

The *NORM* Report

Naturally Occurring Radioactive Material Control
Volume VIII, Number 1 (August 2002)

Index

Regulatory Update	1
State Regulations (listed alphabetically)	2
Federal Activity	
EPA	21
NRC	23
MMS	27
Canadian Guidelines	28
Is Radiation as Dangerous as They Say?	29
CRCPD NORM Activities	30
Radiation Reduces Natural Cancer Deaths	30
Philips Services	31
NORM in the Literature	31
Meeting Calendar	34
Regulatory References	35
NORM Manuals Available	36

Regulations for the Control of Naturally Occurring Radioactive Materials - An Update

The status of regulations for the control of NORM contamination is summarized for all 50 states, the Environmental Protection Agency (EPA), the Nuclear Regulatory Commission (NRC), the Minerals Management Service (MMS), Canada, and the Conference of Radiation Control Program Directors (CRCPD) beginning on page 2. NORM contamination is not limited to the petroleum industry, and several non-petroleum states are drafting rules for the control of NORM in other industries. Each regulatory agency was contacted during June and July 2002.

During 2001 two more states have enacted regulations for the control of NORM. Maine adopted the CRCPD Part N regulations effective August 1, 2002 and West Virginia extensively revised their general regulations for the control of radiation and have included NORM regulations. The revised regulations became effective July 1, 2001.

Several other states have enacted regulations for some aspects of NORM control; e.g., remediation and cleanup of contaminated areas and the disposal of contaminated material. Many states consider NORM to be regulated by their general rules on radiation.

The states, besides Maine and West Virginia, which have specific regulations for the control of NORM are Arkansas, Georgia, Louisiana, Mississippi, New Mexico, Ohio, Oregon, South Carolina, and Texas.

There currently are no federal regulations specifically for the control of NORM, although the Environmental Protection Agency appears to be moving in that direction. Two multi-agency groups are looking into better and more efficient ways to regulate low-activity materials and harmonize radiation standards and risk management among the various federal member agencies. See details in the NRC section (Page 23).

Canada now has published their *Guidelines for the Management of Naturally Occurring Radioactive Materials*. Some of the features of the Guidelines were summarized in the Volume VII, No.3 issue of *The NORM Report*.

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Summaries of State and Federal Regulations for the Control of NORM

ALABAMA

Alabama is waiting for the CRCPD recommendations for the control of NORM before finalizing their redraft of the state's proposed NORM regulations. There is no time table for the regulations to be adopted. There has been some interest in plugging and abandoning wells, but there have been no requests from industry for NORM regulations.

ALASKA

There is no NORM regulatory activity in Alaska at the present time. Although the price of oil has risen significantly, the budget is still very tight. Nothing will probably be done until the federal government (e.g. the EPA) mandates the Alaskan legislature to do something about NORM, similarly to what is currently happening with radium/radon in drinking water. There is some concern as to how radium removed from drinking water will be treated.

There have been no current problems with NORM contamination that have been referred to the State for action. The oil companies take care of their own NORM problems. Contaminated wastes are either being sent to Washington State for disposal or to the EPA-permitted injection well on the North Slope.

The Arctic Monitoring Assessment Program which is a consortium of all the Arctic countries, is starting to take an interest in NORM-type material. It is not known how this will translate into the U.S.

Committee's action on the issue.

ARIZONA

A proposed rule relating to NORM was to be published in the Arizona Administrative Register around the first of the year (2002). Public comments on the proposed rule were to be accepted through at least February 24, 2002. After some delay it is anticipated that activity on the proposed rule will start again in August 2002.

This new Article 11 in Arizona's general regulations for the control of radiation is added to regulate technologically enhanced naturally occurring radioactive material (TENORM). Because naturally occurring radioactive material is not regulated under the Atomic Energy Act, except for certain materials containing source material and byproduct waste from source material extraction, its regulation is primarily a state regulatory issue. These new rules are drafted to protect the public from exposure to radionuclides in the natural environment and associated technically enhanced natural radiation. Human activities have caused an increase or altered distribution of naturally occurring radioactive materials in the environment. These materials are made up of radium, thorium, uranium, potassium and radon. The proposed rules in Article 11 follow suggested state regulations published by the Conference of Radiation Control Program Directors (CRCPD). Affected industries will include gas and oil, phosphogypsum, water treatment,

and those industries that may come in contact with material or equipment used in the aforementioned industries, such as metal recyclers.

For the present, all radioactive materials, including NORM, are addressed in Arizona's general radiation regulations.

ARKANSAS

The Arkansas NORM regulations constitute Section 7 of the *Arkansas Rules and Regulations for Control of Sources of Ionizing Radiation*. The revised regulations were summarized in the Fall 96 issue of this newsletter. There are no plans to revise the NORM regulations in the near future.

CALIFORNIA

The California Division of Oil, Gas and Geothermal Resources has indicated they would like to make a NORM survey of geothermal facilities in the state, but nothing has been done yet.

In 1993, California underwent a peer review of its oil and gas exploration and production waste management regulatory programs. The review was conducted by the Interstate Oil and Gas Compact Commission (IOGCC), in cooperation with the U.S. Environmental Protection Agency and other interested groups. One recommendation of the review team was for a thorough evaluation of the industry NORM survey data by the appropriate state agencies to verify the extent of oil and gas field NORM

(Continued on page 3)

CALIFORNIA (continued)
in California.

Subsequent to the IOGCC peer review, and following increased public and governmental interest in NORM issues, the California Department of Conservation, Division of Oil, Gas and Geothermal Resources and the California Department of Health Services, Radiological Health Branch conducted a more comprehensive survey of selected sites.

This effort was in cooperation with the oil and gas industry. The sites chosen for the study were selected because they were points where NORM was expected to occur; the sites were not selected randomly. All six oil and gas districts in the state were sampled in this study. Four hundred seventy-five radiation measurements were taken in 70 oil and gas fields. Besides gamma radiation meter readings, 124 samples of pipe scale, produced water, tank bottoms and soil were collected and analyzed by the Sanitation and Radiation Laboratory of the Department of Health Services to assess the actual concentrations and radionuclides present.

The results of the study indicate that NORM is not a serious problem in California oil and gas production facilities - confirming the findings found in an earlier survey (1987). In the 1987 survey, seventy-eight percent of the measurements were at background levels. A few sites had elevated levels of NORM. Further, studies of those sites should be considered. Routine protective measures may be all that

is necessary to minimize exposure to radiation in these particular areas. The survey results and laboratory analyses are reported in: *A Study of NORM Associated with Oil and Gas Production Operations in California*. The report was issued by:

Department of Health Services
Radiological Health Branch
and
Department of Conservation
Division of Oil, Gas and
Geothermal Resources

Elevated levels of NORM were found in material from some of the production facilities. The NORM was found in water filters and softeners, gas processing equipment, pipe scale, and tank bottoms. However, these elevated levels were not high enough to be of immediate health concern.

Copies of the report are available from:

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A summary of the report recommendations was in the Fall 96 issue of *The NORM Report*.

Promulgation of NORM regulations in California is a low priority at present. However, it is expected that California will enact NORM regulations sometime later.

In February 2002, environmental activists sponsored four new California Senate and Assembly bills that seek to overturn existing Federal and State regulations governing the control of radioactive materials in the State of California. These bills will have a major impact on all radioactive material users in California.

The bills are based on radiation paranoia, and are designed to eliminate all use of radioactive materials by industry, medicine and academia in the State of California.

Existing regulations ensure the safe cleanup of contaminated sites using a well established process and well established cleanup standards.

Existing regulations ensure that disposal of waste in the State of California will not result in a significant contamination of the environment.

The proposed bills seek to usurp existing regulations that are based on sound science and fully protect the public from risk of exposure to radiation.

Access to the proposed bills can be obtained through

www.leginfo.ca.gov/bilinfo.html

COLORADO

There are no specific rules for the disposal of NORM in Colorado. NORM is treated like any other radioactive material. Part 18 of the Colorado Rules and Regulations Pertaining to Radiation Control (milling of uranium and thorium)

(Continued on page 4)

COLORADO (continued)

has been updated to conform to Criteria 6(6) of 10 CFR 40, Appendix A (benchmark dose criteria). A specific provision has been added that prohibits any material being disposed in a tailing impoundment that would prevent the transfer of that impoundment to DOE upon termination of the license.

Colorado does have a solid waste regulation that says sewage sludge must be below 40 picocuries per gram gross alpha activity before it can be sent to a landfill or otherwise "free released." The state is working on guidance for water treatment facilities that must extract radionuclides to comply with the CWA.

However, in April, the Governor of Colorado signed a bill addressing disposal of radioactive waste in Colorado. The final language of the bill creates a category of radioactive waste called "classified waste." It requires transcripts of 2 public hearings and an environmental assessment to be considered by the State Health Department in their review of applications for disposal of classified waste (aimed primarily at a uranium mill that is interested in some TENORM/FUSRAP/similar materials for direct disposal or reprocessing). The bill does not address material for reprocessing, just direct disposal. Suffice it to say that citizen outrage prompted the drafting and passage of this bill in just three weeks.

There is no specific NORM regulatory activity in Colorado at this

time.

CONNECTICUT

Connecticut now has an approved radiation limit for decommissioned facilities of 19 millirem per year above background. Although specifically addressed to decommissioned facilities, by inference it applies to any radioactive material, by-product or NORM.

The 19 mrem/yr is based on Connecticut's specific adjustments to standard EPA/NRC modeling and to current technology for making radiation measurements in the field.

Starting with the 19 annual millirem limit, one can calculate back to determine exempt count rates for specific isotopes and field conditions using field survey equipment.

Using *Guidelines for Disposal of Drinking Water Wastes Containing Radioactivity* (U.S. Environmental Protection Agency draft, June 1994) and Nuclear Regulatory Commission limits for the release of licensed material, the Connecticut Department of Environmental Protection put together its first guidelines for an actual water treatment facility. The 19 millirem/yr limit will also be used in developing guidelines for water treatment and other facilities, giving case-by-case guidance. Simply put, the guidance will be to apply NRC discharge limits above background radioactivity. EPA Region 1 has given preliminary concurrence on this interpretation of EPA's Draft guidance. The thinking on this — "If it came from the

ground and nothing was done to enhance it, it can go back into the ground."

Although an EPA Region 1 health physicist agreed with the proposed scenario that "there is no radiological concern if it came from the ground, it could be returned to the ground if there had been no technical enhancement." However, an EPA expert on Underground Injection Controls (UIC) stated that the Clean Water Act amendments in its later revision, allows the injection of only water that meets federal drinking water standards. This would seem to exclude the return to the environment of any water treatment residue (salts from water softeners, filter backflush, etc.).

DELAWARE

There are no specific regulations for NORM in Delaware. NORM, NARM and other radioactive materials are considered to be covered in the general regulations for the control of radiation enacted in 1993. A revision of the general regulations became effective September 1, 1995. The revision tightened the compliance aspect of the regulations. NORM is considered to be covered in Sections C and D, Radioactive Materials, in the regulations.

The Radiation Control Regulations are being considered for further revision, particularly Parts H and K. The revisions are at least six months to a year away.

NORM contamination appears to

(Continued on page 5)

DELAWARE (continued)

be minimal in the state. Occasionally a call is received from a salvage yard or steel mill reporting that their gate radiation monitors had detected gamma radiation above background on a load of scrap metal.

FLORIDA

In addition to following up on post 9/11 security, the Florida Department of Health, Bureau of Radiation Control continues to devote staff resources to research the scope of the state's TENORM issues to support its evaluation of appropriate regulatory approaches. Its recent focus has been on the state's heavy mineral sands industry. Two facilities located in the northeast part of the state generate source material as a result of their separation of economic minerals from ancient beach sand deposits. The state is working with the industry to improve their radiation protection programs to address the radiological hazards associated with both the source material and the TENORM progeny present at the sites.

Florida does regulate gyp stacks requiring stacks to be lined with geomembrane liners and capped with a soil cover. The idea is to mitigate leachate release into the underlying Floridian Aquifer emanating from the stack.

GEORGIA

Georgia's regulations for the control of NORM became effective in October 1994. There have been no changes in the rules since. Revisions to the general rules and

regulations for the control of radiation became effective May 6, 1997.

Georgia recently again revised several of their radiation rules. Following Board approval at their February meeting, the revisions became effective April 18, 2002. No substantive changes were made in Georgia's NORM rule (**391-3-17-.08 REGULATION AND LICENSING OF NATURALLY-OCCURRING RADIOACTIVE MATERIALS (NORM).**)

The following describes the "clean-up" revisions. The Rule is amended as follows: typographical errors are corrected in .08(7)(c)l. and 2. correcting the abbreviation for the word "gram" from "gm" to "g"; and correcting the typographical error in .08(15)(a)5.(i) from Title "II" to Title "11".

HAWAII

Hawaii's current rule on radiation, Chapter 11-45, will be updated in 2003, but NORM will probably not be included in the update. NORM problems that do arise meanwhile can be handled on a case-by-case basis under the general radiation regulations.

Hawaii does not now have any particular problems with NORM. Although Hawaii does not have petroleum production, it does have geothermal wells on the big island. Possible NORM contamination in these geothermal wells has not been addressed.

There is also some concern about radioactivity and radiation contamination in the state's military posts

and bases, including old radium gauges and instruments. Additionally, there may be some NORM associated with the dry dock activities in the state.

IDAHO

Idaho has no regulations specific to the control of NORM. There are general statutory and regulatory provisions in the existing Idaho law giving the Department of Environmental Quality authority to address problems with NORM should they arise.

The Department of Environmental Quality has drafted regulations with respect to the **DISPOSAL** of rad wastes not regulated by the NRC, such as **NORM/TENORM**. These rules have been adopted by the Idaho Legislature and are now in effect. Also the states commercial haz waste disposal facility, US Ecology, has a Part B HWMA permit that has been modified to provide for additional permit conditions regarding the acceptance of FUSRAP and NORM wastes.

ILLINOIS

In June 2001 a draft of the Illinois TENORM regulations was sent to the Illinois Department of Nuclear Safety (IDNS) staff for comment.

The draft of the Illinois TENORM regulations will be revised as soon as the latest draft of the the Conference of Radiation Control Program Directors, Inc. (CRCPD) model rule (SSRCR Part N TENORM) by the CRCPD's SR-5 Working Group is approved by the CRCPD Board of Directors.

(Continued on page 6)

ILLINOIS (continued)

At this time it is expected that the Illinois draft rules will be presented to stakeholder meetings this fall. The Illinois TENORM regulations will be summarized in **The NORM Report** when available.

INDIANA

No new regulations for the control of NORM have been enacted or proposed in Indiana. There have been incidents involving NORM — contaminated materials in scrap yards, etc. It is expected there may be a need for NORM regulations sometime later.

IOWA

Iowa does not have specific regulations for the control of NORM. The Iowa general regulations for radiation control are assumed to cover NORM and are used when NORM problems arise. Most of the NORM problems in Iowa involve NORM contaminated metal sent to scrap recyclers.

KANSAS

Regulations for the separate and specific control of NORM have not been proposed in Kansas. Regulations for the control of all radioactive materials in Kansas implicitly include NORM. NORM problems that do arise are handled on a case-by-case basis, taking into consideration radiation exposures to the public and workers.

Kansas regulators have been working closely with the scrap industry, but there is no indication of probable legislation concerning NORM issues.

KENTUCKY

The Kentucky Department of Environmental Protection continues to work on a satisfactory long term disposal site for NORM. Meanwhile, remediation activities in the Martha Oilfield are proceeding gradually and continually towards the final phases of the cleanup of the field. Remediated materials are being stored in a temporary site pending the resolution of discussions on long term storage.

When the public clamor over the contamination of the Martha Oilfield dies down, consideration will be given to promulgating NORM regulations.

LOUISIANA

Following the adoption of the first state regulations for the control of NORM, Louisiana's revised NORM regulations became effective January 20, 1995. A draft of an *Implementation Manual for Management of NORM in Louisiana* was released in September, 1995. The Table of Contents of this manual was given in the Fall 95 issue of *The NORM Report*.

The introduction to the Implementation Manual states "On January 20, 1995, the revised NORM regulations (LAC 33:XV. Chapter 14) became effective. This revised Implementation Manual reflects the changes and revisions which were made. It also includes the Radiation Protection Division's position on certain NORM issues that are not specifically addressed in the NORM regulations." The final edition of the NORM

Implementation Manual is being prepared, but it may be some time before it is completed.

There have been no changes or revisions in the Louisiana NORM regulations since 1995 and none are planned.

Chem Waste has received approval for the disposal of NORM wastes containing up to 150 pCi/gm.

US Liquid sites in Louisiana can receive wastes containing less than 30 pCi/gm.

The number of P&A disposal wells has increased in Louisiana probably due to the high costs of NORM waste disposal.

There is one commercial facility operated by Phillips Services. It is allowed to operate as a commercial facility because during the incineration process used the NORM is diluted. It is required that the incinerator wastes be disposed as incinerator RCRA waste. As long as the NORM wastes contain less than 30 pCi/gm the Department is not concerned about it from a regulatory point.

Chevron has a NORM injection well for their own wastes from a specific cleaning area (that is, a non-commercial facility.) Chevron was refused permission to bring NORM wastes from Chevron facilities in Mississippi for disposal in their Louisiana injection well.

Meetings have been held with the Hazardous Waste Division to dis-

(Continued on page 7)

LOUISIANA (continued)

cuss the disposal of NORM contaminated mixed wastes in a hazardous waste landfill. One problem is that the hazardous waste disposal regulations in Louisiana prohibit the disposal of RCRA hazardous wastes containing NORM in a hazardous waste landfill.

The Louisiana regulations are based upon federal regulations. There has been some contact with the EPA in an attempt to determine the intent of the federal regulations. Knowing the intent of the federal regulations may suggest some options which can be used for the disposal of the hazardous wastes containing small concentrations of NORM. The federal regulations do allow some radioactivity, e.g., cesium-137, in the wastes to be disposed of in a hazardous waste landfill. Up to 100 picocuries cesium per gram can be disposed of this way.

MAINE

Maine has proposed a rule revising their adopted Part N to bring it into agreement with the current CRCPD Part N Suggested State Regulations for the Control of NORM which is currently before the CRCPD Board of Directors for approval. The public comment period for the Maine proposed rule ended at the end of February. Following confirmation that the proposed rule is acceptable, the rule becomes effective August 1, 2002.

Maine does have NORM - contaminated water treatment wastes. Many water supplies in Maine contain significant concentrations of

radium, radon and uranium. Ion exchange resins used in water treatment can become "hot" with radium and uranium. Carbon filters used to remove radon from water become contaminated with the radon decay products, i.e., radioactive lead, bismuth and polonium.

The recent National Academy of Science report (*Risk Assessment of Exposure of Radon in Drinking Water, 1998*) and EPA's imminent adoption of radon in water MCL will mandate the state adopt water treatment wastes regulations.

MARYLAND

Maryland has no specific regulations for the control of NORM. NORM is handled under the general radiation regulations. These general regulations were revised to bring the rules into line with 10 CFR 20 as well as making other changes deemed advisable. The revisions became effective October 9, 1995.

MASSACHUSETTS

Massachusetts does not have specific regulations for the control of NORM. NORM is considered to be a subset of NARM and NARM is considered to be regulated by the Massachusetts general radiation regulations.

The amended general radiation regulations became effective July 9, 1999.

MICHIGAN

There have been no significant changes in the Michigan guidance documents for the control of NORM and although none are

planned for the immediate future, the CRCPD's Part N is being closely followed to determine if it should be the basis for future NORM regulations in Michigan.

Michigan continues to work with the oil and gas industry sites to identify and control NORM, and they continue to provide assistance in determining cost-effective means for disposal of NORM-contaminated soils and equipment. The scrap metal industry in Michigan is particularly concerned about receiving radioactively contaminated metals, including NORM-contaminated metals.

The cleanup and disposal guidelines that are being used in Michigan have been updated with respect to references to applicable state laws and improved ties to federal MARSSIM guides. That is, some regulatory and technical updates have been made, but there have been no really substantial changes to the present guidelines.

There have been some successful remediations at several oil and gas facilities that had slightly contaminated soils. The contaminated soils were sent to solid waste landfills in Michigan. The Michigan guidelines for disposal in type 2 municipal solid waste landfill allow up to 50 pCi/gm radium-226 to be disposed. This can be a large cost saving. Analysis has shown that this level shows an insignificant risk to the public.

Michigan is resurveying many sites for NORM contamination. The

(Continued on page 8)

MICHIGAN (continued)

original surveys had been made in the early 90s. The resurveys show that, generally, oil and gas sites which showed NORM contamination in the earlier surveys showed even greater contamination in the present study. For example, radiation readings of 18 milliroentgens per hour (18,000 microroentgens per hour) were seen at a gas separator and radioactivity levels of radium-226 as high as 150,000 to 200,000 pCi/g are seen in oil and gas facilities.

NORM levels in paper mills in Michigan have been reported at concentrations at just over 800 pCi/g.

MINNESOTA

Minnesota has no regulations for the specific control of NORM; it has regulations for devices that use discrete NARM (e.g. radium-226) as a source of radiation.

One landfill in Minnesota has been permitted to receive NORM wastes. The level of NORM which will be accepted at the landfills has not been determined.

Concern about NORM is increasing as more people learn about NORM contamination. One problem that has arisen is the zircon sands left when foundries go out of business. Allowing these NORM wastes to be disposed in a landfill will make the disposal easier.

In 1998, the Minnesota Department of Health began the process to become an Agreement State with the U.S. Nuclear Regulatory

Commission. Minnesota hopes to become an Agreement State in August 2003.

MISSISSIPPI

Responsibility for NORM in Mississippi is currently divided between the Department of Health and the Oil and Gas Board. The Oil and Gas Board was to have authority for NORM at the wellsite (effective July 1, 1995). After the petroleum leaves the wellsite the Department of Health was to have jurisdiction for any NORM contamination.

However, the Mississippi legislature enacted legislation that gave the Oil and Gas Board jurisdiction over all oil and gas wastes. However, the *Mississippi State Board of Health Regulations for Control of Radiation, Section 801.N* is still in effect. The Division of Radiological Health continues to process licenses from contractors for NORM decontamination at industrial facilities. The attorney for the Department of Health believes that any commercial remediation, etc. will still have to be licensed by the Department.

Although the jurisdictional conflict involving the Department of Health and the Oil and Gas Board has not been completely resolved, it has been smoothed out to a degree. If the NORM wastes are generated by E & P activities, it is assumed to be under the jurisdiction of the Oil and Gas Board. If the dosage from the NORM reaches a certain level, the Department of Health assumes jurisdiction. The Department of Health does not appear to be dis-

puting this. The Oil and Gas Board has assumed jurisdiction for about 99% of NORM associated with oil and gas.

On August 11, 1995, the Oil and Gas Board issued a proposed **Rule 69: Control of Oil Field NORM**. The rule provides the regulations for the control of oil field NORM to ensure that radiation exposures of workers and members of the general public are negligible. The rule applies to NORM that has been derived from the exploration and production activities of oil and gas operations within Mississippi.

Revisions made to Rule 69 at the public hearing in August 1995 were summarized in the Winter 96 issue of **The NORM Report**.

Rule 69 was appealed to the Mississippi State Supreme Court where it was decided in favor of the Oil and Gas Board.

Rule 69 has been implemented. Oil and gas operators have conducted NORM surveys on all their properties. Over 1,500 survey data have been entered in a computer. The data will be analyzed to determine how many sites are over a selected concentration level of NORM contamination.

The Oil and Gas Board received a petition to amend statewide Rule 68. **Rule 68, Disposal of Naturally Occurring Radioactive Materials (NORM) Associated with the Exploration and Production of Oil and Gas** became effective in September 1994. The petition

(Continued on page 9)

MISSISSIPPI (continued)

which was received from the US Oil & Gas Association, Alabama/Mississippi Division asks the Oil and Gas Board to authorize the surface and subsurface landspreading of Naturally Occurring Radioactive Materials (NORM) associated with the exploration and production of oil and gas. The original Rule 68 did not authorize landspreading as a method of NORM disposal.

Special hearings were held before the Oil and Gas Board commencing on August 18, 1999. At a hearing held September 15, 1999 arguments and closing statements were heard.

(Editor's Note: Some of the Oil and Gas Board's thinking on the revisions to Rule 68 to allow landspreading were discussed in the Volume VII, No. 2 issue of **The NORM Report**.)

The Board found that the maximum radiation levels in the proposed amendments which would authorize the surface and subsurface landspreading of NORM E&P oilfield wastes, are significantly more restrictive than the radiation levels contained in **Statewide Rule 69: Control of Oil Field NORM** which was approved by the Mississippi State Oil and Gas Board and became effective June 1, 1996, and which has recently been upheld on appeal by the Chancery Court of the First Judicial District of Hinds County, Mississippi. The Board found that existing Statewide Rule 69, among other things, prescribes standards for the

cleanup or remediation of property containing NORM E&P oilfield wastes. The Board noted that property for unrestricted use could have a maximum ambient exposure rate of 50 microrem per hour which is equivalent to concentrations of thirty (30) picocuries per gram. The Board's own expert, Dr. Vern Rogers, previously testified during the hearing on Statewide Rule 69, that this maximum soil concentration would result in no demonstrable health and safety impact on the residents of the State of Mississippi. The Board found that the proposed amendments to Statewide Rule 68, which were before the Board would allow the surface and subsurface landspreading of NORM E&P oilfield wastes only where the maximum NORM concentrations do not exceed five (5) picocuries per gram. The Board found that the proposed landspreading amendments to Statewide Rule 68 contain maximum NORM concentrations which are six (6) times more conservative than the NORM concentrations prescribed in existing Statewide Rule 69. In addition, the Board found that the maximum radiation exposure rate of 40 millirem per year, as proposed is fully supported by the overwhelming weight of the credible scientific testimony as being safe and fully protective of both human health and the environment.

The Board stated that in developing the landspreading rules, it had been the objective of the Board to develop rules which are sufficiently protective of oilfield workers, the general public and the environment,

which do not conflict with existing state or federal regulations, which are technically sound, and which are implementable by those subject to their provisions. The Board was of the opinion and found that the landspreading rules being adopted fully meet all these objectives.

The Board found however, after careful evaluation, that a number of additional revisions should be incorporated into the proposed landspreading amendments to Statewide Rule 68 which differ significantly from the rule as originally proposed. These additional revisions were also summarized in the Volume VII, No.2 issue of **The NORM Report**.

The effective date of the amended Rule 68 was January 19, 2000. Subsequently, an appeal of Rule 68 was filed in Lincoln County but was dismissed by the courts.

MISSOURI

There are no specific NORM regulations in Missouri and none are planned. Occurrences of NORM problems are handled under the state's general regulations for the control of radiation.

MONTANA

There have been no new developments applicable to NORM regulations in Montana. The regulations for the control of radiation have not been revised since 1980 and NORM is not considered to be included in these general radiation regulations. The Montana Department of Health and Environmental Sciences does have the statutory authority for NORM
(Continued on page 10)

MONTANA (continued)

regulations, but there is no funded program for their development.

NEBRASKA

There has been no change in the status of NORM regulations in Nebraska. The state believes NORM is included in their general rules for the control of radiation. There are no plans for specific NORM rules.

Like many other states, Nebraska receives comments and questions from recyclers. Some of these recyclers have "requested" NORM rules so they can use NORM limits, e.g., 50 microrem/hr, to know when they can refuse or accept contaminated scrap.

NEVADA

Nevada has no specific NORM regulations and none have been proposed. Comprehensive statutes for the control of radiation address NORM and NARM similarly.

NEW HAMPSHIRE

New Hampshire considers NORM to be a subset of NARM and the state has always regulated NARM in the same manner as the Agreement State materials (e.g. by-product, source, and special nuclear material). New Hampshire has reviewed "Part N", the Suggested State Regulations for the Control of NORM as published by the Conference of Radiation Control Program Directors, Inc. (CRCPD), and has begun draft rulemaking for regulation of TENORM (Technically Enhanced NORM) sources.

New Hampshire has significant quantities of radionuclides in drinking water. Treatment of the New Hampshire water supplies often results in resins and filters containing high concentrations of radium, uranium and radon decay products. Regulation and disposal of these water treatment wastes are issues currently being discussed by the state's Health Department and Environmental Department.

NEW JERSEY

New Jersey is in the process of revising part of its regulations, including those involving TENORM. TENORM is defined in N.J.A.C. 7:28-12.3 as any naturally occurring radioactive material whose radionuclide concentrations or potential for human exposure have been increased by any human activity. The Department has had a policy regarding the cleanup of contaminated sites such that any discharge to a sewage treatment plant must meet the New Jersey Groundwater Quality Standards. These standards are the same as the US EPA drinking water standards. This policy is being codified into our regulations at N.J.A.C. 7:28-11 "Disposal by release into sanitary sewerage systems".

Also, the Commission on Radiation Protection is considering revising N.J.A.C. 7:28-4.3 "Exemption from requirement for a license for manufacture, production, transfer, distribution or arrangement of distribution, sale, lease, bail, receipt, acquisition, ownership, possession or use of all naturally occurring and accelerator produced radioactive materials". Currently the rule

exempts NORM of an equivalent specific radioactivity not exceeding that of natural potassium (10^{-9} Ci/g). The exemption language being considered would exempt the following:

1.) NORM occurring in natural abundance and which are not technologically enhanced NORM, whether intentionally or unintentionally,

2.) Persons who receive, own, possess, use, process, transfer, distribute, or dispose of TENORM if the materials contain any combination of radium-226 and radium-228 at concentrations less than or equal to 5 pCi/g (dry weight) and a total volume of less than 50 cubic yards.

3.) Radon gas that is being expelled to the outside atmosphere as part of a radon remediation system.

4.) Sewage sludge which may contain elevated concentrations of NORM from the partitioning process which is the outcome of normal operations of the sewage treatment plant. Beneficial re-use of such sludge may be subject to other restrictions as determined by the Department.

The proposal is expected to be published in the New Jersey register in December, 2002. Interested persons may contact Jenny Goodman at (609) 984-5498 or jenny.goodman@dep.state.nj.us.

Soil Remediation Standards for Radioactive Materials, N.J.A.C. 7:28-12, was adopted on August 7, 2000. The response to the comment document, final rule, guidance manual on characterization and

(Continued on page 11)

NEW JERSEY (continued)

final status surveys, and the spreadsheet used to implement the standards are all available on the Radiation Protection Program's website:

<http://www.state.nj.us/dep/rpp/index.html>

New Jersey has about 10 sites that are in some stage of cleanup. Most are using all or part of the rule for the cleanup levels and MARSSIM to implement final status surveys.

NEW MEXICO

The New Mexico NORM regulations, *Subpart 14: Naturally Occurring Radioactive Materials (NORM) in the Oil and Gas Industry* became effective August 3, 1995.

Rule 714, Disposal and Transfer of Regulated NORM for Disposal provides the regulatory framework for the disposal options addressed in the Part 14 NORM regulations. Rule 714 became effective July 15, 1996. Rule 714 was summarized in the Summer 96 issue of **The NORM Report**.

The guideline document draft for use with the NORM regulations (Appendix A of the regulations) is also available. The guide is entitled *Appendix A: Regulation Guidelines for the Management of NORM in the Oil and Gas Industry in New Mexico*. The purpose of the document is to provide guidance to persons involved with facilities or equipment associated with the production of oil and gas and how to conduct screening surveys with portable radiation detectors to identify NORM and to initiate determination of needed radia-

tion protection controls. The guide is intended for individuals licensed by the New Mexico Environment Department and permitted by the New Mexico Oil Conservation Division. The document is intended to assist general and specific licensees in the proper use, transfer, transport, storage and disposal of regulated NORM.

The guide describes the type and extent of information needed by the New Mexico Radiation Licensing and Registration Section staff to evaluate an application for a specific license for authorization to perform commercial services involving NORM contamination.

The guide is for general guidance in preparation of the license application and should not be considered as all the information that may be required for a particular application. Nor is it a substitute for the applicant's safety evaluation of the proposed activity. The applicant must ensure that the application correctly and adequately describes the commercial services offered, and the radiation safety measures and procedures to be followed to provide adequate protection. For this guide, decontamination means deliberate operations to reduce or remove residual NORM contamination from equipment, facilities or land.

Copies of the State of New Mexico Radiation Protection Regulations (including the NORM rules), can be downloaded from the Department's website at

www.nmenv.state.nm.us

The official title of the regulations

is 20 NMAC 3.1.

New Mexico also has an advisory which may be of interest. The advisory is entitled **TIMELY DISPOSAL AND DECOMMISSIONING ADVISORY: NEW REGULATIONS THAT REQUIRE TIMELY DISPOSAL OF RADIOACTIVE MATERIALS THAT ARE NO LONGER IN USE**

In recent years, Section 318 of the New Mexico Radiation Protection Regulations (NMRPR) [20.3 NMAC] pertaining to timeliness in the decommissioning of facilities were extended to include timely disposal of unused radioactive materials in compatibility with changes to the regulations of the Nuclear Regulatory Commission.

Some licensees have been advised in the past by this Bureau that they should dispose of unused material, however no enforcement was taken upon declination of the licensee. This will no longer be the case. Licensees receiving past advisories by this Bureau to begin decommissioning and/or dispose of unused radioactive material, and are still in possession of such material, must make disposal arrangements as soon as possible. Also, future directives to dispose of unused material or to begin timely decommissioning must be acted upon promptly.

When licensed activities have not been conducted for a period of 24 months at a particular location that contains residual radioactive material (or radioactivity), or if a licensee decides to cease licensed

(Continued on page 12)

NEW MEXICO (continued)

activities in a particular building or an entire site, the licensee must notify the Department of this and either begin decommissioning or submit a decommissioning plan.

Similarly, when a licensee possesses radioactive material that has not been used for a period of 24 months, or radioactive waste that has not been accessed (e.g., to add more waste to an unfilled container) for a period of 24 months, the Department considers these materials as "unused" and/or unneeded, therefore requiring disposition.

There are several reasons for these requirements, but the most important one is to prevent companies from keeping unused material (or contamination) until disposal becomes prohibitively expensive or even impossible, and presents a liability to the state. Also, unused material presents a particular hazard because it is far more likely to be involved in incidents of loss of control or illegal disposal. Finally, material in storage would present an inordinate opportunity for certain persons to use such material in the performance of various criminal or terrorist activities.

NEW YORK

On July 31, 2000, the New York State Department of Environmental Conservation amended the Department's **Rules and Regulations for Prevention and Control of Environmental Pollution by Radioactive Materials** (6 NYCRR Part 380), which control the disposal of radioactive materials and radioac-

tive wastes in this State. The amendment was promulgated as an emergency rule (effective July 31, 2000) and added a new category of radioactive waste to those radioactive wastes that are regulated under Part 380. These radioactive wastes may not be accepted for disposal at a facility regulated under the provisions of the State's solid waste management regulation, 6 NYCRR Part 360 (Part 360). The full text of the amended Part 380 is available on the Department's website at www.dec.state.ny.us/website/regs/380.htm.

Type of Radioactive Wastes Affected

This regulation affects radioactive wastes that were produced when ores were processed to extract uranium and thorium before November 11, 1978. (Similar wastes produced after that date are regulated by the US Nuclear Regulatory Commission.) Uranium and thorium are both naturally occurring radioactive materials, and the ores in which they are found contain other radioactive elements that are produced by the radioactive decay of the uranium and thorium. When the ores are processed to remove the uranium and thorium, the resulting waste products can contain high concentrations of these radioactive materials. These wastes have been considered by some to be NORM wastes that were heretofore unregulated. Often, the buildings and lands where the ores were processed became contaminated with these radioactive wastes.

Typical Waste Forms Excluded from Landfills by this Amendment

Cleanup of these sites usually involves removing contaminated

soil. In addition, buildings and other structures often must be demolished. These result in waste soils and demolition debris. Some of these wastes are not contaminated with radioactive material and their disposal is regulated as solid waste under Part 360. However, some wastes will contain radioactive uranium, thorium, and their decay products at concentrations greater than what normally is found in those wastes due to naturally occurring radioactive materials. Under this amendment, those wastes are radioactive wastes and cannot be accepted at landfills in New York State.

Rulemaking Process

The Part 380 amendment became effective as a final rule on February 2, 2002.

The Department had received some negative responses from several corporations but also received positive responses from other groups.

New York continues to have problems with radiation alarms being set off at landfills.

NORTH CAROLINA

Nothing presently is being proposed for NORM regulations for North Carolina. The state recognizes that NORM is an issue that may need further attention, particularly in scrap metal yards. The state is also aware that there are North Carolina industries that generate NORM wastes, such as the phosphate industry, waste water treatment sludge, and metal mining and processing wastes. For the pre-

(Continued on page 13)

NORTH CAROLINA (continued)

sent, North Carolina remains committed to interacting with industry, Federal and state agencies and providing assistance in resolving disposition of NORM wastes.

North Carolina is considering ways to standardize its methods of responding to incidents involving NORM/TENORM. Examples of such incidents include scrapyard/landfill portal monitor trips and mine refuse/industrial waste disposal. It can take an excessive amount of time to investigate each portal monitor trip and similar incidents at landfills and scrapyards. The state cannot afford to send a health physicist or other technical staff to each facility requesting assistance. At one end an agency could act as a free health physics consultant and guide them through every step in disposing of the NORM, or at the other extreme, fax the facility a list of available qualified consultants and coordinate things from the office.

NORTH DAKOTA

North Dakota does not have specific regulations for the control of NORM. The state is currently revising their Radiation Control Regulations, but no changes are expected with respect to NORM.

OHIO

The revised Ohio regulations for the control of radiation, including NORM and NARM, were summarized in the Spring 97 issue of The NORM Report. The regulations were revised to agree with the federal regulations as an initial step in Ohio's application to become an

Agreement State. The Agreement State status became effective August 31, 1999.

It is probable that more specific NORM regulations will be necessary within the next 12 to 18 months.

OKLAHOMA

Oklahoma has no specific regulations for the control of NORM contamination. The draft of NORM regulations prepared by the Department of Environmental Quality's Radiation Management Advisory Council was tabled indefinitely at the request of the state legislature.

Oklahoma became an Agreement State effective September 29, 2000.

In the aftermath of 9/11, radioactive materials licensees, especially Agreement State licensees, are being encouraged to review their security measures.

OREGON

There are no new developments regarding NORM regulations in Oregon.

Oregon has NORM regulations entitled *Regulation and Licensing of Naturally Occurring Radioactive Materials (NORM)*.

The rules that became effective in January 1990 are found in the Oregon Administration Rules, Chapter 333, Division 117 - Health Division. The Oregon NORM rules were summarized in the Winter 96 issue of **The NORM Report**.

A few comments may be helpful in evaluating the impact of NORM regulations in Oregon: "NORM is regulated in Oregon in order to lower the risk to the public by properly using and disposing of NORM from large quantity users. Typically, disposal is to Oregon Department of Environmental Quality (DEQ) permitted landfills and less than ten large foundries or rare mineral extraction NORM/TENORM licenses are active in any year in Oregon." (This includes two large Broad Scope A - Industrial licensees.)

PENNSYLVANIA

All radioactive materials including NORM are addressed in Pennsylvania's general radiation regulations. At present there are no specific NORM regulations.

A draft of solid waste regulations has been prepared by the Bureau of Radiation Protection and the Bureau of Land Recycling and Waste Management. This started as guidance about five years ago and has evolved to codify the essential elements so that now all the 300 landfills, transfer stations and resource recovery facilities (e.g. incinerators) will be required to monitor for radiation.

Maximum performance standards (alarm set points, etc.) and best management practices were set out in the regulations and guidance. That is, what can and what can't be accepted in a solid waste facility. Some 95% of the radioactive materials being disposed of in the landfills are short-lived nuclides, e.g.

(Continued on page 14)

PENNSYLVANIA (continued)

from nuclear medicine facilities. But, occasionally the landfills do receive some NORM waste, and it is expected that when the northwest counties of the state, where there is an oil and gas industry, start installing monitors many more instances of NORM will be seen.

Particularly noteworthy in these regulations and guidance is that if an alarm goes off because of cover materials taken from an undisturbed environment being taken to a landfill, the materials are exempt from the regulations. That is, if there is no enhancement of the radioactivity, the materials are exempt.

If there is TENORM, i.e., technically enhanced NORM, a small quantity can be accepted by the landfills* if certain conditions are met. One cubic meter of material can be accepted without further approvals if the material contains less than 5 picocuries radium per gram, and the dose rate is less than 50 microrem/hour. Approval to accept other materials in the landfills will be handled on a case-by-case basis. The set point for the gate radiation monitors is 10 microRem/hour above background.

The title of Document Number:250-3100-001 is: *Final Guidance Document on Radioactivity Monitoring at Solid Waste Processing and Disposal Facilities*. Effective date: Sept. 16, 2000.

Now over the next two years, the 300 landfills must submit action

plans, install radiation monitoring equipment, developing procedures, training staffs, etc.

Nine out of ten radioactive wastes sent to landfills in Pennsylvania are short-lived radioactivities from medical wastes. The landfills will either need multichannel analyzers and the expertise to interpret the results or hire a consultant to separate the TENORM from the medical wastes. The medical wastes will be allowed to be disposed of in the landfill while the TENORM must meet the requirements above to be accepted by the landfill.

Pennsylvania is a major state for the disposal of solid wastes from most of the states bordering Pennsylvania.

The Comment/Response Document entitled *Report to the Environmental Quality Board on the Proposed Guidance Document on Radioactivity Monitoring at Municipal and Residual Waste Processing and Disposal Facilities* can be downloaded from: http://www.dep.state.pa.us/dep/subject/Rec_Final_Technical_guidance/Rec_Final_Technical_guidance.htm (The document is at the bottom of the table.)

A copy of the document may also be available from:

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At a recent meeting of ISCORS (see the NRC section later in this newsletter), Dave Allard addressed the question of why the regulations and guidance were needed. He said one reason was because landfill alarms were being tripped by radioactively contaminated waste from medical treatments, even though such disposal was legal. Staff has to respond to these alarms, which expends resources. The issue is complicated by the fact that those landfills which have installed radiation monitors have different alarm set points and sensitivities. On a national basis, different regulations exist related to the deregulated and exempt radioactive materials that may trip an alarm. It appears that solid waste facilities have been installing monitors (without mandate) for the following reasons: to protect their image and legal interests; because current state permit conditions prohibit acceptance of "radioactivity"; to avoid cleanup cost if contamination is discovered; to reassure citizens; and concern for illegal disposal of low level radioactive waste.

He went on to say that the expected result of these new regulations and guidance is that: all Pennsylvania solid waste facilities will have to install radiation detection equipment, develop site-specific action plans, and respond to alarms. Sources of radioactivity commonly encountered by landfills were described, most of which originate from nuclear medicine procedures and consumer products. Naturally occurring radioactive material (NORM) or technologically

(Continued on page 15)

PENNSYLVANIA (continued)

enhanced NORM (TENORM) is also detected, as well as lost radium or byproduct material sealed sources.

As to the objectives of regulations and guidance, the state's motivation is to protect the public, workers, and the environment from unnecessary radiological impact. Also, solid waste facilities would be protected from contamination and subsequent costly remediation (e.g., incineration). Other benefits would be to prevent unlawful low level radioactive waste disposal; to assist facilities in complying with regulations; and conserve state resources by reducing unnecessary response activity. A set of basic regulatory limitations pertaining to the processing of prohibited radioactive materials such as specifically licensed naturally occurring or accelerator produced material (NARM), low level waste, and byproduct, source, special nuclear, and transuranic materials was outlined. There are also limitations on radioactive materials which cannot be processed unless approved by the state, such as short-lived materials from medical treatment, TENORM, and consumer products.

The actual regulations with alarm set points and general guidance is available, as well as a Consumer Fact Sheet. Contained in the guidance is information on developing action plans, detection and initial response, monitoring equipment, characterization, determining origin, disposition, disposal options, and records and notification. This

information is available on the Department of Environmental Protection web site.

David Allard has prepared a survey questionnaire for distribution to the states to determine the extent of radioactive materials being allowed into landfills around the country. The result of the survey will be reported in a future issue of **The NORM Report**.

RHODE ISLAND

Rhode Island has no specific regulations for the control of NORM and none are in the planning stage. NORM is considered to be covered under the state's general radiation control regulations.

SOUTH CAROLINA

Part IX -- Licensing of Naturally Occurring Radioactive Material (NORM) became effective June 30, 1995 in South Carolina. There have been no changes in the regulations and none are proposed. Part IX was summarized in the Summer 95 issue of **The NORM Report**.

SOUTH DAKOTA

South Dakota has regulations for the control of radiation, but nothing specific to NORM. No legislation has been proposed to regulate NORM.

TENNESSEE

NORM contamination in Tennessee is handled like any other radioactive material. If it is enhanced above background levels, an assessment is made to determine if it constitutes a problem. If it does, it is dealt with similarly to any other radioactive material, i.e.,

by using the general radiation regulations. There are no specific regulations for the control of NORM and none are planned. It appears that as more people learn about NORM, more instances of NORM contamination are being reported.

TEXAS

The Texas Department of Health has jurisdiction for NORM except for the disposal of NORM contaminated wastes. The Texas Railroad Commission has jurisdiction for the disposal of oil and gas industry NORM wastes, while the Texas Natural Resource Conservation Commission has responsibility for the disposal of NORM wastes not associated with oil and gas exploration and production.

In April, 1999, the Texas Department of Health (TDH) finalized revisions to 25 Texas Administrative Code, §289.259, *Licensing of Naturally Occurring Radioactive Material (NORM)*. The revisions included new definitions that support the changes in the rule. Exemptions for oil and gas NORM waste are redefined and exemptions for pipe (tubulars) and other downhole or surface equipment contaminated with NORM are clarified. Specific licensing requirements for spinning pipe gauge operations that perform NORM decontamination and for persons receiving NORM waste from other persons for processing or storage are added. Other minor grammatical changes are made to the section for clarification.

Over the last several years, industry

(Continued on page 16)

TEXAS (continued)

has indicated that they consider "routine maintenance" to be the repair and maintenance of equipment for restoring it to its intended use or efficiency, despite the presence of oil and gas NORM. Decontamination of equipment contaminated with NORM above the exempt limits may occur incidental to the routine maintenance. The TDH acknowledges that not all routine maintenance activities result in a significant increase in radiation exposure risk. Simple routine maintenance tasks such as replacing or repairing a valve, changing filters, or "pigging" a pipe are such activities.

The wording in the revised rule, "Maintenance that provides a different pathway for exposure than is found in daily operations and that increases the potential for additional exposure is not considered routine," was proposed to define the risk the department is concerned about. In discussions with the industry, the TDH determined that the activity that presents the most concern is vessel entry. The industry considers this to be routine maintenance. However, this is the type of operation that the TDH believes presents a significantly increased risk from an enclosed environment where an inhalation risk (a different pathway for exposure than is found in daily operations) from NORM can be present.

The TDH acknowledges that unlike the employees of a company specifically licensed to perform decontamination, the employees or contractors of a general licensee

would be performing vessel entry on an infrequent basis and thus, the radiation exposure risk is lowered due to the time factor.

The TDH drafted language that will outline radiation safety precautions that must be followed when vessel entry is conducted during routine maintenance, but wishes to seek further input from the industry on that draft language. However, in order for several of the other revisions of this section supported by comments to become effective and for the section to be reformatted in **Texas Register** format, no change to the wording about routine maintenance was made prior to the rule revisions being finalized.

In July, 1999, the TDH held a workshop to explain the revisions to the rule and to get stakeholder input on the draft language about routine maintenance. Over 75 people attended the workshop and the TDH received a good amount of input on the draft language. The staff will be reviewing the input received during the workshop and will develop new draft revisions to 25 TAC §289.259. TDH hoped to have the revisions before the end of 2000, but legislative priorities for other regulatory actions pushed this back to at least the spring of 2002. The TDH is in the process of putting together a working paper (which is an internal document). After the document is "approved" internally it will be sent out to interested parties for comment.

The three agencies are considering some additional changes to the NORM rules, particularly concern-

ing exemptions. The agencies are coordinating the suggested rule changes with each other to insure consistent final NORM rules.

The Texas Railroad Commission's Statewide **Rule 94: Disposal of Oil and Gas NORM Wastes** took effect February 11, 1995. This rule sets forth requirements for the safe disposal of NORM that constitutes, is in, or has contaminated oil and gas wastes. Rule 94 was summarized in the Winter 95 issue of **The NORM Report**.

In 2000 the Railroad Commission conducted a survey of 612 randomly selected oil and gas sites throughout the State to determine the radioactivity level of various types of oil and gas equipment, including tanks, flow lines, valves, pumps, and well tubulars relative to background levels. NORM radioactivity above the regulatory level of 50 $\mu\text{rem/hr}$ was detected at 59 sites. Of a total of 5,916 readings of oil and gas equipment, 203 were higher than 50 microrem/hr. To augment the study, the Texas Department of Health surveyed 24 pipe yards around the State. Pipe at four yards had levels of NORM radioactivity above 50 microrem/hr. The survey results and other pertinent data were used to evaluate the effectiveness of the current regulations for the detection, control, and disposal of oil and gas NORM. The study was completed by December, 2000.

Legislation signed into law on May 22, 2001 authorizes the Railroad Commission to require the

(Continued on page 17)

TEXAS (continued)

owner/operator of oil and gas equipment used in exploration, production, or disposal to determine whether the equipment is contaminated or contains oil and gas NORM waste, and identify any equipment so determined.

The Texas Railroad Commission is currently proposing to amend their NORM rules as a result of legislative mandate. It is proposed to require survey and tagging of NORM contaminated equipment. More information on the proposed changes to the Railroad Commission NORM rules can be found at the Texas Register website <http://lamb.sos.state.tx.us/texreg/archive> in the February 8, 2002 issue under Railroad Commission.

There has been no change to the Texas Natural Resource Conservation Commission (TNRCC) non-oil and gas NORM requirements. However, since the issuance of the 40 CFR 141, *National Primary Drinking Water Regulations for Radionuclides (Radium-226, Radium-228, and Natural Uranium)*, the TNRCC is in the process of implementing rules mirroring the EPA standards. Options for achieving compliance under these new rules for drinking water are limited to either finding an alternate source or treating the water to lower the radionuclide concentration to acceptable levels. The TNRCC is currently investigating the potential need for new or amended NORM rules addressing the management of drinking water treatment residuals.

A drinking water advisory group with representatives from Texas water utilities and the public has been established. Meetings with this stakeholder group are being held to obtain input. Two questionnaires are being sent out to obtain more specific information from water utilities. The first questionnaire was sent to 125 drinking water utilities with NORM concentrations in their drinking water that may exceed the EPA standards. This questionnaire was designed to determine how many of the utilities would be able to find an alternate source of drinking water. The TNRCC is currently compiling this information and hopes to obtain results by the end of 2002.

The second questionnaire will be sent only to those utilities who may have to treat their water and manage the residuals. This questionnaire is scheduled to be distributed in early March 2002. The information gathered will be used to determine the most environmentally conscious and cost effective management method for each of the utilities. The current rules will be evaluated, and rule changes may be implemented if significant need exists. If required, they will be completed in late 2003 to 2004.

UTAH

NORM is considered to be in Utah's comprehensive radiation control regulations. No specific NORM regulations have been proposed in Utah.

On July 9, 2001, a license was issued to Envirocare of Utah to receive and dispose of container-

ized Class A, B, and C low-level radioactive waste in a new cell. The license does not become effective until the legislature and the Governor authorize the new facility and no construction or receipt of waste can occur as well. If either the legislature or Governor disapprove the facility, the license (effective until July 9, 2006) is immediately terminated.

The license decision was appealed to the Utah Radiation Control Board. During the pre-hearing phase, a motion for summary judgement was considered which dismissed 8 of 9 contentions. The Board has set forth a schedule which results in a hearing on the remaining issue on or after October 21, 2002.

A citizen's initiative was filed and certified on April 12, 2002. The initiative called the Radioactive Waste Restrictions Act would place a tax on all radioactive waste destined for Envirocare. The money raised would fund education and homeless programs in Utah. Proponents are now gathering signatures. If an adequate number of signatures are collected and certified, the initiative will appear on the November 2002 Utah General Election ballot. This will be determined by July 1, 2002.

(Tooele Transcript Bulletin Online Edition July 4, 2002

Anti-Envirocare Initiative Shot Down

by Jacqueline Cheney

Staff Writer

The waste-tax initiative that had

(Continued on page 18)

UTAH (continued)

gathered more signatures than any other Utah initiative campaign, failed to meet the state's requirements today and will not be placed on the General Election ballot in November.

The Radioactive Waste Restrictions Act, a measure that would prevent Envirocare from bringing higher levels of radioactive waste into the state and raise taxes on the low-level waste it currently stores, just couldn't cut it as the State Elections Office finished up the tallying.

Waste-tax backers celebrated in June the collection of 131,547 signatures, more than enough they thought, to meet the 76,180 registered voter requirement in 20 out of Utah's 29 counties. However, last-minute efforts by opponents, including a name-removal campaign, dropped the signature totals enough to disqualify the initiative.

"We're very pleased that the people who signed the petition, and who had a second chance to remove their names, did so, and helped us defeat this "initiative," said Hugh Matheson, chairman of Utahns Against Unfair Taxes, a group opposed to taxing by initiative.

But the initiative's sponsors aren't ready to quit. The backers have called the disqualification a "temporary setback" and plan to pursue the petition in 2004, the next election year.

"A concerted intimidation effort has been waged in several small counties," said Mickey Gallivan,

chairman of the sponsor organization. "As a consequence, it appears the initiative will not make the ballot this November. However, this is a temporary delay. The signatures we have gathered are good for two election cycles. We will gather enough for the 2004 ballot. It's as good as done, and no radioactive waste industry bullying will be able to stop it."

One of the efforts to disqualify the initiative was led by Envirocare, the one company that would be affected if the initiative would have passed. Employees and volunteers went door to door asking residents if they had been misled into signing the petition, which they said had been inaccurately represented as a measure against spent nuclear fuel rods in Skull Valley. Envirocare also paid for notaries to make the name removal official.

The name removal campaign succeeded in dropping the total signatures collected to 95,929, which means 35,618 names were removed from the petition around the state. The final total may have been more than 76,180, but it was not enough to meet the individual county requirements. Only 14 counties certified, and Tooele was not one of them.

Joyce Hogan, Envirocare community relations manager in Tooele, said she was pleased that their hard work paid off. "We are grateful to everyone who has helped in this enormous task. We not only succeeded in decertifying Tooele County, but also several other counties around the state," Hogan

said.

Dennis Rockwell, chairman of the Tooele County Commissioners, was also grateful that the measure, which could have put Envirocare out of business, causing significant harm to the county's economy, was disqualified. "If the petition would have been presented honestly, we wouldn't have had to go through what we did. I hope this opens the eyes of the public. It is important to read what you are signing," he said.

Another effort, led by Utahns Against Unfair Taxes and state legislators, is a lawsuit challenging the residency of several petitioners. Matheson said it is still uncertain if the lawsuit will continue. It may if they can prevent the initiative from making it to the next election year's ballot.

The initiative, if passed, would have used the taxes for helping the homeless and improved education, sponsors said. The Utah Education Association backed the measure for this reason, and leaders were disappointed with the petition's outcome. "The UEA is involved in the initiative because it addresses two very important issues, namely health and safety of children and providing new sources of funding for our schools. It is unfortunate that the public will not be able to vote on this issue this November," UEA president Phyllis Sorensen said. "However, the Legislature now has the opportunity to act to make sure the radioactive waste industry in Utah is paying a fair tax on the burden we all share for

(Continued on page 19)

UTAH (continued)

accepting other states' waste. We have started an important policy discussion that deserves input from all Utahns in the months to come."

Still, it is a policy discussion that many Utah teachers feel the UEA shouldn't have ever started. The Tooele Education Association is currently circulating a petition among the state's educators, which asks the UEA to stop spending money on political issues that don't primarily focus on education.

The initiative would have imposed a 15% gross receipts tax on all radioactive waste including a \$20 per cubic foot tax on bulk NORM waste. Containerized NORM waste is charged a \$150 per cubic foot tax. Generators are also subject to the same regulatory fees as are now collected. The text of the 53 page initiative can be found at <http://elections.utah.gov/> under "Propositions, Initiatives, and Referendums."

VERMONT

Vermont has no direct regulations for the specific control of NORM and none are planned.

Concern has been expressed as to the radiation received by some workers in granite plants due to radioactive materials (NORM) in dust and the air. An excess of lung cancers has been reported in employees who have worked for a long time in the stone industry. Silicosis used to be the primary result of working with stone, but now lung cancer is reported to be a serious hazard as well. Some per-

sons have expressed a desire to investigate this in more detail, but limited time and testing capability permit only so much activity. The bottom line is that the regulators are being watched to see what they decide appropriate concentrations of NORM (radium) should be.

Vermont has become concerned with the levels of radioactivity in the drinking water in some areas of the state. Some individual wells have very high levels and need immediate treatment to protect the health of the residents. Some of the treatment systems if used would create filters that need to be regulated under the hazardous materials regulations. With others the backwash violates the Vermont Groundwater Standards and is at a level that is defined as radioactive in the federal UIC regulation as well. Vermont is also concerned that the radioactivity in many cases is being drawn out of a deep aquifer and disposed of in an aquifer close to the surface.

The radioactivity in drinking water study is progressing, albeit slowly. Additional federal funding has been secured, bringing the grant to \$79,600. The UNH Water Treatment Center proposes to provide an additional \$39,890 bringing the total available funding to \$119,490. Vermont is in the process of finalizing the grant agreement with the Center.

In the meantime Vermont has been trying to secure sites in the state to investigate. Unfortunately, site owners are reluctant to allow study of their sites unless we can provide

anonymity and guarantees that we will not take any action of enforcement based on the results of the study. Our public records law makes it difficult to keep any information confidential, although we can ask the Center to not identify the sites directly in the report. Other states may have the same problem as well. As for enforcement, we can assure site owners that they will not be singled out for enforcement separate from any class of enforcement actions that might evolve, but that is of little reassurance to them.

Denise Springborg, our coordinator at NEIWPC, is continuing to seek participants and will be checking in with other states for sites, hoping to get the study underway this summer. The grant agreement has a completion date of April 2004.

In a coordinated effort with this work, Vermont has been doing an evaluation of the availability of information on areas with a high likelihood or possibility of radioactive groundwater in Vermont. We are trying to develop a map of such areas with the data and its "accuracy" level. Some of the data was accumulated in the 60s from "flyovers" by people looking for possible uranium mining sites, and other data are obtained from actual monitoring of wells.

VIRGINIA

Virginia has no specific regulations for the control of NORM. NORM is considered to be covered in the general regulations for the control of radiation. These general regula-

(Continued on page 20)

VIRGINIA (continued)
tions are being revised.

WASHINGTON

Washington has no specific regulations for the control of NORM and none are being planned.

In August 2000 the draft Environmental Impact Statement (EIS) for the Commercial Low-Level Radioactive Waste Disposal Site was jointly issued by the Washington State Department of Health and Washington State Department of Ecology. The draft EIS evaluated alternatives for renewal of the US Ecology, Inc. license to operate the site, limits for disposal of diffuse Naturally Occurring or Accelerator Produced Radioactive Material (NARM), and closure of the site. Public comments were received on the draft EIS through November 2000.

The agencies original intent was to publish a final EIS in March 2001. Based on the volume and substance of the comments received, it became apparent that there was a lot more work to do before a final EIS can be completed. The new schedule is to issue a final EIS no later than December 2002.

There are many tasks the agencies will continue to work on in preparation of the final EIS. Some of these tasks are:

1. Individually answering all comments received during the comment period,
2. Integrating the data from the site investigation into the Chemical Risk Assessment, Ground Water Modeling, and Radioactive Risk

Assessment,

3. Evaluating an alternative of zero volume for NARM disposal,
4. Evaluating impacts for air transportation of waste,
5. Evaluating transportation impacts for construction of the closure cover,
6. Researching and evaluating more operational enhancements including the use of trench liners,
7. Clarifying the role of the Model Toxics Control Act in closing the commercial site, and
8. Planning Phase III of the site investigation, including hiring a consultant to facilitate public participation in the Data Quality Objective (DQO) Process.

The agencies appreciate all the comments received on the draft EIS. Many of the tasks listed above reflect recommendations made during the comment period. Although the time and effort required to respond to the comments requires an extended schedule, the agencies believe this additional effort will result in a Final EIS that better answers the public's questions and concerns.

The responses to the comments received have been completed and the final EIS is being prepared. The final EIS is due before December 2002.

For more information, please contact Nancy Darling, Washington Department of Health, (360) 236-3244, Nancy.Darling@doh.wa.gov or Larry Goldstein, Washington Department of Ecology, (360) 407-6573, lgol461@ecy.wa.gov.

US Ecology has always met state regulations. The Environmental Impact Statement will evaluate the effects of the three actions to show that the site will be safe for at least 1,000 years.

WEST VIRGINIA

The general regulations for the control of radiation have been extensively revised and have been approved by the state legislature. The revised regulations which now include NORM rules became effective July 1, 2001.

In addition to the inclusion of NORM rules, the revisions to the radiation regulations were very extensive, going from a 75 page document to a 450 page document. The NORM rules are largely based on the CRCPD Part N Suggested State Regulations for the Control of Naturally Occurring Radioactive Materials.

West Virginia has an issue with contaminated metal from a coal mining process and the subsequent disposal of non-RCRA and non-CERCLA materials. When the coal filters on the shaking process which are used for removing some of the impurities including sulfur from the coal are exposed to sulfuric acid from the oxidized sulfur, the metal corrodes and uranium and thorium and their decay products inherently present in the coal deposit in the corrosion pits, etc. This causes a problem in the disposal of the scrap metals.

WISCONSIN

Wisconsin has no specific regula-

(Continued on page 21)

WISCONSIN (continued)

tions for the control of NORM, except those imposed by the Department of Natural Resources for the disposal of materials containing radium-226. The state does have general regulations for the control of radiation.

Wisconsin's general radiation regulations are being revised as part of becoming an Agreement State. The final draft of Wisconsin's new radiation protection rules and a report of the Department of Health and Family's Services's response to public and initial legislative comments are posted on the Department's web site at www.dhfs.state.wi.us. The radiation protection rules have been legislatively approved. They will go into effect 30 days after publication in the Wisconsin Administrative Register.

Specific NORM regulations are not in the revision. NORM rules will be addressed later -- NORM is an issue unto itself. The current revision focuses on the Atomic Energy Act and NARM.

WYOMING

Wyoming has no regulations for the control of NORM and none have been proposed. But, the issue has been discussed at a SERC meeting and the committee has inquired what surrounding states and the federal agencies (EPA/NRC) are doing and what regulations are in place. Wyoming is currently reviewing options using Wyoming's neighbors information as a basis for the next action.

At the current time, there is no plan to initiate any NORM regulations besides those currently in place (environmental rules/regulations).

Wyoming relies on voluntary cooperation for the control of NORM. For example, scrap yards and other recyclers have installed gate radiation monitors, etc.

Considerable scale is found in the Wyoming oil and gas industry but there appears to be no support for NORM regulations. The problem with that scenario is that there are no controls on NORM/TENORM within the state for the most part -- only some restrictions on produced water and ground water. For example, produced water cannot be discharged if it contains more than 60 picocuries radium per liter.

Wyoming no longer has regulations that require the registration of radioactive materials.

FEDERAL ACTIONS**ENVIRONMENTAL PROTECTION AGENCY (EPA)**

In July 2000, EPA sent a report to Congress stating the Agency's views on the need to revise its guidelines for TENORM because of the 1999 National Academy of Sciences evaluation (see **The NORM Report** - Fall 1999/Winter 2000 issue). EPA explained the technical and policy basis for its views and submitted the NAS report along with the EPA report. The EPA report is available to be read or downloaded electronically on EPA's TENORM Internet web site at: <http://www.epa.gov/radia->

[tion/tenorm/docs/nas_resp.pdf](http://www.epa.gov/radiation/tenorm/docs/nas_resp.pdf)

The Agency's current approach to TENORM is to :

- Study and issue individual technical reports on TENORM-producing industries to determine what is in the wastes and products from each industry and how much risk they pose. The Agency will focus on TENORM materials from specific sources in a series of separate reports.
- Identify and study existing TENORM sites to assemble a nation-wide view of the problem. This consists of a variety of field projects that will give EPA more information on the sources, characteristics and risks of TENORM.
- EPA will seek to partner with other organizations to enhance data sharing and avoid duplication of efforts. Meetings and partnerships with stakeholders will help to review technical reports plus identify appropriate courses of study and action for each TENORM product or waste.
- Ultimately develop and provide education and guidance for radiation protection, and for safely and economically handling, cleaning up and disposing of TENORM.

(Continued on page 22)

EPA (continued)

Accordingly, with this approach, EPA will not be developing a revision of the draft report *Diffuse NORM Wastes: Waste Characterization and Preliminary Risk Assessment* originally issued in April 1993. Instead, it plans to use some materials in that report plus new information and revised risk analyses in each of its technical reports. The first of those reports will be on TENORM from uranium mining and is currently in preparation.

The U.S. Environmental Protection Agency has recently published a report titled *Radiation Protection at EPA - The First Thirty Years*. The report describes the radiation protection responsibilities transferred to EPA when it was established in 1970 and the statutes that have been enacted over the past 30 years that provide the Agency additional radiation protection responsibilities. The second part of the report provides information on key EPA implementation activities and highlights the significant radiation protection precedents established by these activities.

As a companion to this report, EPA has developed a one-page timeline identifying, by decade, the EPA administrators, radiation protection statutes and authorities, implementation activities, and external factors. This report is currently available on the Web at

www.epa.gov/radiation/rpdpubs.htm

The Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual is currently available for public review. This

follows the review by federal and state agencies which generated more than 2,000 comments. The manual was revised based on these comments and it is now available for public review and for peer review by the Environmental Protection Agency's Science Advisory Board.

The MARLAP Manual is a document which provides guidance for the planning, implementation, and assessment phases of those projects which require the laboratory analysis of radionuclides. MARLAP's basic goal is to provide guidance and a framework for project planners, managers, and laboratory personnel to ensure that radioanalytical laboratory data will meet a project's or program's data requirements and needs. To attain this goal, the manual seeks to provide the necessary guidance for national consistency in radioanalytical work in the form of a performance-based approach for meeting a project's data requirements. The guidance in MARLAP is designed to help ensure the generation of radioanalytical data of known quality appropriate for its intended use.

MARLAP was developed by a working group which included representatives from the EPA, the Department of Energy, the Department of Defense, the Nuclear Regulatory Commission, the National Institute of Standards and Technology, the U.S. Geological Survey, the U.S. Food and Drug Administration, the Commonwealth of Kentucky, and the State of California. Since MARLAP employs a performance-

based approach to laboratory measurements, the guidance contained in the manual is applicable to a wide range of programs, projects, and activities which require radioanalytical laboratory measurements.

Examples of data collection activities that MARLAP supports include site characterization, site cleanup and compliance demonstration, decommissioning of nuclear facilities, remedial and removal actions, effluent monitoring of licensed facilities, environmental site monitoring, background studies, and waste management activities.

MARLAP is divided into two main parts. Part I is aimed primarily at project planners and managers and provides guidance on project planning with emphasis on analytical planning issues and analytical data requirements. Part I also provides guidance on developing project-specific analytical requirements, selecting analytical methods, preparing project plan documents and radioanalytical statements of work, obtaining and evaluating radioanalytical laboratory services, data verification, data validation, and data quality assessment.

Part II of MARLAP is aimed primarily at laboratory personnel and provides guidance in the relevant areas of radioanalytical laboratory work. The chapters in Part II are intended to serve as a resource base of information on the laboratory, analysis of radionuclides and provide guidance on a variety of activ-

(Continued on page 23)

EPA (continued)

ities performed at radioanalytical laboratories, including sample preparation, sample dissolution, chemical separations, instrument measurements, data reduction, etc. Part II also has chapters on measurement statistics, laboratory quality assurance and quality control, and waste management for radioanalytical laboratories. While the chapters in Part II do not contain detailed step-by-step instructions on how to perform certain laboratory tasks, the chapters do provide information on many of the options available for these tasks and discuss advantages and disadvantages of each.

Everyone is invited and encouraged to review and provide comments on the manual through the following Web site: <http://www.eml.doe.gov/marlap/>. From the Web site, the manual can be reviewed and printed and the Web site has instructions on how to submit comments on the manual. All comments received by 15 December 2001 were reviewed and considered by the MARLAP Workgroup. Comments received after that date will be considered if it is possible to do so.

The EPA is also participating in an IAEA technical working group who is preparing a report on the world occurrence of naturally occurring radioactive materials. The report is tentatively scheduled for publication in 2003.

EPA Related Web Pages**Radiation Protection Division****(RPD)**

A division of the EPA, the RPD web page provides detailed information and links to the various programs associated with radiation protection activities:

www.epa.gov/radiation/index.html

**Radioactive Waste Disposal:
"Disposal of Naturally Occurring
and Accelerator-Produced
Radioactive Materials"**

This EPA produced page discusses the various sources, uses, and disposal methods for accelerator-produced and naturally occurring radioactive materials. This site can be reviewed at:

www.epa.gov/rpdweb00/radwaste/narm.htm.

**National Emissions Standards:
"National Emissions Standards
for Hazardous Air Pollutants
(NESHAPs): Radionuclides"**

This web page provides information and links to NESHAP's exposure limits from specific sources of air pollutants that are known or suspected to cause serious health problems:

www.epa.gov/radiation/neshaps/index.html

**Human Health and
Environmental Damages**

This site provides supporting documentation that illustrates the human health and environmental damages that can be caused by poor management of mining and mineral processing wastes.

www.epa.gov/epaoswer/other/mining/minedock/damage.htm

TENORM Program:

Technologically-Enhanced

Naturally-Occurring Radioactive Materials Homepage. The TENORM Program was coordinated to condense the information from a variety of organizations that have identified an array of materials that present a radiation hazard to people and the environment. www.epa.gov/rpdweb00/tenom/index.html

**Federal Guidance for Radiation
Protection:**

EPA web page which provides information and links to Federal guidance documents for protecting the public from the harmful effects of radiation.

www.epa.gov/rpdweb00/federal/index.html

**NUCLEAR REGULATORY
COMMISSION (NRC)**

The Commission has instructed the NRC staff to look into better and more efficient ways to regulate low-activity materials (unimportant quantities of source materials, i.e., less than 0.05% thorium and uranium which are basically similar to NORM and TENORM). The staff was instructed to form a working group with other federal agencies.

This working group is formally named the **INTERAGENCY JURISDICTIONAL WORKING GROUP EVALUATING THE REGULATION OF LOW CONCENTRATIONS OF URANIUM AND THORIUM.**

The Working Group has identified several steps necessary for developing "best approaches" recommendations for regulatory respon-

(Continued on page 24)

NRC (continued)

sibilities. The Working Group needs to: (a) better understand the uses and quantities of source material which are being used/processed that would fit into the scope of the Working Group's review; (b) identify concentration ranges and their potential doses; (c) determine where there are any potential issues or risks related to public health and safety regarding public or occupational doses, or environmental impacts; and (d) evaluate current regulatory controls of these materials.

The Working Group believes it must also develop criteria for making decisions and recommendations regarding the issues. It has already begun gathering information on the materials that are being used/processed that fall within the scope of its evaluation. Once this is complete, the Working Group will focus on the issues and, in light of current regulatory controls, develop options and recommendations for the future regulation of these materials.

As the Working Group progresses in this endeavor, it will consider how the options and recommendations address the Agency's performance goals: (1) maintain safety; (2) increase public confidence; (3) increase effectiveness, efficiency, and realism; and (4) reduce unnecessary regulatory burden.

The agencies on this working group are the Nuclear Regulatory Commission, the Environmental Protection Agency, the Department of Energy, OSHA and the Army

Corps of Engineers. The Group is looking at ways to better regulate low-end materials, which include TENORM. They are exploring options where one option might be for the Commission to defer regulations of unimportant quantities of source materials.

The Group, which met March 6-7, 2002 discussed the best approach to delineate the responsibilities of the NRC and other regulatory agencies regarding source materials with low concentrations of uranium and thorium and their decay products. The meeting was open to the public. The topics under discussion included: (1) staff's analysis of the results of NUREG-1717, "Systematic Radiological Assessment of Exemptions for Source and Byproduct Materials," for those materials applicable to the working group's task; (2) discussion of options with focus on outcomes; and (3) key points for staff recommendations to the Commission. Representatives from the following agencies/organizations participated in the meeting: Organization of Agreement States and the Conference of Radiation Control Program Directors; the Environmental Protection Agency; the U.S. Army Corps of Engineers; the Occupational Safety and Health Administration; and the Department of Interior, Bureau of Land Management. Internally, representatives from the Office of Nuclear Material Safety and Safeguards, the Office of the General Counsel, and the Office of State and Tribal Programs participated.

As part of the next steps, the staff is sending a paper to the Commission this summer. Depending on Commission direction and the approved option, the staff will contact the other agencies and States at a formal level to address the option if it impacts other agencies and the States.

Estimates of possible doses from uranium and thorium suggest that the concentration limit of 0.05% (500 ppm) may not be adequately protective of public health and safety and the environment. However, lowering the concentration limit below this level could lead NRC to regulate many activities (including almost all mineral processing and product manufacturing) unrelated to the nuclear fuel cycle. This was not intended in the 1946 and 1954 Atomic Energy Acts.

Additionally, many naturally-occurring materials containing uranium and thorium also contain radium at elevated concentrations that could pose health and safety impacts that may be more significant than the uranium and thorium that are present in the materials. The Jurisdictional Working Group will review and evaluate potentially relevant and applicable regulations and explore ways to regulate those materials containing uranium and/or thorium which could pose a risk to humans and the environment. The Jurisdictional Working Group will also consider possible regulatory approaches, including shared roles among Federal and State agencies, to address such con-

(Continued on page 25)

NRC (continued)

cerns and minimize the associated risks.

NRC staff discussed the following option in more detail: Decrease NRC responsibility, such that NRC regulates only uranium and thorium extracted for the purposeful use of uranium and thorium. All other uranium and thorium would be considered naturally occurring radioactive material, and could be regulated by the States and the EPA under their current authorities. The exemption in Section 40.13(a) would be eliminated with this option. This will minimize inconsistencies within NRC regulations. It will also remove impediments so the States and EPA can regulate uranium and thorium within their regulations or standards for naturally occurring radioactive material or general radiation protection standards. The staff is evaluating whether this option would require a legislative change or whether it could be implemented by a reinterpretation of the Atomic Energy Act that could be included in 10 CFR Part 8.

Implementation will need to be further evaluated with NRC's Office of the General Counsel.

The representatives from EPA and OSHA thought this option was a reasonable approach. The representative from EPA thought EPA could easily incorporate this into their current programs with minimal impact. A member of the public commented that NRC would have to look at the cost to small businesses.

Loren Setlow, EPA, provided a summary of the National Academy of Sciences (NAS) Report, *Evaluation of Guidelines for Exposures to Technologically Enhanced Naturally Occurring Radioactive Materials*, which was completed in 1999, as well as a summary of the EPA's response to Congress (June 2000). The NAS was tasked with determining whether the differences in the guidelines for TENORM developed by the EPA and other organizations are based upon scientific and technical information or on policy decisions related to risk management. If the guidelines developed by the EPA and other organizations differ in their scientific and technical bases, the NAS was to look at what the relative merits of these assumptions are. Additionally, the NAS was to determine whether there is relevant and appropriate scientific information that has not been used in the development of TENORM guidelines.

The NAS determined that the differences are based essentially on differences in policy judgments for risk management, and that the differences are not based on technical issues. All current scientific information on TENORM is reflected in current guidelines.

The NAS made several recommendations for EPA's consideration. The EPA has several activities related to TENORM. It is studying individual TENORM sources and looking at existing sites. Based on these studies, EPA may develop education and guidance for safe

and economical handling, clean-up and disposal of TENORM. The EPA is also working with other organizations in developing TENORM solutions, such as the ISCORS NORM Subcommittee, and the Sewage Sludge and Ash Subcommittee.

At the September 26, 2001 meeting there was a discussion of the EPA comments on Part N (CRCPD). EPA submitted two sets of comments on Part N, from the Office of Radiation and Indoor Air (ORIA) and from the Office of Emergency and Remedial Response (OERR / Superfund). There are two comments specific to the Working Group's work: 1) the definition of TENORM does not appear to cover everything that could be considered TENORM, and 2) the exemption for zircon should be eliminated.

At the December 13, 2001 meeting James Kennedy, NRC/DWM, discussed NRC's comments, dated August 10, 2001, on Part N. Mr. Kennedy provided a description of NRC's perspective in commenting on the document:

- (1) NRC has no authority over TENORM.
- (2) NRC wants to promote consistency in regulation of nuclear materials and risk management standards and approaches.
- (3) TENORM is both similar to and different from AEA materials.
- (4) The states and CRCPD have authority to set policy over how TENORM is to be handled.
- (5) NRC acknowledges NAS recommendations.

(Continued on page 26)

NRC (continued)

The NRC comments to the CRCPD that are specific to the work of the Working Group are (a) strengthen the justification for the zircon exemption, and (b) explain in the Rationale what consideration has been given to setting a concentration standard for other radionuclides.

The group was provided information from the *Part N Rationale and Implementation Guidance*, specifically related to the proposed exemption. These documents discuss in more detail the proposed exemption and the data the Part N working group reviewed. Steve Collins, with the State of Illinois Radiation Control Program, and Chairman of the CRCPD Part N Working Group, discussed this information. In addition to information received from Charlie Simmons, the Part N working group reviewed data from Australia and South Africa on the mining and processing of zirconium. Where possible, the Part N working group looked at real data instead of relying on default values.

Ms. Taylor (NRC) provided a summary of key points for the Commission paper, developed from prior Working Group meetings and discussions. Mr. Setlow indicated that a point that needs to be made is the number of waste sites that would be affected by TENORM regulations.

Another committee, the Interagency Steering Committee on Radiation Standards (ISCORS), is charged with harmonizing radia-

tion standards and risk management practices among the various federal agencies. The agencies on the Steering Committee include the Nuclear Regulatory Commission, the Environmental Protection Agency, the Department of Energy, Health and Human Services, Department of Transportation, Department of Defense, Department of Labor/OSHA, and the Department of State.

The Steering Committee has several subcommittees, including a NORM Subcommittee. The members of this subcommittee include all the members of the parent committee except the Department of State. Representatives from various states attend meetings as observers.

The mission of the ISCORS NORM Subcommittee is to ensure effective communication and coordination among member agencies involved with regulatory, oversight, and disposal issues for NORM wastes, and products containing NORM. At the direction of the full ISCORS Committee, the Subcommittee may take on responsibility for issues on other types of radioactive waste and materials.

The most recent meeting of the ISCORS Committee was January 8, 2002, but no information on that meeting is available yet. At the October 1, 2001 meeting, Loren Setlow reported that the NORM Subcommittee had been scheduled to meet July 26 for the purpose of continuing the drafting of a white paper on agency responsibilities for NORM/TENORM. That meeting was postponed and the drafting was

rescheduled for October or November. No other information on the drafting of the white paper is available.

Loren Setlow, Chairman of the NORM Subcommittee, reported on accomplishments in the year 2001, and plans for 2002. The Subcommittee held three meetings during the year with members from seven Federal agencies and one State agency. The Subcommittee provided a forum for exchanging information on current agency activities, proposed regulations, new reports, as well as planned international meetings at which NORM issues were to be discussed. Member agencies were briefed on the CRCPD implementation plan for Part N, plus the status of NRC's Jurisdictional Working Group which is examining improved methods for regulating low-activity source material. The Subcommittee also discussed EPA efforts regarding NORM, and other national developments.

Mr. Setlow reported that Walt Cofer from the State of Florida is the new State member of the NORM Subcommittee, replacing Tom Hill of Georgia.

The Chair of the Mixed Waste Subcommittee, Gustavo Vazquez, DOE, summarized the accomplishments of the mixed waste Subcommittee in the year 2001. The Subcommittee provided input to the EPA's Office of Solid Waste regarding the mixed waste rule that was issued in the Federal Register in May 2001. The group also held

(Continued on page 27)

NRC (continued)

periodic meetings to discuss current mixed and radioactive waste initiatives and issues. Among these discussions, the Subcommittee provided input to DOE on its Radiological Control Criteria (RCC) initiative for low-level mixed waste, and also on how to respond to issues and questions raised by the Conference of Radiation Control Program Directors on the RCC. Subcommittee members were briefed and provided copies of DOE's draft responses on key issues in advance of a successful meeting with the CRCPD E-5 Committee.

Michael Boyd, EPA, reported that an EPA working group continues its efforts on a draft of the Federal Guidance for the General Public (FGGP) and will issue it to the Subcommittee for its review in the near future. Once the draft goes to the Subcommittee, members will share it within their agencies and with the members of the full committee so they are able to represent their agency at Subcommittee meetings. A draft of the Dose-Risk Information Brief was distributed to ISCORS members. This paper identifies conversion factors for estimating the risk of cancer incidence and mortality as a function of dose. Although the conversion of dose to cancer risks using these conversion factors will not satisfy the requirements for a comprehensive radiation risk assessment, they may be of use for making less rigorous comparisons of risk. NRC expressed some concerns about the factors being inconsistent with the

factors it has used, and will provide feedback through the Subcommittee.

On the international front, IAEA has tabled efforts to publish clearance levels. Instead, they have broadened the scope of the efforts to define the concentrations of radionuclides below which the application of the Basic Safety Standards does not apply. NRC staff participated in an IAEA Consultant's Meeting in December 2001. This meeting resulted in a draft Safety Guide that has a dose objective for artificial radionuclides of 10 mSv/a (1 mrem/y) in materials and equipment, based on the world-wide UNSCEAR survey and judgment. Naturally occurring radionuclides are limited to 0.5 Bq/g (13.5 pCi/g), except K-40, which is 4 Bq/g (108 pCi/g), in materials and equipment. For foodstuffs the Codex Alimentarius values, which correspond to a dose criterion of up to 5 mSv/a (500 mrem/y), and for water the WHO drinking water guidance was adopted. The WHO drinking water concentrations correspond to a reference dose of 0.1 mSv/a (10 mrem/y).

The European Commission has already established clearance guidance for all materials and will soon post the levels on the world-wide web for NORM materials.

Bob Meck of NRC, reported that finalization of the agency's draft *NUREG-1640 Radiological Assessments for Clearance of Equipment and Materials from Nuclear Facilities* was peer

reviewed by the Center for Nuclear Waste Regulatory Analysis. Resolution of peer review and public comments has been initiated, and the final version is expected to be published by Summer 2002.

Follow-on technical information on inventory, collective dose, and costs is under development. Inventory data on "clean," "likely clean," and "nearly clean" materials and equipment is needed, as these categories are the most likely candidates for clearance.

The next meeting of ISCORS was scheduled for July 9, 2002 but no information on that meeting is available.

It is my understanding that the ISCORS Annual Report for 2000 has been released, but it is not yet available on their Web page.

Information on ISCORS, including the NORM Subcommittee can be found on the ISCORS Web page at <http://www.iscors.org>

According to the Atomic Energy Act of 1954 the NRC cannot regulate NORM, but is very interested in the subject since NORM is very similar to what the NRC does regulate.

MINERALS MANAGEMENT SERVICE (MMS)

The Minerals Management Service Gulf of Mexico OCS Region has released a *NOTICE TO LESSEES AND OPERATORS OF FEDERAL OIL, GAS, AND SULFUR LEASES AND PIPELINE*

(Continued on page 28)

MMS (continued)

RIGHT-OF-WAY HOLDERS IN THE OUTER CONTINENTAL SHELF, GULF OF MEXICO OCS REGION: Guidelines for the Sub-Seabed Disposal and Offshore Disposal Storage of Solid Wastes. This Notice to Lessees and Operators (NTL) supercedes NTL No. 96-03, dated May 8, 1996, on this subject.

It updates regulatory citations, makes minor technical amendments, and includes a statement on the Paperwork Reduction Act of 1995. The Guidelines became effective September 24, 1999. The background section of the Guidelines is reproduced below.

NTL No. 99-G22
BACKGROUND

This Notice to Lessees (NTL) provides standardized guidelines and instructions for the sub-seabed disposal and offshore storage of solid wastes generated from oil and gas development on the Outer Continental Shelf (OCS) in the Gulf of Mexico OCS Region (GOMR). This NTL applies only to such solid wastes that are classified as exempt exploration and production (E&P) wastes under the Resource and Conservation and Recovery Act (RCRA) (see 40 CFR 261.4(b)(5)). These exempt E&P wastes include drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of oil, gas, or sulfur on the OCS.

According to 30 CFR 250.300(b)(2), you must obtain approval from the Minerals

Management Service (MMS) of the methods you will use to dispose of drill cuttings, sand, and other well solids. Under this authority, the MMS GOMR requires that you must obtain approval for the sub-seabed disposal of all wastes, and for the offshore storage of E&P wastes that contain naturally occurring radioactive materials (NORM) above background levels. You must obtain these approvals before you may proceed with such disposal or storage operations.

This NTL provides guidance and instructions on the disposal of these E&P wastes, worker safety when handling these wastes, and the contents of application to dispose of or store these wastes. The procedures regarding waste disposal outlined in this NTL do not supercede, but are supplemental to, those procedures for abandonment of wells as specified in Subpart G of 30 CFR 250.

This Notice to Lessees (NTL No. 99-G22) is available on the Internet at the following URL:
http://www.gomr.mms.gov/homepg/regulate/regs/ntls/ntl_1st.html

CANADA

**CANADIAN GUIDELINES
FOR THE MANAGEMENT
OF NATURALLY OCCUR-
RING RADIOACTIVE
MATERIALS (NORM)**

June 2000

Prepared by the Canadian
NORM Working Group of the
Federal Provincial Territorial

Radiation Protection
Committee

Editor's note: The Canadian NORM Guidelines are now published. They can be downloaded from the web by accessing the Saskatchewan Labour website:
<http://www.labour.gov.sk.ca/safety/publications/publications.htm>
and selecting, under brochures, the **Canadian Guidelines for NORM.**

Or they can be directly accessed from the Health Canada Website:
http://www.hcsc.gc.ca/ehp/ehd/catalogue/rpb_pubs/00ehd245.pdf.

The Table of Contents of the Canadian Guidelines as well as the Preface, Introduction, Purpose, etc. were included in the Canada report in the Volume VII, No. 3 issue of **The NORM Report**. It is recommended that those interested obtain a copy of the Guidelines.

Guideline Basis

The Guidelines are based on the most recent international standards recommended by the International Commission on Radiological Protection (ICRP) and CNSC regulations. The recommendations of the ICRP represent an international consensus on radiation protection standards and provide the basis for regulatory control of radioactive materials in virtually all countries of the world. As these regulations and standards are subject to periodic amendment, the Guidelines may also be updated to reflect amendments to accepted national and international radiation protection practices. The ICRP and

(Continued on page 29)

CANADA (continued)

International Atomic Energy Agency (IAEA) radiation protection philosophy and recommendations of significance for NORM in Canada are contained in ICRP reports 60, 65, 68, 72 and 77 and IAEA Safety Series 115.

The various jurisdictions in Canada are now using the Canadian NORM Guidelines. The group that prepared the Western Canadian NORM Guidelines are examining methods to keep some of the hands-

on material in that document while modifying or deleting text in the Western Canadian Guidelines so that it is compatible with the Canadian NORM Guidelines. ■

Is Radiation as Dangerous as They Say?

by

Walter Huda

John Cameron made a video, "Is Radiation as Dangerous as They Say?", for a Medical Effects of Ionizing Radiation Course at the Armed Forces Radiobiology Research Institute at Bethesda, Maryland, in August 2001. The video is 45 minutes long and is accompanied by a complete printout of all 48 slides used in the presentation. In addition, the package includes two articles by Cameron: "Is Radiation an Essential Trace Energy?" and "Promoting Understanding of Radiation in the Radiology Clinic". It is distributed by Medical Physics Publishing, 4513 Vernon Blvd., Madison, WI 53705, for \$25.

The video attempts to provide evidence to support the presenter's belief that moderate doses of radiation are probably beneficial. The two major topics that are addressed in this video are a detailed discussion of natural background variations in the world and two studies that are claimed to demonstrate beneficial effects of radiation (British Radiologist Study and The Nuclear Shipyard Worker Study). A proposal is made to test the hypothesis that increased levels of radiation to senior citizens in the Gulf States to the level found in the mountains would reduce their death rate. The video concludes with an outline of using the concept of Background Equivalent Radiation Time (BERT) to explain to patients undergoing diagnostic examinations how much radiation they will receive from a given procedure. For example, a chest x ray is taken to be equivalent to seven days of background radiation, whereas a whole-body CT is equivalent to four years of background radiation.

Cameron clearly has little time for scientific bodies that make periodic pronouncements on radiation risks-

that is, the International Commission on Radiological Protection (ICRP), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), and the National Academy of Sciences Committee on the Biological Effects of Ionizing Radiation (BEIR). Current conventional orthodoxy on radiation protection, including that of the National Council on Radiation Protection and Measurements (NCRP) in the United States, requires radiation doses to be justified by a net benefit and all doses to be kept as low as reasonably achievable (ALARA). Recommendations for radiation workers are for a dose limit of 20 mSv/yr, and members of the public are subject to an annual limit of 1mSv. According to the current scientific consensus, there is no good reason to believe in a threshold dose for carcinogenesis, let alone that radiation at low levels could actually be beneficial!

Cameron, who had a long and very distinguished career in medical physics, uses this video to explain his own evolution of understanding of ionizing radiation effects. In the 1950s, he believed that it was important to reduce the radiation dose from diagnostic x-rays. By the 1970s, Cameron was convinced that it is much more important to get a good radiological image. In recent years, the presenter has come to believe that moderate doses of radiation are likely to be beneficial, since radiation may "stimulate the human immune system" and thereby result in healthier individuals. Anyone interested in understanding why Professor Cameron takes issue with the pronouncements of the ICRP/UNSCEAR/BEIR/NCRP scientific orthodoxy would clearly benefit by viewing this video and studying the associated handouts. ■

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS (CRCPD)

CRCPD's SR-5 Working Group submitted its latest revised draft Part N with its Rationale, Matters for Future Consideration, and revised Implementation Guidance to the CRCPD Board of Directors in September 2001 for evaluation and approval.

Information regarding the SR-5 Working Group and its revisions to Part N (May 2001 draft) was included in the Volume VII, Number 3 issue of **The NORM Report**. This information was provided by Steve Collins (IL), Chair of SR-5.

Before submitting the latest Part N draft to the Board for approval, editing, revision, and formatting of the Part N, the Rationale, Matters for Future Consideration, the Implementation Guidance documents, and replies to peer reviewer's comments were completed.

See the NRC section in this issue of

The NORM Report beginning on page 23 for information on the EPA and NRC responses to the latest draft of Part N.

As of July 15, 2002, the Board has not approved the Part N documents, but instead have asked Collins to research a couple of items the Board wants more information on before they consider approval.

The CRCPD Board of Directors asked that the SR-5 Part N (TENORM) Task Force research comments made during the concurrence review to determine if further revision would resolve concerns. SR-5 held a teleconference in April 2002 and held a meeting in early May 2002. Substantial revisions were proposed to Part N and the Implementation Guidance. The revised Part N, Rationale, Matters for Future Consideration, and Implementation Guidance will be sent out for a 60 day Peer Review.

The comments will be analyzed, necessary revisions made (if necessary, further Peer Review of the changes based on comments), and replies to the Peer Review comments will be made, then the documents will be submitted to the CRCPD Board of Directors to obtain federal agencies concurrence review and Board Approval of the documents (60 days for concurrence review).

The revisions to Part N included, among others, adding definitions for "conditional release," adding a zircon and zirconia exemption provision, revision of the 100 mrem/yr TEDE to members of the public to be for all licensed or registered sources of radiation, rather than just 100 mrem/yr from TENORM alone.

The final approved Part N will be summarized in **The NORM Report** as soon as it is available. ■

Radiation Reduces Natural Cancer Deaths by A. N. Tschaeche, CHP

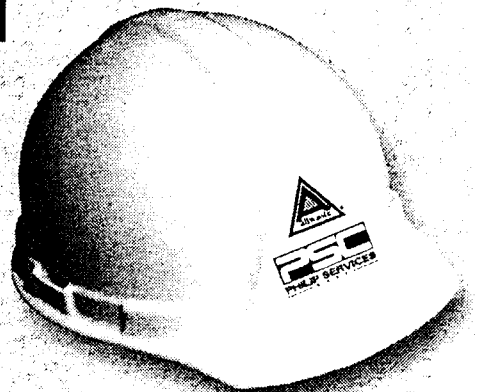
From 1983 to the present time certain individuals in Taiwan have been chronically exposed to gamma radiation from ^{60}Co . One study of those individuals, soon to be published in the journal *Nonlinearity in Biology, Toxicology and Medicine*, reports in the abstract as follows: "About 1700 apartments were contaminated by Cobalt-60; about 10,000 residents lived in the apartments unknowingly for 9 to 19 years and received quite large excess radiation averaged in dose about 0.34 Sv, high up to 4 Sv; but the health effects of such amount of radiation did not increase their cancer mortality based on the LNT model of ICRP and the RERF investigation report of the A-bomb explosions in Japan. On the contrary, the hormetic effects of such radiation received by the residents had reduced their

spontaneous or natural cancer deaths to only about 3.4 % of the general population." (This is a translation of a document written in one of the Chinese languages and will be revised to improve the translation.)

If the reported results are true, they could cast doubt on the wisdom of continuing to use the linear no-threshold hypothesis as a basis for setting radiation protection standards and certainly would cast doubt on the calculation or estimation of any deleterious health effects based on that hypothesis. When the paper is published in the peer-reviewed journal, it would be worthwhile for health physicists to read it and come to their own conclusions about its implications for their profession. ■

Defining Oilfield Services

oil·field ser·vic·es – see “Allwaste”, a Philip Services Company, defining oilfield services for 16 years. all·waste – synonymous with pride, quality and safety.



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**All substances are poisons; there are none which are not poisonous.
 The right dose differentiates a poison from a remedy.**

NORM in the Literature

MOVEMENT OF RADIONUCLIDES IN TERRESTRIAL ECOSYSTEMS BY PHYSICAL PROCESSES

by

Lynn R. Anspaugh, Steven L. Simon, Konstantin I. Gordeev, Ilya A. Likhtarev, Reed M. Maxwell, and Sergei M. Shinkarev

Abstract--Physical processes that effect the movement of radionuclides in the temperate environments post-deposition are considered in this paper. The physical processes considered include the interception of radionuclides by vegetation, resuspension, and vertical migration in soil. United States and Russian results on the interception of radionuclides are reviewed and defined in terms of models that are currently undergoing evaluation and revision. New results on resuspension are evaluated, and a preliminary new model for the time-dependent resuspension factor is proposed. Chernobyl-related results on the movement of radionuclides into the soil column are presented, as is a revised model for this process based upon recent results from Ukraine.

Health Phys. 82(5):669-679: 2002

Field Comparison of the Sampling Efficacy of Two Smear Media: Cotton Fiber and Kraft Paper

by

Mark G. Hogue

Abstract--Two materials were compared in field tests at the Defense Waste Processing Facility: kraft paper (a strong, brown paper made from wood pulp prepared with a sodium sulfate solution) and cotton fiber. Based on a sampling of 46 pairs of smears, the cotton fiber smears provide a greater sensitivity. The cotton fiber smears collected an average of 44% more beta activity than the kraft paper smears and 29% more alpha activity. Results show a greater sensitivity with cotton fiber over kraft paper at the 95% confidence level. Regulatory requirements for smear materials are vague. The data demonstrate that the difference in sen-

sitivity of smear materials could lead to a large difference in reported results that are subsequently used for meeting shipping regulations or evaluating workplace contamination levels.

Health Phys. 83(Supplement 1):S45-S47; 2002

RADSMART, HAND HELD GAMMA RAY SPECTROMETER / SURVEY METER WITH ON-BOARD, ISOTOPIC QUANTIFICATION

by

R. Polichar, J. Rolph, L. Bray, D. Emmons, and A. Polichar (Science Applications International Corporation, 16701 West Bernardo Drive, San Diego, CA 92127)

Abstract--In this paper we discuss the RadSmart hand-held gamma ray spectrometer based on the use of a CsI(Tl) scintillator coupled to a PIN diode. This instrument was designed to meet the needs of detecting and identifying nuclear materials within normal commercial shipping channels. This gamma ray sensor was connected to a 1024 channel multi-channel analyzer and an on-board RISC processor capable of identifying spectra associated with normally transported isotopes. The use of a relatively large (8-cc) scintillation crystal sensor provides an effective sensor for this type application. The control for the system resides on a 32-bit RISC processor, supporting a unique multi-peak fitting algorithm that rapidly identifies a range of radiation sources common to industrial, medical or weapons applications. The system is capable of storing a few hundred spectra and filing them by date and time. Resolution on ^{137}Cs is typically between 5.5 and 6.5%, comparable to a NaI sensor, without the need for frequent calibration due to temperature or voltage drifts. The entire system is enclosed in a lightweight package that can be carried and operated with one hand.

Paper THAM-D.6 presented at the Forty-Seventh Annual Meeting of the Health Physics Society, 16-20

(Continued on page 33)

NORM in the Literature (continued)

June 2002 in Tampa, Florida.

TRAINING FOR NEW RSO'S--WHAT IS MOST IMPORTANT?

by

R. Johnson (Radiation Safety Academy,
Gaithersburg, MD 20877)

Abstract--Why 40 hours? Wouldn't 16 or 24 hours be enough? These are the questions often raised by newly assigned RSOs who are concerned about fitting training needs into busy schedules. The majority of RSOs on the 22,000 radioactive material licensees in the U.S. are not full time specialists in radiation safety. Most of them have multiple duties, and radiation safety is often only a small part of their assigned tasks. They are not usually interested in becoming professional health physicists. They only want to know how to fulfill their duties as an RSO with the least difficulties while juggling many other requirements of their jobs. Most have little idea of what may be necessary to carry out the duties of an RSO. Over the years, 40 hours has come to be accepted by States and the NRC as minimal training for RSOs on small limited scope licenses at research, university, and industrial facilities. Professional HP instructors for RSO training find that 40 hours is a very limited time to prepare RSOs for radiation safety responsibilities commensurate with the goals of the Health Physics Society (excellence in the science and practice of radiation safety). Instructors are constantly challenged about what topics are most important and how much time to allow. A standard 40-hour agenda may not meet the needs of RSOs from different licenses. For example, an industrial sealed source gauge user would not need to know about requirements of 10 CFR 35. Users of unsealed sources do not need to know about sealed source inventory and leak test requirements. Likewise sealed source users do not need to know about contamination surveys. Ideally each new RSO would receive training tailored to their specific type of license to maximize the value of a 40-hour class. This paper will evaluate which training topics are of most importance and invite audience feedback.

Paper THAN-C.9 presented at the Forty-Seventh Annual Meeting of the Health Physics Society, 16-20 June 2002 in Tampa, Florida.

DEVELOPING A RADIOACTIVE WASTE PROGRAM FOR NEW RSOs

by

S. Austin (CI-Radiation Safety Academy,
Gaithersburg, MD 20877)

Abstract--One of the challenges faced by new RSOs or licensees may be developing a radioactive waste management program. Not only are there regulatory challenges, but many practical challenges such as recognizing the wastes generated, best methods of sorting and segregating these wastes at the point of generation, collection within the facility, temporary storage, and identifying qualified vendors to package, pick-up, transport, process and dispose of the wastes. RSOs typically have to get management buy-in when developing this program due to space and facility requirements and for assuring adequate funding to allow for prompt disposal. Failure to do so typically leads to wastes stored in a variety of locations, poor inventory control, and accumulation of large volumes with no plan for characterization, packaging, and shipment off-site for processing and disposal. A sound written program will eliminate many of these problems and reduce the burden on licensees and RSOs.

Paper P.66 presented at the Forty-Seventh Annual Meeting of the Health Physics Society, 16-20 June 2002 in Tampa, Florida.

Running a Small Radiation Safety Program

by

Andrew Karam (Associate Editor of the Health
Physics Newsletter)

This excellent article gives non-health physicists a good starting place for a radiation safety program for their facility. The article is in the February 2002 issue of **The Synergist**, an AIHA publication. ■

Meetings Calendar

The "International Conference on Occupational Radiation Protection: Protecting Workers Against Exposure to Ionizing Radiation" will be held in Geneva, Switzerland, August 26-30, 2002. The objective of the Conference is to foster the exchange of information on current issues related to the exposure of workers to ionizing radiation in the course of their work and to formulate recommendations, as appropriate, regarding measures to strengthen international cooperation in occupational radiation protection. The Conference will address the issue of establishing occupational radiation protection standards and providing for their application. It will focus on a number of specific problems, inter alia, the complex issue of controlling occupational exposure to natural sources of radiation.

For more information contact Ms. Evelyne Janisch, Division of Conference and Document Services, Conference Service Section International Atomic Energy Agency, IAEA-CN-91, Vienna International Centre, P.O. Box 100, Wagramer Strasse 5, A-1400 Vienna, Austria. Telephone No.: +43-1-2600-21312; Telefax No.: +43-1-26007; E-mail: e.janisch@iaea.org. On the web visit <http://www.iaea.org/worldatom/Meetings/>.

The U.S. Department of Energy's (DOE) Hanford site invites all interested parties to participate in the **4th Annual Hanford ALARA Workshop** to be held October 21-23, 2002 in Richland, Washington at the Red Lion Hotel. The Workshop will feature presentations by subject matter experts from a variety of arenas including the Department of Energy, commercial power, and private industry. Planned discussions include dose and contamination control, waste minimization, mock-up training, protective clothing, work planning, conduct of ALARA programs, environmental ALARA, biological control, Decontamination & Decommission, lessons learned, and new technologies. The workshop focuses on education and information exchange for applied ALARA.

For more information, please consult the workshop website: <http://www.hanford.gov/alara/workshop.cfm>.

You are cordially invited to **WM'03, the 29th Annual Waste Management Symposium** on February 23-27, 2003. The conference will be held in Tucson, Arizona at the Tucson Convention Center. The conference is hosted by the University of Arizona. Sponsoring organizations include the American Nuclear Society, New Mexico State University Waste-Management Education and Research Consortium (WERC), the American Society of Mechanical Engineers and NEA/OECD. The conference is also organized in cooperation with the U.S. Department of Energy and the International Atomic Energy Agency.

More than 2,000 scientists, engineers, government officials, academic leaders, and corporate managers attend this conference from national and international companies, agencies, and institutions. Approximately 68 Technical Sessions and 600 technical papers and several workshops are scheduled over the four-day event. Topics selected for WM'03 will be presented through technical papers involving research, development, and operational experience in nuclear waste, mixed waste, hazardous waste, mill tailings, environmental remediation, waste management, and decommissioning.

This conference has been referred to as the premier conference of the nuclear waste management industry. Attendees to the conference are typically decision makers of large world-wide corporations and government procurement agencies. The Exhibition is represented by approximately 160 companies. Exhibitors and sponsors represent government contractors, nuclear equipment manufacturers and vendors, commercial and government nuclear service companies, and disposal facilities operators. Areas of interest include, but not limited to, protective clothing, remote/robotic handling, hazardous waste storage, transportation, diagnostic instrumentation, engineering design and construction, environmental laboratories, decontamination and decommissioning, and environmental remediation. ■

Any fool can criticize, condemn, and complain -- and most fools do. - Dale Carnegie

Regulatory References

Title 10 CFR Part 20 ---- Standards for Protection Against Radiation	U.S. AEC 1974 ----	Termination of Operating Licenses for Nuclear Reactors, NUREG 1.86 U.S. Atomic Energy Commission, Washington, D.C. June 1974
Title 10 CFR Part 61 ---- National Emission Standards for Radionuclide		
Title 29 CFR Part 1910.96 ---- Ionizing Radiation	ARKANSAS	Rules and Regulations for Control of Sources of Ionizing Radiation. Section 7 NORM
Title 33 U.S.C. 466, et seq. ---- Federal Water Pollution Control Act as amended		
Title 40 CFR Part 141 ---- National Primary Drinking Control Program; Criteria and Standards	GEORGIA	Rules and Regulations for Radioactive Materials, Chapter 391-3-17, Section 08-Regulation and Licensing of NORM
Title 40 CFR Part 190 ---- Environmental Radiation Protection Standards for Protection Power Operations	LOUISIANA	Title 33: Environmental Quality Part XV: Radiation. Chapter 14: Regulation and Licensing of NORM
Title 40 CFR Part 192 ---- Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings	MISSISSIPPI	Part 801 Section N Licensing of NORM Oil and Gas Board, Rule 69, Control of Oil field NORM
Title 40 CFR Part 440 ---- Ore Mining and Dressing Point Source Category	NEW MEXICO	Subject 14: NORM in the Oil and Gas Industry
Title 42 U.S.C. 300, et seq.---- Safe Drinking Water Act, as amended	OREGON	Regulations and Licensing of NORM Oregon Administrative Rules, Chapter 333, Division 117 -- Health Division
Title 42 U.S.C 2011, et seq. ---- Atomic Energy Act of 1954, as amended		
Title 42 U.S.C 4321, et seq.---- Toxic Substances Control Act (TSCA)	SOUTH CAROLINA	Part IX, Licensing of NORM
Title 42 U.S.C. 4341, et seq.---- Conservation and Recovery Act of 1976 (RCRA)	TEXAS	Texas Department of Health-- Texas Regulations for Control of Radiation (TRCR) Part 46, Licensing of NORM Railroad Commission of Texas-- Rule 94, Disposal of Oil and Gas NORM Wastes
Title 42 U.S.C 7401, et seq. ---- Clean Air Act; as amended		
Title 42 U.S.C. 7901, et seq.---- The Uranium Mill Tailings Radiation Control Act of 1978		

NORM Manuals Available

The manual which I use in teaching my 2-day course ***NORM Contamination - An Emerging Environmental Problem*** is available. The manual contains over 800 copies of the slides used in the course. Although designed originally for the oil and gas industry, the manual is updated regularly and contains material about NORM contamination in other industries.

In addition to being an inclusive text on NORM, the manual can be easily used to structure in-house information or training courses on NORM.

The Table of Contents shown below indicates the range of topics in the manual.

1. Fundamentals of Radiation Protection
2. Radiation / Radioactivity Units
3. Biological Effects of Radiation
4. Radiological Protection
5. Introduction to NORM Contamination
6. NORM Contamination - Radium
7. NORM Contamination - Radon
8. NORM in Oil & Gas & Other Industries
9. Fundamentals of Radiation Detection
10. NORM Surveys

11. Disposal of NORM Wastes
12. Federal Regulations
13. State Regulations
14. Canadian Guidelines
15. Recommended Industrial Hygiene
16. Program Suggestions for NORM Control
17. Radiation Litigation & Minimization
18. Conclusions
19. Glossary

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In addition to the manual for the 2-day NORM course the manual from my 1-day course is also available. The two manuals are similar in content—but the 2-day course manual is more detailed. The 1-day course manual contains about 400 slides.

The cost of the 2-day course manual is \$195 (US) and the cost of the 1-day course manual is \$125. ■

The NORM REPORT

A TENORM Contamination Newsletter

		<u>Non-Profit Org'ns</u>
4 Issues	\$125	\$75
8 Issues	\$250	\$140

To order call: (479) 646-5142
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