RADIATION SAFETY

Metrics & Reports 2015

UNIVERSITY OF CALIFORNIA UC RIVERSIDE | Environmental Health & Safety

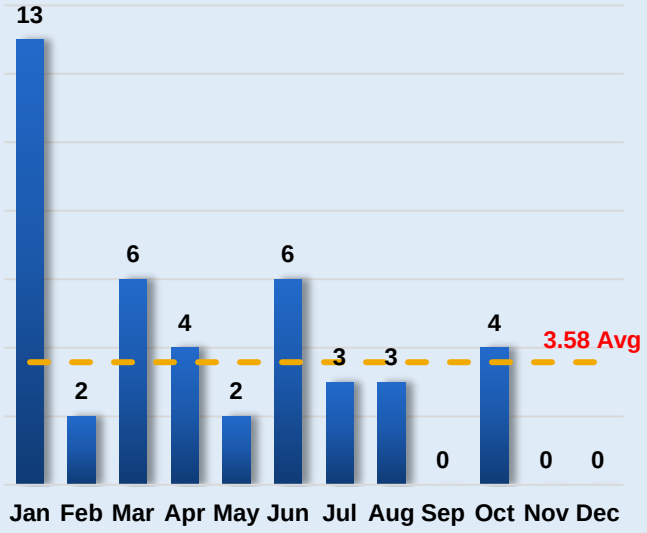
Background Radiation Safety requirements include:

- Radiation Safety Training
- Radiation Use Authorization (RUA) & Licensing
- Inventory Management
- Sealed Sources Leak Test
- Exposure Monitoring
- Quarterly Laboratory Inspections
- X-Ray Producing Machines
- Annual Equipment Calibrations

Radiation Safety Training

Before handling radioactive materials or radiation producing machines, all laboratory personnel must complete **Radiation Safety Initial Training**. After 3 years a **Radiation Safety Refresher Training** must be completed.

2015 Radiation Safety: Initial Training



A total of 43 laboratory personnel have completed the initial training course in 2015.

Incomplete Radiation Refresher Training

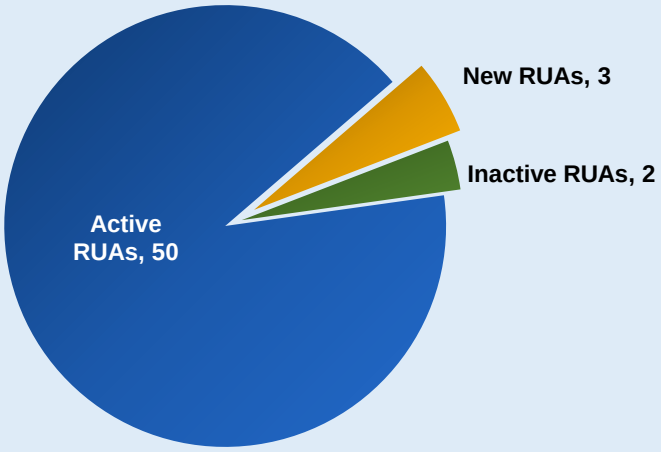
As of December 31, 2015, the following individuals were not current with their **Radiation Refresher Training** requirements, they are as of 12/1/2016.

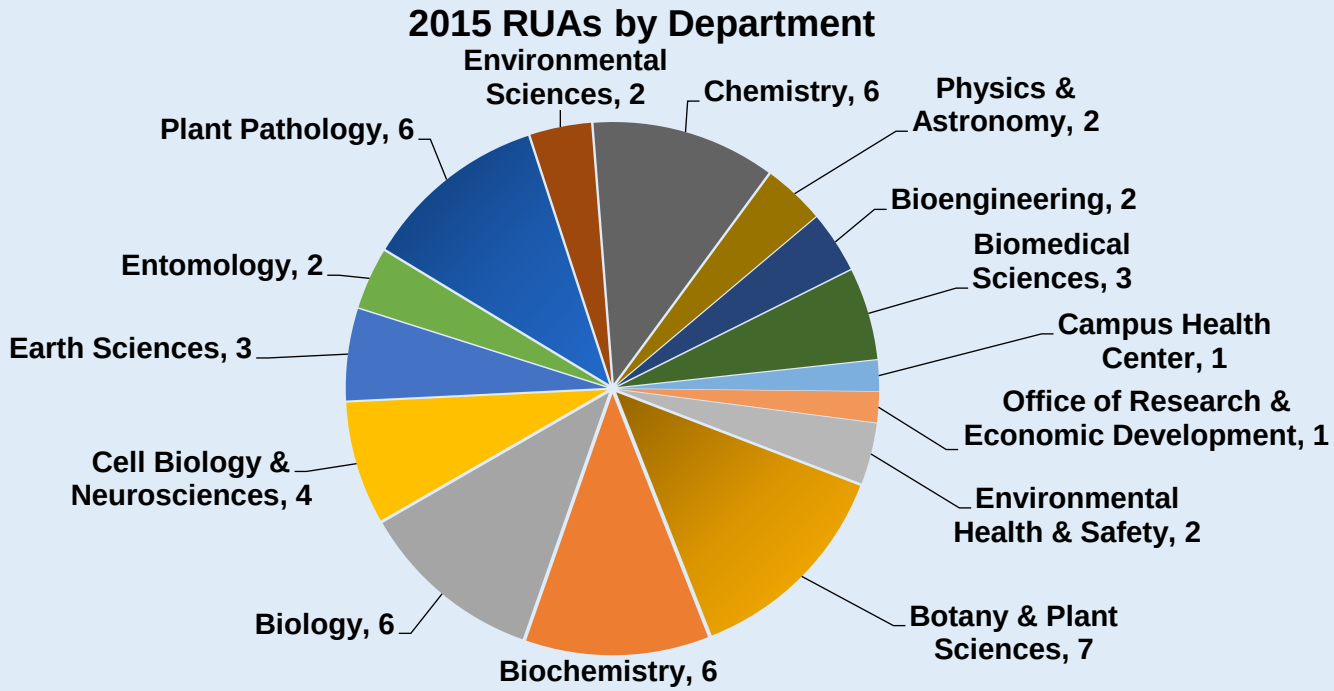
Individual	Department
Ming Wang	Plant Pathology
Jacob Andrew	Biology
Alejandro Cortez	Botany/Plant Sciences
Irene Lavagi	Botany/Plant Sciences
Tainran Jia	Botany/Plant Sciences
Graciel Diamante	Environmental Sciences
Jasmine Minor	Physics/Astronomy
Jinfeng Lu	Plant Pathology
Huan Wang	Plant Pathology

Radiation Use Authorization & Licensing

An RUA form must be submitted to the Radiation Safety Officer to become active user. For new RUAs, laboratory space is inspected for best practice procedures in handling radioactive material or radioactive producing machines.

2015 Radiation Use Authorization



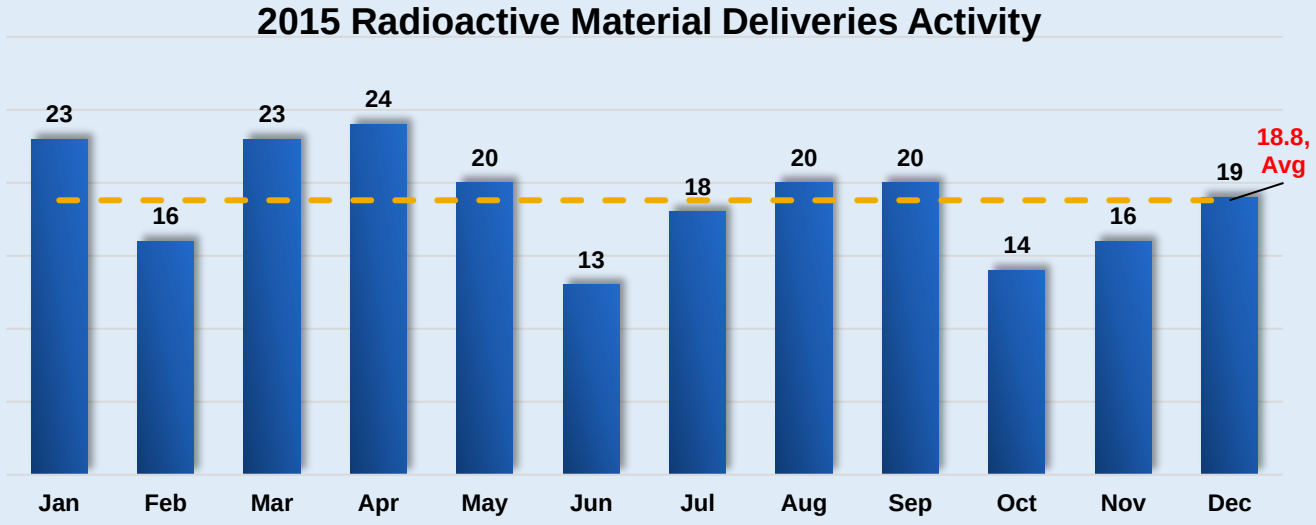


Broadscope Radioactive Materials Licensing:

On March 23, 2006, a license renewal application was submitted for renewal to the Radiological Health Branch (RHB). The RHB allowed EH&S to operate under the old license. No correspondence requesting renewal documents was received from the RHB in 2015.

Inventory Management

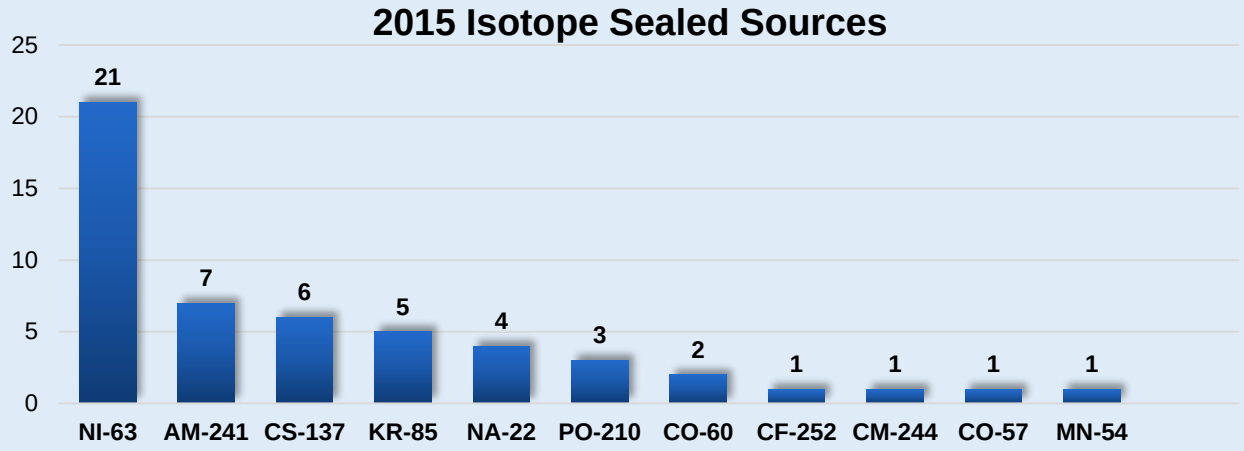
Deliveries of radioactive materials are recorded by EH&S upon receipt and must be delivered to the requested department users immediately.



On average,18.8 radioactive materials were delivered each month.

Sealed Sources Leak Test

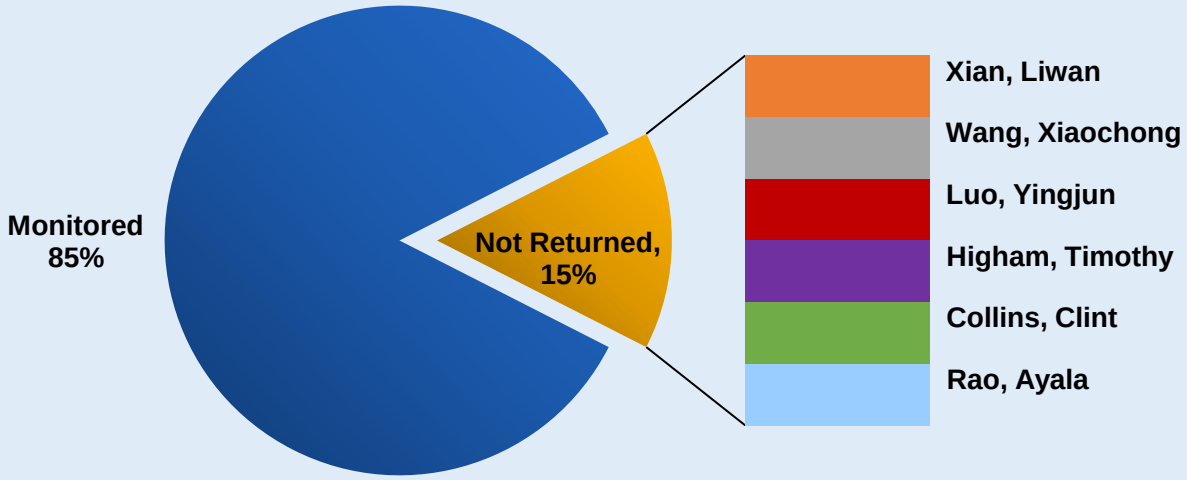
Sealed sources are radioactive material that is permanently sealed in a capsule or closely bonded in a solid form. Biennial leak tests are conducted for beta/gamma emitters over 100 µCi and alpha emitters over 10 µCi. A sealed source fails a leak test if the contamination on the filter paper used exceeds 0.005 µCi.



Out of 158 sealed sources a total of 52 were leak tested biannually in June and December.

Exposure Monitoring

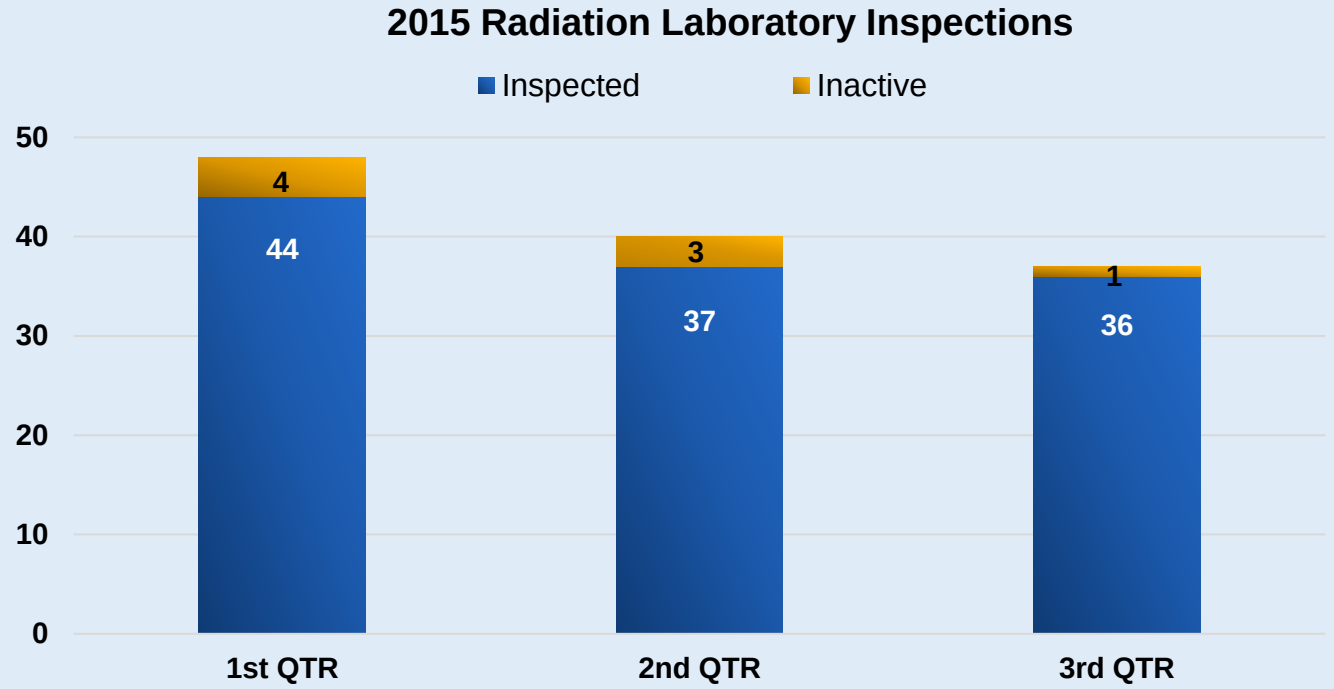
Laboratory personnel must be monitored for radiation exposure using dosimeter badges. Badges are requested online via the EH&S Dosimeter/Badge Request Form. Dosimeter badges are processed monthly, or quarterly depending on the type of radioactive materials being used. *In 2015, there were 124 monthly dosimetry badges monitored out of a total of 126, averaging 10.3 badges a month. 98% of the monthly dosimeter badges were returned for monitoring.*



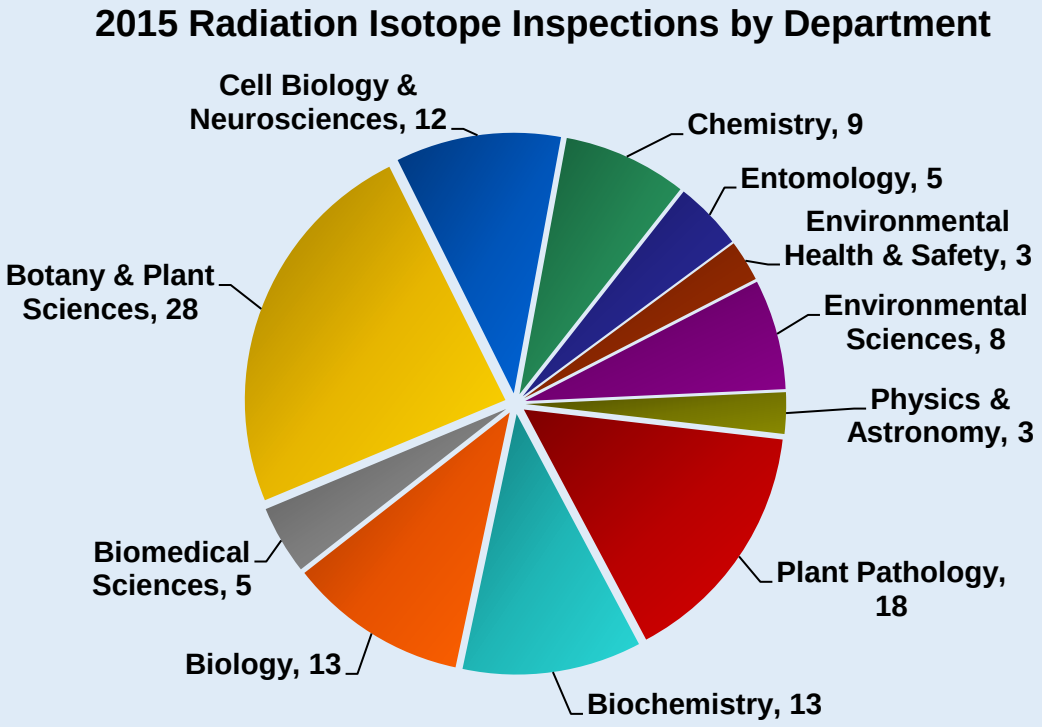
In 2015, 68 quarterly dosimetry badges were monitored out of a total of 80. 85% of the quarterly dosimetry badges were returned for monitoring. 6 primary investigators did not turn in their badges for 2 quarters.

Quarterly Laboratory Inspections

In 2015, Laboratories with radioactive materials are inspected three times a year.



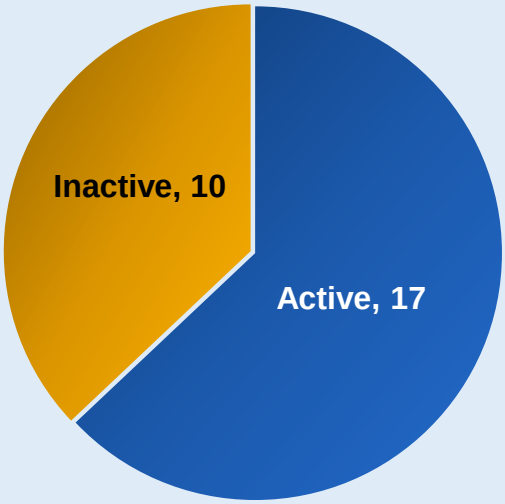
In 2015, there were a total of 117 laboratory inspections and 8 laboratories that went inactive.



X-Ray Producing Machines

Radiation Producing Machines (RPMs) must be inspected annually.

2015 Active X-Ray Producting Machines



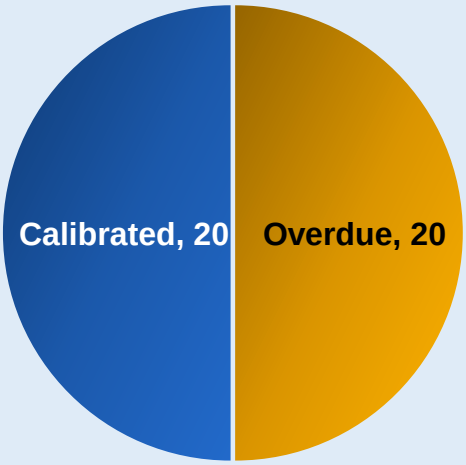
Department	Active	Inactive
Campus Health Center	5	
Advance Microscopy	4	
Chemistry	2	2
Biochemistry	1	
Biology	1	
Biomedical Sciences	1	
Botany & Plant Sciences	1	
Chemical & Environmental Engineering	1	
Earth Sciences	1	4
Electrical Engineering		1
Geology		1
Physics & Astronomy		2

In 2015, a total of 100% of RPMs were inspected and only 63% of these machines are active. RPM licensing cost ~$200 per year regardless if they are in use.

Annual Survey Meter Equipment Calibration

All Survey Meters are required to be calibrated annually.

2015 Calibrated Instruments



Department	# of Overdue Instruments
Biochemistry	6
Plant Pathology & Microbiology	4
Biology	2
Botany & Plant Sciences	2
Chemistry	2
Bioengineering	1
Cell Biology & Neurosciences	1
Entomology	1
Environmental Sciences	1

In 2015, a total of 20 instruments have been identified as active and were calibrated annually. 20 instruments were overdue for calibration. 50% of these instruments were overdue for calibration. The new UC Radiation System will automatically remind users to calibrate their system annually.