Radiation Protection Program 2019 Annual Audit
Texas Tech University
January 27, 2020

TAC 289 Reference	Description	Comment(s)	Responsible for Action	Where Documented	Current Status	Target Date
201(g)	Do we have a current listing of all sealed sources	Yes	RSO	RSO office	1	
201(g)(1)(A)	Has each sealed source, except as specified in 201(g)(2), tested for leakage or contamination and the test results received before the sealed source is put into use unless the licensee has a certificate from the transferor indicating that the sealed source was tested within six months before transfer to the licensee.	Yes	RSO	RSO office	1	
201(g)(1)(B)	Have the sealed sources that are not designed to emit alpha particles been tested for leakage or contamination at intervals not to exceed six months?	Yes, the leak testing dates for all active sealed sources are included on the institutional radiation inspection schedule.	RSO	RSO office	1	
201(g)(2)	Have we had any leaking source? If so was 201(g) and 202(bbb) followed?	No leaking sources	RSO	RSO's office	1	
202(f)(1)	Has TTU develop, document, and implemented a radiation protection program sufficient to ensure compliance with the provisions of TAC 289.202?	Yes, The radiation protection program is written into the Radiation Safety Manual	RSO	Radiation Safety Manual	1	
202(e)(2)	Has TTU used procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and public doses that are as low as is reasonably achievable (ALARA)?	Yes	RSO and Sublicensee	Radiation Safety Manual	1	
202(e)(3)	Has TTU revised the radiation protection program content and implementation at intervals not to exceed 12 months?	Yes, the Radiation Safety Program Audit is presented to the Radiation and Laser Safety Committee each February.	RSO and RLSC	RSO office and minutes of Rad Safety Committee meetings	1	
202(f)	Has any radiation worker received the following dose limits? Deep Dose 5 rem Eye 15 rem Skin 50 rem Extremity 50 rem Organ 50 rem	No	RSO	Landauer's monthly and quarterly reports	1	

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202(j)(1)	For all radiation workers, does TTU have a record of radiation dose received during the current year?	Yes	RSO	Landauer's monthly and quarterly reports	1	
202(j)(2)	For all Radiation workers, does TTU have records of lifetime cumulative occupational radiation dose?	Yes, have to retrieve the information from the hard copy records.	RSO	Landauer's monthly and quarterly reports	1	
202(j)(3)	Does TTU have a record of the occupational dose that the individual received during the current year, a written signed statement by the individual, or from the individual's most recent employer for work involving radiation exposure, that discloses the nature and the amount of any occupational dose that the individual received during the current year?	Yes	RSO	Dosimetry files in RSO office	1	
202(j)(4)	Does TTU have an up-to-date TAC Form 289.202(ggg)(9) or equivalent?.	Yes, we maintain exposure histories for rad workers for the calendar year.	RSO	Dosimetry Files In RSO Office	1	
202(j)(4)	Does TTU have a record of all exposure histories, as required by 202(j)(1), on TAC Form 289.202(ggg)(9) or equivalent of all the information required on that form?	All individual dosimetry files contain either previous exposure histories, or documented proof that we attempted to obtain a history(copy of our request letter and signed form by the individual to obtain the history)	RSO	Landauer's monthly and quarterly reports	1	
202(j)(4)	Does the form or record show each period in which the individual received occupational exposure to radiation or radioactive material?	Our present procedure concerning the rare instance of a radiation worker receiving 10% or greater of their annual occupational exposure limit(5 Rem) during a monitoring period is to perform an exposure investigation and present them with our equivalent version of TAC Form 289.202(ggg)(9) .	RSO	Past Landauer's monthly and quarterly reports	1	
202(k)	Did TTU have any Planned Special Exposures? If so was 202(k) followed?	No	RSO		1	
202(m)	Does TTU have any minors as radiation workers? If so, was the occupation dose limits for minors followed?	TTU currently has no minors as radiation works. If a minor would be occupationally exposed to radiation; the 500 mRem/yr limit would be followed.	RSO	Landauer's monthly reports	1	

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202(m)	Has TTU had any declared pregnant workers? If so, was the dose to an Embryo/Fetus followed?	We have a procedure of documenting declared pregnancies of radiation workers, counseling them using NRC Regulatory Guide 8.13, issuing a fetal monitoring badge immediately, closely examining the monthly fetal exposure reports, and issuing the expecting mother a copy of both hers and the fetus's exposure reports during the gestation period.	RSO	Declared pregnancies files in RSO office and dosimetry Files in RSO Office	1	
202(p)(2)(B)	Are all instruments and equipment used for quantitative radiation measurements operable and calibrated at intervals not to exceed 12 months?	Yes, all Radiation Safety and Sublicensees' instruments that are currently being used for quantitative radiation measurements are annually scheduled for calibration.	RSO	In-House calibration log and calibration file in RSO office	1	
202(p)(2)(C)	Have all instruments and equipment used for quantitative radiation measurements that have been repaired been calibrated?	Yes	RSO	Calibration file kept in RSO office.	1	
202(p)(3)	Does TTU dosimetry processor hold current personnel dosimetry accreditation for the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology; and approved in this accreditation process for the type of radiation or radiation's included in the NVLAP program that most closely approximates the type of radiation or radiation's for which the individual wearing the dosimeter is monitored?	Yes, Landauer's contract	RSO	Landauer's Contract	1	
202(p)(5)	Has any Personnel dosimetry been issued for use periods greater than three months?	No.	RSO		1	
202(q)(1)(A)	Do all workers that are likely to receive, in one year from sources external to the body a dose in excess of 10% of the limits in 202(f)(1) have a badge?	Yes, all Radioactive materials and x-ray workers that have the possibility of receiving 10 % of their annual dose limit are monitored.	RSO	Landauer's monthly and quarterly reports	1	
202(q)(1)(B)	Do all minors and declared pregnant workers likely to receive, in one year from sources external to the body, a does in excess of 10% of any of the applicable limits in 202(l) and 202(m) have a badge?	Yes, all minors and declared pregnant workers have in the past, and will receive in the future-a monthly badge.	RSO	Landauer's monthly reports	1	

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202(y)	Does TTU have security from unauthorized removal or access licensed or registered sources of radiation that are stored in unrestricted areas.	All of our sources are kept in restricted areas, locked.	Radiation Safety Office and Sublicensee		1	
202(y)(1)	Does TTU have control or constant surveillance of licensed radioactive material that is in an unrestricted area?	All of our radioactive material is kept in restricted areas	RSO	Inspection reports	1	
202(aa)	Does each radiation area have a conspicuous sign or signs bearing the radiation symbol and the words, Caution, Radiation Area?	Yes, this is confirmed during the quarterly radiation laboratory inspections.	RSO	Inspection reports	1	
202(cc)(1)	Does TTU ensure that each container of license material bears a durable, clearly visible label bearing the radiation symbol and the words "CAUTION RADIOACTIVE MATERIAL" or "DANGER RADIOACTIVE MATERIAL." The label shall also provide information, such as the radionuclides present, an estimate of the quantity of radioactivity, the date for which the activity is estimated, radiation levels, kinds of materials, and mass enrichment, to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures?	Yes, all containers of radioactive material are checked for proper labeling during receipt of the material, and verified during the sublicense's quarterly inspections.	RSO		1	
202(cc)(2)	Does TTU prior to removal or disposal of empty uncontaminated containers to unrestricted areas, remove or deface the radioactive material label or otherwise clearly indicate that the container no longer contains radioactive materials	Yes. It is stated in the Radiation Manual that the Sublicensee must deface all radioactive material labels before disposal	RSO		1	
202(ee)(2)	Have all radioactive packages been monitored externally for contamination?	Yes	RSO	Receipt records	1	
202(ee)(3)	Have all packages been monitored as soon as practicable after receipt of the package, but not later than two hours after the package had been received?	Yes	RSO	Receipt records	1	

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202(ee)(4)(A)	Has TTU received any contaminated shipments of radioactive material (3,000 dpm/100 c^{m2})? If so were the guidelines in TAC 289.202(g) followed?	No contaminated shipments this year	RSO	Receipt records	1	
202(ee)(5)(A) and 202(ee)(5)(B)	Has TTU established, maintained, and retained written procedures for safely opening packages in which radioactive material is received, and ensured that the procedures are followed and that due consideration in given to special instructions for the type of package being opened?	A SOP titled Radioactive Shipment Contamination Checks that details the receiving procedures for radiological shipments and suffices for compliance with TAC 289.202(ee)(5)(A).	RSO	Radiation Safety's SOP binder.	1	
202(ll)	Does TTU transfer waste for disposal, discharged, or decay licensed material only: (1) By transfer to an authorized recipients as provided in 202(qq), or to the US Department of Energy; or (2) by decay in storage; or (3) by release in effluents within the limits in 202(n); or (4) as authorized pursuant to 202(gg) or 202(hh)?	Yes, according to TAC 289.202, specific to types of materials used	RSO	Disposal Logs	1	
202(f)(2)	Does the organization that receives our waste containing licensed material for (1) treatment prior to disposal; or (2) treatment by incineration; or (3) decay in storage; or (4) disposal at an authorized land disposal facility; or (5) storage until transferred to a storage or disposal facility authorized to receive the waste specifically licensed?	Yes, requires applicable permit and liability insurance and return of manifest dispositions	RSO	Disposal Logs	1	
202(gg)(1)(A)	Is TTU's licensed liquid waste readily soluble, or readily dispersible biological material, in water?	Yes, only readily soluble and dispersible biological material is used.	RSO	Disposal Logs	1	
202(gg)(1)(B)	Does TTU's quantity of licensed radioactive material that TTU releases into the sewer in one month divided by the average monthly volume of water released into the sewer by TTU exceed the concentration listed in Table III of TAC 289.202(ggg)(2)?	No, daily limits are calculated and not exceeded	RSO.	Disposal Logs	1	

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202(gg)(1)(C)(i)	When TTU releases more than one radionuclide does TTU determine the fraction of the limit in Table III of TAC 289-202(ggg)(2) represented by discharges into sanitary sewage by dividing the actual monthly average concentration of each radionuclide released by the licensee into the sewer by the concentration of that radionuclide listed in Table III of TAC 289-202(ggg)(2) ; and the sum of the fractions for each radionuclide required by 202(gg)(1)(C)(i) does not exceed unity; and the total quantity of licensed radioactive material that the licensee releases into the sanitary sewage in a year does not exceed 5 curies of hydrogen-3, 1 curie of carbon-14 and 1 curie of all other radioactive materials combined?	Yes, using the ratio formula in TAC 289.202(ggg)(2) which is not greater than 1 curie for all radio nuclides	RSO.	Disposal Logs	1	
202(mm)(2)	Has TTU retained the records of the radiation protection program including the provision of the program until the Agency terminates each pertinent license or registration requiring the record, and retain the audits and other reviews of program content and implementation for three years after the record is made	Yes	RSO and RLSC	RLSC Minutes/ Landauer reports/ Yearly report	1	
202(nn)(1)	Has TTU maintained records showing the results of surveys and calibrations required by 202(p) (survey meters) and 202(ee)(2) (packages) for three years after the record was made?	Yes, we do have three years worth of records for the survey meters and package surveys.	RSO.	Calibration book kept in RSO office. Receipt forms kept with RSO	1	
202(oo)	Does TTU have five years after the record was made of test for leakage or contamination of sealed sources required by TAC 289.201(g)?	Yes	RSO	Sealed Source records in RSO's office	1	
202(rr)(1)	Has TTU maintained records of doses received by all individuals for whom monitoring was required pursuant to TAC 289.202(q), and records of doses received during planned special exposures, accidents, and emergency conditions?	Yes	RSO	Landauer's monthly and quarterly reports	1	

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202(rr)(2) and 202(rr)(3)	Has TTU maintained the records specified in 202(rr) on TAC Form 298.202(ggg)(9), in accordance with the instructions for TAC Form 298.202(ggg)(9), or in clear and legible records containing all the information required by TAC Form 298.202(ggg)(9), at intervals not to exceed one year?	Yes, all annual exposure histories are printed on a TAC Form 298.202(ggg)(9) equivalent form and filed in the individual's dosimetry file.	RSO	Dosimetry files in RSO's office.	1	
202(rr)(4)	Has TTU maintained the records of dose to an embryo/fetus with the records of dose to the declared pregnant woman, and the declaration of pregnancy, including the estimated date of conception?	Yes	RSO.	Landauer's monthly reports & the individuals declared form	1	
202(tt)(1)	Has TTU maintained records of the disposal of license material made pursuant to 202(mm)(2) and 202(nn)? Have these records been retained until the Agency terminates license requiring the record?	Yes	RSO.	Disposal Records or archive files	1	
202(ww)	Has TTU had any stolen, lost or missing licensed or registered sources of radiation? If so was TAC 289.202(ww) followed?	TTU has not had any stolen, lost, or missing licensed or registered sources of radiation during the year.	RSO	RSO office	1	
202(xx)	Has TTU had any incidents that an individual may receive (I) a total effective does equivalent of 25 rems or more; (ii) an eye dose equivalent of 75 rems or more; (iii) a shallow dose equivalent to the shin or extremities or a total organ dose equivalent of 250 rads or more or the release or radioactive material inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake 5 times the occupational ALI? If so was TAC 289.202(xx) and TAC 289.203(d)(4) followed?	No incidents this calendar year.	RSO and Sublicensee		1	
202(yy)	Did TTU have any exposures, radiation levels, or concentrations of radioactive material exceeding the limits? If so was TAC 289.202(yy) and 202(aaa)(2) followed?	No exposures, radiation levels or concentrations of Radioactive material exceeding the limits	RSO		1	

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203(b)(1)	Does TTU post current copies of the following documents? (1) the rules in this TAC 289.203 and TAC 289.202; (2) the license, certificate of registration, conditions or documents incorporated into the license or certificate of registration by reference, and amendments thereto; (3) the operating procedures applicable to work under the license or registration; and (4) any notice of violation involving radiological working conditions, or order issued pursuant to TAC 289.201, and any response from the licensee or registrant. If 289.203(b)(1) is not practicable, does TTU have posted a notice which describes the document and states where it may be examined?	Yes, all radiation workers are informed where this information is maintained via the Notice To Employees postings in the rad labs.	RSO	Notice To Employees postings in all rad use areas. Information and files maintained in RSO office	1	

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203(c)	Does TTU inform all individuals working in or frequenting any area where sources of radiation are used or stored (1) of the storage, transfer, or use of radioactive material or of radiation in these areas; (2) instructed in the health protection problems associated with exposure to such radioactive material or radiation, in precautions or procedures to minimize exposure, and in the purposes and functions of protective devices employed; (3) instructed in and instructed to observe, to the extent within the worker's control, the applicable provisions of Agency rules, licenses, and certificates of registration, for the protection of personnel from exposures to radiation or radioactive material occurring in such areas; (4) instructed of their responsibility to report promptly to the licensee or registrant any condition which may lead to or cause a violation of Agency rules, licenses, or certificates of registration, or unnecessary exposure to radiation or radioactive material; (5) instructed in the appropriate responses to warning made in the event of any unusual occurrence or malfunction that may involve exposure to radiation or radioactive material; and (6) advised as the radiation exposure reports which workers may requires pursuant to TAC 289.203(d) and potential radiological health protection problems associated with the source(s) of radiation?	Yes in the Radiation Safety Short Course	RSO	Training Outline	1	

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203(d)(1)	Do all radiation exposure data for an individual and the results of any measurements, analyses, and calculation of radioactive material deposited or retained in the body of an individual reported to the individual as specified in 203(d)? Does the information reported include data and results obtained pursuant to Agency rules, orders, or license and certificate of registration conditions, as shown in records maintained by TTU pursuant to Agency rules? Is each notification and report in writing, include appropriate identifying data such as the name of the licensee or registrant, the name of the individual, and the individual's social security number, individuals exposure information, and contain the statement "This report is furnished to you under the provision of the TAC 289.203. You should preserve this report for further reference."?	Yes	RSO	Dosimetry files, On-Site database, and Landauer exposure reports	1	
203(d)(2)	At the written request of any worker, does TTU advise such worker annually of the worker's exposure to radiation or radioactive material as shown in records maintained by TTU pursuant to TAC 289.202(rr)?	Yes	RSO.	Dosimetry file	1	
203(d)(3)	Upon termination of employment or association does TTU furnish to each worker exposure exceeded one-tenth of any limit specified in TAC 289.202(f)(1), a report of the individual's exposure to radiation or radioactive material within 30 days after the exposure of the individuals has been determined by TTU and covers each calendar quarter in which the individual's activities involved exposure to radiation?	Yes, exposure histories are sent to every terminated employee upon request on our equivalent version of the TAC Form 298-202(ggg)(9), and we retain a copy of it in their permanent dosimetry file.	RSO.	Dosimetry files	1	
203(d)(3)	At the request of any worker, does TTU furnish such worker a report of the individual's exposure, regardless of the amount of exposure?	Yes	RSO	Dosimetry files	1	

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252(f)(6)(A)(i)	Does TTU's Radiation Safety's staff have substantial experience in the use of a variety of radioisotopes for a variety of research and development uses?	Yes				
252(f)(6)(A)(ii)	Does TTU have a radiation safety committee composed of such persons as an RSO, a representative of senior management, and one or more persons trained or experienced in the safe use of radioactive materials that will review and approve proposals for such uses in advance of purchase of radioisotopes?	RLSC membership consists of the RSO, researchers trained in radioactive material and/or radiation producing equipment use, laser users, non-rad users, a legal expert, a representative from the Director of Safety Services, and the Associate Vice-President for Research as the senior management representative.	RLSC chairperson and TTU President's Office	Appointing Orders and RLSC Minutes	1	
252(f)(6)(A)(iii)	Has TTU appointed an RSO in accordance with TAC 289.252(g)?	Yes		Appointment letter from the President	1	
252(f)(5)	Does TTU have the names and qualification of the committee and designated RSO?	Yes - Radiation License	RSO and RLSC	Radiation License	1	
252(g)(2)	Does the RSO meet the minimum standard qualification listed in TAC 289.252(g)(2)?	Yes	RSO	Resume' and BRC file in Austin	1	
252(g)(3)	Has TTU outlined the specific duties of the RSO to match that of TAC 289.252(g)(3)?	The specific duties and responsibilities of the RSO are delineated in the Radiation Safety Manual.	RSO	TTU's Radiation Safety Manual	1	
252(w)	Does the Radiation Safety Short Course include subjects listed in appendix TAC 289.252(w)?	Yes	RSO/ and RLSC	Training Outline	1	

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Description	Comment(s)	Responsible for Action	Where Documented	Current Status	Target Date
Does the RLSC membership meet requirements for representation?	Yes	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	
Are the credentials of RLSC members on file?	Yes	RSO	RSO office	1	
Meeting minutes are maintained and contain a copy of the agenda, attendance, issues covered and conclusions, RSO's activity report, list of items for further action, summary of decisions and/or actions taken/planned, and applicable attachments and enclosures	Yes, these items are contained in the meeting minutes as required.	RSO	RLSC Meeting Minutes folder in the RSO's office.	1	
Evidence is available to indicate that the RLSC has reviewed/approved license amendments/renewal requests and other responses required by the BRC	Yes	RSO	RLSC Meeting Minutes folder	1	
RLSC has reviewed operation of the Radiation Protection Program at least annually	Yes	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	
Evidence indicates that the RLSC has granted and/or withdrawn Principle Investigator (PI) status	Yes	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	
Applications for RAM/RPE use clearly state the conditions, limitations, and manner of use.	Yes, Applications not containing this information are rejected.	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	
Applications for RAM/RPE clearly state training and experience of applicant	Yes, Applications not containing this information are rejected.	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	
RLSC has established possession limits as part of application review	Yes, requested possession limits are reviewed in connection with the research protocol involved	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	
RLSC has reviewed the radiation safety training program for adequacy.	Yes, the radiation safety short course content was reviewed during the calendar year	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	
Changes to RLSC membership reported to BRC as applicable	Yes, all changes to the committee have been reported to and approval granted by the BRC	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	
Are there written enforcement policy's in regard to violations by Pi's?	Yes, in the RLSC section of the Radiation Safety Manual	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	
Are there written guidelines if corrective action is required by the RLSC?	Yes, in the RLSC section of the Radiation Safety Manual	RSO, RLSC Chairperson	RLSC Meeting Minutes folder	1	

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Does the Radiation Safety Office teach the Radiation Safety Short Course at appropriate time intervals?	Yes, the short course is offered every month	RSO	Notebook in RSO office and database.	1	
Is an attendance record maintained for the Radiation Safety Short Course?	Yes, This information is maintained in a departmental database and in hard copy	RSO	Database and notebook in RSO office	1	
Does the Radiation Safety Office maintain current RAM inventories of Pi's?	Yes, This information in maintained on the database and in hard copy.	RSO	Health Physics Assistant database.	1	
Are dosimetry (Film badges, TLD's) returned to the Radiation Safety Office in a timely manner?	The dosimetry system is operating well.	RSO	Dosimetry records in RSO office	1	
Does the Radiation Safety Office have both base line and routine bioassays on radiation workers that work with both Iodine-125, Iodine-131 and Hydrogen-3?	Base line and routine bioassays are now being performed on isotope users that meet the activity action level for the specific isotopes listed in the Radiation Safety Manual	RSO	Dosimetry files and Bioassay folder in the RSO's office	1	
Does the Radiation Safety Office have written procedures on how to perform bioassays?	Yes	RSO	Radiation Safety Office SOP binder and Bioassay folder in the RSO's office	1	
Are inspections being performed in a timely manner?	Yes	RSO	Inspection files	1	
Does the Radiation Safety Office have a listing of all Pi's and laboratories?	Yes, This information is kept on the database and hard copy information is maintained in the annual reports binders.	RSO	Reports binders in RSO office	1	
Does the Radiation Safety Office have a listing of current rad workers?	Yes	RSO	Sublicensee hard copy files in RSO office.	1	
Does the Radiation Safety Office have a listing of badge numbers for past and present workers	Yes, the listings are maintained on the departmental databases and in hardcopy in our dosimetry record books.	RSO	Departmental databases and in hardcopy in our dosimetry record books	1	

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