



THE UNIVERSITY OF
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Radiation Safety Audit System

Safety and Health

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Radiation safety audit system

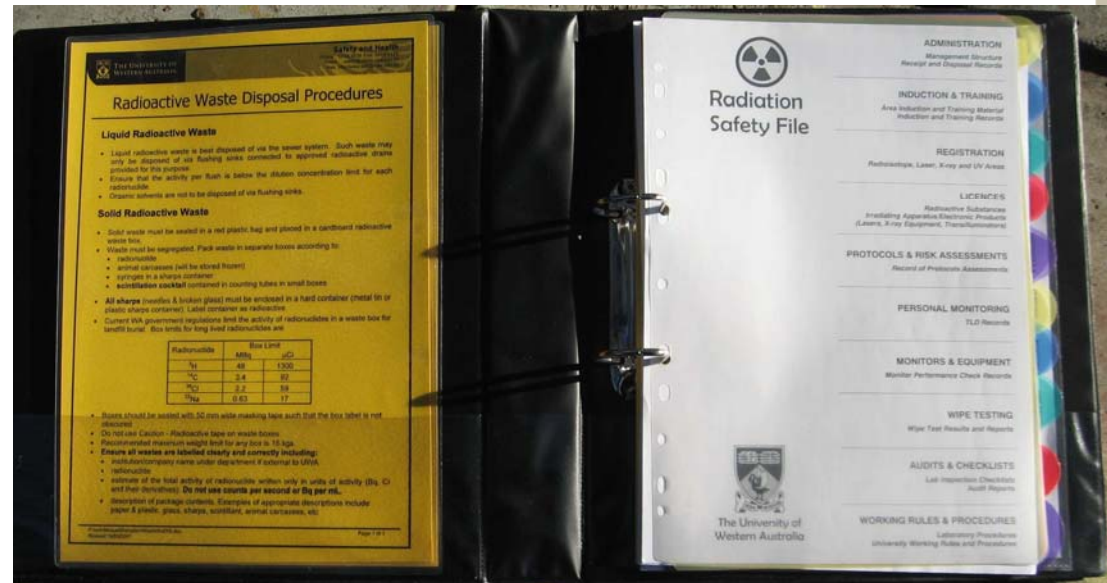
Aims (to maintain an appropriate level of radiation safety):

- Clearly define Management and Supervision – individuals and roles
- Provision of a clear system – clear obligations and how to satisfy them - Requirements and Guidance
- Easy to use – Minimise documentation, provide proforma where possible.
- Little ambiguity in what is expected – System and audit file show the way.
- Minimise the work for the client – Radiation audit file and database.
- Uniform system across campus – Radiation audit file.
- Established network of key people – SRSOs. (Section Radiation Safety Officers)



The audit system integrates

- SRSO
- Safety and Health
- Database
- Training
- Web site
- Uniform documentation resource
- Radiation audit file
- Annual audit





The audit process covers the following detail

Management structure : names individuals
 roles of individuals
 documentation and records requirements
 supervision, instruction, training, working rules

Detailed requirements for: Radioactive substances
 Lasers
 X-rays
 UV emitting devices

in the form of check lists

For example



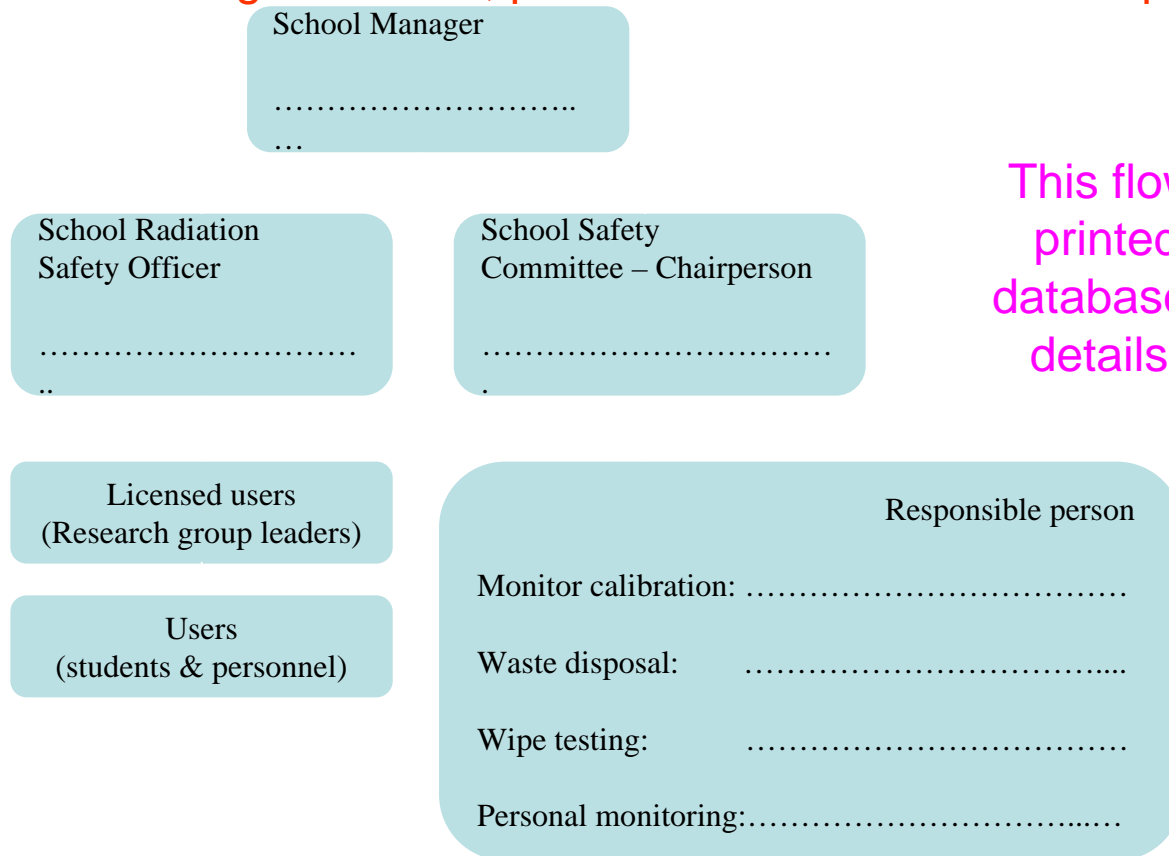
1. Management

Requirement:

Outline the management structure for radiation safety in your school/section

Guidance:

There should be a clear picture of the management structure and it should look something like the diagram below, please fill in the names in the places shown.



This flowchart is
printed off the
database with the
details filled in



Management systems - detail

- Where is the radiation audit file kept?
- Are your radiation registration records up to date?
- Are your license records up to date?
- Are they consistent with registration details?
- Are the relevant research group leaders and other personnel licensed?
- Are your risk assessments (Protocol) details up to date?
- Are they consistent with license details?



2. Supervision, training, instruction, working rules

Requirement

Do you have systems that ensure occupants of the laboratory are suitably supervised, trained, instructed and that radiation working rules are on display?
Is there a system for induction of new personnel for radiation safety?
Are appropriate radiation safety working rules available?
Are records for radiation safety inductions and training up to date? Where are they located?
etc

Guidance

The induction process provides a beginning point for a personal record. It must include records of the points below. It provides a permanent record that the manager has managed their personnel, with regard to safety in an appropriate manner.
etc.

Audit areas



There is a tiered structure:

- Registration - items and location must be on the registration.
- License - is required to use or deal with the item.
- Protocol - is required for each task using the item.
- Items - Radioactive materials, Lasers, X-rays, Transilluminators & UV

Common features:

Registration	Orders	Personal and area monitoring
Licensing	Waste disposal	Working rules
Protocols	Training	etc

Varying features:

Details of particular use – for example



e.g. - Radioactive materials - detail

1. Records of radioactive materials - receipt and disposal
2. Laboratory design and services
3. Designated radiation areas and labelling
4. Radiation monitoring equipment
5. Radiation surveys
6. Personal monitoring procedures
7. Wipe testing
8. Equipment and shielding
9. Waste disposal
10. Emergency procedures – radiation

These are the sections provided in the audit file



Radioactive materials - more detail

1. Records of radioactive materials - receipt and disposal

Is there a written work instruction available for the recording system?

Are records of receipts and disposal up to date - what was the last entry date?

Are materials booked in when received?

Are materials booked out as they are used?

Are radionuclides used consistent with Protocol, license and registration details?

Are there unknown or unmarked packages in the fridge or waste storage area?

2. Laboratory design and services

Do areas conform to the appropriate Acts, Regulations, Standards and Codes?

Unsealed Radioisotopes Course Notes, UWA

Radiation Safety Act 1975 and Radiation Safety (General) Regulations 1983

AS/NZS 2243.4, AS/NZS 2982.1

Code of Practice for the Safe Transport of Radioactive Material (2001)

National Standard for Limiting Occupational Exposure to Ionizing Radiation

3. Designated radiation areas and labelling

Are specific areas for radiation procedures designated and suitably identified?

Is there labelling on relevant entry doors?

etc



Lasers - detail

1. Records of laser holdings and designated laser areas
2. Laboratory design
3. Designated radiation areas and labelling
4. Shielding, equipment, interlocks
5. Emergency procedures



X-ray machines - detail

1. Records of x-ray machine holdings and designated x-ray areas
2. Laboratory design
3. Designated radiation areas and labelling
4. Shielding, equipment, interlocks
5. Radiation monitoring equipment
6. Radiation surveys
7. Personal monitoring procedures
8. Emergency procedures



Transilluminators and UV sources - detail

1. Records of transilluminator holdings and designated areas
2. Design and quality of equipment
3. Designated radiation areas and labelling
4. Shielding, equipment, interlocks
5. Emergency procedures

Database

Microsoft Access

File Edit View Insert Format Records Tools Window Help

MAIN SWITCHBOARD : Form

MAIN SWITCHBOARD

Orders Protocols Contacts

Microsoft Access - [Audit : Form]

File Edit View Insert Format Records Tools Window Help

Tahoma 8 B I U

Audit

Enter Department: Biomedical & Chemical Sciences - f

Print Management Structure

Print File Labels Avery L7162

Print Trefoils

Print SR50 Labels Avery L7162

Print Read working rules acknowledgement pages

Record: 1 of 62

Form View

Microsoft Access - [ManagementStructure : Report]

File Edit View Tools Window Help

Type a question for help

Fit Close Setup

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http://www.safety.uwa.edu.au

27-Apr-11

Management structure for radiation safety
Biomedical & Chemical Sciences - Biochemistry M310

It is recommended that a lever arch file be used for the day to day management of radiation safety in schools. This file would contain a number of sections covering different aspects of radiation processes, for example, wipe testing, protocols, records of receipts, waste disposal, monitor calibration sheets. It would also contain relevant working rules and process instructions.

The management structure in the school/section for radiation safety is outlined below.

```

graph TD
    SM["School Manager  
Jennifer Stevenson"] --> SRSO["School Radiation Safety Officer  
Paul Attwood"]
    SM --> SSC["School Safety Committee - Chairperson  
Greg Allen"]
    SRSO --> SLSO["School Laser Safety Officer"]
    SRSO --> LU["Licensed users  
(Research group leaders)"]
    SRSO --> U["Users  
(students & personnel)"]
    SLSO --> RP["Responsible person  
Paul Attwood"]
    RP --> MC["Monitor calibration: Paul Attwood"]
    RP --> WD["Waste disposal: Paul Attwood"]
    RP --> WT["Wipe testing: Paul Attwood"]
    RP --> PM["Personal monitoring: Paul Attwood"]
  
```

Attached:

Copy of radiation registration details
Copies of licenses
Copies of Protocols

Page: 1

Ready NUM

Database



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Microsoft Access - [MAIN SWITCHBOARD : Form]

Microsoft Access - [FAX ORDERS]

File Edit View Insert Format Records Tools Window Help

Type a question for help

FAX ORDER

PRINT New Back

SELECT SUPPLIER:

SELECT DELIVERY TO:

FROM:

INSTITUTION ORDER:

Protocol number:

Order number:

Activity: Units = MBq

Isotope:

Product name:

Product code:

Price: Total price:

Quantity:

General text:

Date faxed: FAX ID.: Printed:

Record: of 1269

Form View

NUM



Radiation audit file

- Records are arranged **uniformly** across campus in audit files provided by S&H.
- Changes are made to detail throughout the year and following annual audit.
- New pages with updated details are printed from the database by S&H and replace outdated pages.

What this achieves



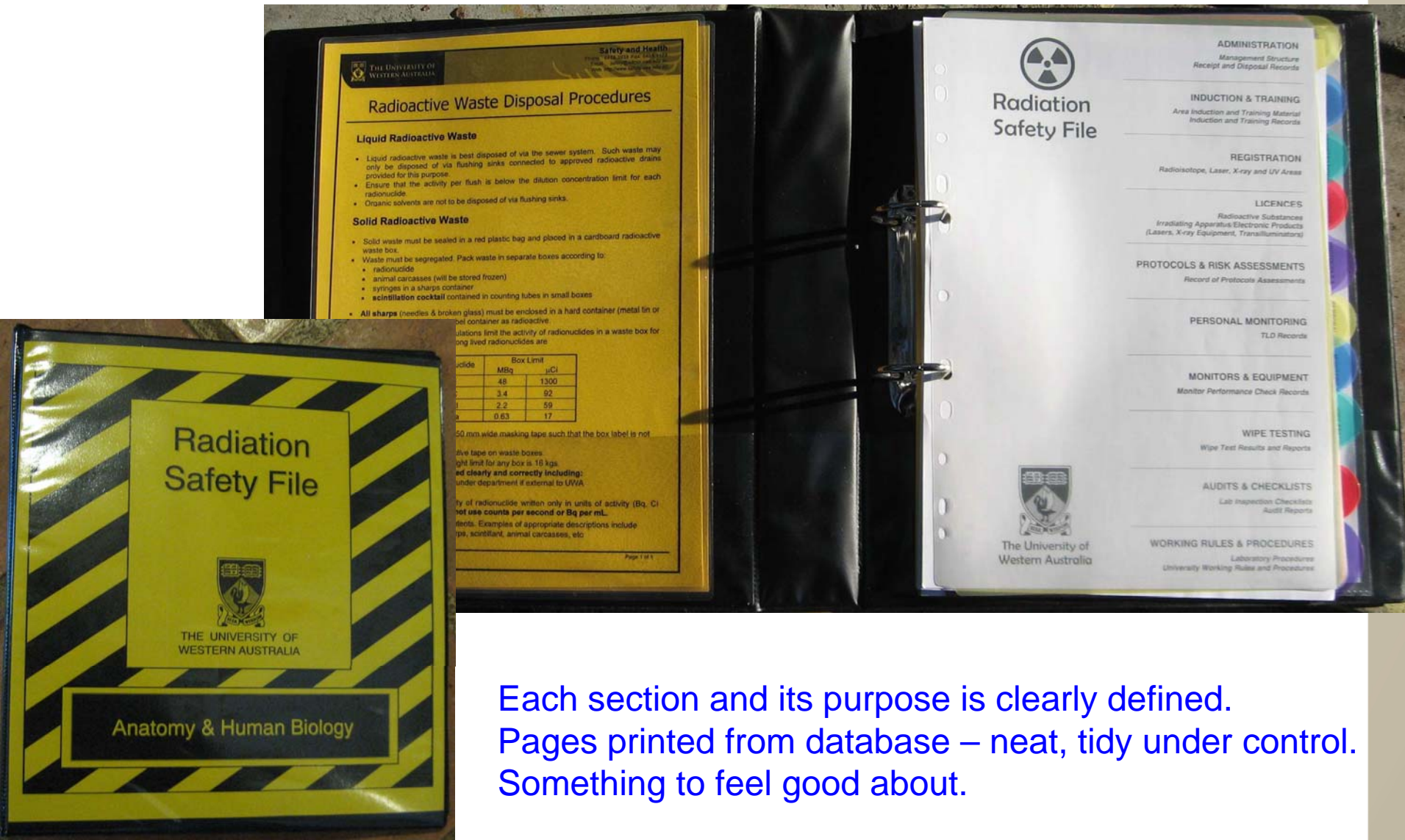
Radiation audit file

What this achieves:

- Is quick, efficient system that saves time and effort in Sections and S&H.
- Makes sure that information is up to date and in consistent format.
- Values the clients in Sections, gives them an element of involvement and therefore ownership.
- The whole process easy to visualise with a beginning and clear end.
- Importantly the client clearly sees it is efficient and makes their job much easier – **so they like us.**
- **After all the SRSO's are not paid to do this.**



Radiation audit file



Each section and its purpose is clearly defined.
Pages printed from database – neat, tidy under control.
Something to feel good about.



Protocols

Simple risk assessment required for each significantly different process. Includes a check of:

- License
- Registration – rooms, activities and isotopes
- Training
- Ordering
- Waste disposal
- Monitoring – personal and area
- Sign off to ensure relevant people in the dept or section are clearly aware of the new work.

All these are checked against S&H database before the protocol is approved.

Orders are placed once the protocol has been confirmed to cover the materials being ordered – the database is used in real time.

frs028 - Microsoft Word

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Safety and Health
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 http://www.safety.uwa.edu.au

Working Rules for OHCWA Intra-oral Dental X-ray Units

Working rules are essential to ensure that all intra-oral dental x-ray units are used in accordance with legal requirements and with a high standard of safety for patients, staff, students and others.

- Intra-oral dental x-ray units may only be operated by a qualified dentist, by dental ancillary personnel (Refer 2) under the direction and supervision of a dentist, or by a qualified radiographer on the instructions of a dentist or medical practitioner, and only for the purposes for intra-oral radiography and lateral oblique radiography of the mandible. No other person is authorised to operate these units.
- Dental ancillary personnel means a person who has satisfactorily completed a Radiological Council approved radiation safety training course.
- These units are not to be operated or used for human diagnostic radiography unless covered by a current Certificate of Compliance.
- Note that the default exposure value when turning on the unit is the adult mode.
- Select and fit the cone to be used in the exposure. It is recommended that whenever feasible that the long cone be used in order to keep the absorbed dose to the patient as low as possible.
- The exposure values must be selected according to the cone used, image mode, adult/child, exposure region, time and kV (usually pre programmed).
- Ask the patient to sit down. Place a protective lead apron over the patient's chest.
- Position the film/sensor and cone as required.
- When taking an exposure ensure the patient remains as still as possible. Move as far away from the x-ray tube as the length of cable permits. No one except the patient may remain in the radiation area whilst the exposure is taken. Operators and observers should be standing at least two metres from the patient's head during exposures and conscientiously using any protective shielding provided.
- Maintain visual contact with the patient and x-ray unit during the exposure.
- Check that the ready light is on. Press and hold the exposure key on the control panel for the duration of the exposure. The exposure warning light will come on. An audible warning sound should accompany the exposure.
- Immediate measures must be taken to remove potentially hazardous situations arising from x-ray beams that may be emitted due to an equipment defect, misalignment or any other reason.
- The OHCWA School Radiation Safety Officer (SRSO) is: Professor Paul Abbott
- Service may only be carried out by a technician with a suitable license from the Radiological Council.
- All incidents and injuries must be reported to the SRSO and UWA Safety and Health.
- These working rules are to be prominently displayed by the x-ray unit control panel at all times.

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 Email safety@uwa.edu.au
 Web: http://www.safety.uwa.edu.au

Working Rules for the use of Ultraviolet Transilluminators



CAUTION

ULTRAVIOLET HAZARD




- THE PERSPEX SHIELD SUPPLIED SHOULD BE CLOSED WHILST THE UV LIGHT IS ON.


IF THE WORK REQUIRES THE SHIELD TO REMAIN OPEN


- ALL PERSONS IN THE ROOM MUST COVER ALL EXPOSED SKIN.
- FACE AND EYES MUST BE COVERED BY WEARING AN APPROPRIATE UV ABSORBING FULL FACE SHIELD.
- HEAVY DUTY RUBBER GLOVES SHOULD BE WORN ON THE HANDS. STANDARD LABORATORY GLOVES ARE NOT SUITABLE FOR HAND PROTECTION FROM UV.

THE MAXIMUM PERMISSIBLE EXPOSURE PER DAY FOR UNCOVERED SKIN AT THE SURFACE OF THE SOURCE IS

LESS THAN 0.3 SECONDS


 HAND PROTECTION
MUST BE WORN


 FACE SHIELD
MUST BE WORN


 PROTECTIVE CLOTHING
MUST BE WORN

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Conclusion

The system:

- Works well – audits are quick and focus on changes.
- Does not relieve SRSO's and sections from controlling their radiation safety
- It assists them by removing the drudgery and allowing to focus on changes.
- Makes sure the safety bases are covered.
- That data is uniform in format and therefore efficient to assess.
- That data is orderly and in a form SRSO's can feel good about.
- **Makes us popular and valued by the clients !**