

Radiation Act 2005

Annual Report
for the Financial Year
ending 30 June 2008

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Introduction

The *Radiation Act 2005* came into effect on 1 September 2007.

Section 134 of the Radiation Act requires that the Secretary, in respect of each financial year, must publish a report that:

- (a) describes the activities of the Secretary under this Act;
- (b) includes a summary of all authorities issued, renewed, suspended, cancelled, varied, transferred or surrendered during that year;
- (c) includes all radiation incidents investigated in that year;
- (d) includes a summary of all prosecutions for offences against this Act or the regulations commenced in that year; and
- (e) includes any other prescribed matter.

In past annual reports of the Radiation Advisory Committee, which, prior to September 1, 2007 was established under the *Health Act 1958*, a summary was included of the numbers of authorities issued by the Department under that Act. In view of the Secretary's obligations under Section 134 of the Radiation Act, a summary of authorities will not henceforth be included in the Committee's annual report but will be included in the report of the Secretary.

Prior to 1 September 2007 the department administered Part 5, Division 2AA, of the Health Act and the *Health (Radiation Safety) Regulations 1994*. From 1 September 2007 the department administers the Radiation Act and *Radiation Regulations 2007*.

Within the Department of Human Services, the radiation safety functions are administered through the Legionella & Radiation Safety Section of the Environmental Health Unit of the Public Health Branch. The Section has two specific teams – the Radiation Safety Team comprising the specialist radiation safety officers supported by the Registration & Licensing Team which provides the administrative assistance to process licence applications and deal with inquiries. These teams are also supported by the position of Expert Adviser, Radiation Safety.

The Radiation Safety Team (RST) of the department also provides advice on radiation health aspects of non-ionising radiation sources, including ultraviolet radiation, lasers, radiofrequency (RF) radiation, power lines, mobile phones, and communication towers. However, communications bands of the RF spectrum, including those used by mobile phones and communication towers, are regulated by the Australian Communications and Media Authority (ACMA). This includes health impacts of RF radiation in communications bands.

Development and implementation of the Radiation Act 2005 and Radiation Regulations 2007

The development of the *Radiation Act 2005* was a major initiative. It has created a regulatory framework that is consistent with the National Directory for Radiation Protection (NDRP), published by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and endorsed by all Australian Health Ministers.

Victoria is one of the first States or Territories to develop legislation since the development of the NDRP and, as other jurisdictions develop similar legislation, it is expected that there will be much greater national uniformity in the regulation of radiation practices.

The purpose of the Radiation Act is to protect the health and safety of persons and the environment from the harmful effects of radiation.

The Act:

- Repealed the previous radiation safety legislation contained in the Health Act and the Health (Radiation Safety) Regulations.
- Defines what is radioactive material
- Establishes a new system of licensing the conduct of radiation practices ("management licences") and also the licensing of natural persons who use radiation sources ("use licences"). Typically, management licences are held by corporate entities.
- Creates significant offences for the conduct of unauthorised radiation practices or the unauthorised use of radiation sources.
- Creates significant offences for the causing of another person to receive a radiation dose higher than the prescribed dose.
- Creates for the first time the significant offence of causing serious harm to the environment.
- Includes regulation-making powers under which the Radiation Regulations (available on the Victorian Legislation and Parliamentary Documents website) have been made. The Radiation Regulations came into effect on 1 September 2007 at the commencement of the Radiation Act.
- Re-establishes a Radiation Advisory Committee.
- Created a framework for the introduction of mandatory testing of certain types of radiation sources at specified intervals.

The department undertook a significant effort to communicate with over 11,000 stakeholders about the introduction of the Radiation Act and in the development of the regulations. This featured newsletters, presentations to key stakeholders, formation of a reference group and the holding of workshops across Victoria during May 2007 to assist stakeholders gain information about the new legislation.

The regulations were made on 31 August 2007.

The implementation of the legislation has on the whole been successful with a significantly improved licensing system which has dramatically reduced 'red tape' for large licence holders who operate multiple sites with large numbers of radiation sources. In one case, a single management licence has replaced over 200 registrations and licences issued under the previous laws.

Testing of Prescribed Radiation Sources

One of the features of the Radiation Act was the creation of the framework for the introduction of mandatory testing of certain types of radiation sources against radiation safety standards.

The Radiation Act requires that prescribed radiation sources may only be used if they have a valid certificate of compliance by the date specified in the Radiation Regulations. Certificates of compliance may only be issued by testers approved under the Act for that purpose.

The following types of X-ray equipment, when used for human diagnostic imaging purposes, have been prescribed by the Regulations and require periodic testing against the Department's radiation safety standards:

- Plain Film Radiographic X-ray Equipment
- Fluoroscopic X-ray Equipment
- Computed Tomography Scanners
- Mammography X-ray Equipment

The implementation of this testing program is an important step towards improving radiation safety in Victoria and for reducing exposures received by users of radiation and patients undergoing radiological procedures.

There have been 25 testers approved to test these types of radiation sources. The testing of the radiation sources has progressed well and a review of the safety standards will be undertaken in the 2008/9 year to ensure that the system can be further improved. The RST will be undertaking auditing of the testers during the 2008/9 year and closely monitoring compliance with the requirements.

Summary of authorities issued by the Department

Under the Health Act, most types of radiation sources had to be registered individually. This requirement was replaced by the current system of management licences under the Radiation Act whereby a person may hold one management which covers a number of radiation sources possessed at a number of sites. The previous requirement for those persons who operated radiation sources to hold an operator licence was replaced by the system of use licences under the Radiation Act. Use licences are essentially the same as operator licences.

The reporting period for this Annual Report is the 2007/8 financial year but as the Radiation Act did not come into effect until September 1, 2007, this reports lists the numbers of licences or registrations issued under the Health Act during period 1/07/07 to 30/08/07 in Table 1 and the numbers of authorities issued under the Radiation Act during period 1/09/07 to 30/06/08 in Table 2.

Table 1 Numbers of licences or registrations issued under the Health Act during period 1/07/07 to 30/08/07

Registrations:	47
Operator Licences:	46
Institution Licences:	2

Table 2 Numbers of authorities issued under the Radiation Act during period 1/09/07 to 30/06/08

Use Licences:	717
Management Licences:	418
Approved Testers:	31

The total numbers of authorities under the Radiation Act as of 30 June 2008 are listed below in Table 3.

Table 3 Total numbers of authorities issued as of 30 June 2008

Use Licences:	5829
Management Licences:	2358
Approved Testers:	25

Radiation Incidents

Thirty three incidents were reported to the Department during the 2007/2008 financial year. Common causes of the medical incidents were found to be human error in relation to correct patient identification procedures and incorrect protocols being used for scans. The incidents reported are summarized below.

DESCRIPTION OF INCIDENT	ACTION TAKEN
<p>A patient had undergone a non-contrast CT examination of the cervical spine. At the time, the patient had been referred to the private radiology suite involved to undergo a CT scan of the lumbar-sacral region, but was incorrectly booked to have a scan of the cervical spine. A protocol for the CT was provided by the radiologist as being "C- ST + bone". The radiographer performing the scan had not checked the scan protocol against the referral, despite having completed a 'time-out' procedure that specifically asked for this verification. The referral slip had clearly indicated "↓ back/sacral region". The total effective dose received by the patient as a result of the incident was estimated to be 1.5 mSv.</p>	<p>All radiographers at the facility were reminded to check the referral slip prior to scans. The director of radiology mandated that radiologists at the hospital write the body part to be imaged on scan protocols.</p>
<p>A patient underwent an unnecessary CT scan of the abdomen/pelvis. The clinical notes made by the referring physician had stated 'CT Cholangiography please as requested by Gastro'. The radiologist involved approved a CT Cholangiography protocol and this was performed. The referring physician later said that she wanted a colonography examination rather than the procedure that had been performed. It appeared that an error was made by the referring physician as she had not correctly indicated the procedure that was required on the request slip. The total effective dose to the patient as a result of the procedure was estimated to be 13 mSv.</p>	<p>The referring physician was alerted to the error, and the colonography examination was later carried out. The department wrote to the hospital management advising of the updated arrangements for reporting of incidents under the Radiation Act.</p>
<p>A patient incorrectly underwent an administration of 775 MBq Tc-99m. A request was made for the patient to undergo a whole body bone scan. After the patient was requested to attend the nuclear medicine department to be scanned, the unit that requested the scan indicated that the patient did not require it. The cause of the maladministration had been the referring physician placing an incorrect patient identification label on the request form for the procedure. The total effective dose to the patient was estimated to be 5.6 mSv.</p>	<p>The RST wrote to the hospital management advising of the updated arrangements for reporting of incidents under the Radiation Act. The referring physician was advised of the reason for the maladministration and counselled that more care must be taken when referring patients for procedures to ensure the correct patient details are attached to the request form.</p>

DESCRIPTION OF INCIDENT	ACTION TAKEN
<p>An incorrect CT brain scan (non-contrast) of a patient was performed. The patient had been sitting in the waiting area when their name was called out. The radiographer assumed that the patient had been scheduled to undergo a CT scan, when in fact the patient had been supposed to undergo an ultrasound procedure. The total effective dose as a result of this scan was estimated to be 0.75 mSv. The cause of this incident was the failure of the radiographer correctly to verify the patient's identity by checking the ID bracelet.</p>	<p>The radiographer was informed of the error and all radiographers at the centre were reminded of the hospital's policy regarding correct identification of patients. RST wrote to the hospital, reminding them of the need to conduct a root cause analysis for incidents in order to identify systematic causes of incidents, and possible preventative measures.</p>
<p>A patient incorrectly underwent pre and post contrast CT scans of the brain. The total effective dose received by the patient as a result of these scans was estimated to be 1.6 mSv.</p>	<p>The radiographer was informed of the error and all radiographers at the centre were reminded of the hospital's policy regarding correct identification of patients. RST wrote to the hospital, reminding them of the need to conduct a root cause analysis for incidents in order to identify systematic causes of incidents, and possible preventative measures.</p>
<p>A patient presented for a CT scan of the thoracic spine. The clinical notes for the patient indicated that a radiograph was required. The referral requested that a CT scan be performed and a protocol for this procedure was subsequently drawn up by a radiologist. The clinical notes indicated that the patient had clinical indications in both the thoracic and cervical spine, but the scan referral did not indicate which area needed to be scanned. The radiographer performed the CT scan as per the protocol. The medical intern who requested the scan had made the request for the wrong area of the spine. The total effective dose to the patient was estimated to be 7.2 mSv as a result of the scan.</p>	<p>A report on the maladministration indicated that it would be desirable for a senior medical practitioner to request images if possible or ensure that junior practitioners understand the reasons for and intended benefit of scans that they request.</p>
<p>A patient underwent an unnecessary CT scan of the brain. The patient had been scheduled to undergo a radiograph, but was conducted into the CT room by mistake. The radiographer conducting the scan checked the identity wristband of the patient, but did not compare it with the name on the request form for the CT scan. The total effective dose to the patient was estimated to be 3.4 mSv as a result of the scan.</p>	<p>RST advised the hospital to introduce a 'time-out' policy in relation to the verification of patient identity and scan protocols, as had been introduced at some other major hospitals in Victoria. Time-out procedures require radiographers and nuclear medicine technologists to verify the identity of the patient, the modality to be used for imaging and the region of the body to be imaged.</p>

DESCRIPTION OF INCIDENT	ACTION TAKEN
<p>A patient underwent an administration of 200 MBq gallium-67 citrate, although he had been scheduled to undergo a myocardial viability test using thallos chloride. The error occurred because the nuclear medicine technologist that was performing the scan misread the label on the vial containing the radiopharmaceutical and incorrectly assumed that thallos chloride was the agent that was being drawn up and injected. The total effective dose to the patient was estimated to be 20 mSv.</p>	<p>The chief nuclear medicine technologist at the department counselled the technologist who made the error about the importance of verifying that the correct radiopharmaceutical is drawn up and administered. As an interim measure pending the completion of an internal review, vials of gallium citrate and thallos chloride were kept in separate, appropriately labelled lead castles.</p> <p>RST requested that the nuclear medicine department of the hospital implement double-checking of radiopharmaceutical identification by a second technologist.</p>
<p>Doses of radiopharmaceuticals for both a bone scan (99mTc-HDP) dose and a gastric emptying procedure were drawn up in the nuclear medicine laboratory of a hospital. The dose for the bone scan was inadvertently added to the porridge meal that had been intended for the gastric emptying procedure. The patient received approximately 5 mSv total effective dose as a result of this scan. This dose is, however, only an approximation as the calculation was to be based on the dose coefficient for injection of 99mTc-HDP, as a value for ingestion is not thought to be available.</p>	<p>The technologist was advised to take care and label all radiopharmaceuticals that are drawn up and are waiting to be administered.</p> <p>RST requested that the nuclear medicine department of the hospital implement double-checking of radiopharmaceutical identification by a second technologist. RST also recommended that the centre implement a 'time-out' procedure to reduce the possibility of similar errors occurring in the future.</p>
<p>A patient had undergone a CT examination of the brain twice, although only one examination had been intended. The cause of this error was the request form being faxed twice to the radiology department by mistake because the original appointment for the scan had been cancelled. The total effective dose to the patient was estimated to be 1.8 mSv as a result of the unnecessary scan.</p>	<p>RST advised the hospital to ensure any request slips for CT procedures that are faxed are stamped to indicate that they have been faxed.</p>
<p>A patient underwent an unnecessary CT scan of the brain. This occurred because the request slip had been faxed to two hospitals, which caused a booking to be made at both hospitals for the same scan. The total effective dose to the patient was estimated to be 1.8 mSv as a result of the unnecessary scan.</p>	<p>RST advised the hospital to ensure any request slips for CT procedures that are faxed are stamped to indicate that they have been faxed.</p>
<p>Three patients were administered 740 MBq 99mTc-pertechnetate by mistake. The cause of this error had been that the vial containing the radiopharmaceutical had been incorrectly labelled. Three doses were drawn up and administered from the vial, with the error only being recognised during an attempt to perform the intended bone scan. Each patient received a total effective dose of approximately 9.6 mSv as a result of the maladministrations.</p>	<p>RST requested the institution to forward details as to the reason for the incorrect labelling of the vial.</p>

DESCRIPTION OF INCIDENT	ACTION TAKEN
<p>A patient underwent a CT scan of the chest with contrast. This occurred because the patient mistakenly answered to a name that was called in the waiting room that sounded similar to their own name. The radiographers concerned failed to verify the identity of the patient prior to the scan in accordance with the hospital's patient identification procedure. The total effective dose to the patient was estimated to be 4.2 mSv as a result of the unnecessary scan.</p>	<p>A meeting was held of radiographers in the radiology department to reiterate the importance of taking extra care in identifying patients in a busy environment, as per the hospital's patient identification procedure. A 'time-out' form was to be developed for identification of patients prior to CT scans at the hospital.</p>
<p>RST received a call-out to student accommodation premises for the University of Melbourne. The Metropolitan Fire Brigade reported a suspected deliberate contamination of a recreation room with a large amount of granulated powder.</p>	<p>Two officers from RST attended the scene and performed monitoring of samples taken from the room. This monitoring showed no evidence of radioactivity above background levels.</p>
<p>Two authorised officers from RST were called to attend a landfill site after staff at the site identified a nuclear moisture/density gauge that was being stored on site. The gauge and its transport container were in good condition and measured radiation levels confirmed that the gauge shutter was securely closed. The gauge appeared to have been unused for quite some time.</p>	<p>The gauge was transferred to the DHS interim storage facility pending investigation into its ownership status.</p>
<p>A male patient underwent an unnecessary CT scan of the abdomen. This was due to the placement of an incorrect patient identification sticker onto the request form by a medical intern. The data provided in the report were insufficient to allow estimation of the total effective dose received by the patient.</p>	<p>A surgical consultant was asked to review the request practices of the intern involved in order to reduce the risk of a similar mistake occurring in the future. The hospital also initiated a review of the process for management of patient histories and diagnostic requests. RST wrote to the hospital requesting that the Radiation Safety Officer of the hospital provide the relevant data to a medical physicist so that a dose estimate could be performed. RST further requested that a process of hand-writing of names on request forms, in addition to attachment of identification labels, be implemented to reduce the risk of similar incidents occurring in the future.</p>
<p>A fluoroscopy unit at a Melbourne hospital was used in an unauthorised manner by an individual who was not licensed to do so. A radiographer had finished one screening session and was required for another session but had another urgent case that she had to attend to in the interim. She therefore left the unit switched on with the key in place. On returning from the urgent case she discovered that the unit had been used in her absence.</p>	<p>In response to the incident, the hospital has advised all staff working in the hospital's operating theatres about the correct procedure regarding licensed use of fluoroscopy units. Radiographers at the hospital have been reminded to disable an unattended image intensifier and a sign has been placed on all mobile fluoroscopy units to remind staff that the machine must be only be used by a licensed operator.</p>

DESCRIPTION OF INCIDENT	ACTION TAKEN
<p>A patient underwent a CT scan of the brain without contrast, when it had been intended that the patient receive a CT scan of the brain with contrast. The total effective dose to the patient was estimated to be 1.4 mSv as a result of the scan.</p>	<p>RST wrote to the hospital acknowledging their report. RST advised that the report did not indicate whether or not the hospital's established time-out procedure was followed in this case. RST sought clarification on this.</p>
<p>A patient underwent a CT scan of the brain that had been intended to evaluate a stroke that a patient had suffered. When the scan was performed it was noticed that the patient had a brain tumour. The referring physician was advised after the scan to see if he had attached the correct patient identification label. The physician had indicated that he asked someone else to attach a patient ID sticker to the request form as he could not find one. The incident was reported as a sentinel event within the hospital's internal incident reporting system, and the physician concerned was notified of the error. The patient concerned was notified of the incident. The total effective dose to the patient was estimated to be 1.96 mSv.</p>	<p>RST recommended that the hospital encourage hand-writing of patient names on request forms in addition to attaching patient identification stickers.</p>
<p>A patient had been scheduled to undergo an administration of ^{99m}Tc MAG3 for a renal study at a private imaging centre. The scan scheduled prior to this patient's booking was a bone scan using ^{99m}Tc HDP and the injection trolley had been prepared for this injection. However the bone scan patient was running late, so the renal patient was scanned instead. The nuclear medicine technologist concerned did not replace the dose of ^{99m}Tc HDP with the dose of ^{99m}Tc MAG3 and did not check the dose sticker provided prior to injection. As a result the patient concerned was administered with 840 MBq ^{99m}Tc HDP. The total effective dose to the patient was estimated to be 4.6 mSv as a result of the maladministration. The patient was advised of the error.</p>	<p>RST recommended that the centre adopt a time-out procedure that involved the checking of the pharmaceutical, isotope, and activity prior to administration.</p>

DESCRIPTION OF INCIDENT	ACTION TAKEN
<p>An incident occurred on a radiotherapy linear accelerator at a rural oncology centre on 1 January 2008 involving the unauthorised adjustment of beam profile parameters. The alterations to the accelerator were discovered while work was being carried out on the accelerator on 2 January 2008. Settings on potentiometers on the 6MV program board had been changed from the values recorded during the previous service. It was ascertained that the alterations were carried out by a physicist at the centre. The accelerator's internal control system was able to maintain the beam geometry during subsequent patient treatments and the self checking system was able to prevent any clinically significant consequences to any patients.</p>	<p>The centre instituted a rehabilitation program for the physicist concerned. The physicist was placed on a two year probation and his performance was to be closely monitored by his supervisor. His progress was also to be reviewed by a disciplinary panel.</p>
<p>A patient unintentionally underwent a CT scan of the brain/face. At the time, however, the patient had been scheduled to undergo a CT scan of the face/cervical spine. The radiographer performing the scan had been interrupted a number of times by doctors, and it appears that the e-request form for the intended procedure got mixed up with other forms. The radiographer did not re-check the form before the scan. The total effective dose to the patient was estimated to be 3.1 mSv as a result of the scan. The patient had been informed of the error.</p>	<p>RST sent the hospital involved sample time-out procedure out forms.</p>
<p>A patient unintentionally underwent a CT scan of the brain. At the time, however, the patient had been scheduled to undergo a CT scan of the chest. There had been a mix-up with patient details, and staff involved did not correctly follow the centre's identification policy. The total effective dose to the patient was estimated to be 1.5 mSv as a result of the incorrect scan.</p>	<p>RST wrote to the institution acknowledging the report.</p>
<p>A patient underwent a CT scan of the abdomen and chest instead of the intended CT scan of only the abdomen, as intended. An incorrect CT protocol was used because the radiographer involved had been interrupted by reception staff on the phone, notifying of arriving patients. The total effective dose to the patient was estimated to be 3.5 mSv as a result of the unnecessary scan.</p>	<p>RST wrote to the hospital suggesting that a time-out procedure may have been helpful in his case.</p>

DESCRIPTION OF INCIDENT	ACTION TAKEN
<p>A patient wrongly underwent an administration of 820 MBq Tc-99m HDP. This occurred because the person that was scanned answered a call made in the waiting room of the centre for another patient. The patient was asked to confirm the date of birth that was provided to them by the staff member. The patient was also asked about previous bone scans. The patient answered "yes" to all questions that were asked by the staff member. After the patient had been injected with the radiopharmaceutical it was realised that the incorrect patient had been injected, as the patient had actually been scheduled for a DEXA scan.</p>	<p>RST advised the institution that closed questions should not be used during verification of patient identity but that the patient should be asked to provide identifying details themselves. It was also suggested that nuclear medicine patients be kept separate from patients waiting for other types of procedures. In addition, it was suggested that the time-out procedure would have been beneficial if properly followed in this case.</p>
<p>On 18 March 2008 a patient was referred by two different physicians to undergo two separate CT scans at a Melbourne hospital. The first scan was of the abdomen and was scheduled for March 2008. This scan was performed as intended. The second scan, of the chest, was scheduled for October 2008. Referral slips for both scans were given to a radiographer. The radiographer then performed both scans, as the date on the referrals was not checked. Consequently the scan that was scheduled for October 2008 was performed in error. The total effective dose to the patient was estimated to be 6 to 8 mSv as a result of the CT chest scan.</p>	<p>In response to this case the administrative staff and the radiographer involved have been reminded to check both the date of the referral and the date of the examination provided on referral slips. A time-out procedure conducted prior to the CT scan may have assisted in this situation. RST sent the hospital sample time-out forms for their consideration.</p>
<p>A patient underwent a CT scan of the chest, abdomen, and pelvis with contrast. The patient had actually been referred from the emergency department of the hospital to undergo an ultrasound scan. The radiographer who performed the CT scan verbally identified the patient but the identification was incorrect. The patient was subsequently informed of the error. The total effective dose to the patient was estimated to be 18.6 mSv as of a result of the CT scan.</p>	<p>In response to the incident, a new patient identification policy was developed by the hospital. In addition, radiation incidents are to be discussed at the monthly medical imaging quality meetings. The incident occurred prior to a letter sent to the hospital that included a suggested time-out form for CT procedures.</p>
<p>On 29 February 2008, a patient at a Melbourne hospital received an unnecessary repeat CT scan of the chest four days after the original scan. The total effective dose to the patient was estimated to be 6.3 mSv as a result of the repeat scan.</p>	<p>RST wrote to the hospital detailing the outcome of the investigation of the incident.</p>

DESCRIPTION OF INCIDENT	ACTION TAKEN
<p>A patient at a Melbourne hospital was administered an incorrect radiopharmaceutical whilst undergoing a cardiac stress test. It had been intended that the patient would be administered with 400 MBq ^{99m}Tc-MIBI. The dose for the procedure was drawn up by an intern who was not under supervision at the time. The dose was calibrated and the dose slip was printed as 'MIBI'. Upon scanning the patient the staff saw that the target organ was the brain rather than the heart as had been intended. As a result of the maladministration, the cardiac procedure had to be repeated on the patient. The total effective dose to the patient was estimated to be 5.2 mSv as a result of the maladministration.</p>	<p>In response to the incident, the intern concerned was given instructions to identify radiopharmaceuticals prior to dispensing. The hospital also indicated that supervision of interns whilst dispensing radiopharmaceuticals would be intensified in the short term.</p>
<p>A patient unintentionally received a CT scan of the cervical spine. The patient had required, and received, plain radiographic investigation of the cervical spine. The referral slip for this procedure had requested that the general radiographer call the CT radiographer once the radiographs were complete. This had been intended to determine the need for a further CT based on the plain radiographs, in consultation with the referring practitioner. The general radiographer incorrectly communicated to the CT radiographer that the patient was to undergo a CT scan. There was not a protocol for the CT scan that had been requested on the referral slip. The time-out procedure was followed by the CT radiographer who assumed, however, that notes made by the general radiographer on the referral slip were a CT protocol made by the radiology registrar. The total effective dose to the patient was estimated to be 7.5 mSv as a result of the unnecessary scan.</p>	<p>The time-out procedure followed by the CT radiographer failed to prevent the unnecessary scan. The RST wrote to the institution reminding them of the need for a referral for each scan and of the need to read referrals carefully.</p>
<p>A patient was referred from a Melbourne hospital to undergo a nuclear medicine scan at a facility on site at the hospital. The referring medical practitioner, however, attached an incorrect patient identification label on the request form. The patient was administered with 215 MBq ^{99m}Tc DIDA. Some time after the scan was performed, a surgical registrar from the hospital rang the nuclear medicine centre and this was when the mistake was discovered. The total effective dose to the patient was estimated to be 3.7 mSv as a result of the scan.</p>	<p>RST wrote to the hospital acknowledging the report.</p>

DESCRIPTION OF INCIDENT	ACTION TAKEN
<p>A patient was brought from the emergency department of the hospital to the radiology department for a CT scan. The CT assistant had brought the patient in having read the referral and details. The patient provided their name, which was different to what the assistant had read out to them, however the assistant did not pick this up. The CT radiographer had then asked the patient if the date of birth was 15.10.1967 to which the reply was "yes". This response was not correct, and the date provided by the radiographer was not the date that patient had provided. The CT scan was then performed. It become evident later that the patient was actually scheduled for a knee radiograph. The total effective dose to the patient was estimated to be 9 mSv as a result of the unnecessary scan.</p>	<p>RST wrote to the radiology department recommending the implementation of a time-out procedure.</p>
<p>A patient had been referred by a general practitioner to a Melbourne hospital to undergo a CT scan of the cervical spine. The attending radiographer, however, performed a CT scan of the lumbar spine. A report from the hospital indicated that the radiographer did not thoroughly check the request form for the procedure. The total effective dose to the patient was estimated to be approximately 19 mSv as a result of the unintended scan.</p>	<p>RST wrote to the hospital requesting details of measures undertaken to prevent a similar incident occurring in the future. In addition, RST recommended that the hospital implement a time-out procedure for CT scans.</p>

Prosecutions

DHS successfully prosecuted a company for failing to properly transport radioactive materials in accordance with the requirements of the Code of Practice for the Safe Transport of Radioactive Materials (1990).

The company was found guilty, without conviction, in the Broadmeadows Magistrates Court on 26 June 2008 of failing to transport radioactive materials in accordance with the Code. The non-compliance related to inadequate labelling associated with a vehicle transporting a package containing a soil moisture/density gauge containing caesium-137 and americium-241. A 12 month good behaviour bond was imposed on the Company and ordered that they pay \$6,000 to the Court Fund.

Mineral Sands Mining Projects

The Department is actively regulating the radiation elements of the expanding mineral sands sector in Victoria. Two licences were issued (prior to the 2007/2008 financial year) for each of two sites operated by one mining company for the mining and milling of mineral sands containing naturally occurring radioactive materials. Radiation management plans were reviewed and discussed with the company prior to and during the EES phases and reviewed in conjunction with periodic reporting results that were requirements of conditions attached to the licences. The Department applies the ARPANSA Code of Practice on Radiation Protection in the Mining and Milling of Radioactive Ores when regulating companies dealing with ores and other concentrates with activity concentration levels of radionuclides above those specified in the Radiation Regulations.

During the course of the financial year, an officer of the Radiation Safety Section conducted inspections of the mining and processing sites to ensure compliance of the company with the regulatory requirements under the Radiation Act.

Solaria

On 23 August 2007, the Minister for Health, the Hon Daniel Andrews MP, made a commitment to have regulations controlling solarium in place by the end of the year. The development of a full regulatory impact statement in order for the intended regulations to be in place by the end of 2007 was not possible and an exemption from this requirement was sought and obtained. Interim regulations were developed that prescribed "tanning units" as non-ionising radiation apparatus.

Under the interim regulations, a management licence was required to possess tanning units and conditions were placed on these licences that required compliance with requirements of the Australian/New Zealand Standard AS/NZS 2635:2002, *Solarium for cosmetic purposes*. Further regulations with a regulatory impact statement will be developed during 2008.

The department commenced field inspections of these sites during the 2008/9 year and undertook a number of enforcement activities.

Transport of Radioactive Material

Under the Radiation Act, a person must hold a management licence in order to transport radioactive material. The RST has undertaken a review of the licensing arrangements for the transport of radioactive material and will be implementing a number of changes during the 2008/9 year to further improve the regulation of this radiation practice.

Synchrotron

In June 2001, the Victorian Government announced plans to build Australia's first synchrotron facility on a site located near the corner of Blackburn and Wellington Roads, Clayton. A synchrotron enables the study of atomic scale information that underlies scientific and technological progress in disciplines ranging from pharmaceutical development to materials synthesis and environmental remediation.

The facility commenced operation in April 2007 with an initial suite of five beam lines. During the course of the 2007/2008 a further three beam lines commenced operation. In addition, the imaging and medical therapy (IMT) beam line is being constructed. The shielded enclosures for the IMT beam line within the synchrotron building were completed in late 2007 with construction on the tunnel and external satellite buildings nearing completion in late 2008. It is expected that the IMT beam line will commence operation early 2009.

It is intended that the number of beam lines will be progressively increased up to the design capacity of 30 beam lines.

The Department has been closely involved with the project through regular meetings and updates. At various stages, inspections were carried out to observe and monitor the radiation safety practices, the facilities and the synchrotron site itself. Licences were issued by the Department for the facility, and to accelerator physicists, accelerator operators, and companies and persons involved in the installation of the synchrotron equipment.

Emergency Management

The Department is the control agency for incidents involving radioactive material, in accordance with the Victorian emergency management arrangements. The Department maintains a 24/7 emergency response capability with two comprehensively equipped on-call vehicles. A scientific officer recruited by the Department during the financial year underwent a number of training courses including the Introduction to Emergency Management held by the SES; incident control system (ICS) fundamentals; personal protective equipment usage; and handling of emergencies involving chemical, biological and radiological (CBR) agents. These courses are now the minimum undertaken by all scientific officers of the Radiation Safety Team who are rostered to be on-call to respond to incidents.