FY2005 ANNUAL REPORT
ARIZONA RADIATION REGULATORY AGENCY

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HIGHLIGHTS OF FY2005

During calendar year 2004, shippers reported that 13,700,000 Curies of radioactive materials in the form of either Large Quantity Radioactive Material shipments or Highway Route Controlled Quantity shipments which were shipped across Arizona. All but 15,000 Curies were transported on I-40. The appropriate legislative committees and Governor's Office were notified about the general information of each shipment. In addition, law enforcement agencies were notified of the details of each shipment. The carriers of such shipments were required to periodically notify the Arizona Terrorism Intelligence Center while the shipments were in state. Please note these statistics do not include any data for shipments smaller than the Large Quantity Radioactive Material or Highway Route Controlled Quantity shipments. Virtually all of the shipments were Cobalt 60 to be utilized in the irradiation of products.

The Agency conducted several training classes for first responders. In case of an accident involving radioactive materials or a weapon of mass destruction, the first responders need to have access to information regarding the presence and quantity of radiation. These classes provide the necessary training for these individuals and the confidence to utilize the instrumentation provided. The Agency is purchasing equipment for use in the event of a weapon of mass destruction involving radioactive material. These devices are usually referred to as a radioactive material dispersion device or RDD. The Agency has also participated in exercises with the Phoenix Bomb Squad of the Phoenix Police Department.

In the event of a weapon of mass destruction attack in Arizona utilizing a radioactive material dispersion device the Agency is prepared to advise the Governor and other elected officials of the projected consequences. We estimate that if only one event occurs within the United States, we will have federal support within 4 to 8 hours. If multiple events occur within the Unites States, then federal support may be delayed by 12 to 48 hours arriving. Until federal support arrives all radiological technical assessment will be made by the Agency.

In August of 2004, the Agency responded to a reported leakage of a U.S. Department of Energy shipment. The shipment originated at the U.S. Department of Energy facility in Paducah, KY and consisted of waste material bound for the Nevada Test Site for disposal. On arriving on the scene, our representative determined, that while material was leaking out of the shipping container, none of the leaked material was radioactive. Several questions did arise regarding the adequacy of the shipping containers. We were informed that 3 of 5 containers were leaking in this series of shipments. As a result of inquiries by the Governor, the U.S. Department of Energy suspended the remaining shipments pending an investigation. The investigation was completed in June and the shipments were expected to resume in July with improved containers and packaging protocols.

As a result of concerns expressed by citizens in Mohave County regarding the fallout from the Nuclear Weapons testing in the 1950s and 1960s, the Agency Director conducted a public hearing. The Director's report of the hearing indicates that while some 50 persons testified as to their personal suffering they were unable to specifically state the any given case was in fact caused by the radiation exposure. Equally clear is, the Federal Government is paying compensation to persons in other areas of the state which were exposed even less than the

citizens in Mohave County. The Director recommended to Governor Napolitano and the National Academy of Science Committee that as a matter of simple equity, all of Mohave County should be receiving such payments. The citizens were also quite concerned that the United States may begin testing again, perhaps even secretly. At one time the Agency conducted monitoring through out the State which would detect any unreported leaks of significance, but the program had to be suspended due to budgetary constraints in 2002.

X-RAY COMPLIANCE PROGRAM
Fiscal Year 2005

The X-ray Program is responsible for the registration and inspection of machine produced radiation sources. Personnel are also available to interact with registrants and the public on issues of radiation safety.

COMPLIANCE

Activity in the Program continues to increase. The number of facilities grew from 4501 Registrants in FY 2004 to the FY 2005 total of 4677 Registrants, a 3.9% increase. Concurrently, the number of machines increased from 11028 to 11673, a 5.8% increase and the number of tubes increased from 11683 to 12281, a 5.1% increase.

624 Facility Inspections were completed representing 13.3% of all registered facilities. These inspections resulted in 101 violations occurring in 75 facilities. We inspected 1480 x-ray tubes during FY 2005. We ended FY 2005 with 39.3 % of the facilities overdue for inspection compared to 22.49 % overdue at the end of FY 2004. The overdue inspections can be directly attributed to a reduction in the number of available, funded inspector positions.

X-ray Program Rules require that those personnel applying radiation to humans be either licensed by the Medical Radiologic Technology Board of Examiners (MRTBE) or exempt from the rules. There were 6 registrant MRTBE violations during FY 2005, which was less than the 17 violations in FY 2004. These violations do not include those issued by MRTBE. The decrease in violations can be attributed to an increase in the MRTBE Investigator activity and a reduction in the number of hospital and medical facilities inspected.

Numerous registration actions occurred during the year as facilities were bought, sold, traded, merged and incorporated. These changes included replacement, modifications, additions and deletions to radiation equipment inventories. There were 1801 documented record changes to our database this fiscal year compared to 2212 changes in FY 2004.

Again, higher than usual personnel turnover was experienced during the year, which resulted in filling 2 positions. At the end of the fiscal year, there were two unfunded positions. A budgetary crisis during FY 2003 subsequently resulted in our loss of funding for two inspector positions.

MAMMOGRAPHY QUALITY STANDARDS ACT (MQSA)

In 1994 the Agency entered into an agreement with the Food and Drug Administration (FDA) to administer the MQSA Program for the State of Arizona. This Program requires an annual inspection of all state mammography facilities. Such an inspection consists of a comprehensive review of the facilities' mammographic diagnostic capabilities including the qualifications of

physicians, technologists and medical physicists; proper machine operation, development of film, reporting of results, and medical audit of positive results.
The Agency has developed and implemented rules for state mammography facilities that either coincide with the interim MQSA Law or provide for more specific rules applicable to the needs of Arizona. As a result, a state inspection is also performed at the time of the MQSA inspection. Substantial changes in state mammography regulations to comply with the final MQSA Regulations of April 29, 1999, were made during the 5 year rule review and have been submitted to the Governor's Regulatory Review Board.

During FY 2005, 140 facilities were inspected for the FDA and the state. Several facilities were inspected more than once since their scheduled annual inspection rotation occurred twice during the fiscal year. In retrospect, the State Inspection Program has improved the quality of Mammography in Arizona as demonstrated by a gradual reduction in the number of violations as the program has progressed. Specifically, the MQSA facility non-compliance rate has dropped from 42% initially, to a rate of 15.9% at the end of FY 1999. MQSA violations increased to 40 % during fiscal 2000 due to new facility startups and final FDA/MQSA Regulation requirements. State inspections during FY 2005 resulted in a noncompliance rate of 2.9%, a decrease in the rate of 3.1% in FY 2004.

At present, the Agency has two State Health Physicist assigned to mammography inspection duties. Future plans include training of an additional inspector to provide coverage for expanded activities and personnel backup.

The FDA continues to encourage voluntary compliance as the primary goal of the MQSA Program. The standards can be met with the continuous and diligent application of quality control procedures. Improved diagnostic images and accurate mammographic film interpretation will result in earlier detection of breast cancer prompting appropriate, life-saving, medical attention.

COMPUTERIZED TOMOGRAPHY PROGRAM

During FY 2002 new rules were adopted which require those facilities with medical CT X-ray Units to have their machine checked annually by a "qualified expert." The testing, as outlined in the rules, involves checking CT machines for patient dose levels, table alignment, image resolution and establishing quality control standard procedures. There are 177 CT facilities in Arizona, an increase of 41.6 % over the 2004 total of 125. The CT facilities have demonstrated compliance with the new rules for annual health physicist equipment review, providing the patients with an additional measure of radiation safety.

We continued to be challenged by facilities that wished to do "walk-in" patients or what we call screening. Rules allow a screening radiographic procedure only for mammography facilities. The CT facilities are required to perform their studies, as are other medical facilities, based upon an order from an Arizona licensed physician.

The regulatory and medical communities continue to debate the efficacy of "screening type CT studies." While this discussion continues, the public is encouraged through advertisements to seek out the CT Procedures that they think are appropriate for their personal health care.

The medical community introduced the new Pet/CT Combination Unit for diagnosing various active disease processes, now referred to as Fusion Imaging. This temporarily created an issue of technologist operator certification for us since nuclear medicine and x-ray were being used together.

INDUSTRIAL RADIOGRAPHY

Revisions in rules affected the radiographer community in Arizona by requiring a certification of the radiation safety officer through testing. The American Society for Nondestructive Testing was selected as the administrator for the examination. The Agency has proctored the examination for radiographers several times during FY 2003. We are satisfied that this certification process will improve the industrial radiography safety practices in Arizona.

FUTURE RESOLVE

Plans for FY 2006 are to maintain the overall number of inspections performed at a high level consistent with efficient output. Newly hired State Health Physicists will continue their training either at special off-site sessions or through in-service education within the Agency. We plan to request additional clerical help to more efficiently respond to inquiries, to improve record keeping and to shorten correspondence and registration application turn around time.

X-RAY COMPLIANCE STATISTICS
Fy2005 Annual Report

Category of Registrant	Tubes Registered (%)	Tubes Inspected (%)	Facilities Non-Comp. (%)
Chiropractic	792 (6.45)	87 (10.98)	10 (11.49)
Dental	7,189 (58.54)	921 (12.81)	29 (11.11)
Educational	154 (1.25)	2 (1.30)	0 (0.00)
Hospital	1,252 (10.19)	39 (3.12)	3 (75.00)
Industrial	446 (3.63)	25 (5.61)	4 (33.33)
Medical	1,510 (12.30)	106 (7.02)	13 (20.63)
Mammography	265 (2.16)	214 (80.75)	4 (3.10)
Podiatry	133 (1.08)	12 (9.02)	3 (25.00)
Veterinary	540 (4.40)	62 (11.48)	9 (19.15)
Totals	12,281	1,468 (11.95)	75 (12.18)

RADIATION MEASUREMENTS LABORATORY

Radiation Measurements Laboratory (RML) activities during Fiscal Year 2005 included the following: Palo Verde Nuclear Generating Station (PVNGS) off-site radiological monitoring; participation in emergency response drills at PVNGS requiring analytical analyses; limited statewide environmental radiation monitoring; the Arizona Radon Project; and drinking water analysis support to the Arizona Department of Environmental Quality (ADEQ).

The RML has continued to perform radiological monitoring in accordance with the Palo Verde Nuclear Generating Station (PVNGS) Off-site Emergency Response Plan. This includes sampling and analysis of air, water, soil, milk, vegetation, and fruit as well as the use of thermoluminescent dosimeters (TLDs) to measure low-level ambient radiation. Resources include a mobile laboratory for field sample analyses. Laboratory analysis results reveal no increase in environmental background radiation levels in the vicinity of PVNGS.

Due to budgetary constraints, the RML had to suspend monitoring other locations within the state. The RML has contracted with the ADEQ to perform radioactive analyses for special drinking water and aquifer studies in the state. Laboratory analyses results reveal some waters to contain high levels of the naturally occurring radionuclides such as uranium and radium as established by the Safe Drinking Water Act. Continued monitoring is necessary in assuring future safe levels of radiation in Arizona's drinking water and represents one of the essential components of the Agency's operations.

RADIOACTIVE MATERIAL/NON-IONIZING RADIATION
Annual Report FY 2005

RADIOACTIVE MATERIAL RADIATION COMPLIANCE

The Radioactive Materials (RAM) Program is still struggling to adjust and adapt to the changing needs of the Federal Government and the State of Arizona. The RAM Program, at this time, still retains four FTE's and when filled, fulfills the varying duties plus their normal inspection and compliance duties. One of the RAM positions spends most of their time drafting and publishing new and amended rules that govern the way that the Agency conducts its licensing, registration and inspection duties for the users of radioactive material and devices within the state. Additionally, this person is also responsible for conducting administrative duties with regard to RAM licensing, amendments and terminations. One of the RAM positions is tasked with the duty of keeping up with the posting and entering of Sealed Source and Device (SS&D) changes which are published by the United States Nuclear Regulatory Commission (USNRC). Additionally, one person is responsible for maintaining a log of the Therapeutic and Diagnostic Misadministration list. And finally, the fourth RAM member is responsible for the maintenance of the out-of-state licensee's which use RAM within the state while performing work in Arizona under Reciprocity.

Personnel shortage problems continue to plague the RAM program. The newly acquired RAM inspector, hired in November 2003, sent to the USNRC five week course in September 2004 and trained by the existing RAM inspectors, was lost to ASU in March of 2005. Fortunately, an X-Ray inspector trained at the same USNRC five week course in September, 2004, was recruited to fill the position. However, this person had to attend NEXT training on CT scanning X-Ray devices and has to perform a number of inspections within the state on these devices. Additionally, the individual has to be trained to perform RAM inspections. This Program has been continually tasked with the need to train new personnel in the performance of their duties which has caused the Program to fall further behind in the performance of RAM inspections.

This is further complicated by the fact that a vacant RAM position can not be filled due to budget constraints. This continues to have a deleterious effect on the ability of RAM to keep up with its schedule of required RAM inspections.

The continued non-availability of funding by the USNRC and the State of Arizona for the training and maintenance of inspector expertise has impacted greatly in the ability of ARRA inspection personnel to maintain currency with the fast changing regulatory requirements.

NON-IONIZING RADIATION

Arizona's regulatory authority to control sources of non-ionizing radiation stems from the Title 30, Chapter 4 sections authorizing other aspects of the program. The regulations controlling sources of non-ionizing radiation are found at Title 12, Chapter 1, Article 14 of the Arizona Administrative Code. The sources specifically covered by regulation include laser sources, radio frequency (RF) sources, and sources of ultraviolet radiation produced by electronic devices. The

statutory authority and the regulatory framework appropriately cover these sources and will help to assure Arizona residents of protection from unnecessary and hazardous exposures.

The number of nonionizing radiation registrants continues to increase annually. We have a current total of seven hundred thirty six registrants as of July 1, 2005. The total number of current registrants represents an overall increase of ninety-six new registrants. With the largest number being medical laser users. Approximately 17 percent of the registrants were inspected during the year.

The nonionizing radiation protection program has one FTE authorized. The program growth requires that efforts be placed on significant issues and projects. Maintenance of a satisfactory non-ionizing radiation program will require additional staffing. Additional time has been utilized in support of the Radioactive Materials Program due to staffing shortages within the NRC mandated program. Laser use in the human arena evolves daily with new procedures and laser/light source equipment being developed. Significant increases in cosmetics/aesthetics for hair removal and skin rejuvenation are being observed.

Title 12, Chapter 1, Article 14 of the Arizona Administrative Code has finally been approved and is now in effect. The rule changes appear to have been accepted, with much activity in bringing the registrants into compliance. An inordinate amount of time has been devoted to the Cosmetic/Hair Removal issues during the year. This area of laser use is evolving faster that any other aspect of non-ionizing radiation use and has the potential for significant impact on the general public.

FY 2005
Licensing Statistics
Radioactive Materials Licensing and Inspection Program

Licenses (Total Number)		379
Medical (Types A, B, C, Broad and Tele)		156
General Medical		15
Industrial (Types A, B, C, Limited, Portable, and Fixed Gauges)		135
Industrial Radiography (Fixed and Mobile)		6
Academic (Broad and Limited)		5
Miscellaneous Licenses		62
*	Number of Particle Accelerator's	55
**	Number of High Dose Rate Brachytherapy's (Included in the Licensed Facility)	8
New Licenses and Renewals		90
New Particle Accelerator Registration and Renewals		33
Inspections Performed		110
Licensing Actions (Amendments and Terminations)		349
***	Reciprocity (Inspections)	2
	(Liscensee's)	35

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* As of January 1996, the RAM Program assumed the responsibility for the inspection and registration of Particle Accelerators (PA's). Management of these radiation users was transferred to RAM from the X-RAY Program.

** Not included in the overall Licensee total.

*** Reciprocity is Arizona's recognition of an out-of-state licensee's Specific License for the use of radioactive materials within the State of Arizona. A General License is issued for this purpose.

NON-Ionizing Radiation Statistics

Registration Type	# Inspected FY-2005	# Registrations FY-2005
Tanning Facilities	49	289
Medical Laser Facilities	26	318
Industrial Laser Facilities	4	80
Laser Light Shows	9	51
Radio Frequency Facilities	3	24
Power Line Surveys	00	
Other, include Radioactive Material	31	
Total inspections	**122**	**Total Registrations 736**

New Registrants	135
Registrant Terminations	39
Total Registrant Actions	299

EMERGENCY RESPONSE PROGRAM ANNUAL REPORT – FY 05

GENERAL

The Emergency Response Program (ER) is involved in and responds to radioactive materials (RAM) incidents. This includes preparation for and participation in offsite response to any incident occurring at the Palo Verde Nuclear Generating Station (PVNGS); the transportation of transuranics to the Waste Isolation Pilot Plant (WIPP), and on-scene response to hazardous materials incidents statewide in which RAM is involved. Training is also provided to organizations that respond initially to hazardous materials incidents around the state: police, fire, medical and emergency service personnel. The ER Program also tracks, and provides assistance in inspections of special radioactive materials shipments that travel across Arizona Interstate Highways.

PLANNING

As part of the radiation emergency response planning effort, the program requested and was granted U.S. Department of Home Land Security funds. The funds have allowed the program to acquire critical radiation monitoring equipment that will be essential to the response effort should a radiological incident occur in the state. The program will continue to strive for improvement in our planning efforts to meeting our state and national priorities of preventing and responding to any radiological emergency.

TRAINING

Training this fiscal year involved conducting two four-day training sessions in response to the Palo Verde Nuclear Generating Station (PVNGS). Several monitor pool refresher classes and participation in a full-scale Plume Exposure Drill. The Program conducted a large number of training sessions for hazardous materials first responders covering both “standard” response and if necessary, response to a “Dirty Bomb” –Explosives with Radioactive Materials used by terrorists. It is the Program’s goal to continue to train, assist and respond to any and all radiological incidents within our State.

WASTE ISOLATION PILOT PLANT

The Waste Isolation Pilot Plant (WIPP) in southern New Mexico has been open for several years and has been receiving transuranic waste. The first shipment of transuranics to the WIPP occurred along Arizona I-40 in January 2004. However, the waste scheduled to transit Arizona will be from the Nevada Test Site and Lawrence Livermore National Laboratory and is characterized as contact handled, meaning that radiation dose rate outside the containers is very low. The Program’s Emergency Response Coordinator for radioactive waste activities has been extremely active in reviewing and streamlining WIPP-related training programs primarily for

first responders, but also for medical personnel and hospitals. Coordination and outreach activities with affected state agencies, e.g., Emergency Management, Transportation and Public Safety, and with the five counties through which I-40 passes – Mohave, Yavapai, Coconino, Navajo, and Apache – for medical and first responder training have been major functions of this position during the past several years. Principal activities for first responders included equipment issue, e.g., survey instrument kits to units not receiving them in FY 2004 including instrument training; binoculars, instrument exchange for calibration; and personal protective equipment. WIPP briefings were also conducted and several meetings involving the affected states were held to assure continued safety.

INCIDENTS

During this fiscal year, ER and the Agency responded to 13 incidents involving radioactive materials. Several incidents involved moisture/density gauges that were stolen or involved in accidents; others involved radioactive scrap that were detected at the entrance of their facility and reported to the agency. The most noted incident/response was a Department of Energy shipment of Uranium Tetrafluoride (UF4) that appeared to be leaking material en route to the uranium disposal site in Nevada. The incident response and investigation concluded no radioactive material had leaked from the shipment package. Governor Napolitano was deeply concerned about the incident and sent a letter to DOE requesting an appropriate investigation of the shipping program for this campaign. The Governor also was concerned as to what steps are being taken to improve the integrity of radioactive shipment across the State of Arizona.

The Agency has continued the program of placing civil defense monitoring instruments with response organizations that want them. This year, ER calibrated 45 survey instruments, 200 dosimeters, and exchanged/distributed 45 civil defense instrument sets to HAZMAT organizations.

RADIOACTIVE SHIPMENTS THROUGH ARIZONA

Fifty three highway route controlled quantity (HRCQ) shipments totaling 10.7 million curies of radioactive material crossed Arizona highways this fiscal year. Notifications were sent to DPS officers to alert them of these shipments in the case of they are involved in an accident or emergency.

COMMUNICATIONS

Communication is one of the most important aspects of emergency response planning as well as of the actual response. During this reporting period, there were 55 Nuclear Alert Net (NAN) drills and four telecommunications tests. The latter tests are those in which the entire communications system is checked.

COMMITMENT TO EXCELLENCE BY PROVIDING THE BEST POSSIBLE RESPONSE TO THE STATE OF ARIZONA.

Emergency Response Program is committed to providing the best possible response capability to the citizens of Arizona. The program will continue to work with our partners in the first responder community and provide highest quality of assistance to any radiological accident or incident in the state of Arizona.

Arizona Medical Radiologic Technology Board of Examiners
2004-2005 Annual Report

The Medical Radiologic Technology Board of Examiners (MRTBE) was established in 1977 after extensive study and review of documented statistics revealed that: (1) the major portion of the populations man-made radiation exposure in the United States is from the use of medical and dental x-ray producing equipment; and (2) of that portion, a significant amount is unnecessary because of the sub-optimal use of equipment by the operator. The preamble of the MRTBE law states:

"It is declared to be the policy of this State that the health and safety of the people of the state must be protected against the harmful effects of excessive and improper exposure to ionizing radiation. Such protection can, in some major measure, be accomplished by requiring adequate training and experience of persons operating ionizing radiation equipment under the direction of licensed practitioners. It is the purpose of this act to establish standards of education, training and experience and to require the examination and certification of operators of x-ray equipment."

Arizona Revised Statutes §32-2801 et. sec., provide for a Board of Examiners consisting of ten members appointed by the Governor, and a statutory chairman who is the Director of the Arizona Radiation Regulatory Agency. The responsibilities of the Board include:

Assuring that applicants have met minimum standards of education and training.

Setting standards for, and granting approval to schools of radiologic technology.

Administering certification exams for technologists, special permit applicants and refresher exams for technologists who have not practiced for three years.

Conducting investigations to assure compliance with MRTBE statutes and rules.

Pursuing statutory remedies to resolve problems involving uncertified, non-exempt ionizing machine operators.

Interacting with national and state professional and certifying organizations for technologists.

Assuring optimum testing standards by contracting when necessary with national professional registries to administer certifying exams to qualified applicants.

MRTBE CERTIFICATES

Certification	**Number of Active Certificates**
Radiologic Technologist	5,824
Therapy Radiologic Technologist	453
Nuclear Medicine Technologist	462
Mammography Radiologic Technologist	998
Practical Radiologic Technologist	1,031
Practical Radiologic Technologist Unlimited	24
Practical Radiologic Technologist Podiatry	100
Special Permit	6
TOTAL	**8,898**

THE MEDICAL RADIOLOGIC TECHNOLOGY
BOARD OF EXAMINERS

MEMBERS	STAFF
Aubrey V. Godwin, MS, Chairman	John M.Gray, RT
Tammy Allgood, Public Member	Executive Director
Carol A. Conti, Radiologic Technologist	
Dean L. Gain, M.D., Licensed Practitioner	Sarah Penttinen
Marco Lara, Radiologic Technologist	Special Investigator
Michael J. Locke, Practical Radiologic Technologist	
Jonathan Sanders, Radiologic Technologist	Stephanie Erra
Martin G. Schotten, Radiologic Technologist	Administrative Secretary
Burton N.Shapiro, D.C., Licensed Practitioner	
Shirley Wagner, Nuclear Medicine Technologist	Vacant
Vacant, Public Member	Administrative Secretary (2)

Correspondence should be to:
Mr. John Gray, RT; MRTBE; 4814 S. 40th Street; Phoenix, AZ 85040-2940. Phone (602) 255-4845