPO (TENORM) or RS (TENORM) c. AELB <p>2. Investigations shall be conducted by the licensee to determine the causes of this incident.</p> <p>3. RPO (TENORM) shall notify the incident to the AELB within 24</p>

¹¹ If relevant.

NO.	INCIDENT	BEFORE INCIDENT	DURING INCIDENT	AFTER INCIDENT
				<p>hours of the incident.</p> <p>4. Prepare a report to the AELB within 30 days of the incident. [Note: refer to Part 7 (1)]</p>
3.	Fire, flood, and other natural disasters ¹²	-	<p>1. The following should be contacted:</p> <ul style="list-style-type: none"> a. The company's rescue team, firefighters, medical teams or police¹³. b. Area Security personnel. c. OBTL, RPO (TENORM) or RS (TENORM). d. The AELB within 24 hours of the incident. <p>2. Pipes and equipment containing radioactive scales are moved away from the fire/flood (if</p>	[Note: refer Part 7(1)]

¹² Please add or adjust according to the conditions of the company's premise.

¹³ If relevant.

NO.	INCIDENT	BEFORE INCIDENT	DURING INCIDENT	AFTER INCIDENT
			<p>possible).</p> <p>3. Make sure no member of the public approaches the area.</p> <p>4. RPO (TENORM) must ensure that the pipes and equipment containing radioactive scale affected by the fire/floods, does not cause any contamination. If such contamination occurs, the RPO (TENORM) shall plan and implement measures for decontamination</p>	
4.	Special Planned Exposure	Obtain prior approval from the AELB	Shall be determined by the AELB	Shall be determined by the AELB

PART 8

REFERENCES¹⁴

1. Atomic Energy Licensing Act 1984 (Act 304)
2. Regulations on Radiation Protection (Licensing) 1986 [PU (A) 149]
3. Regulations on Radiation Protection (Transport) 1989 [PU (A) 456]
4. Radiation Protection Regulations (Standards Basic Security) 1988 [PU (A) 61]
5. Occupational Safety and Health Act 1994 (Act 514)
6. LEM/TEK/30 Sem.2, September 1996
7. Document 'International Maritime Dangerous Goods' (IMDG) (latest edition)

¹⁴ Please attach all references used including safety document of the company.