



## **3 Day Radiation Safety Officer (RSO) Exploration Course**

<b><u>When:</u></b>	<b>Radiation in perspective, course review and assessment</b>
<b><u>Where:</u></b>	Radiation In perspective Review and Assessment
<b><u>Cost:</u></b> \$2,400 + GST	- Quick overall course review - 2 hr assessment

Morning tea, afternoon tea and lunch will be provided.  
Course notes will be provided prior to the first day of the course.

### **Course structure:**

The course is in 6 modules that are broken into 20 sections.

#### **An introduction to radiation**

Basic Radiation Physics  
Properties of ionizing radiation  
Properties of Natural ionizing radiation

#### **Understanding radiation from a biological perspective**

Internal and External Hazards  
Biological effects of ionizing radiations

#### **Radiation Safety and Protection**

Radiation Safety Principles  
Safe Working Techniques  
Personal Hygiene  
Administrative Controls

#### **Radiation Detection, Measurement and Dose**

Radiation Detection & Measurement  
Radiation Monitoring Practical  
Radiation Monitoring Programs  
Radiation Dose Limits  
Radiation Dose Calculations

#### **Legal and Practical aspects of Radiation Management Practices for a project**

Radiation Management Plans  
Reporting and Audits  
Radioactive Waste management  
Decontamination and Emergency Procedures  
Transport Considerations  
Legal Aspects

### **Who is the course aimed at**

This course is appropriate for personnel involved in the mining industry where geological surveys, drilling, mineral processing and sample analysis for uranium, and where Naturally Occurring Radioactive Materials (NORMs) may be significant.

### **Assumed Background**

The structure of the course is set with the expectation that the participants already have a reasonable understanding of activities carried out on an exploration or mineral sands processing site.

### **Assessment**

Open book exam with a pass mark at least 65%

### **Course Numbers**

In Perth: Minimum of 2 people

**Note: Enrolments are strictly limited to 10.**

On Site: Minimum of 3 people

(travel and accommodation supplied for trainer)

To REGISTER please contact:

**Mining Radiation Safety Australia**

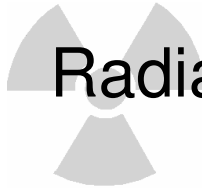
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Maddington WA 6109

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## **Radiation Safety Officer (RSO) - Oil and Gas.**

**When:**

**Where:**

**Cost:** \$1,900 + GST

Morning & afternoon tea and lunch will be provided.  
Course notes will be provided prior to the first day of the course.

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**Course structure:**

The course is in 6 modules that are broken into 20 sections.

**An introduction to radiation**

Basic Radiation Physics  
Properties of ionizing radiation  
Properties of Natural ionizing radiation

**Understanding radiation from a biological perspective**

Internal and External Hazards  
Biological effects of ionizing radiations

**Radiation Safety and Protection**

Radiation Safety Principles  
Safe Working Techniques  
Personal Hygiene  
Administrative Controls

**Radiation Detection, Measurement and Dose**

Radiation Detection & Measurement  
Radiation Monitoring Practical  
Radiation Monitoring Programs  
Radiation Dose Limits  
Radiation Dose Calculations

**Legal and Practical aspects of Radiation Management**

**Practices for a project**

Radiation Management Plans  
Reporting and Audits  
Radioactive Waste management  
Decontamination and Emergency Procedures  
Transport Considerations  
Legal Aspects

**Radiation in perspective, course review and assessment**

Radiation In perspective  
Review and Assessment  
- Quick overall course review  
- 2hr assessment

**Assumed Background**

The structure of the course is set with the expectation that the participants already have a reasonable understanding of activities carried out in oil and gas exploration and production

**Who is the course aimed at**

This course is for technical and management staff involved or soon to be involved in oil and gas generation and staff that may be in charge of safety on site.

*To REGISTER please contact:*

***Mining Radiation Safety Australia***  
*3/1862 Albany Highway*  
*Maddington WA 6109*  
*Phone: 08 9452 7939*  
*Fax: 08 9452 2524*  
*Email: [info@radsafe.com.au](mailto:info@radsafe.com.au)*

Please email or fax indicating names of the personnel who will attend.

**Note: Enrolments are strictly limited to 10.**

Early Payment or Purchase order is recommended to secure your place.

**RADIOLOGICAL COUNCIL**  
**RADIATION SAFETY ACT**  
**RADIATION SAFETY (QUALIFICATIONS) REGULATIONS 1980**  
**FIXED RADIATION GAUGES – INDUSTRIAL**  
**SYLLABUS**

The examination syllabus for Radiation Safety in FIXED RADIATION GAUGES – INDUSTRIAL as provided for in the Radiation Safety (Qualifications) Regulations 1980.

The examination comprises two sections:-

- Core Paper – closed book, one hour multiple choice examination covering general radiation safety.
- Main Paper – Open book, two hour written paper covering the safe use of fixed gauges.

### **CORE PAPER**

Legislation - Radiation Safety Act 1975  
                  - Radiation Safety (General) Regulations 1983  
Dose limits - radiation workers  
                  - non radiation workers  
Radiation types and properties  
Background radiation  
Quantities & units of measurement  
Biological effects  
Radiation risk  
Basic radiation safety calculations  
Inverse square law  
Pro rata dose calculations  
Personal radiation monitoring  
Principles of protection

### **WRITTEN PAPER**

#### **1. Properties and Uses of Radiation**

Properties of  $\alpha$ ,  $\beta$ ,  $\gamma$ , x and n radiation, energy of the radiations, absorption, scatter, transmission factors, half and tenth value layers, inverse square law.

##### *Radioactive Substances*

Half-life, decay constant, decay curves, specific activity, specific gamma ray constant.

## 2. Production, Detection and Measurement of Radiation

### *Radioactive Substances*

Atomic structure - electrons, protons and neutrons, atomic number, atomic weight, isotopes, radioactive isotopes, radioactive decay, production of radiation, units of radioactivity.

### *Detection and Measurement*

Ionisation, GM tubes, ionisation chambers, scintillation detectors and measuring instruments incorporating these three detectors, photographic films, film badges, TLD, various direct reading personal monitoring devices, integrating and dose rate measuring devices, energy dependence, time constant, techniques of use and limitations of the various types.

Units of Measurement of Ionising Radiation (SI Units).

## 3. Biological Effect of Radiation

Genetic, somatic, short and long term effects, dose-effect relationships, dose equivalent limits.

## 4. Circumstances that may give rise to radiation hazards and means of protecting persons from those hazards

### *Use of Time, Distance and Shielding in Protection.*

Scattered radiation, leakage radiation, radiation penetrating into occupied or public areas, warning signs, barriers, shields, site surveillance and security, general safe working procedures.

### *Radioactive Substances*

Sealed sources, loss of integrity of the encapsulation, wipe tests, shielded source housings and associated mechanisms, locking systems, source security, working procedures to ensure safe use of radioactive sources and to avoid radiation hazards, loss of or accidents to radioactive sources, contamination and decontamination, requirements for transport and storage of sources.

## 5. The Radiation Safety Act and Regulations

Those parts of the Act and Regulations applicable to the proposed usage of ionising radiations.

## 6. Standards, Rules, Codes or Specifications

- (1) Applicable to Radiation Gauges only -

*Code of practice for the safe use of radiation gauges (1982)* published by the National Health and Medical Research Council.

- (2) Generally applicable -

*Recommendations for limiting exposure to ionizing radiation (1995)* published by the National Health and Medical Research Council.

- (3) Applicable to Transport of Radioactive Substances only -

*Code of practice for the safe transport of radioactive material (2001)* published by the Australian Radiation Protection and Nuclear Safety Agency.

## 7. Legal Aspects

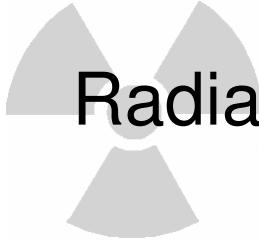
Radiation Safety Act and Regulations, Working Rules and Emergency Procedures required to be prepared and followed by licence holders, Registration and Licence Conditions.

## 8. Matters Relating Specifically to Use of Gauges in Industry

Basic principles of operation of density, level, moisture, thickness and other gauges using radioactive substances, hazards which may arise to persons installing and maintaining gauges and to other persons, protective measures to be adopted in practice.

## EXCLUSION

This syllabus does not relate to the actual manipulation of radioactive sources such as may be involved in loading of sources into source housings and the repair of defective housings containing sources.



# Radiation Professionals PTY LTD

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ABN: 60 126 395 739

## 1 Day Radiation Awareness

### When

### Where

**Cost** \$750 + GST per person

Morning & afternoon tea and lunch will be provided.  
Course notes will be provided prior to the course.

### Who the course aimed at

This course is an awareness course for technical and management staff involved or soon to be involved in uranium exploration or mineral sands exploration and mining (with radioactive waste product).  
This course is not intended as a training course for people who will be acting in a radiation safety role.

### Assumed Background

The structure of the course is set with the expectation that the participants already have a reasonable understanding of activities carried out on an exploration site.

### Course structure:

The course is in 6 modules:

- **An introduction to radiation**
- **Radiation as a biological hazard**
- **Detecting Radiation and Radiation Dose**
- **Radiation Safety and Protection**
- **Practical aspects of Radiation Management Practices for a project**
- **Radiation in perspective and review**

*To REGISTER please contact:*

### **Mining Radiation Safety Australia**

3/1862 Albany Highway

Maddington 6109

Phone: 08 9452 7939

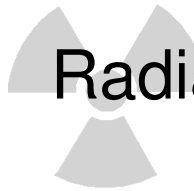
Fax: 08 9452 2524

Email: [info@radsafe.com.au](mailto:info@radsafe.com.au)

Please email or fax indicating names of the personnel who will attend.

**Note: Enrolments are strictly limited to 10.**

Early Payment or Purchase order is recommended to secure your place.



## **2 Day Unsealed Radioisotope Handling Course – Lab and Assay Personnel.**

### **When**

### **Where**

**Cost**            \$1,500 + GST per person

Morning tea, afternoon tea and lunch will be provided.  
Course notes will be provided prior to the first day of the course.

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### **Course structure:**

The course is in 6 modules that are broken into 20 sections. The nature of the hazards is outlined, how protection might best be afforded, appropriate working techniques to minimise the radiation dose and administrative arrangements and legal obligations.

#### **An introduction to radiation**

Basic Radiation Physics  
Properties of ionizing radiation  
Properties of Natural ionizing radiation

#### **Understanding radiation from a biological perspective**

Internal and External Hazards  
Biological effects of ionizing radiations

#### **Radiation Safety and Protection**

Radiation Safety Principles  
Safe Working Techniques  
Laboratory Safety  
Practical Laboratory Session

#### **Radiation Detection, Measurement and Dose**

Radiation Detection & Measurement  
Radiation Monitoring Practical  
Radiation Monitoring Programs  
Radiation Dose Limits  
Radiation Dose Calculations

#### **Legal and Practical aspects of Radiation Management Practices for a project**

Radiation Management Plans  
Reporting and Audits  
Radioactive Waste management  
Decontamination and Emergency Procedures  
Transport Considerations  
Legal Aspects

### **Radiation in perspective, course review and assessment**

Radiation In perspective  
Review and Assessment  
- Quick overall course review  
- Assessment

### **Who is the course aimed at**

This course is appropriate for personnel assaying samples with unsealed radioisotopes. The course has been approved by the Radiological Council and fulfils the necessary training requirements for personnel using unsealed radioisotopes under the Radiation Safety Act WA 1975.

### **Assessment**

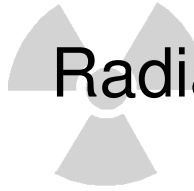
A test concludes the course. A pass mark of at least 65% is required.

### **Course Numbers**

In Perth: Minimum of 2 people  
**Note: Enrolments are strictly limited to 10.**

On Site: Minimum of 3 people  
(travel and accommodation supplied for trainer)

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## **2 Day Radiation Safety - Geologists and Site Managers.**

### **When**

### **Where**

**Cost**            \$1,500 + GST per person

Morning tea, afternoon tea and lunch will be provided.  
Course notes will be provided prior to the first day of the course.

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### **Course structure:**

The course is in 6 modules that are broken into 20 sections. The nature of the hazards is outlined, how protection might best be afforded, appropriate working techniques to minimise the radiation dose and administrative arrangements and legal obligations.

#### **An introduction to radiation**

Basic Radiation Physics  
Properties of ionizing radiation  
Properties of Natural ionizing radiation

#### **Understanding radiation from a biological perspective**

Internal and External Hazards  
Biological effects of ionizing radiations

#### **Radiation Safety and Protection**

Radiation Safety Principles  
Safe Working Techniques  
Personal Hygiene  
Administrative Controls

#### **Radiation Detection, Measurement and Dose**

Radiation Detection & Measurement  
Radiation Monitoring Practical  
Radiation Monitoring Programs  
Radiation Dose Limits  
Radiation Dose Calculations

#### **Legal and Practical aspects of Radiation Management Practices for a project**

Radiation Management Plans  
Reporting and Audits  
Radioactive Waste management  
Decontamination and Emergency Procedures  
Transport Considerations  
Legal Aspects

### **Radiation in perspective, course review and assessment**

Radiation In perspective  
Review and Assessment  
- Quick overall course review  
- 2 hr assessment

### **Who is the course aimed at**

This course is appropriate for technical and management staff that may be in charge of safety on site, such as Geologists, where geological surveys, drilling, mineral processing and sample analysis for uranium, and where Naturally Occurring Radioactive Materials (NORMs) may be significant.

### **Assumed Background**

The structure of the course is set with the expectation that the participants already have a reasonable understanding of activities carried out on an exploration site.

### **Assessment**

Open book exam with a pass mark at least 60%

### **Course Numbers**

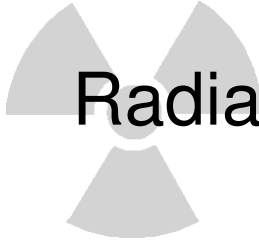
In Perth: Minimum of 2 people

**Note: Enrolments are strictly limited to 10.**

On Site: Minimum of 3 people

(travel and accommodation supplied for trainer)

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## Radiation Safety – Induction Course – Drillers and Field Personnel (2 hours)

### When

### Where

**Cost** \$200 + GST per person

Morning tea will be provided.  
Radiation Safety Manual will be provided at the course.

### Who the course aimed at

This course is an awareness course appropriate for drillers and field personnel involved or soon to be involved in uranium exploration or mineral sands exploration and mining (with radioactive waste product). The nature of the hazards and their control are outlined, in particular how protection can best be afforded using appropriate working techniques, equipment, radiation monitoring, administrative arrangements and legal obligations.  
This course is not intended as a training course for people who will be acting in a radiation safety role.

### Assumed Background

The structure of the course is set with the expectation that the participants already have a reasonable understanding of activities carried out on an exploration site.

### Course structure:

The course is in 6 modules:

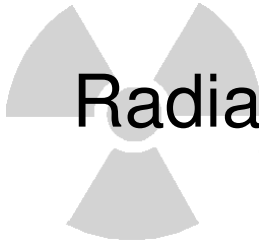
- **An introduction to radiation**
- **Radiation as a biological hazard**
- **Detecting Radiation and Radiation Dose**
- **Radiation Safety and Protection**
- **Responsibilities and Legal aspects**
- **Radiation in perspective and review**

### Course Numbers

In Perth: Minimum of 4 people (group discounts apply)  
**Note: Enrolments are strictly limited to 10.**

On Site: Minimum of 5 people  
(travel and accommodation supplied for trainer)

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## Radiation Safety Seminars

### When

### Where

**Cost** \$75 + GST per person

The Radiation Seminar is appropriate for staff directly involved in the uranium and mineral sands exploration and mining industry. The seminar is aimed at raising awareness of the risks associated with these industries and the legal and ethical obligations held by companies operating within these industries.

The seminar covers radiation safety in relation to the handling of sources of ionising radiation commonly found in exploration and mining. In particular the nature of the hazard is outlined, how protection might best be afforded from the hazard, appropriate working techniques used to minimise the risks and levels of exposure, administrative arrangements and legal obligations.

Seminar content includes

- Basic radiation physics – what is radiation
- Radiation biology – what is the effect
- Radiation safety – how to protect yourself
- Radiation protection
- Legal aspects – your obligations
- Discussion and questions

**Time** as organised – approximately 2 hours

### Seminar Numbers

In Perth: Minimum of 10 people

On Site: Minimum of 10 people  
(travel and accommodation supplied for presenter)

*To REGISTER please contact:*

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