



PMS - SLAEB

Personal Monitoring Service
Sri Lanka Atomic Energy Board
(Tel: 94-11-2533427-8, 2533449 Fax: 94-11-2533448)

General Information, Rules & Regulation, Terms & Conditions to Customer (License / User Institute /Hospital) that obtain the PMS from Sri Lanka Atomic Energy Board (SLAEB)

Employers and workers shall be aware of the danger and inherent risks of radiation and Annual Limits of radiation doses recommended for workers and pregnant workers. Personal Monitoring Service (PMS) of the SLAEB only provides facilities to estimate the occupational radiation doses of workers under the limits stipulated by the International Basic Safety Standards (BSS) for Protection against Ionizing Radiation and for the Safety of Radiation Sources (IAEA Safety Series No: 115, 1996 and new revision in 2011). As such radiation workers shall be knowledgeable to handle/operate radiation apparatus, sources etc. adhering to necessary safety precautions to protect himself /herself, public and patients when handling / operating radiation apparatus and sources of ionizing radiation that emit ionizing radiation, to keep the doses below radiation dose limits. The employees (radiation workers) should be made aware that the TL dosimeters provided by the SLAEB will not give any protection for radiation exposures and this dosimeter records only the radiation dose received by the wearer. **(Dose limits: a single year effective dose limit is 50 mSv for the whole body provided that total dose for five years period is 100 mSv and dose per year is 20mSv, average over the period of five years, 1mSv per year for a pregnant woman)**

1. Personal Monitoring Service (PMS) is carried out to measure occupational exposures of radiation workers for their radiation safety as recommended by Radiation Protection Regulations on Ionizing Radiation Protection of Atomic Energy Safety Regulations no. 1 of 1999 and the International Basic Safety Standards (BSS) for Protection against Ionizing Radiation and for the Safety of Radiation Sources (IAEA Safety Series No: 115, 1996 and latest revision in 2011).
2. As per regulations and IAEA Basic Safety Series (BSS), Workers in supervised area do not require personal monitoring devices. Therefore labourers /minor staff, nurses who work outside the Radiation facility (where the radiation dose level is within the recommended level for the general public) and such workers entering the radiation facilities (a control area) only occasionally, do not require a PMS. Workers who enter the radiotherapy, brachytherapy facilities, nuclear medicine facilities and workers who assist for interventional radiological procedures do require personal dosimeters.
3. Thermo-luminescence dosimeters (Harshaw TLD-100) are used to measure occupational exposure of radiation workers. Thermo-luminescence dosimeter (TL Dosimeter or TLD badge) consists of two parts, the holder and the TLD card. The TLD card consists of two detectors (two dosimeter chips); the unfiltered detector which is used to measure the skin dose and filtered detector which is for the measurement of the whole body dose. **Under this service, Effective Dose for Whole Body is estimated** within the uncertainty stated in the IAEA Safety Guide No. RS-G-1.3 and results are reported to the User Institute.
4. Nominating a qualified Radiation Protection Officer (RPO) to coordinate the service and giving him / her responsibility and facilities to discharge his / her duties as per rules & regulation, terms & conditions, and instructions given in PMS/INS-02 are essential. Also nominating a deputy RPO to work with regard to PMS in the absence of the RPO may be necessary.
5. Nominating a Radiation Protection Officer (RPO) in each department/section/unit/laboratory in institute may be necessary to coordinate the PMS, distribution of fresh TLDs to workers, collection of used/unused TLDs at the end of each monitoring period.
6. Cost of TLD holders and holder Opener/s should be paid before commencement of the service. TLD cards are issued free of charge. **If TLD cards are lost or damaged, cost of the cards will be recovered from the user institution at the prevailing rate at that time.**
7. First batch of consignment of dosimeters contains TLD cards and holders for the radiation workers and for measurement of background radiation as per applicable regulations and a TLD holder Opener (which is used to open the Holder to insert the TLD card without damaging it).
8. An extra TLD card and a holder are issued for background radiation measurement and this dosimeter (a holder containing a TLD card) should be kept in a place where there is no opportunity to receive radiation, except background radiation. (This dosimeter could be kept in an office room).
9. In general, a set of TLD cards are issued on bi-monthly basis to institution (for a two- month monitoring period).

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10. Please ensure to return the used and unused TLD cards issued for a monitoring period as one batch to the SLAEB for dose assessment immediately after receiving a set of fresh TLD cards for the next monitoring period. (Note: In general, another set of Fresh (annealed) TLD cards are sent to user institute one week prior to beginning of next monitoring period. At the beginning of monitoring period a fresh TLD cards should be used to replace the used and the unused TLD cards in previous monitoring period). In the event of receiving of a fresh/annealed batch of TLD cards for the next monitoring is delayed due to technical reasons, the users shall continue the use of existing cards until fresh/annealed cards are received or follow the instructions which will be provided by the SLAEB.
11. Fresh /annealed TLD cards will not be issued to radiation workers who do not return the used/unused TLD cards issued for the previous monitoring period as no additional TLD cards are available. Only two cards are allocated for a worker. Please note that it is not possible to guarantee the accuracy of results of TLD cards which are not returned on time.
12. If, after 14 days of notification to return TLD cards, the Institute fails to do so, a direction will be issued to recover the cost of TLD Cards which have not been returned (refers to as “unreturn TLD cards”). If institute does not response to the SLAEB’s communication, Service may be terminated until due payments are made.
13. In general, the dose report is sent to the Institute/RPO (to the name of the person given by the institute) by the SLAEB within 4 weeks after receiving the used TLD cards with details of distribution of cards. The workers should be informed their own exposures by the Radiation Protection Officer of the respective institute. Dose reports of workers should be maintained for 30 years after retirement of workers.
14. Request the service first time for radiation workers should be submitted by sending a completed Application Form, PMS/FM-01 together with duly completed Personal Data Form, PMS/PDF and a bio-data form, PMS/BDF.
15. Request of TLDs for new radiation workers and holders/ holder openers to replace damage ones should also be submitted by sending a completed Application Form, PMS/FM-01A together with relevant forms.
16. User institute/ licensee shall maintain records, receipts of postal / courier delivery of TLD Cards. These details are necessary to trace lost TLDs during the delivery.
17. User institute/ licensee shall ensure to pack Goods/TLDs as it is required to prevent their damage during transportation to destination.
18. Prices charged by the SLAEB for supply of goods and related services performed under the contract may vary without notice.
19. User institute/ licensee shall be well aware that it is a responsibility of the employer to investigate overexposures and take precautionary action to minimize the radiation level as low as reasonably achievable.
20. User institute/ licensee shall bear all cost and expenses incurred (for all travelling, and board and lodging expenses) for attending any matter /issues/provision of training/investigation in connection with the service.
21. The SLAEB recommends the User Institution to work out a scheme to take disciplinary action against radiation workers who deliberately irradiate or misuse /mishandle TLDs, in order to avoid such unauthorized acts. **Invoices may be issued to recover the cost in connection with the investigation of overexposures and carrying out additional tests to verify the performance of TLDs that record higher doses if reasons for overexposures are due to negligence of radiation workers.**
22. User institute/ licensee shall return all TLD Cards provided by the SLAEB and make the due payments before terminating the service.
23. User institute/ licensee shall settle all invoices issued in respect of this service within 14 days from the date of invoice. Service may be terminated until due payments are made.
24. User institute/ licensee shall inform the names of resigned and retired radiation workers to enable the SLAEB to terminate the service and update records.

- Note:** 1. User Institute / licensee referred in this document is the institute (customer) obtains PMS from the SLAEB.
2. Issuing TL dosimeters for Government Hospitals are the responsibility of the Medical Supplies Division (of Ministry of Health).
 3. Any government hospital wishes to purchase TL dosimeters from the SLAEB, a separate request should be submitted by the head of the hospital to the SLAEB.
 4. Application Form, PMS /FM-01 together with duly completed Personal Data Form, PMS/PDF and Bio-data Form, PMS/BDF should be submitted for request of PMS first time for workers of new lab/institute.
 5. Application Form, PMS /FM-01A together with duly completed Personal Data Forms, PMS/PDF should be submitted for request of PMS for new workers of the lab/institute which has already registered.

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Instructions on how to use Thermo-luminescent Dosimeters to Radiation Workers

Radiation workers shall be aware of the danger and inherent risks of radiation and Annual Limits of radiation doses recommended for workers and pregnant workers. Personal Monitoring Service (PMS) of Sri Lanka Atomic Energy Board (SLAEB) only provides facilities to estimate the occupational radiation doses of workers under the limits stipulated by the International Basic Safety Standards (BSS) for Protection against Ionizing Radiation and for the Safety of Radiation Sources (IAEA Safety Series No: 115, 1996 and new revision in 2011). As such radiation workers shall be knowledgeable to handle/operate radiation apparatus, sources etc. adhering to necessary safety precautions to protect himself /herself, public and patients when handling / operating radiation apparatus and sources of ionizing radiation that emit ionizing radiation, to keep the doses below radiation dose limits. The employees (radiation workers) should be made aware that the TL dosimeters provided by the SLAEB will not give any protection for radiation exposures and this dosimeter records only the radiation dose received by the wearer if the dosimeter is properly used as per the instruction provided. **(Dose limits:** a single year effective dose limit is 50 mSv for the whole body provided that total dose for five years period is 100 mSv and dose per year is 20mSv, average over the period of five years, 1mSv per year for a pregnant woman)

The TL Dosimeter (TLD badge) consists of two parts, the holder and the Harshaw TLD-100 card. The TLD card consists of two detectors (two dosimeter chips); the unfiltered detector which is used to measure the skin dose and filtered detector which is for the measurement of the whole body dose. **Under this service Effective Dose for Whole Body are estimated** within the uncertainty stated in the IAEA **Safety Guide No. RS-G-1.3** and **results are reported to the User Institute.**

The instructions on how to use TLDs are given bellow.

1. The TLD badge should be worn by the radiation worker on his/her chest or waist during their work. If protective lead apron is worn, the badge should be worn under the lead apron at chest level. TLD badge should be worn in such a way that the filters of the holder are visible from front). The extra badges provided to workers engaged in interventional radiological procedure should be worn at the neck level, outside the protective thyroid shield.
2. Please note that the TLD card numbers are listed in front of the names of the users in the Distribution Form, PMS/DF. As such, respective users should obtain appropriate TLD cards from the Radiation Protection Officer (RPO). Please ensure to use only the TLD card assigned to respective user as given in the TLD Card Distribution Form. A TLD badge allocated to one user should not be shared with any other person.
3. When the dosimeters are not in use TL Dosimeter should be kept in a radiation free area and away from high intensity light sources, high temperature places where hot plates, ovens and furnaces are used.
4. Do not damage the TLD cards by scratching, pasting labels and applying glue.
5. Hand over the used and unused TLD card to the RPO once the fresh /annealed batch of TLD cards is received for the next monitoring period. This is essential for estimation of accurate dose and smooth functioning of the PMS.
6. It is imperative that the used /unused TLD cards issued for a monitoring period be returned as one batch immediately after receiving annealed TLDs for the next monitoring period, to process them, in order to ascertain occupational doses received by each worker. Please note that the existing card should not be removed /changed from the holder until a fresh supply of TLD cards for the next survey period is received.
7. In general, the TLD cards are issued for a period of two months. In the event of receiving of a fresh/annealed batch of TLD cards is delayed, continue the use of existing cards until fresh cards are received.
8. Fresh TLD cards will not be issued to radiation workers who do not return the used/unused TLD cards issued for the previous monitoring period as no additional TLD cards are available. Only two sets of cards are allocated for a institute.
9. Returning TLD cards to the SLAEB through the RPO as soon as possible when high exposure is suspected.
10. Radiation workers are responsible for adhering to all laws, rules, regulations, terms & conditions and guidelines pertaining to the use of PMS.
11. Radiation workers are responsible for reporting any loss or contamination of the dosimeter to the RPO.
12. Radiation workers are responsible for informing the RPO of any exposures which have exposed at a previous employer when beginning employment at new institution. They are also responsible for notifying the RPO of termination of employment and returning the radiation dosimeter at the end of monitoring period and their employment.

Terms and Conditions:

1. *Misuse of TL Dosimeters may result to terminate the Personal Monitoring Service.*
2. *If TLD cards are lost or damaged, cost of the cards will be recovered from the user institution at the prevailing rate at that time.*
3. *Invoices may be issued to recover the cost for investigation of overexposure and carrying out additional tests to verify the performance of TLDs if the overexposures are due to negligence of radiation workers.*

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Duties and Responsibilities of Radiation Protection Officers (RPO)

The duties and responsibilities of Radiation Protection Officer (RPO) with regard to monitoring of occupational exposures of radiation workers are as follows:

1. Distribution of TL Dosimeter Cards to radiation workers according to the card numbers assigned for each worker given in Distribution Form provided along with the dosimeters. [Note: RPO may request TLD cards with Distribution Form without assigning card numbers for each radiation worker and he may assign card numbers at the time of distribution of cards]
2. Ensure that personal monitoring devices (TLDs) are worn by all radiation workers when they are engaged in radiation work as per instructions given by the Sri Lanka Atomic Energy Board (SLAEB).
3. Maintaining dose reports and other records sent by the SLAEB and informing the workers regarding their exposure levels. The dose records of the workers should be maintained for 30 years after retirement of workers.
4. When the dosimeters are not in use TL Dosimeters should be kept in a radiation free area and away from high intensity light sources, high temperature locations/places where hot plates, ovens and furnaces are used.
5. The TL Dosimeter allocated for measurement of background radiation should be kept in a radiation free area, except background radiation and away from hot plates, ovens and furnaces. (This dosimeter can be kept in the office room).
6. Returning TLD Cards (without holders) to the SLAEB should be done as soon as possible when high exposure is suspected.
7. Carrying out investigation on overexposures and sending reports to the Sri Lanka Atomic Energy Regulatory Council (AERC) with a copy to the SLAEB after intimation of the overexposures by the SLAEB.
8. Ensure that the TLD card allocated to one person should be not shared by another worker, during the same monitoring period.
9. Ensure to pack Goods / TLDs as is required to prevent their damage during transportation to destination.
10. Collecting all TLD cards (both used and unused TLD cards issued for a monitoring period) and returning them as one batch to SLAEB immediately after receiving a fresh batch of TLD cards for the next survey period. At the time of collection of used cards it is important to verify whether radiation workers have used the cards with correct numbers assigned for them.
11. In general the TLD cards are issued for a period of two months. In the event of receiving of a fresh batch of TLD cards is delayed, instruct the users to continue the use of existing cards until fresh cards are received.
12. The names of the workers who are no longer in service should also be provided through the Head of the Institute / Department in order to terminate the provision of Personal Monitoring Service.
13. Person In-Charge of Personal Monitoring Service of the respective institution or the RPO should assist to insert the TLD card in to the holder (holder Opener may be required to open the holder without damaging it).
14. Determine the need for personal monitoring for workers, distribute and collect personal radiation monitoring devices on time, evaluate & monitor personal radiation exposure records for trends and high exposures, notify individuals and their supervisors of radiation exposures approaching the limits, and recommend appropriate remedial action.
15. Ensure that all incidents, accidents, and personal exposure to radiation in excess of recommended dose limits for occupational exposure for radiation workers are investigated and reported to the AERC with a copy to the SLAEB through the Head of the institute, if required/requested, within the required time limits.

Terms and Conditions:

1. *Misuse of TL Dosimeters may result to terminate the Personal Monitoring Service.*
2. *If TLDs are lost or damaged, cost of the cards will be recovered from the user institution at the prevailing rate at that time.*
3. *Invoices may be issued to recover the cost for investigation of overexposure and carrying out additional performance tests to verify the performance of TLDs if the overexposures are due to negligence of radiation workers.*

Note: Application Form, PMS /FM-01A together with duly completed Personal Data Forms, PMS/PDF should be submitted for request of PMS for new workers of the lab/institute which has already registered.

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