MARK COLEMAN
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

FRANK KEATING
Governor

March 23, 2000

Paul Lohaus, Director
Office of State Programs
US Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Dear Mr. Lohaus:

We appreciate the effort that the Review Team has put into reviewing our Final Application for Agreement Status. We also appreciate the speed with which the review was accomplished. As we have discussed, and as the Governor stated in his letter accompanying the Final Application, completing the Agreement State delegation process by September 30, 2000 is very important to the State.

We submit the following comments in response to your letter of March 10, 2000:

1. ***"Please clarify how the 3.45 FTE level of effort was determined."***

Page 2 and 3 of Section 6.1 of the application described our estimate of how staff time will be initially allocated on a member-by-member basis. The following paragraphs summarize the agreement state time information from these pages. Note that the less experienced staff members will be spending significant time as trainees on agreement state license categories they are not yet qualified to inspect or license. We allocated a significant amount of time for this activity. However, we did not include this time allocation in the 3.45 FTEs allocated for the program.

In the case of Pam Bishop, the numbers from page 2 are 5% of her time for agreement rulemaking, 20 percent of her time for agreement inspections, and 45 percent of her time for agreement licensing, giving a total of .05 + .20 + .45 FTE. Pam Bishop contributes a total of .7 FTE to the agreement state program.

Earlon Shirley's time allocations are also listed on page 2. Mr Shirley will contribute .2 FTE for inspections, and .5 FTE for licensing. This makes a total of .7 FTE in the agreement state program from Mr. Shirley.

Steven Fernandez will contribute .5 FTE to inspections and .15 FTE to licensing in the agreement state program. His contribution totals .65 FTE.

Steve Hoggard contributes .45 FTE as an agreement state inspector and .15 FTE as an agreement state licensor (his trainee time was not included in this number).

Ms. Heath contributes .15 FTE as an agreement state inspector.

Mr. Matthews contributes .15 FTE as an agreement state inspector.

Mr. Broderick contributes .5 FTE, mostly in inspector accompaniments, rules development, and management review of licenses prior to approval.

Total commitment to the agreement state program (in FTEs) described in our application was as follows:

.5	Broderick
.7	Bishop
.7	Shirley
.65	Fernandez
.6	Hoggard
.15	Heath
.15	Matthews

3.45 FTE TOTAL

Please take particular note that Matthews and Heath each contributed only .15 FTE to the agreement state program as described in our final application. Thus the two of them together contributed .3 FTE of the 3.45 FTE allocated to the program (less than 10% of total staff time).

Notice that Hoggard, Heath, Matthews, and Flynn also contributed time specifically allocated for training in the agreement state program by acting as assistants for more experienced personnel in inspection and licensing. These time commitments (in FTEs) for training were described in our application as follows:

.1	Hoggard
.25	Heath
.25	Matthews
.25	Flynn

.85 FTE TOTAL

Over time these staff will become qualified in more and more inspection and licensing areas, and the need for them to spend time in training will decrease. This means that in the long run, this .85 FTE will be available for other areas in DEQ's radiation management program. It is likely that most of it will be available for the agreement state program.

You have correctly pointed out that one math error was made in our calculations. Near the top of page 2 of your letter you identify (summarizing) ***"a discrepancy between the 105 days allocated for medical/therapeutic inspections and the 90.5 days assigned to complete the activity"***

Page 4 of Section 6.1 of our application states in paragraph 2 that 100.5 days (90.5 days for Hoggard + 10 days for Bishop/Fernandez/Shirley) are allocated for nuclear medicine inspections, while page 3 states that there are 21 such inspections which would require 105 days. Apparently a manual transcription error resulted in 100.5 days being recorded as 105 days. Thus, our analysis was 4.5 person-days/year off. Since our inspection time provided a 33 person-day "cushion" for each year (see the first paragraph of page 4), and our overall time allocations reserved an additional 10% of the program for unforeseen contingencies, we do not feel this invalidates our analysis. However, it is incorrect, and we will make appropriate corrections in the matrix you requested.

Note that events have forced us to change some of the time allocations described in the initial application. The NRC has cancelled the June Inspection Procedures Course which we planned to have Matthews and Heath attend. Ms. Heath will be undergoing ankle surgery and physical therapy which will probably make her unavailable in late CY 2000. Also, Mr. Hoggard will not be able to attend the Licensing Procedures Course until September, which is after the time we hopefully will have become an Agreement State, and would leave little or no time for him to gain licensing experience through assisting NRC or Agreement State licensing staff. Accordingly, we are modifying our proposed time allocations to allow for these developments. The new allocations retain a staffing level of 3.45 FTEs for the Agreement State program. The new allocations are as follows:

Broderick		
AEA Inspection accompaniments	5%	11.25 days/yr
AEA Rules Development	5%	11.25 days/yr
AEA Management Review of licensing	30%	67.5 days/yr
AEA Enforcement Activities	10%	22.5 days/yr
Non-Agreement State Activities	40%	
Reserved for contingencies	10%	
Bishop		
AEA Rules Development	5%	ll.25 days/yr
Agreement State Inspections	30%	67.5 days/yr
Agreement State Licensing	50%	112.5 days/yr
Industrial Radiography Certification	5%	
Reserved for contingencies	10%	
Shirley		
Agreement State Inspections	25%	56.25 days/yr
Agreement State Licensing	55%	123.75 days/yr
Training Coordination	10%	
Reserved for contingencies	10%	
Fernandez		
Agreement State Inspections	50%	112.5 days/yr
Agreement State Licensing	20%	45 days/yr
Industrial radiography certification	10%	
Non-Agreement State Activities	10%	
Reserved for contingencies	10%	
Hoggard		
Agreement State Inspections	65%(5% as trainee)	135 days/yr
Agreement State Licensing	5% (all as trainee)	
Non-Agreement State Activities	20%	
Reserved for contingencies	10%	
Heath		
Agreement State Inspections	15%(all as trainee)	
Agreement State Licensing	10%(all as trainee)	
Non-Agreement State Activities	65%	
Reserved for contingencies	10%	
Matthews		
Agreement State Inspections	15%(all as trainee)	
Agreement State Licensing	10%(all as trainee)	
Industrial Radiography Certification	25%	
Non-Agreement State Activities	40%	
Reserved for contingencies	10%	
Flynn (or new hire)		
Agreement State Inspections	25%(all as trainee)	
Non-Agreement State Activities	65%	
Reserved for contingencies	10%	

Note that Oklahoma has adopted the relevant portions of 10CFR by reference. Although it is possible that Oklahoma will write its own rules equivalent to all or part of 10CFR at some future date, there are no plans to do so at this time. As long as Oklahoma adopts relevant rules by reference, this should minimize time needed for AEA rulemaking issues.

Note also that Oklahoma's staff is primarily in the Oklahoma City main office, but that one Radiation Management Section member (Fernandez) is based in Tulsa. Since a great many of Oklahoma's licensed facilities will be in the Oklahoma City or Tulsa area, this will minimize travel time on inspections.

Finally, note that 2.85 of the 3.45 FTEs allocated to the Agreement State program are from the program's four most experienced staff. All have at least three years in the Oklahoma Radiation Management program, and two of them (Broderick and Bishop) have six years in the radiation control program, and substantial previous experience working with radiation and in other environmental regulatory programs. One other of this group (Shirley) has substantial previous environmental regulatory experience in Oklahoma's water and hazardous waste programs. The remaining .6 FTE allocated to the Agreement State program is a staff member with two years of experience in the Oklahoma radiation control program. The other staff (Heath, Matthews, and others) will be involved only in a training capacity until they complete the process for approval as an Agreement State inspector as described in Oklahoma's final application. Thus all of the personnel initially responsible for Oklahoma's Agreement State activities will have at least two years of experience in the radiation program, and most will have substantially more.

2. ***"Please provide a more detailed staffing analysis"***

As you requested, we have prepared a matrix depicting projected staff time evaluations. The matrix is similar to the example you provided. A copy is attached. The assumptions in this matrix are more conservative (allot more staff time for some facilities) than those used in the original analysis. In particular, note that we have assumed that one license renewal each year is received in all categories, even those categories with only a very small number of licenses (such as broad scope medical or nuclear pharmacy). Note that Broderick, Bishop, and Shirley still have significant amounts of unallocated licensing or management license review time available (about 15 days each for Bishop and Shirley, over 30 days for Broderick). Of course, the allocations continue to designate 10% of each staff members time for "contingencies" such as incident response, reciprocity inspections, and the unexpected. Together, these allow a considerable amount of time for our most experienced staff to deal with problems such as increased license renewals in some years caused by clustering of license expiration dates, or by the transition from 5-year license durations to 10-year license durations. The new matrix does assume three totally new license applications per year, rather than five as in the analysis from our original application. Steve Hoggard is assumed to be able to do the initial inspection for one of these new licenses; the remaining inspections, and all licensing, are done by Bishop and Shirley.

The license extensions granted by NRC to most of their licensees do not expire for some time after Agreement Status is expected. This will give Oklahoma a good opportunity to initially focus on the inspection program with a minimum of licensing obligations.

About 11 days per year is allocated for management accompaniments of AEA inspections by the Program Manager. This allows for about three days with each staff member doing AEA activities. Many of these accompaniments will be in the Oklahoma City area, which will take very little travel time. As more inspectors are qualified to do AEA inspections, the average time spent with each inspector will decrease, but the program will also be more mature at that time. In any case, about two days with each inspector should be available for management accompaniments in most years, even when all members of the staff are doing AEA work.

In the revised time allocations, we continue to provide .85 FTE as training time for our less experienced personnel. As these personnel become qualified in various tasks, this time will become available for the Agreement State program or other tasks as necessary. Adding AEA qualifications to Hoggard, Matthews, and Heath will greatly increase the depth and flexibility of the program. It is expected that Matthews will become qualified to do Basic AEA Inspections near the end of CY 2000. Mr. Hoggard is expected to

become qualified to do Basic AEA Licensing by early 2001, though the exact timing will depend on when license renewals and applications are received, and on his performance. We will work to add additional areas of AEA inspection qualification for Mr. Hoggard as well. Ms. Heath is expected to work to qualify as a Basic AEA Inspector and then licenser when she is able to return to duty around the end of CY 2000. All these qualifications will follow the procedure outlined in our Final Application.

a. ***Please provide specific information regarding how long Oklahoma has been conducting a NARM registration and informal inspection program and the experience of staff in implementing this program (e.g. how many facilities have been registered, how many inspected, and the specific type of NARM facilities that have been inspected.***

DEQ has been performing informal NARM registrations since the agency was formed in 1993. This program was initiated because many vendors, particularly of NARM medical radionuclides, will not ship radioactive materials to a facility which does not have some form of recognition by the state. We refer to this as an "informal" registration program because we have never implemented rules to require it. DEQ has adopted and implemented rules comparable to 10 CFR 20 which govern NARM usage. We do not have rules comparable to Part 30, 34, 35, etc., and there is no licensing program. The rules are official rules, have been in place for many years, and are in no sense informal. We have done a very limited number of inspections of registrants against these rules. These began in 1996, but very few were performed for several years. We have inspected 12 NARM facilities since January 1997. The state fiscal year beginning in June 1999 was the first year in which staff had specific NARM facilities assigned to them to inspect, and most of these inspections have been done since that time. If DEQ staff used the term "informal" for these inspections, it was a poor choice of words on our part. There is nothing informal about these inspections, as they are conducted against a valid set of rules. These rules have been replaced by OAC 252:410-20 in the rules in effect beginning June 1, 2000.

We have attached copies of the registration forms for NARM. We have also attached copies of the NARM inspection checklists developed in-house by DEQ staff, and of the inspection checklists for various types of x-ray machines and particle accelerators which were developed in-house by DEQ staff.

It should be noted that our program of inspecting x-ray machines and particle accelerators has been in place and extensively used since at least 1994. The inspections of therapeutic particle accelerators are quite complex, and incorporate many of the elements found in AEA teletherapy inspections.

Since January 1997, DEQ has conducted 10 medical NARM inspections (nine in 1999 or later), 2 research NARM inspections, responded to 51 incidents and allegations (mostly NORM, some DU or discarded medical byproduct material), conducted 210 industrial and analytical x-ray inspections, and ten industrial and therapeutic accelerator inspections. We conducted eleven investigations regarding non-ionizing radiation during this time. These programs have involved in-house training in inspection procedures, use of inspection checklists, preparation of NOVs, and are very similar to the inspection program that will be used for AEA activities.

b. ***Confirm and describe your plans to ensure that an adequate number of staff members will complete the training and experience requirements, and be qualified to carry out independent work to maintain the program on or before the projected date the Agreement is to be signed.***

STAFF PREPARATION--RADIATION PROTECTION EXPERIENCE

In NRC's program assessment criteria, "QUALIFICATIONS OF REGULATORY AND INSPECTION PERSONNEL" breaks technical staff into three categories of radiation protection experience and training. This assessment evaluates Oklahoma's staff in terms of these three categories. Each staff member's date of initial employment with the Oklahoma radiation control program is listed in parentheses after their name:

Evaulation and Inspection Functions--Bachelor's degree (or equivalent) in physical or life sciences and specific training - radiation protection

Broderick (June '94), Bishop (September '94), Shirley (May '97), Fernandez (April '97)--All except Shirley have relevant graduate degrees (industrial hygiene, radiological science, and environmental management respectively), Shirley has a relevant bachelor's degree (engineering physics). Broderick and Bishop each have over five years of radiation protection work experience in the Oklahoma radiation program, as well as several years of prior experience working with radioactive materials or radiation protection; When Agreement Status is reached, Shirley and Fernandez will have three years of radiation protection work experience with the Oklahoma program. All of these personnel have attended nearly all of the available relevant NRC training courses, including the Applied Health Physics course, inspection and licensing courses, and the majority of use-specific courses. Bishop has completed the NRC Health Physics Technology ("two week") course; Fernandez is enrolled to attend it in April, 2000. Bishop and Shirley have or are about to have one week working with NRC staff in Arlington, TX. Bishop, Shirley, and Fernandez will spend at least two more weeks working with NRC or agreement state staff on licensing and other issues. Bishop, Shirley, and Fernandez each have accompanied NRC staff on numerous inspections.

Bachelor's degree (or equivalent) in physical or life sciences, training in health physics, and approximately two years of work experience in radiation protection field

Steve Hoggard (February '98) has a bachelor's in Environmental Science, an associate's in chemistry, and over two years of radiation protection experience with the Oklahoma program. He has attended the Applied Health Physics Course and the NRC inspection procedures, nuclear medicine, and brachytherapy/teletherapy courses. He has enrolled to attend the NRC Health Physics Technology ("two week") course in April, and the licensing procedures course in September. He has accompanied NRC staff on several inspections.

Academic background in physical or life sciences, varying amounts of specific training in radiation protection, but little or no actual work experience in the field

Jerry Matthews (February '99) has one year experience with the Oklahoma radiation program, and a degree in Education specializing in science education. Andrea Heath (March '99) has one year experience with the Oklahoma radiation protection program, and prior work in radiation protection, monitoring, and decontamination at nuclear power plants. Ms Heath has a bachelor's degree in Industrial Engineering, and an associate's degree in radiation protection technology. Ms. Heath arguably could fall in a higher category. Both Mr. Matthews and Ms. Heath are attending the Applied Health Physics course in March/April, 2000. They have attended the MARSSIM course, and will attend other training later in 2000. Mr. Matthews will complete the NRC nuclear medicine course in August, and the NRC inspection procedures course in September (the June course mentioned in the Final Application was cancelled by NRC). Ms. Heath will be having surgery on her ankle and subsequent physical therapy during this time, but will attend these or other relevant NRC courses when she returns. When she returns to work, she will qualify as an inspector using the procedure described in the Oklahoma Final Application. Note that Heath and Matthews combined were originally planned to provide only .3 FTE of the 3.5 FTE allocated to the Agreement State program (not 30% each of all AEA inspections). Due to the cancellation of the June Inspection Procedures training course, they are now not expected to contribute time to the Agreement State program except in a training capacity. When they are qualified as inspectors under the procedure listed in our Final Application, some of their training time will be reallocated as time for conducting actual AEA inspections. When this happens, it is likely that Steve Hoggard's AEA inspection time will be reduced and his time training for AEA inspections and licensing will be increased.

FORMAL NRC TRAINING COMPLETED ("X" indicates completed; month indicates class in 2000)

	Brod.	Bishop	Shirley	Fern.	Hoggard	Heath	Matthews
5-week	X	X	X	X	X	March	March
2-week		X		April	April		
inspection proc.	X	X	X	X	X		September
licensing proc.	X	X	X	X	September		
well logging	X	X	May	X			
radiography	X	X	X	X			
transportation	(DOE)	X	X	X			June
MARSSIM	X	X	X	X		X	X
nuc. med.	X	X	X	X	X		August
brach. & tel.	X	X	X	X	X		August?
Perf.-based Inspection	June	June	June	June	June		
Root Cause	X	X	August	August	August		

OTHER FORMAL RADIATION TRAINING:

Broderick--DOE radioactive waste transportation; Medical uses of Radionuclides (ORAU); HAZWOPER Supervisor; NRC HP Topical Review--Brachytherapy & Teletherapy
Bishop--HAZWOPER; NITON XRF Manufacturer training; Administration of Isotope Radiography Safety Programs (Sentinel); Essentials for recognizing hazardous materials and wastes during landfill operations (Altitude Training Assoc.); Health Physics Engineering (ORAU); NRC HP Topical Review--Transportation; Naturally Occurring Radioactive Materials (IOGCC); RERO
Shirley--HAZWOPER; Introduction to Health Physics (NRC); Radiation Safety at Superfund Sites (EPA)
Fernandez--HAZWOPER; Introduction to Health Physics (NRC)
Hoggard--HAZWOPER
Matthews--HAZWOPER; Radiation Safety at Superfund Sites (EPA); NITON XRF Manufacturer Training
Heath--HAZWOPER; Radiation Safety at Superfund Sites (EPA)

During CY 2000 we expect to send Matthews to the Applied Health Physics Course, Inspection Procedures course (the September course, since the June course was cancelled by NRC), Nuclear Medicine Course, and possibly the Transportation Course. We expect to send Hoggard to the Health Physics Technology Course, Licensing Procedures Course, and Performance-based Inspection Course. We expect to send Fernandez to the Health Physics Technology Course and the Performance-based Inspection Course. Shirley is expected to attend the Performance-based Inspection Course and the Well-logging course. We also expect that Bishop and Broderick will attend the Performace-based Inspection Course. After Agreement Status, we will continue to expand the qualifications and training of our staff.

STAFF PREPARATION--REGULATORY SKILLS EXPERIENCE

It should be noted that DEQ operates numerous environmental programs under delegation or oversight of the EPA. Agreement State status is the last major federal delegation available to DEQ. DEQ and it's predecessor agencies have for many years operated EPA-approved regulatory programs in air and water pollution, and in hazardous and solid waste. These programs are subject to careful oversight and review by EPA to assure that they are professional, adequate, and consistent with national standards. DEQ's Waste Management Division (which includes the Radiation Management Section) and its staff have received numerous recognitions and awards from EPA for merit or excellence Conducting a program involving licensing and inspection of environmental and toxic activities, even highly technical ones, is a routine activity for the agency, and the agency is accustomed to federal oversight to ensure adequacy and compatibility. Most of the staff who will be involved in Agreement State activities have substantial prior experience in these programs, including writing and reviewing permits (licenses), conducting inspections for compliance with the terms of a permit and with detailed regulations, investigating incidents and allegations, and doing enforcement for noncompliance.
DEQ's radiation control program has conducted an inspection program for radiation sources for many years. The program includes detailed rules governing x-ray machines, certain NARM X-ray fluorescence equipment, particle accelerators, and therapeutic radiation machines. DEQ has conducted inspections of users of such equipment for many years, and uses a system of regulations, inspection checklists, letters reporting inspection results, and notices of violations which is very similar to the Agreement State inspection program described in Oklahoma's final application. Some of these facilities, notably therapeutic particle accelerators, are quite technically complex and require significant expertise. Therapeutic particle accelerator inspections are similar in many respects to AEA teletherapy inspections. DEQ conducts an inspection program for NARM users as well. It has similar use of regulations, checklists, inspection letters, and notices of violation.
Oklahoma's Radiation Management Section identified a Radium paint site in need of remediation, and worked with EPA's Emergency Response Team to successfully clean up the site, finishing about 1996.

Broderick
Mr. Broderick has been head of DEQ's radiation control program since 1994. He has extensive experience in rules development and program management. He has managed DEQ's inspection and registration programs for radiation, including leading many incident responses. He has worked closely with other programs on multimedia radiation issues. He has four years of experience with the Oklahoma air pollution control program in which he did inspections of vehicle air pollution control inspection stations, worked on rules development with the Air Quality Council, and worked closely with EPA on approval of amendments to Oklahoma's air pollution control state implementation plan (SIP). Mr Broderick has four years of experience in radiation-related work with the US Army, during which he served as a radiation safety officer, did radiation surveys, and worked on nuclear weapons.

Bishop
Ms. Bishop has been an inspector in DEQ's radiation control program since 1994. She has also worked extensively with the Program Manger and the Radiation Management Advisory Council on development of new rules and regulations regarding radiation, including a complete revision of DEQ's rules regarding industrial x-ray machines. She has participated in numerous NRC inspections and incident investigations. She has lead the state response or participated in state investigation of numerous radiation incidents. She was the principal state contact in working with EPA's Emergency Response Team to successfully clean up a Radium paint facility. From 1988 to 1994, Ms. Bishop worked in the Oklahoma City air pollution control program, a regulatory program governed under delegation from EPA. A "State Implementation Plan" (SIP) filed with EPA governed how the program was run and ensured adequacy and compatibility of the program. The program was regularly reviewed by EPA under a process comparable to the IMPEP. Ms. Bishop's duties included conducting inspections of air pollution permittees subject to detailed and technical environmental regulations and permits. Facilities she inspected included incinerators and numerous industrial facilities. Ms. Bishop also investigated complaints (allegations) regarding air pollution. Although Ms. Bishop did not write permits herself, she inspected according to the permit provisions, and one of her duties was reviewing new permits for enforceability before final issuance.

Shirley
Mr. Shirley has been has been an inspector with DEQ's radiation control program since 1997. Has accompanied NRC inspectors on numerous inspections and incident investigations, and has participated or lead state response in several incident investigations, including an accidental exposure of a member of the public to x-ray radiography, numerous NORM incidents, some AEA incidents, and an incident where a truck was believed to have incorporated radioactive material in the truck frame. From 1993 to 1997, Mr. Shirley was a permit engineer in Oklahoma's hazardous waste management (RCRA) program. His duties included writing permits for management of hazardous waste at facilities such as Class I hazardous waste injection wells, hazardous waste treatment storage, and disposal facilities, oil refineries, and numerous industrial facilities handling or disposing of hazardous waste. He conducted initial compliance inspections for these facilities and assisted inspectors with regular inspections (RCRA CEI--Compliance Evaluation Inspections). Careful oversight of this program was conducted by EPA to ensure its adequacy and compatibility, including regular program reviews similar to IMPEP. From 1988 to 1993, Mr. Shirley was a permit engineer for the Oklahoma Water Resources Board. His duties included interpreting water use regulations, developing permits and rules for water use, and serving as a Hearing Examiner in disputes regarding water usage. He conducted inspections regarding dam safety and groundwater usage.

Fernandez
Since 1997, Mr. Fernandez has worked as an inspector in Oklahoma's radiation control program. He conducted inspections on users of industrial, analytical, and therapeutic x-ray and radioactive materials users. He also accompanied NRC inspectors in the state. He shared the lead with Mr. Shirley in one accidental public exposure incident involving an x-ray industrial radiography machine. He has accompanied NRC in investigating several incidents including a brachytherapy patient intervention and investigation of a lost portable gauge. From 1993 to 1997, Mr. Fernandez coordinated environmental and safety issues at a manufacturing facility in private industry. He was responsible for ensuring and documenting compliance with state and OSHA environmental health and safety regulations.

Hoggard
Since 1998, Mr. Hoggard has worked as an inspector in Oklahoma's radiation control program. He conducted radiation compliance inspections as described above, and accompanied NRC inspectors in the state. He has worked on some radiation incident investigations involving NORM, abandoned x-ray machines, and abandoned source material. Mr. Hoggard has some prior experience as a technician in a chemical lab.

Matthews
Since 1999, Mr. Matthews has worked as an inspector in Oklahoma's radiation control program, conducting inspections under the DEQ radiation program as described above. He has been approved as an x-ray machine inspector. From 1993 to 1999, Mr. Matthews worked in Oklahoma's air pollution control program as an inspector. His duties included conducting inspections regarding compliance with air quality regulations and permits. He handled complaints and allegations, and conducted reactive inspections in response to complaints regarding air pollution. In 1992-3, Mr. Matthews performed various other duties in Air Quality, including auditing vehicle safety and air pollution inspection stations for compliance with air pollution requirements. All air quality programs he worked on were required to be adequate and compatible with national EPA rules and standards, and were regularly reviewed by EPA under a process similar to IMPEP.

Heath
Since March 1999, Ms. Heath has worked to be an inspector in Oklahoma's radiation control program. She has not yet been approved to do independent inspections. She has done some accompaniments of NRC inspectors in the state. For three years prior to coming to the radiation program, Ms. Heath worked as coordinator of DEQ's NPDES (OPDES after Oklahoma received delegation) industrial pretreatment program. This is an EPA-delegated program that requires cities in Oklahoma to prevent industrial operators from discharging pollutants into the city sewer system that will not be removed or neutralized by the city system prior to release into the environment. She reviewed city programs and checked for compliance with EPA requirements, including adequacy of statutes. She also conducted inspections of

industrial pretreatment systems at facilities covered by these city programs to check for compliance. She performed these duties as Oklahoma received NPDES delegation for the first time, and was an important figure in implementing the OPDES program.

Memoranda have been prepared for each of these staff describing what inspections they will be initially authorized to perform. This meets the criteria in our Final Application that inspection and licensing authorizations be made in writing. Copies of these memoranda are attached to this letter.

Prior to assuming Agreement State status, we will continue to improve our staff skills, through in-house training and opportunities to work on licensing and inspection with Region IV staff, and staff of other Agreement States. We will keep NRC informed on these activities.

After assuming Agreement State status, we will continue to increase the qualifications of our staff. Staff members who are not now qualified to perform AEA functions will gradually be trained in these functions and assume part of the inspection and licensing load. Our estimates of staff time allocate .85 FTE as training time for staff to acquire new AEA functions. As these staff gradually acquire more and more qualifications, some of this training time will be available for other radiation functions, including the Agreement State program.

c. Please provide the basis of your evaluation that staff members have, or will have gained sufficient knowledge and understanding during training and accompaniments to meet the qualifications for licensing and/or inspection under the Formal Qualification Plan contained in Section 6.2 at the time the Agreement is signed.

In this document we have expanded upon the previously-provided material to describe our plan for qualifications. We have described the experience with radiation and non-radiation regulation of our staff, described the radiation protection training and experience of our staff, and outlined our plan to ensure that all staff involved in the Agreement State program are well-qualified to perform the duties that will be expected of them. Our training program is based on that described in the OAS/NRC Working Group Document on Training. In some areas, our program is more restrictive (higher standards) than that document, notably in that we use in-house training strictly as a supplement to the formal NRC training courses, not as a substitute for them. Our training program includes in-house and external training on inspection and licensing fuctions, in-house and external training on specific specialized radiation uses, and (at least for our initial staff) experience gained by working with other AEA regulatory programs. In addition to their previous work experience in radiation protection and other environmental regulatory activities, our initial staff has spent and is spending considerable time enhancing their training and experience by working with regulators from NRC both in Oklahoma and at the NRC Region IV office, and conducting inspection and licensing with existing Agreement State programs. Many of the initial staff will also spend time working with experienced Agreement State programs in other states. The total experience of each of our initial staff members is equivalent or superior to that described as a minimum qualification in our application.. Staff members qualifying in the future will undergo the qualification process described in our Final Application. This process is very similar to the process used by NRC to qualify their inspectors, and is consistent with the OAS/NRC training document.

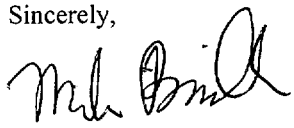
Oklahoma will ensure that staff will be qualified to perform licensing and inspection functions for all types of AEA licenses that they inspect or license. Specifically, no individual will be a lead inspector or senior license review on such a license unless the individual has demonstrated competency by either completing the training described in Oklahoma's Final Application, or by designation by the Program Manager. These designations will be recorded in the training file maintained by the radiation control program training officer (currently Earlon Shirley). No designations will be recorded without the approval of the Program Manager.

Memoranda officially assigning initial AEA authorizations are attached as mentioned above. These explicitly describe each staff member's training and experience, and relates them to authorized Agreement State duties. Because of the training course schedule changes, and personnel considerations described in this letter, these designations differ slightly from those described in our final application. Each staff

member with Agreement State duties authorized has or will have qualifications and experience equivalent to those described in our final application. As described on pages four and five of Section 6.2 of the Final Application, it is expected that after these initial authorizations as the program begins, it will be very unusual for an authorization to be made for any individual who has not completed the training described in Oklahoma's Final Application. The Program Manager will only make such designation in an unique circumstance, for an individual who has clearly demonstrated equivalent training and experience, most likely in the case of a new hire with industry work experience and training in the specific field.

If you have further questions, please feel free to call me. Please note that I will be on annual leave and unavailable from March 29 to April 6. During that time, feel free to contact Pam Bishop if you need clarifications or additional information.

Sincerely,



Mike Broderick
Environmental Program Manager
Radiation Management Section

Attachments:
NARM Registration Form
NARM Inspection Checklist
X-ray inspection forms
Industrial accelerator inspection form
Therapeutic inspection form >1 MeV
Therapeutic inspection form <1 MeV
Staffing Analysis
AEA activity authorization memos

Rev. 1/00

DEPARTMENT OF ENVIRONMENTAL QUALITY
707 NORTH ROBINSON, P.O. BOX 1677
OKLAHOMA CITY, OKLAHOMA 73101-1677

REGISTRATION OF USERS OF RADIOACTIVE MATERIALS

(Accelerator Produced, Naturally-Occurring and Generally Licensed)

This form properly completed and filed with the State of Oklahoma, Department of Environmental Quality, constitutes registration of the radioactive materials herein named. Registration does not imply approval or disapproval.

1. Name of Company/Facility: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Phone Number: _____ Ext: _____ FAX Number _____

2. Location Address (if different from above): _____

_____

3. Person in Charge of the Facility: _____

4. Radiation Safety Officer: _____
Statement of Qualifications: _____

_____

5. Do you have a NRC Materials License: Yes__ No__
If yes what is the License Number: _____

6. List of Radioactive Materials (copy this form if additional sheets are necessary):

Item No	Isotope	Sealed	Unsealed	Form	Source Strength	*Type	Use	Max.

* **A** = Accelerator produced, **G** = Generally Licensed, **N**= Naturally Occurring

7. Signature of Owner or Authorized Agent: _____
Please print or type Name and Title: _____
Date: _____

FOR OFFICIAL USE ONLY
Registration number: _____
Date Processed: _____
Signature of Registering Officer: _____

Rev. 1/00

Instructions for filling out the Registration Form

1. Please complete the form according to the instructions listed below.
2. This form is to be used for registration of accelerator produced, naturally occurring and/or generally licensed radioactive materials

Item 1 **Name and address of Company**. The name of the company is the individual, corporation, organization, business association, institution, or agency having legal responsibility for the administrative control of the x-ray machines, whether as owner, lessee, or otherwise. The owner, lessee, or authorized agent is responsible for the registration of accelerator produced, naturally occurring and/or generally licensed radioactive materials used by the company or organization. When there are several facilities owned by the same company within Oklahoma where accelerator produced, naturally occurring and/or generally licensed radioactive materials are used, a separate Registration Form shall be completed for each installation.

Mailing address. The address to which all correspondence concerning the company or facility should be sent. Please include address, city, state, and zip-code.

Phone number. Phone number and extension of the contact person at the company/facility

Item 2 **Location Address**. This is the physical location of a facility where registered radioactive material is used. The location address shall be designated by the owner/lessee but should include applicable information such as street address, building, yard use, or use throughout the state.

Item 3 **Person in Charge of the Facility**. This the individual responsible for the operation of the facility.

Item 4 **Person(s) responsible for Radiation Safety**. This should include the individual responsible for all radiation safety within a company, organization, or institution and the individual or individuals responsible for the radiation safety in various separate areas or locations where the x-ray machines are used.

Statement of Qualifications. A short statement of each person's training and experience in the areas of radiation safety and use should also be included.

Item 5 **List of Radioactive Materials**:

Isotope - List the symbol and mass number of the radioisotope to be registered.

Sealed/Unsealed - Check the appropriate column to indicate whether the source is sealed or unsealed.

Form - List whether the radioisotope is a solid, liquid or gas.

Source Strength - The activity of the source. Please indicate the units, i.e. Ci (curies), mCi (millicuries), μCi (microcuries), etc.

Type - Please write: **A** for Accelerator produced, **G** for Generally Licensed and **N** for Naturally Occurring

Use - Briefly describe how the radioisotope is used.

Max. - Please list the maximum activity that will be on hand at any particular time.

Item 6 **Signature of Owner, Lessee, or Authorized Agent**. The owner is the same as in item 1. The authorized agent is an individual designated by the owner, lessee, or chief administrative officer to act for him. For any one user, as an individual, corporation, organization, business association, institution, or agency, only one individual should sign as owner, lessee, or authorized agent. Please type or print the name of the individual under the signature and include their title and date signed.

DEPARTMENT OF ENVIRONMENTAL QUALITY
RADIATION MANAGEMENT SECTION

ACCELERATOR PRODUCED AND NATURALLY OCCURRING RADIOACTIVE MATERIAL

NAME OF FACILITY_____ REG#_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

DATE_____ INSPECTOR(S)_____

CONTACT_____ PHONE#_____

RADIATION SAFETY OFFICER_____

HEALTH PHYSICIST_____

SEND LETTER TO_____

Rule Number (OAC 252:400)	Requirement	[1]✓	Details
1-4 9-24(b)	Records of receipt, transfer, and disposal of NARM maintained		
9-12	Personnel monitoring equipment (PME) provided/used or exemption granted.		
9-29(a)	Records of (PME) available (*See 1 below*)		
9-11(a)	Surveys performed to establish compliance with 9-6 (unrestricted area limits)		
9-11(b),(c)	Survey instruments operable, calibrated and appropriate (*See 2 below*)		
9-11(d)	Records of and calibration maintained		
9-13(a)-(e) 9-14	Radiation and high radiation areas, airborne radioactivity areas, NARM storage posted		
9-13(f)	Containers labeled		
9-15	Storage and control of NARM		
9-17(a)	Timely NARM package pick-up		
9-17(b)	Packages monitored when received		
9-17(c)	Procedure for safety opening packages available and followed.		
9-18	Waste properly stored/disposed (*See 3 below*)		
9-29	Records of surveys, monitoring of incoming packages, and disposal kept and complete		
9-30, 31,33	Theft/ loss, incidents, overexposure, excessive levels and conc. reported		

1. Check (✓) if a violation has been identified.

1. PME required for entry into a radiation area and use of any source of radiation unless an exemption has been granted by the Department.
Highest reading: Last report period: _____

Cumulative for the year: _____

Vendor providing personnel monitoring equipment: _____

_____

2 Surveys should be conducted in the storage(waste and source) and work areas. Equipment should be calibrated in accordance with 9-11(c).
Type of radiation detection equipment available _____

_____

3 If waste is shipped for near surface land disposal, 9-24 through 28 apply. Describe methods used to dispose of the radioactive material.

_____

_____

_____

Additional Comments:

_____

_____

_____

Results of Confirmatory Survey(s):

Surveyor: _____ Area(s) surveyed: _____

Survey Meter: Mfg/Model _____ S/N _____

Probe: Mfg/Model _____ S/N _____

Calibration Date _____ Bkg _____

Description of survey and results:

STATE OF OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY
RADIATION MANAGEMENT SECTION

GENERAL INFORMATION CONCERNING INDUSTRIAL X-RAY FACILITIES

NAME OF FACILITY_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

REG#_____ DATE_____ SURVEYOR_____

CONTACT_____PHONE#_____

NO. MACHINES_____ NO. TUBES_____

TYPE OF MACHINES_____

_____

_____

CURRENT LICENSE: **YES**___ NO___

SEND LETTER TO:_____

DATE OF LAST INSPECTION_____ANY RECOMMENDATIONS YES__ NO__

_____

_____

OAC 252:400-13-5 Operators received training:

in radiation safety? **YES**__ **NO**__ in the proper operating procedures? **YES**__ **NO**__

OAC 252:400-9-12(a) Operators supplied with film badges/TLD's? **YES**__ **NO**__ **NA**__

OAC 252:400-9-12(b) Has an exemption been granted by the Department? **YES**__ **NO**__

OAC 252:400-13-5(b) Are finger or wrist dosimetric devices used by operators of OPEN-BEAM SYSTEMS that are not equipped with a safety device? **YES**__ **NO**__ **NA**__

OAC 252:400-9-29(d) Are the exposure records available? **YES**__ **NO**__ **NA**__

Highest reading: Last report period. _____ Cumulative for the year. _____

Company that supplies the personnel monitoring equipment. _____

OAC 252:400-9-11(b)(c) radiation survey equipment **YES**__ **NO**__ **NA**__

Calibrated at least yearly? **YES**__ **NO**__ Correct instrument type? **YES**__ **NO**__

ANALYTICAL
X-RAY EQUIPMENT

DATE_____

MODEL_____

LOCATION_____

OPERATING KVP_____ OPERATING MA_____

MAX KVP_____ MAX MA_____

OAC 252:400-13-2(b)(2) A warninglight with the words "X-RAY ON", or similar words near any switch that energizes an x-ray tube and illuminated only when the tube is energized? YES__ NO__

OAC 252:400-13-2(d) Is the x-ray equipment labeled with a sign or signs bearing the RADIATION SYMBOL and the words?

(1) "CAUTION - HIGH INTENSITY X-RAY BEAM", or words having a similar intent, on the x-ray source housing? YES__ NO__

(2) "CAUTION RADIATION - THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED", or words having a similar intent, near any switch that energizes an x-ray tube? YES__ NO__

OAC 252:400-13-3 Are radiation surveys performed:

(1) Upon installation of the equipment? YES__ NO__

(2) Following any change in the initial arrangement,number, or type of local components in the system? YES__ NO__

(3) Whenever personnel monitoring devices show a significant increase over the previous monitoring period? YES__ NO__

OAC 252:400-9-29(d) Do the radiation survey records include:

1. Date __ Name __ Survey instruments(s) __ Location of the survey __

OAC 252:400-13-3(c) Is each area or room posted with a sign or signs bearing the RADIATION SYMBOL and the words "CAUTION - X-RAY EQUIPMENT" or words having a similar intent? YES__ NO__

OAC 252:400-13-4(a) Are normal operating and safety procedures written and available to all analytical x-ray equipment workers? YES__ NO__

OAC 252:400-13-4(b) If a safety device or interlock has been bypassed, was approval of the radiation safety officer obtained? YES__ NO__

(1) If a safety device or interlock has been bypassed, is there a readily discernible sign bearing the words "SAFETY DEVICE NOT WORKING", or words having a similar intent in view? **YES__ NO__**

V. COMMENTS:

_____

_____

_____

_____

_____

AREA SURVEY: Background_____ Instrument_____#_____

Probe_____#_____ Calibration Date_____

STATE OF OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY
RADIATION MANAGEMENT SECTION

X-RAY EQUIPMENT (OPEN BEAM)

DATE_____ MODEL

_____LOCATION_____

OPERATING kVp_____ MAX kVp_____ OPERATING mA_____ MAX mA_____

OAC 252:400-13-2(a) Are the following safety devices provided?

(1) A device which :

(a) Prevents the entry of any portion of an individual's body into the primary x-ray beam path or; **YES__ NO__ NA__**

(b) causes, upon the entry of any portion of an individual's body into the primary beam path, the beam to be shut off. **YES__ NO__ NA__**

(2) Has an exemption been granted by the Department from the requirement of a safety device? **YES__ NO__**

OAC 252:400-13-2(b) Are the following warning devices provided?

(1) (a) X-ray tube "ON-OFF" status near the radiation source housing; **YES__ NO__**

(b) And/or shutter "OPEN-CLOSED" status near each port on the radiation source housing, if controlled in this manner. **YES__ NO__**

(2) A warning light with the words "X-RAY ON", or similar words located near the on/off switch and illuminated when the tube is energized. **YES__ NO__**

OAC 252:400-13-2(d) Is the x-ray equipment labeled with a readily discernible sign or signs bearing the RADIATION SYMBOL and the words:

(1) "CAUTION - HIGH INTENSITY X-RAY BEAM", or similar words on the x-ray source housing; **YES__ NO__**

(2) "CAUTION RADIATION - THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED", or similar words near the on/off switch **YES__ NO__**

OAC 252:400-13-2(e) If installed after May 26, 1994, is each port on the radiation source housing equipped with a shutter that cannot be opened unless a collimator or a coupling has been connected to the port? **YES__ NO__ NA__**

OAC 252:400-13-3 **Radiation surveys:**

(1) Upon installation of the equipment? **YES**__ **NO**__

(2) Following any change in the system? **YES**__ **NO**__

(3) Whenever personnel monitoring devices show a significant increase? **YES**__ **NO**__

OAC 252:400-9-29(d) Do the survey records include:

Date _____ Name _____ Survey instrument(s) _____ Location _____

OAC 252:400-13-3(c) Area or room containing x-ray equipment posted with a sign(s) bearing the RADIATION SYMBOL and the words "CAUTION - X-RAY EQUIPMENT" or similar words? **YES**__ **NO**__

OAC 252:400-13-4(a) Are normal operating and safety procedures written and available to all x-ray equipment workers? **YES**__ **NO**__

OAC 252:400-13-4(b) If a safety device or interlock has been bypassed was approval of the RSO obtained? **YES**__ **NO**__

(1) If a safety device or interlock has been bypassed, is there a readily discernible sign bearing the words "SAFETY DEVICE NOT WORKING", or similar words on the radiation source housing? **YES**__ **NO**__

AREA SURVEY: Background_____ Instrument_____#_____

Probe_____#_____ Calibration Date_____

LOCATION	**RADIATION LEVEL**

STATE OF OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY
RADIATION MANAGEMENT SECTION

PARTICLE ACCELERATORS (INDUSTRIAL)

DATE:_____

MODEL_____LOCATION_____

ENERGY OUTPUT: type particle_____ energy_____

OAC 252:400-15-3 (4) Has a radiation safety officer been appointed? **YES__ NO__**

OAC 252:400-15-6.

(a) Has each person who is to be an operator:

(1) Instructed in and demonstrated understanding of radiation safety? **YES__ NO__**

(2) Received copies of and instruction in the permittee's operating and emergency procedures? **YES__ NO __**

(3) Trained in use of the particle accelerator and related equipment? **YES__ NO__**

OAC 252:400-15-7.

(a) Did a qualified expert design the particle accelerator installation and performed an initial radiation area survey? **YES__ NO__**

OAC 252:400-9-29.

(d) Radiation survey record(s) shall include:

Date __ Name of the surveyor __ Survey instrument(s) __Survey Locations __

and are the records available for review by Department? **YES__ NO__**

OAC 252:400-9-13.

(b) Each radiation area posted with sign(s) bearing the RADIATION CAUTION SYMBOL and the words:

(1) "CAUTION" or "DANGER" (2) RADIATION AREA **YES__ NO__ NA__**

(c)(1) Each high radiation area posted with sign(s) bearing the RADIATION CAUTION SYMBOL and the words:

(A) "CAUTION" or "DANGER" (B) HIGH RADIATION AREA **YES__ NO__ NA__**

OAC 252:400-15-8.

(a) Control console clearly labeled and easily discernible? **YES__ NO__**

(b) Safety interlock at each entrance to a high radiation area? **YES__ NO__**
(c) Each safety interlock operate independently? **YES__ NO__**
(d) Does any defect or component failure in the safety interlock system prevents operation of the accelerator? **YES__ NO__**

(e) Does operation of the accelerator only occur manually by resetting controls at the safety interlock position and, lastly, at the main control console if tripped? **YES__ NO__**

(f) Scram button(s) located in all high radiation areas? **YES__ NO__**

a cutoff switch with a manual reset that prevents restarting from the control console without resetting? **YES__ NO__**

OAC 252:400-15-9.

(a) Does each entrance to a high radiation area, have warning lights that operate only when radiation is being produced? **YES__ NO__**

(b) Does each high radiation area have an audible warning device which is activated for 15 seconds prior to radiation? **YES__ NO__**

OAC 252:400-15-10.

(a) When not in operation, is the accelerator secured? **YES__ NO__**

(b) Is the safety interlock system only used to turn off the accelerator beam in an emergency? **YES__ NO__**

(c) Are safety and warning devices, including interlocks, checked for proper operation at intervals not to exceed three months? **YES__ NO__**

Are results of such tests available? **YES__ NO__**

(d) Are there electrical circuit diagrams of the accelerator and the associated safety interlock systems available? **YES__ NO__**

(e) If, it is necessary to bypass a safety is such action:

(1) Authorized by the radiation safety committee and/or RSO? **YES__ NO__**

(2) Recorded in a permanent log and a notice posted at the control console? **YES__ NO__**

(e) Is a copy of the current operating and emergency procedures maintained at the accelerator control panel? **YES__ NO__**

OAC 252:400-15-11.

(a) Appropriate monitoring equipment? **YES__ NO__**

Calibrated yearly and after each servicing and repair? **YES__ NO__**

(b) Radiation survey performed and documented when changes have been made in shielding, operation, equipment, or occupancy of adjacent areas? **YES__ NO__**

(c) Radiation levels in high radiation areas continuously monitored? **YES__ NO__ NA__**

(d) Area monitors calibrated at intervals not to exceed one year and after each servicing and repair? **YES__ NO__ NA__**

252:400-15-12.

(a) Adequate ventilation in areas where ozone or airborne radioactivity may be produced? **YES__ NO__ NA__**

AREA SURVEY: Background_____ Instrument_____ #_____

Probe_____ #_____ Calibration Date_____

LOCATION RADIATION READING

STATE OF OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY
RADIATION MANAGEMENT SECTION

GENERAL INFORMATION (THERAPEUTIC MACHINES)

DATE_____ NAME OF FACILITY_____
ADDRESS_____CITY_____ STATE____ ZIP_____
REG#_____ NO.MACHINES_____SURVEYOR_____
CONTACT_____ PHONE#_____

RADIOLOGICAL PHYSICIST_____ MEDICAL DOCTOR _____

Is there a Radiation safety committee? Y__ N__
Chairman_____How often do they meet?_____

SEND LETTER TO:_____

DATE OF LAST INSPECTION_____ ANY RECOMMENDATIONS? Y__ N__

_____

_____

OAC 252:400-9-12(a)
Are operators supplied with film badges or TLD's? Y__ N__

OAC 252:400-9-13
Appropriate radiation caution signs in the area? Y__ N__

OAC 252:400-9-29(a)
Exposure records available? Y__ N__
Highest reading: Last period_____ Cumulative_____
Company that supplies the monitoring equipment._____

OAC 252:400-11-4
(a) Are written operating and safety procedures available? Y__ N__

(c) Is the following information available?
(1) Records of receipt, transfer, and disposal? Y__ N__
(2) A copy of correspondence to and from the Department? Y__ N__
(3) Records of surveys, calibrations, spot checks, maintenance, and modifications? Y__ N__

(d) Operators trained in operating and safety procedures? Y__ N__

COMMENTS:

Do they have a simulator? Y__ N__

STATE OF OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY
RADIATION MANAGEMENT SECTION
RADIATION PRODUCING MACHINES USED FOR THERAPY
OF GREATER THAN 1 MeV

Date_____ Registration number_____
Therapy unit _____ Date of manufacture_____
UNIT TYPE: Electron Capability_____ Moving beam capability_____
Primary and secondary beam monitors_____ Multiple x-ray beam energies_____
Max x-ray energy_____electron energies_____

OAC 252:400-11-7:

(b)(1) Records for leakage radiation from the x-ray tube available? Y__ N__
(d)(1)(A) Is there an area survey of the unit? Y__ N__
A resurvey after any significant change? Y__ N__ NA__
A copy sent to the Department within 30 days? Y__ N__
(b)(15) (A) Display of dose monitor unit rate at the control panel? Y__ N__ NA__
(c)(2) Control panel located outside the treatment room? Y__ N__
(c)(3) System provided for the observation of the patient? Y__ N__
(c)(4) Provision made for two-way aural communication? Y__ N__
(c)(5) Room entrances provided with warning lights? Y__ N__
(c)(6) Interlocks at all entrance doors? Y__ N__
If the radiation beam is interrupted by any door opening must the door be closed and radiation manually restarted at the control panel? Y__ N__
(d)(2)(A) Calibrated before the first irradiation of a patient? Y__ N__
Thereafter at intervals which do not exceed 12 months? Y__ N__
And after any significant change in the system? Y__ N__
(B) Calibration supervised by a radiological physicist? Y__ N__
(C) Calibration shall be performed using a **dosimetry system**:
(i) having a calibration factor for cobalt-60 gamma rays traceable to a national standard? Y__ N__
(ii) calibrated within the previous 2 years? Y__ N__

(D) Calibrated to within 5 percent of the dose? Y__ N__
(E) Calibration shall include the following:
(i) the light localizer (radiation vs light field) Y__ N__
accuracy of pt. positioning devices (lasers) Y__ N__
axis of rotation for the table Y__ N__
gantry and jaw system Y__ N__
beam flatness and symmetry Y__ N__
(ii) absorbed dose (rate) at various depths for each effective energy? Y__ N__
(v) verification of transmission and electron buildup factors for all accessories such wedges, shadow trays, and compensators? Y__ N__
(F) Are calibration records kept for 5 years? Y__ N__
(G) A copy of the latest calibration near the control panel? Y__ N__

(d)(3) **Spot checks:** Frequency not over one month? **Y**__ N__

(A) Are procedures in writing and developed by a radiological physicist? **Y**__ N__

(B) Reviewed by radiological physicist within 45 days if done by somebody else? **Y**__ N__

(C) Frequency and acceptable tolerance for each parameter measured specified? **Y**__ N__

(D) Not to exceed one week, are spot checks made of absorbed dose at a minimum of 2 depths in a phantom? **Y**__ N__

(F) Special instructions for when a parameter exceeds acceptable tolerance? **Y**__ N__

(H) Are spot-check measurements kept for 2 years? **Y**__ N__

(d)(4)(A) Individuals in the treatment room during treatment? **Y**__ N__

(b)(3)(A) Identification number on removable filters? **Y**__ N__ **NA**__
description of the filters at the control panel? **Y**__ N__ **NA**__
Is the wedge angle on a wedge filter or wedge tray? **Y**__ N__ **NA**__

(b)(3)(C) **New equipment** which utilized a system of wedge filters, interchangeable field flattening filters, or interchangeable beam scattering foils:

(i) Irradiation only if a selection of a filter or no filter has been made at the treatment control panel? **Y**__ N__ **NA**__

(ii) An interlock system that prevent irradiation if the filter selected is not in the correct position? **Y**__ N__ **NA**__

(iii) Is a display provided at the treatment control panel identifying the filter(s) in use? **Y**__ N__ **NA**__

(iv) Interlock that prevent irradiation if the filter selection in the treatment room and the control panel do not agree? **Y**__ N__ **NA**__

(b)(4) **Beam quality** Have the following beam energy requirements been determined or obtained from the manufacturer of absorbed dose:

(A) Resulting from x-rays in a useful electron beam? **Y**__ N__ **NA**__

(C) At the surface as a fraction of the maximum absorbed dose? **Y**__ N__

(E) Due to neutrons (>= 10MeV)? **Y**__ N__ **NA**__

Beam monitors (radiation detectors):

(b)(5)(A) If two detectors, in separate dose monitoring systems? **Y**__ N__ **NA**__

(C) **(i)** Is each detector removable only with tools and interlocked to prevent incorrect positioning? **Y**__ N__

(iii) Is each dose monitoring system capable of independently monitoring, interrupting, and terminating irradiation?. **Y**__ N__

(iv) **For new equipment:**

(I) does the malfunctioning of one system affect the correct functioning of the second system? **Y**__ N__ **NA**__

(II) Does the failure of any element common to both systems terminate irradiation? **Y**__ N__ **NA**__

(v) Does each dose monitoring system have a legible display at the treatment control panel? **Y**__ N__

For new equipment, Does each display at the control panel:

(I) Maintain a reading until reset to zero? **Y**__ N__ **NA**__

(II) One scale and no scale multiplying factors? **Y**__ N__ **NA**__

(VI) If a power failure, is the information at the control panel retrievable in at least one system for 20-minutes? **Y**__ N__

(b) (6) **(New equipment)** Beam checked for **symmetry** during irradiation? **Y**__ N__ **NA**__

If it exceeds 5 percent, indicated on the control panel? **Y**__ N__ **NA**__

If it exceeds 10 percent, is the irradiation terminated? **Y**__ N__ **NA**__

(b) (7) **(A)** Irradiation possible only when a selection of the dose monitor units has been made at the treatment control panel? **Y**__ N__

(B) Selected dose monitor units displayed until reset manually? **Y**__ N__

(C) Dosimeter reset to zero before each irradiation? **Y**__ N__

(b) (8) **(B)** Secondary dose monitoring system, does it terminate irradiation if the pre-selected number of dose monitoring units has been exceeded by no more than 15% or 40 dose units? **Y**__ N__ **NA**__

(C) (**New equipment**) Secondary system terminate irradiation when not more than 10% or 25 dose units has been detected? **Y**__ N__ **NA**__

(D) **(New equipment)** Does the control panel show which dose monitoring system has terminated irradiation? **Y**__ N__ **NA**__

(b) (9) Is it possible to <u>interrupt</u> irradiation and equipment movements at any time from the treatment control panel? **Y**__ N__

Following an interruption, can you restart irradiation without any reselection of operating conditions? **Y**__ N__

If a change is made of a pre-selected value during an interruption, is irradiation and equipment movements automatically terminated? **Y**__ N__

(b) (10) Is it possible to <u>terminate</u> irradiation and equipment movements at any time from the control panel? **Y**__ N__

(b) (11) **TIMER**

(A) At the control panel **with** a pre-set time selector is there an elapsed time indicator? **Y**__ N__

(B) Does it retain its reading after irradiation is interrupted or terminated? **Y**__ N__ **NA**__

Is timer reset to zero before each irradiation? **Y**__ N__ **NA**__

(D) Does irradiation terminate irradiation when a pre-selected time has elapsed? **Y**__ N__ **NA**__

(b) (12) **Selection of radiation type.** Requirements of equipment with both x-ray and electron therapy:

(A) Irradiation only when a selection of type has been made at the control panel? **Y**__ N__ **NA**__

(C) An interlock system that prevent irradiation if selected operations in the treatment room and control panel do not agree? **Y**__ N__ **NA**__

(D) An interlock system that prevent x-rays, except to obtain a port film, when electron applicators are fitted? **Y**__ N__ **NA**__

(E) An interlock system that prevent irradiation with electrons when accessories specific for x-ray therapy are fitted? **Y**__ N__ **NA**__

(F) Is the radiation type selected displayed at the control panel before and during irradiation? **Y**__ N__ **NA**__

(b) (13) **Selection of energy.** Equipment with different energy cabapilities:

(A) Irradiation only when a selection of energy has been made at the control panel? **Y**__ N__ **NA**__

(B) An interlock system that prevents irradiation if selected operations in the treatment room and control panel do not agree? **Y**__ N__ **NA**__

(C) Is the energy value selected displayed at the control panel before and during irradiation? **Y**__ N__ **NA**__

(D) Interlock system that terminates irradiation if the energy of the electrons striking the x-ray target or electron window deviates by more than 20 percent from the selected energy? **Y**__ N__ **NA**__

(b) (14) **Selection of stationary beam therapy or moving beam therapy.**

(A) Irradiation only when a selection of stationary beam or moving beam therapy has been made at the control panel? **Y**__ N__ **NA**__

(C) Interlock system that prevents irradiation if the selection in the treatment room and control panel do not agree? **Y**__ N__ **NA**__

(D) Is the mode of operation displayed at the control panel? **Y**__ N__ **NA**__

(E) An interlock system provided to terminate irradiation if:

(i) movement of the gantry during stationary beam therapy? **Y**__ N__ **NA**__

(ii) movement of the gantry stops during moving beam therapy unless such stoppage is a preplanned function? **Y**__ N__ **NA**__

(F) For moving beam; a selected relationships between incremental dose monitor units and incremental angle of movement? **Y**__ N__ **NA**__

(i) Interlock system that terminates irradiation if the number of dose monitor units delivered in an arc differs from the selected value? **Y**__ N__ **NA**__

COMMENTS:

NRC PROGRAM CODES ASSIGNED TO EACH CATEGORY ON THE ANALYSIS CHARTS

Academic
3620

Broad Scope Academic
1100,3610,3611

Nuc Med IP 2
2220

Nuc Med IP 3
2120,2200,2511

Nuc Med IP 5
2121,2201,2400,2410

Brachytherapy
2230

Teletherapy
2300

Medical Broad Scope
2110

Nuclear Pharmacy
2500

Measuring Systems (Gauge, GC, Other)
3120,3121,3123,3124

Industrial - Other IP 2
3800

Industrial - Other IP 3
3225,3214,22120

Industrial - Other IP 5
3510,3221,3240,3251

Industrial Radiography
3310,3320

Well Logging
3110,3111

LLW Disposal Services
3234

NEED ANALYSIS

License Category	Number of Licenses	Licensing Renewals/ Yr@__days	Licensing Amendment Days/ Yr	Total licensing Staffdays/yr	Inspection Priority	Inspections/ yr@__days	Inspection staff days/ yr
Academic	10	1@6	5	11	5	2@5	10
Broad Scope Academic	5	1@6	3	9	2*	2@5	10
Nuc Med - IP 2	2	1@6	1	7	2	1@5	5
Nuclear Med - IP 3	51	5@6	26	56	3	17@5	85
Nuclear Med - IP 5	16	2@6	8	20	5	3@5	15
Brachythera py	3	1@6	2	8	1	3@5	15
Teletherapy	2	1@6	1	7	3	1@5	5
Medical - Broad Scope	1	1@6	-	6	1	1@5	5
Nuclear Pharmacy	2	1@6	1	7	1	2@5	10
Measuring Systems (Gauge, GC, other)	76	8@2	38	54	5	15@3	45
Industrial - other IP 2	3	1@6	2	8	2	2@5	10
Industrial - other IP 3	10	1@6	5	11	3	3@5	15
Industrial - other IP 5	8	1@6	4	10	5	2@3	6
Industrial Radiography	19	2@6	10	22	1	19@5	95
Well Logging	12	1@6	6	12	3	4@5	20
LLW Disposal Services	1	1@6	-	6	1	1@5	5
New Applications	3	3@7	-	21	Initial	3@5	15

*To simplify assumptions, one IP3 facility in Program Code 3611 is treated as IP2 here

RESOURCE ANALYSIS

Staff Member	Bishop		Shirley		Fernandez		Hoggard		Broderick		Total	
License Category	Insp	Lic	Insp	Lic	Insp	Lic	Insp	Lic	Insp	Mgmt Rev. Lic	Insp	Lic
Academic		5		5			10			1	10	11
Broad Scope Academic	5	5	5	3						1	10	9
Nuclear Med - IP 2				6			5			1	5	7
Nuclear Med - IP 3		28		23	39		46			5	85	56
Nuclear Med - IP 5		11		7			15			2	15	20
Brachytherapy	5	7	10							1	15	8
Teletherapy	5	6								1	5	7
Medical - Broad Scope	5	5								1	5	6
Nuclear Pharmacy	5		5	6						1	10	7
Measuring Systems (gauge, GC, other)				9		42	45			3	45	54
Industrial - Other IP 2				7	10					1	10	8
Industrial - Other IP 3				10	9		6			1	15	11
Industrial - Other IP 5				9	3		3			1	6	10
Industrial Radiography	27.5	17	17		50.5					5	95	22
Well Logging	10	2	10	9						1	20	12
LLW Disposal Services			4	5	1					1	5	6
New Applications	5	9	5	9			5			3	15	21
Totals	67.5	95	56	108	112.5	42	135			30		

BALANCE ANALYSIS

	Inspection staff days		Licensing staff days	
License Category	Needed	Available	Needed	Available
Academic	10	10	11	11
Broad Scope Academic	10	10	9	9
Nuclear Med - IP 2	5	5	7	7
Nuclear Med - IP 3	85	85	56	56
Nuclear Med - IP 5	15	15	20	20
Brachytherapy	15	15	8	8
Teletherapy	5	5	7	7
Medical - Broad Scope	5	5	6	6
Nuclear Pharmacy	10	10	7	7
Measuring Systems	45	45	54	54
Industrial - Other IP 2	10	10	8	8
Industrial - Other IP 3	15	15	11	11
Industrial - Other IP 5	6	6	10	10
Industrial Radiography	95	95	22	22
Well Logging	20	20	12	12
LLW Disposal Services	5	5	6	6
New Applications	15	15	21	21

March 20, 2000

MEMORANDUM

TO: Pam Bishop

FROM: Mike Broderick, Environmental Program Manager

SUBJECT: Agreement State Authorized Tasks

When Oklahoma becomes an Agreement State, you will be authorized to work in the following areas:

Basic AEA Inspector (inspection/licensing)
Advanced AEA Inspector (inspection/licensing)
Diagnostic/Therapeutic Nuclear Medicine (inspection/licensing)
Teletherapy (inspection/licensing)
Brachytherapy (inspection/licensing)
Nuclear Pharmacy (inspection/licensing)
Industrial Radiography (inspection/licensing)
Well Logging (inspection/licensing)

This authorization is based on my knowledge of your experience as an inspector in the DEQ Radiation Management Section (over five years), your previous work experience doing radiochemistry lab work, your work as an inspector in Oklahoma's air quality program, your graduate degree in Radiological Science, and your completion of the NRC training courses for the above specialized categories. This authorization is contingent on you continuing to work conducting inspection and licensing with the NRC Regional Office and/or another Agreement State. This work is to include inspection preparation, conduct of inspections, writing up inspection results, and licensing operations. I expect that this continuing experience will further enhance your capabilities as a radiation protection regulator.

A copy of this memo will be placed in the Section's training file.

March 20, 2000

MEMORANDUM

TO: Earlon Shirley

FROM: MB Mike Broderick, Environmental Program Manager

SUBJECT: Agreement State Authorized Tasks

When Oklahoma becomes an Agreement State, you will be authorized to work in the following areas:

Basic AEA Inspector (inspection/licensing)
Advanced AEA Inspector (inspection/licensing)
Diagnostic/Therapeutic Nuclear Medicine (inspection/licensing)
Teletherapy (inspection/licensing)
Brachytherapy (inspection/licensing)
Nuclear Pharmacy (inspection/licensing)
Industrial Radiography (inspection/licensing)
Well Logging (inspection/licensing)

This authorization is based on my knowledge of your experience as an inspector in the DEQ Radiation Management Section (about three years), your work as a permit engineer in Oklahoma's RCRA and water resources programs, your degree in Physics Engineering, and your completion of the formal NRC training courses for the above specialized areas. This authorization is contingent on you continuing to work conducting inspection and licensing with the NRC Regional Office and/or another Agreement State. This work is to include inspection preparation, conduct of inspections, writing up inspection results, and licensing operations. I expect that this continuing experience will further enhance your capabilities as a radiation protection regulator.

A copy of this memo will be placed in the Section's training file.

March 20, 2000

MEMORANDUM

TO: Steven Fernandez

FROM: Mike Broderick, Environmental Program Manager

SUBJECT: Agreement State Authorized Tasks

When Oklahoma becomes an Agreement State, you will be authorized to work in the following areas:

Basic AEA Inspector (inspection/licensing)
Advanced AEA Inspector (inspector/licensing)
Diagnostic/Therapeutic Nuclear Medicine (inspection/licensing)
Teletherapy (inspection/licensing)
Brachytherapy (inspection/licensing)
Nuclear Pharmacy (inspection/licensing)
Industrial Radiography (inspection/licensing)
Well Logging (inspection/licensing)

This authorization is based on my knowledge of your experience as an inspector in the DEQ Radiation Management Section (about three years), your previous work experience in industry as an environmental health and safety coordinator, your graduate degree in Environmental Management, and your completion of the NRC formal training courses for all the above specialized areas. This authorization is contingent on you continuing to work conducting inspection and licensing with the NRC Regional Office and/or another Agreement State. This work is to include inspection preparation, conduct of inspections, writing up inspection results, and licensing operations. I expect that this continuing experience will further enhance your capabilities as a radiation protection regulator.

A copy of this memo will be placed in the Section's training file.

March 20, 2000

MEMORANDUM

TO: Steve Hoggard

FROM: Mike Broderick, Environmental Program Manager

SUBJECT: Agreement State Authorized Tasks

When Oklahoma becomes an Agreement State, you will be authorized to work in the following areas:

Basic AEA Inspector (inspection only)
Diagnostic/Therapeutic Nuclear Medicine (inspection only)

This authorization is based on my knowledge of your experience as an inspector in the DEQ Radiation Management Section (about two years), your degree in Environmental Science, and your completion of NRC formal training courses including the Applied Health Physics Course, Inspection Procedures Course, and Nuclear Medicine Course. This authorization is contingent on you continuing to work conducting inspections with the NRC Regional Office and/or another Agreement State. This work is to include inspection preparation, conduct of inspections, and writing up inspection results. It may include some assistance in licensing tasks. I expect that this continuing experience will further enhance your capabilities as a radiation protection regulator. Note that you are not authorized to conduct other categories of AEA inspections, or any AEA licensing until you have qualified for that specific task as described in the Oklahoma Final Application.

A copy of this memo will be placed in the Section's training file.