From: Robert G. Gattone *Region III*
To: jol
Date: 11/29/95 4:59pm
Subject: Generic Concern

Please see attached file...

CC: DAB, bjh

Files: A:\CONCERN

Attachment 10

Doug Broaddus told me you are Co-Chairman for a working group whose primary purpose is to address the control and accountability of gauges, especially generally licensed gauges. I understand part of the working group's purpose is to: (1) review problems/issues associated with the loss of control of these gauges; and (2) make recommendations to correct these problems.

Through a discussion I had with William Pendergrass of LFE, I identified a generic concern that you may be interested in. The concern is that generally licensed device distributors (distributors) do not provide instruction to general licensees regarding NRC regulatory requirements when the general licensee takes possession of licensed material. Frequently, generally licensed devices are shipped by courier from the distributor to the general licensee, and the device remains in the general licensees possession until the distributor arrives on site to install the device. Occasionally, the generally licensed device may remain at the general licensee's facility for weeks or months before it is installed. During this time, the general licensee receives no instruction regarding NRC regulatory requirements (e.g., unauthorized transfer, etc.). Instruction regarding NRC regulatory requirements is typically not provided by the distributor until the time of installation.

I am aware of at least one example where the circumstances discussed above resulted in a violation of 10 CFR 31.5(c)(8) (i.e., unauthorized transfer). Specifically, a distributor shipped a nuclear gauge to a general licensee expecting the general licensee to schedule installation. The general licensee never had the gauge installed. Since the distributor planned on providing licensee training regarding regulatory requirements at the time of gauge installation, the general licensee never received the training. The licensee transferred the gauge to an unauthorized person because it was unfamiliar with the regulatory requirements pertaining to the gauge.

Please provide your comments on this to me.

Thanks...

Joel - interesting idea ... ... group ... limit

Version November 9, 1995

NOTE TO: Joel Lubenau, Co-Chairman
Joint Agreement State-NRC Working Group to Review the Regulation of Devices Containing Radioactive Material

FROM: Christopher Ryder, Project Manager
Risk Study of Sealed Source Device

Ryder 11/9/95

SUBJECT: AN INTERIM MEASURE FOR CONTROLLING DEVICES CONTAINING RADIOACTIVE MATERIAL

1. INTRODUCTION

During a meeting of the Joint Agreement State-NRC Working Group during October 24 and 25, 1995, you asked for options the working group might consider in addressing the problem of lost devices containing radioactive sources. The purpose of this note is to give you an option, which I call here an interim measure. Please realize that this note represents my own view, not in any way the view of the Office of Research.

After reading this note, you should understand the following:

- An interim measure is needed while NRC proceeds with a comprehensive evaluation of options directed at rulemaking.
- The interim measure seems feasible and is not entirely without precedent.
- The interim measure would engage the steel industry, the metal recycling industry, and the regulators in a short term and partial solution.
- Whatever the risk of lost source devices to the metal recycling industries, it will be lower with the interim measure.

I have been hearing versions of the interim measure from various people, including yourself. The measure is not entirely my own thoughts. I have written about it for the consideration of the working group.

2. SUMMARY

Lost source devices pose a hazard to the recycling industry, the steel industry, and possibly the general public. The hazards have mostly been heavy financial burdens to the steel industry from smelting radioactive sources. But a breach or partially breached sealed source *might* pose a health hazard as well.

NRC has efforts to address the problem, but these seek long term solutions. The severity of the financial consequences of a smelting and the potential for unnecessary exposures and additional damage suggest an interim solution to engage the recycling industry, the steel industry, and the regulators, while

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Attachment 11

sound and comprehensive solutions requiring time to develop are sought by the NRC.

An amnesty/bounty program offers incentives to look for and report the discovery of lost source devices. Proper disposal, preferably as recycling, can take the radioactive source out of the scrap metal stream. A study of the reports thus collected would be a basis for making further adjustments to the regulations.

3. BACKGROUND

Recycle workers (e.g., scrap metal dealers, truck drivers) are reluctant to deal with regulators, particularly when they are told they will have to pay large sums to have a radioactive source, which was never theirs, removed. The scrap metal dealers have to contend with four pressures:

- The industry has a thin profit margin.
- Rail carriers want radiation detectors that monitor shipments in and out of scrap yards set high to avoid rejection because of slightly contaminated rail cars. The slight contamination stems from dirt, slag, scale, and refractory brick.
- Steel mills want assurance of a safe supply of scrap metal. They want detectors set low, just a little above background level, to maximize the chance of finding radioactive sources.
- Suppliers of the scrap metal yards do not want to be turned away, do not want a lot of questions asked about their shipments, and do not want regulators being told of rejected shipments.

4. INTERIM MEASURE

The goal of the interim measure is to bring back under control any lost source devices in the recycling stream by offering incentives to discover such devices, get them out of the recycling stream, and report the discoveries. The interim measure will not prevent or reduce the occurrence of the radioactive sources *entering* the recycling stream.

An amnesty/bounty system for workers in the metal recycling industry can give firm assurance that they will not be penalized for reporting the discovery of a source device in the scrap metal stream and will create financial incentives to look for such devices. Amnesty would give uniform assurance of no penalties for reporting about source devices already known to be in or newly discovered source devices in the recycling stream. A small ($50 to $100) bounty for discovering each source device should be given to the person(s) making a discovery to make looking for source devices and calling local authorities worthwhile, but not large enough to encourage abuse. Workers at the scrap metal yards sometimes collect types of metal that are not a direct

product of the yard — they get some extra money on the side. Given this, a $50 to $100 bounty appears reasonable.

An amnesty/bounty system could be financed by a fund created by the steel industry. In effect, it would be insurance. The 56 member mills of the SMA might each initially contribute $100,000 with smaller annual fees to follow. This is not an unreasonable amount considering that radiation detectors can cost as much as $50,000 or more and the smelting of a radioactive source can cost from $2 to $23 million. The interest on a $5.6 million fund would offset expenses:

- Administration of the bounty
- Bounties themselves
- Preparation for proper shipment
- Proper disposal of the source devices

The same fund could serve as (partial) insurance for a smelting of a radioactive source. The notion of using the fund for insurance would also encourage participation in the fund, thus reducing burdens on individual mill owners. Scrap dealers may also be a part of the fund or form an analogous fund since their facilities too are at risk.

The same fund could also pay for the disposal of the radioactive sources. I take *proper disposal* to be either placement in some type of repository or, preferably, recycling. Recycling radioactive sources may also offset the costs.

The proper size of the bounty or the fund should not be of immediate concern. The immediate concern should be to establish a fund and a bounty amount that appears appropriate. Adjustments can be made while the amnesty/bounty program is operating and may even benefit from our studies. The annual fees could be adjusted, depending on the state of the fund.

The logistics of the amnesty/bounty system might be set up as follows. Local authorities would initiate a report of a discovery, sending it to a fund administrator. The fund administrator would serve as a collection point for all discoveries. The event would be closed when payment is sent to the discoverer of the lost source device. The administrator would periodically report discoveries to Agreement States and the NRC. If such an amnesty/bounty system became permanent, the reliability of our data about the radioactive sources would improve. This would be a good way to measure the effectiveness of our regulations.

The NRC and the states would be involved in the program as follows:

- They would have to establish the amnesty and possibly initiate the reports themselves whenever a lost source device is discovered. Licensed health physicists, contracted through the fund, could oversee the disposal of the radioactive material.

- When the licensee of a discovered source can be identified, they would take enforcement actions. The NRC and the states would make this clear to all licensees.

Another matter is informing the metal recycling industries of the amnesty/bounty program. To begin, the industries could be informed though trade associations, such as the SMA and ISRI. But both the SMA and ISRI represent much less than 100% of their respective industries. The SMA and ISRI members could make efforts to be sure that their suppliers are aware of the program. The incentives to do so exist because this problem is not only costing the mill owners, but also causing the scrap metal dealers concern.

An amnesty program is not without precedent. Years ago, the IRS offer amnesty to collect back taxes. I believe NRC has a reason to have lost sources collected because these radioactive sources are a risk to scrap metal dealers, steel mill owners, and possibly even the public. An amnesty program is also compatible with the philosophy I have been learning during my brief training about inspection — emphasize getting matters back into compliance rather than punishing people.

I my opinion, the risk of lost radioactive sources has to decrease with an amnesty/bounty program:

- The program encourages looking for and reporting discovered source devices so that the radioactive sources can be taken out of the scrap metal stream.

- There is incentive to implement the program on the facility level. Because monitoring is not 100% effective, the potential of damage and harm raises concern.

- There is incentive to implement the program on an individual level. The bounty is large enough to making looking worthwhile — workers look for sideline metal for much less. It is not large enough to make abuse worthwhile.

Provisions will need to be made for radioactive material that is unsuited for low-level waste disposal, e.g., TRU and greater than Class C sources.

Advantages

- Partially and directly addresses the problem.

- Creates an environment that encourages reporting discovered source devices.

- When a source device is found, it goes back under control and out of the metal recycling stream.

- Creates incentives to look for and report discoveries of source devices, thereby improving the database about lost radioactive sources.
- A shipment of scrap metal that causes a radiation detector at a scrap yard or mill to sound need not be rejected. There is an incentive to determine the reason for the alarm. The scrap metal supplier and driver get paid for making a delivery.
- Provides an *interim* measure while the long term solutions are being formulated and set into place.
- Demonstrates NRC's intentions to address the problem of lost radioactive sources in a timely (interim) and thorough (Working Group, risk study, and contaminated dust effort) manner.
- Intuitively reduces the risk from lost radioactive sources.

Disadvantages

- Scrap metal dealers and steel mill owners might have to modify their consideration of what constitutes *accepting* a load to promote looking for a source device.
- We have no way of predicting the effectiveness of an amnesty/bounty program. The amount by which the risk would be reduced is unknown.
- An amnesty/bounty program will not *eliminate* the potential for consequences at the scrap yards and steel mills.
- Radioactive material that is unsuited for low-level waste disposal is not considered by the amnesty/bounty program.

In my opinion, the advantages far outweigh the disadvantages.

5. OPINION

I believe that NRC should address the problem of lost radioactive sources in both the long term and short term.

The long term solutions will come from your working group, supplemented by at least my risk study, and will be set in place by the rulemaking process. Another important effort at the NRC is addressing the disposal of contaminated baghouse dust. These efforts will take several years and be more or less permanent. I believe this lengthy procedure is beneficial to all interested parties because it results in a stable regulatory process.

I am leery of accelerating the efforts by sacrificing sound investigations of the options, just to have a solution of some kind set in place soon. I understand the concern of SMA and its members. Nevertheless, such concerns

are not reasons for compromising sound investigations and failing to arrive at the best possible solution. The need for the regulators to proceed through the rulemaking process and the need for the metal recycling industries to have a solution as soon as possible suggests that an interim measure should be taken.

6. RECOMMENDATIONS

I recommend the working group give the interim solution discussed in the note consideration.

November 22, 1995

Note to file

Re Derivation of gauge population estimates for SMA

In response to a request from Chris Stacey of the Steel Manufacturers Association (SMA) I provided the following estimates of the numbers of licensed nuclear gauges distributed in the US (attachment):

	Total	Excluding "Small" Gauges
Specifically licensed	32,000	28,000
Generally Licensed	129,000	58,000
Total	161,000	86,000.

These estimates were accompanied by a number of caveats which, in sum, emphasized that the values were estimates only and subject to further refinement or correction.

The estimates were derived from data provided by and in consultation with Steve Baggett.

In 1993 it was estimated that there were 2,300 specific licensees authorized to use nuclear gauges. Such licensees may have anywhere from one to several hundred gauges; Baggett provided an estimate of 4.7 gauges per license based on limited survey data. Multiplying 2,300 by 4.7 yields 10,810 gauges under NRC jurisdiction.

To account for gauges used in the Agreement States, note was made of the ratio of all NRC materials specific licenses to Agreement State specific licenses, 7,000+/15,000 or roughly, 1:2. It was assumed that this same ratio would apply to gauge licenses leading to a total for the U.S. of 10,810 x 3 or 32,430 (rounded off to 32,000).

In 1993 it was estimated that there were 31,600 persons possessing 450,000 radioactive devices under the general license in 10 CFR 31.5. Of these, 42,900 were nuclear gauges as follows:

Attachment 12

Isotope	Number	Max Ci
^{137}Cs	10,590	4
^{241}Am	5,860	5
^{90}Sr	2,450	1
^{85}Kr	330	1.5
^{60}Co	50	1
Other	23,620	-

To again account for gauges licensed in the Agreement States, the number of gauges under NRC jurisdiction, 42,900 was multiplied by 3 yielding 128,700 gauges distributed to general licensees in the U.S. (rounded off to 129,000).

The total population of nuclear gauges is then the sum of the SL and GL gauges or 161,000.

It can be argued that an estimate of gauge populations should not include the smaller gauges because they do not present significant radiological hazards to that metal recyclers that encounter them (although if found they must be secured and arrangements made for proper transfer or disposal which will cost money). If these gauges are excluded, then the estimates of this population of licensed nuclear gauges distributed are derived as follows:

Of the 2,300 specifically licensed NRC gauge licenses, 300 are for relatively small quantities of radioactive materials in devices such as gas chromatographs that would present minimal radiation hazards. Deducting these leaves a population of 2,000 licensees. This leads to an estimate of 2,000 x 4.7 or 9,400 specifically licensed nuclear gauges under NRC jurisdiction. Accounting for the Agreement States and rounding of yields an estimate of 28,000.

The total of 42,900 generally licensed gauges under NRC jurisdiction includes 23,620 "other" gauges of the same types of small gauges excluded from the specific license estimate. Deducting these leaves a population of 19,280 GL gauges under NRC jurisdiction. Using the same assumption as before to account for Agreement State GL gauges produced an estimate pt 19,280 x 3 or 57,840 GL gauges in the US (rounded off to 58,000).

Joel O. Lubenau
Senior Health Physicist

November 22, 1995

Note to Chris Stacey, Steel Manufacturers Association

Re Estimate of Nuclear Gauges In the US

The following estimates are exactly that, estimates. Some of the caveats to be kept in mind:

o There are two kinds of licenses under which gauges can be used, specific (SL) and general (GL). We require vendors of SL gauges to maintain records of sales and leases of gauges to SLs and we require SLs to maintain inventories and records of transfers, but we do not require this information be sent to the NRC. Thus the number of SL gauges is an estimate, primarily based upon some limited surveys of SLs conducted by the NRC. Vendors of GL devices must report sales and leases of GL devices to GLs to the NRC (or the States). However, estimates of GL devices thus derived do not account for returned, disposed or lost devices.

o Data bases for the estimates are derived from a number of sources including unpublished results of NRC surveys which were conducted for a variety of purposes in different time frames. The different purposes and different time frames can be sources of errors.

o We continue to try to refine and update our estimates. As a consequence, some earlier estimates have been revised. For example, the 1991 FR notice of a proposed rule estimated 600,000 GL devices under NRC jurisdiction that were distributed under 10 CFR 31.5. Staff later reduced this estimate to 450,000.

o Records of specific licenses for gauges issued by Agreement States and records of transfers of devices by vendors to State GL users are not centrally filed in a national data base. As a consequence, the number of State gauges must be estimated. To estimate the number of Agreement State gauges we take note of the ratio of all NRC SLs to all Agreement State SLs which is 1:2 and assume that a similar ratio exists for gauges, both SL and GL. This may be one of our largest uncertainty factors.

o The U.S. Department of Energy (DOE) uses radioactive materials under its own authority and safety requirements and is not subject to either NRC or State licensing. Thus, we have no regulatory information on the types and numbers of devices containing radioactive materials used by the DOE.

o Devices containing radium have been manufactured and distributed in the past. Limited numbers of these devices are still in use, have become mixed with metal scrap and have been smelted in aluminum smelters. Although the Agreement States license radium devices, the Atomic Energy Act does not extend to radium sources. Therefore, our estimates do not include radium devices.

o Lastly, some nuclear gauges contain quantities of radioactive materials in such small amounts that we do not believe that they would present significant radiological hazards to metal recyclers (although metal recyclers who find them could be faced with costs for securing and properly disposing of them). Excluding these gauges would result in an estimate of a population that, while smaller, is of the greatest concern to metal recyclers. Thus, two estimates are provided, one for the total number of licensed gauges distributed in the U.S. and, a second estimate that excludes "small" gauges.

Subject to these caveats, our estimates of the numbers of licensed nuclear gauges distributed in the U.S. are:

	All Licensed Gauges	Excluding "Small" Gauges
Specifically licensed	32,000	28,000
Generally Licensed	129,000	58,000
Total	**161,000**	**86,000**

Current plans for the Working Group meeting on December 19-20 call for NRC staff to brief the Working group on NRC data bases relating to radioactive devices, their applications and limitations. At that time, staff may have more refined estimates of the numbers of gauges in the U.S.

Keep in mind that other types of devices can and have shown up in metal scrap, e.g., radiography cameras, static eliminators, self-luminous devices, thorium alloys, etc. Nuclear gauges are thought to be the most significant group of devices for the metal recycling industry by virtue of the combination of the large number of them and the radiological characteristics of the radioactive sources used in them.

I hope that this information is helpful.

Joel Lubenau

cc: WG Members
    WG liaisons
    DCD
    PDR
    S. Baggett

November 14, 1995

Review Group - Radioactive ~~...~~ Devices

NOTE TO: Working Group Members

FROM: Robert Free and Joel Lubenau
Working Group Co-Chairs

SUBJECT: DRAFT MINUTES OF THE OCTOBER 24-25, 1995 MEETING OF THE JOINT AGREEMENT STATE - NRC WORKING GROUP TO REVIEW DEVICES CONTAINING RADIOACTIVE MATERIALS

Attached are draft minutes of the October 24-25, 1995, meeting of the Working Group. Please provide your comments/corrections to either of the Co-Chairs by December 1, 1995. A revised draft incorporating your comments will be available for your review and approval at the next meeting of the Working Group on December 19-20, 1995.

cc w/attachment:
Working Group Liaisons
October 24-25, 1995 Meeting Attendees
PDR

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Attachment 13

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JOINT AGREEMENT STATE - NRC WORKING GROUP TO REVIEW DEVICES CONTAINING RADIOACTIVE MATERIALS (Working Group)

Minutes of the 1st Meeting of the Working Group
October 24-25, 1995

SUMMARY

The Joint Agreement State-NRC Working Group (WG) formed to review the regulation of devices containing licensed radioactive material held their initial public meeting on October 24-25, 1995 at the Doubletree Hotel, Rockville MD. The Commission had directed the staff to explore the problem of accidental smeltings of devices containing licensed radioactive materials and approved a staff plan to form a Agreement State-NRC Working Group to review the regulation of these devices. The WG meeting was co-chaired by Joel Lubenau, NRC and Robert Free, TX. Five members of the WG and the Conference of Radiation Control Program Directors (CRCPD) liaison were present. In addition to the WG and its liaison, 28 persons attended including 8 representing steel and metal recycling plants and trade organizations, 7 from radioactive device vendors, 2 device users, a health physics consultant, 5 from NRC, 2 from EPA, 1 from U.S. Bureau of Mines and 2 others. (See attachment 1 for a list of attendees).

The first part of the meeting focussed on developing background information for the Working Group. The second portion of the meeting centered on further defining the problem (inadequate inventory control and improper disposal of licensed devices), identifying measuring sticks or effectiveness indicators for regulatory options, agreeing on goals (minimize the negative indicators, maximize the positive indicators) and how to develop regulatory options. Agenda planning for the next WG meeting and organization of the public workshop scheduled for January, 1996 was also covered.

The overall approach taken by the co-chairs was to reach out to as many stakeholders as possible and to maximum opportunity for exchange of views and concerns between the stakeholders (which include the regulators). Ample opportunity was therefore provided in the conduct of the meeting for the public attendees to participate in the WG discussions and this was favorably commented upon particularly by the device vendor representatives. Vendor representatives offered to provide additional statistical information to better define the population of radioactive devices. The Steel Manufacturers Association (SMA) submitted written recommendations for regulatory action at the meeting

Austria will serve as liaison to the WG for the International Atomic Energy Agency (IAEA).

Introductory Remarks by Dr. Paperiello

Carl Paperiello, Director of NRC's Office of Nuclear Materials Safety and Safeguards was introduced. Dr. Paperiello cited the background which lead to the creation of the WG and noted that the WG is part of a new approach for working with the Agreement States to solve problems which could serve as a model for the future. He described the problem facing the WG as mainly the result of generally licensed gauges entering the metal scrap stream. About 1.5 million generally licensed devices have been distributed which include gauges, self-luminous signs, static eliminators, etc. Of these, about 30,000 are nuclear gauges. He challenged the WG to determine how regulatory agencies could keep radioactive devices from entering the scrap metal stream at a time when budgetary resources are shrinking. He suggested that a solution should minimize demands on government resources. The WG would also need to determine whether a regulatory solution should be retrofitted to existing licensed devices. What can the private sector do, for example, should these devices be leased? He noted that even though the estimated annual rate of loss of radioactive devices is low, about 10xE-4, this still would lead to tens of devices appearing in metal scrap annually. The length of the useful life of a device should be considered when designing the device.

In the subsequent discussion it was pointed out that GL gauges are not the entire problem - specifically licensed gauges and other types of devices have become mixed with metal scrap. SMA noted that there has been an exponential increase in the number of discoveries of radioactive materials found in metal scrap.

The NRC co-chair commented that the WG is to address the problem collectively. As part of the planning for this meeting of the WG, a deliberate attempt was made to reach out to stakeholders and to maximize opportunities for discussions between stakeholders and the WG and between themselves. Each of the stakeholders should recognize each others' positions and constraints. For the government regulator stakeholders there is no certainty that Congress and State legislatures will fund additional regulatory efforts. Whatever the solution will be, it will be a tough sell.

Overview: Radioactive Materials in Recycled Metals

Mr. Yusko conducted an overview of the problem of radioactive materials in recycled metals which included a slide presentation (copies of the diagrams used in the presentation are attached, no. 5). The overview included an updating of the Yusko/Lubenau data base on smeltings and discoveries of radioactive materials

mixed with metal scrap that was originally reported in the April, 1995 issue of Health Physics. Worldwide, since 1983, there have been 38 confirmed instances of accidental smeltings of radioactive materials. Of these, 24 have occurred in the U.S. Twenty six smeltings have occurred in steel mills, Other smeltings occurred at mills, foundries or other smelting facilities handling aluminum (5), copper (2), gold (2) and lead, zinc, and vanadium (1 each). ^{137}Cs is the most frequently involved source. Other sources that have been smelted are ^{60}Co (9), ^{226}Ra (3), Th (1), U (1), ^{241} Am (1), accelerator produced isotopes (1) and 1 unknown. In the U.S., most events were discovered by radiation monitoring of the byproducts of smelting, e.g., slag and dross. The number of discoveries has been increasing especially since 1989. Radiation monitoring of metal scrap intended for recycling to detect radioactive sources has lead to the widespread discovery of metal scrap contaminated by naturally occurring radioactive materials (NORM). Stationary radiation monitors have resulted in the greatest number of discoveries of radioactive material in metal scrap (95%). Hand surveys (2%) and warning labels (1%) have also uncovered sources.

As of October 20, 1995, there are 1411 events on the Yusko/Lubenau data base. Of the radioactive materials that have been reported discovered in metal scrap, 62% involve NORM. Materials regulated under the Atomic Energy Act, as amended (AEA) accounted for 8% of the discoveries. In 24% of the cases the radioactive material was not identified. Radium accounted for 5% and accelerator isotopes for the rest.

A total of 166 discrete sources or devices were found. Of these, ^{226}Ra accounted for 41%. AEA materials accounted for the greatest share, 101 discoveries or 61% Sources containing ^{137}Cs were the most commonly found AEA material - 41 cases.

Mr. Yusko noted the costs for the mills and scrapyards - an accidental smelting of a source can cost a steel mill an average of $ 10 million in decontamination and disposal costs and mill shutdown losses. Costs accrue to the government as a result of responding to incidents (which divert resources from other, scheduled regulatory activities) and loss of public confidence in government regulatory programs. Workers and the public are put at risk of exposure to radiation. Although serious exposures in the U.S. to radiation as a result or radioactive materials mixed in metal scrap are not documented, they have occurred elsewhere resulting in death (Estonia) and injury (Mexico and Estonia).

Mr. Yusko recounted recent activities of the CRCPD committee, which he chairs, which is charged with developing standard response procedures for the industry, developing a national reporting system and developing other guidance. The committee has participated in seminars sponsored by the Institute of Scrap Recycling Industries (ISRI) and provided technical assistance to

ISRI in the development of ISRI recommended procedures and a training video for persons handling metal scrap that may be radioactive. He also described the U.S. DOT exemption program which simplifies returns of shipments of scrap to originators when they have been found to contain radioactive material.

Mr. Yusko stressed that the problem is international and that it has, in addition to sources and devices, another component, NORM, that needs to be addressed. In subsequent comments, the NRC co-chair remarked that while NRC maintains databases on reports of lost and stolen devices, intuitively there is more confidence in the data on discovered sources because for persons to report a loss or theft of a device they must (1) know that they have a device and (2) know that it is missing. The data, therefore, are just the tip of an iceberg.

Change to Agenda

Prior to the break for lunch the NRC co-chair proposed that it would be more logical to review of the WG charter as the first item of business in the afternoon rather than discuss it the next day. (see attachment 4). There being no objection, this was done.

Review of the WG Charter

The scope and the background sections of the charter were reviewed without comment. However, in later discussions it was pointed out that under the "Scope" section, the WG is to evaluate "current regulations" while under the "Task" section the WG is to assess "current regulatory programs," a broader charge. The WG agreed that it would be guided by the latter. It was initially agreed that "the problem" was concisely stated in the charter as "[i]nadequate control of licensed devices by licensees [that] has lead to radioactive materials being included in metal scrap intended for recycling," however, subsequent discussions lead to a refinement of the problem description to mean that there was inadequate inventory control and improper disposal by licensees. The WG task was reviewed and it was agreed that the task included assessing disposal of licensed devices.

The seven "issues" in the charter were reviewed. It was commented that some issues may be of a higher priority than others in terms of solving the problem and that the WG may have to offer recommendations on this point. With respect to the issue of "Device Disposal," it was agreed that "options for disposal" means proper disposal and that options could include actions to stimulate proper disposal and penalties to discourage improper disposal. Under "Device Identification," it was agreed that "added requirements" could be either technical or administrative.

How to measure success or failure of a regulatory program engendered considerable discussion during the meeting. On this issue, Dr. Telford suggested later in the meeting[1] 8 ways to measure program success or failure (outcome indicators) or to use as acceptance criteria for regulatory options:

1. Total person-rem dose per annum

2. Number of smeltings per annum

3. Frequency of smeltings per capita of devices per annum

4. Number of devices reported lost per annum

5. Number of "discovered orphaned devices" per annum

6. Financial loss (including dollar costs and losses of jobs) per annum

7. Percentage (or per capita) of devices under proper control per annum

8. Percentage (or per capita) of devices disposed of properly per annum

These measures could be applied nationally or regionally or by State.

Dr. Telford suggested that the goals are to minimize the negative outcome indicators (nos. 1 - 6) and maximize the positive outcome indicators (nos. 7 & 8).

The remainder of the charter was reviewed without comment.

The WG identified issues that were outside the scope of the WG charter. These included disposition of contaminated furnace dusts and sources and devices that are exempt from licensing. On the other hand, the WG agreed that it should address the issue of dealing with licensed sources and devices which licensees can not account for. This is a major item of concern and may become the subject of recommendations for regulatory options.

The NRC co-chair challenged the WG by pointing out that one option available to the Commission that could be viewed as very cost effective would be to actively encourage programs for radiation monitoring of metal scrap streams coupled with stronger penalties imposed against licensees who lose licensed sources, i.e., NRC would not embark on any new or additional regulatory

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[1] Although Dr. Telford's discussion took place the next day, his comments are reported here for clarity.

programs or rulemakings.

NRC Regulatory Approach for Radioactive Materials in Devices

Discussion then proceeded to how the NRC regulates radioactive devices. Dr. Telford described the NRC regulatory approach for devices possessed under a general license ("generally licensed devices") including its history (attachment 6). Both general and specific licenses were authorized by Congress in 1954 when the AEA was passed. General licenses for byproduct material first appeared in the regulations in 1956. General licensed devices are constructed with inherent radiation protection features that permit them to be used by persons untrained in radiation protection. Vendors must provide copies of the general license to recipients and furnish reports of such transfers to the NRC and Agreement States. General licensees are restricted with respect to whom they may transfer such devices. Several persons commented that other types of general licenses exist. With respect to nuclear gauges, it was noted by Mr. Lubenau that while NRC has a scheduled inspection program for specifically licensed gauges and charges such licensees fees, general licensed gauge users are not routinely inspected and do not normally pay fees. Thus, because of the lack of routine government oversight and contacts, the problem may be better described as forgotten sources rather than lost sources.

Mr. DelMedico from NRC's Office of Enforcement described NRC's recently revised enforcement program as it applies to materials licensees. The policy was revised in June, 1995 and is published in NRC publication no. NUREG-1600. Under the revised policy, the base civil penalties in the materials area were raised. Of primary interest to the WG was the discretionary authority applicable to cases where licensees have lost licensed sources. In such cases a civil penalty equal to the cost of properly disposing the source may be imposed.

Alternative Regulatory Approaches by Agreement States

Co-chair Free described Texas' regulatory program for general licensees. Texas general licensees are required to file an acknowledgement form with the State following receipt of generally licensed devices. The fee for filing the form is $200. An on-site inspection program is included in the program and is intended to focus on high priority users but because of resource constraints and other program priorities, it is not yet fully implemented. Vendors have been cooperative in tracing general licensees. The acknowledgement program is in its beginning stages and so the data base for general licensees is not complete. Texas has civil penalty authority and has imposed civil penalties as large as $16,000 for lost sources.

Mr. Heyer, who formerly worked for the TX radiation control

program and guided implementation of the acknowledgement program, provided additional details. The focus of the program was to improve accountability. Quarterly reports from vendors for 15 past years were entered into a database. Using this database, letters were generated informing general licensees of the new program. The initial response rate was 40%. Over 800 general license acknowledgements have been issued. Implementation has taken 3 and 1/2 years thus far and "thousands of staff-hours."

Ms. Haden described the NC program for generally licensed devices. Using the quarterly reports of transfers of such devices supplied by manufacturers, the State sends a registration form to recipient and assigns a registration number. The registrations must be renewed annually at a fee of $75. In effect, the annual registration is a mail survey asking the licensee to confirm possession of the device or report disposal of the device. General licensees are also subject to inspections that are scheduled at a 4 year frequency. The initial response rate to registration notices was 60%. Mail followups are currently in progress for the other 40%. It is expected that approximately 400 general licensees will be registered. The program has been implemented by drawing resources from the State's Agreement program and the State hopes that this will not affect its overall adequacy and compatibility.

Mr. Bolling briefly described alternative programs by other Agreement States. Iowa has a rulemaking under way specific to general licensees. Written questionnaires will be mailed every three years. An on-site inspection is scheduled every 6 years. The annual registration fee will be $150. Oregon carries out a registration program that includes telephone surveys and charges fees. Illinois requires general licensees to register and are contacted annually by mail by the State. Mr. Bolling also reported that he contacted 11 Agreement States and compared their State inspection priorities for selected specific licensees with those of the NRC:

Licensee Category	Inspection Frequency (years) NRC	Agreement States
Teletherapy	3	8 more frequent
Well Logging	3	6 more frequent
Fixed Gauges	5	7 more frequent
Portable Gauges	5	9 more frequent
Irradiators (self-contained, <10 kCi)	5	8 more frequent
Irradiators (panoramic		

or converted teletherapy, < 10 kCi)	3	6 more frequent

Mr. Hall described the 3M program for its radioactive devices. 3M has between 800 and 900 devices in plants throughout the country. Because plant safety personnel are normally concerned about other, non-radiation hazards and plant engineers are primarily with production processes, 3M has placed responsibility for oversight of these devices in its corporate office. The program includes inventory control and inspections. Despite this oversight, sources have been lost even when they have been locked into place. He stressed that communications with the plant personnel concerning controls and accounting of the devices must be at the highest plant management levels. He also stressed that regulatory requirements should be as uniform as possible across the country; differences between NRC and Agreement State requirements are a cause for concern for licensees whose operations are subject to multiple jurisdictions.

Agenda Planning for October 25, 1995

Because of the time taken to review the charter and the length of the discussions of the day's topics, the co-chairs proposed moving the session for public discussion of the stakeholder issues to the next day. This was agreed to and the day's meeting was adjourned.

October 25, 1995

Public Discussion: Stakeholders

The SMA requested an opportunity to present a statement on the problem (attachment 2). SMA stressed the need for a regulatory solution now. The burden has fallen on the steel industry. In addition to the costs incurred by mills that have smelted radioactive sources, all of the SMA members have incurred costs resulting from the need to install radiation detectors. These typically cost $50,000 per unit. Every alarm trip has a cost. People must respond to the alarm. In short, the steel industry is paying more than its fair share. SMA expressed concern over the approach being taken of defining the problem and determining where to go from there versus finding a solution now. The challenge is to improve control of licensed sources. Solutions should include financial incentives, e.g., requiring licensees to pay a deposit for disposal that is refundable upon evidence that the source has been properly disposed of because the biggest cost factor for licensees is disposal cost.

The NRC co-chair iterated the need for stakeholders to hear each others' concerns. Feasible solutions to the problem must be found. Feasibility includes (1) equity in terms of sharing the

burden, (2) minimum adverse effects, (3) maximum effect for the dollar, (4) regulatory solutions are do-able from the NRC's and State's points of view, (5) the solutions become effective in a timely fashion and (6) the consequences of the solutions have been fully considered. They may be more than one solution, variations and options. If so, they must be prioritized. Co-chair Free commented that whatever the solutions are, they must be accepted and implemented by everyone to be effective. One role of the Working Group will be to facilitate the finding of solutions. To "facilitate the facilitator" the Working Group needs input from the stakeholders. Additional public meetings are planned including a public workshop. Who are the stakeholders? How can the Working Group reach out to them?

The sense of the discussion was that while the spectrum of stakeholders had been largely identified (device vendors, device users, recycling industry, metal mills, health physics consultants and government) there is a need to cast a wider net and contact additional people. NRC can use its list of vendors to contact them and can use other media (newsletters, electronic bulletin boards) to contact others. The Agreement States can be asked to notify their vendors and licensees. Other stakeholder groups that need to be contacted are device brokers, licensees who service devices and companies that specialize in demolition of plants and buildings and sell the scrap (and thus might inadvertently take possession of and transfer licensed devices).

Some vendors maintain contacts with customers who have obtained devices from them. One vendor recommends to their customers that when their devices are not in service for an extended period then they should be returned to the vendor for temporary storage. Another vendor commented that some customers decline service contracts or follow up contacts. Co-chair Free suggested that vendors could provide the NRC and the Agreement States with the names of customers who no longer respond to communications from the vendors. Since 10 CFR 31.5 general licensees are exempt from the requirements of Parts 19 and 20 some customers are not interested in training. Several vendors commented that general licensees return devices to them. This aspect and the fact that some devices have also been properly disposed of means that the actual number of devices still in the possession of licensees is less than the distribution figures.[2] Several vendors

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[2] NRC staff has estimated that approximately 450,000 devices have been distributed to about 30,000 NRC general licensees. The number of Agreement State general licensees is not known, however, since the ratio of Agreement State to NRC specific licensees is known, 2:1, it is believed that a similar ratio applies to general licensees. This leads to estimates of roughly 1,500,000 devices that have been distributed to about 90,000 general licensees overall in the U.S. Of these, about 150,000

volunteered to provide data to the WG on devices returned to them.

Vendors do not have uniform product lines. One vendor's gauges primarily use ^{85}Kr, another's products mainly use ^{137}Cs and a third vendor specializes in ^{210}Po products. In the last case, the products, static eliminators, are leased and routinely returned for replacement because of the short halflife.

A vendor expressed the view that although nuclear gauges were a small part of the general licensed device population they seemed to be a large part of the metal scrap problem. Even so, sight should not be lost of other types of devices which have shown up in metal scrap. The large number of nuclear devices presently in use in the U.S. is a result of the efforts by the AEC to stimulate the peaceful uses of nuclear energy. Today, the U.S. manufacturing base is shrinking and this is impacting the nuclear device market. Regulatory requirements, such as imposing fees, can impact the market. It was noted that there are no charges up front for disposal fees. A simple nuclear density gauge can cost from $3,000 to 5,000. Once sold, a vendor has little leverage over a user. Lease arrangements have been very effective in controlling and accounting of devices. Nonetheless, instances are known where leased devices have been returned damaged or have been lost.

Workshop Planning

The WG discussed general approaches for the public workshop. It was agreed that the WG should develop "strawmen" regulatory options to serve as starting points for discussions at the public workshop. Persons who attended the October 24-25, 1995 WG meeting were invited to send their suggestions and ideas for this purpose to the WG Co-chairs by Dcember 1, 1995. At the December, 1995 WG meeting the WG will review the strawmen, finalize them and will issue invitations for stakeholder volunteers to participate in panel discussions. Following the December WG meeting the finalized strawmen will be distributed to the panelists.[3]

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are industrial nuclear devices including about 30,000 nuclear gauges. As noted elsewhere in these minutes, the agenda planning for the next WG meeting calls for a discussion of how such data are generated and their limitations.

[3] Following the October 24-25, 1995 WG meeting, the NRC Co-chair will meet with NRC staff to develop suggestions for structuring and moderating the public workshop drawing upon NRC's extensive experience with public workshops. The staff's recommendations will be included in the agenda for the December, 1995 WG meeting.

Agenda Planning for the December, 1995 WG Meeting

It as agreed to hold the next meeting of the WG on December 19 & 20, 1995. (Note that this is a change from the WG Charter which scheduled this meeting for the week of December 11, 1995). The meeting will be in the Rockville, MD area.[4]

The WG expressed an interest in visiting a scrap processing facility and/or steel mill in conjunction with the December meeting. The NRC Co-chair will pursue this. The tentative date for this activity is December 18th with December 21st as an alternate date in the event of adverse weather.

Based upon the discussions at this meeting the draft agenda for the December 19-20, 1995 WG meeting calls for the following:

o Review and approval of the minutes of the October 24-25, 1995 meeting.

o Review of NRC data bases
  - Distribution of specific and general licensed devices
  - Incidents involving loss/stolen or abandoned sources
  - Exposures of workers and the public to devices

o Review of related NRC contracts/studies
  - Risk assessment
  - Exemption criteria

o Workshop planning

o Planning for the next WG meeting

The Co-chairs stated that there may be a need for a teleconference with the WG prior to the December 19-20, 1995 meeting. If the need arises, the teleconference will be announced beforehand through the NRC Public Meeting Announcement System. To the extent practicable, the teleconference will be limited to procedural and logistical matters.

Minutes of the Meeting

The Co-chairs will draft minutes of this meeting. The objective is to have draft minutes of the meeting available for

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[4] Subsequent to this meeting the NRC Co-chair confirmed that the site of the December 19-20, 1995 meeting will again be in the Randolph Room, Doubletree Hotel, Rockville, MD.

distribution to all attendees by November 20, 1995.[5]

[5] Implicit in this is that these minutes will be <u>draft</u> minutes subject to review and approval by the WG. Review and approval of the WG minutes is included in the agenda for the December 19-20, 1995 WG meeting.

Attachment 2

JOINT AGREEMENT STATE - NRC WORKING GROUP TO REVIEW
THE REGULATION OF DEVICES CONTAINING RADIOACTIVE MATERIALS

October 24-25, 1995 Meeting

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STATEMENT OF THE
STEEL MANUFACTURERS ASSOCIATION

ON
LOST RADIOACTIVE SOURCES IN THE
FERROUS SCRAP SUPPLY

U.S. NUCLEAR REGULATORY COMMISSION-STATE WORKING GROUP
PUBLIC MEETING

OCTOBER 24 - 26, 1995

The Steel Manufacturers Association ("SMA") consists of 56 North American companies that operate 123 steel plants and employ approximately 63,000 people. Our U.S. member companies are represented in the U.S. Congress by 93 Congressional Districts located in 38 states.

The member companies of the SMA are widely dispersed geographically, with 45 located in the United States, eight in Canada, and three in Mexico. The SMA also has 121 Associate Member companies, located worldwide, that supply goods and services to the steel industry.

Most of the SMA companies operate electric arc furnaces ("EAF") to make raw steel from a feedstock of almost 100% ferrous scrap. Some SMA members are reconstituted integrated (ore-based, using a 10-20% scrap feedstock) companies, producing steel from iron ore and other raw materials.

SMA members account for approximately 40% of U.S. steel production and are the largest recyclers in the country. EAFs consumed approximately 42 million net tons of scrap metal in 1994 (source: U.S. Bureau of Mines), including the steel scrap derived from 9 million junked automobiles and from tin cans, old appliances, and other discards in our society.

GROWTH FORECAST

Mini-mills, carbon specialty steel mills, and reconstituted integrated mills represent a competitive and dynamic segment of the North American steel industry. They are rapidly capturing an increasing share of U.S. markets. The output of EAF steel producers will reach nearly 50% of U.S. steel production in ten years.

Attachment 2

LOST RADIOACTIVE SOURCES: ECONOMIC CONSEQUENCES AND RISKS TO HUMAN HEALTH AND THE ENVIRONMENT

Scrap metal purchased as a feedstock by EAF steelmakers increasingly contains shielded radioactive sources, such as cesium-137 or cobalt-60. Typically, these are radioactive heads from gauges used in manufacturing operations that have shut down, or those contained in discarded hospital equipment, or in retired equipment resulting from U.S. military downsizing. These radioactive sources are generally shielded in lead containers, which can pass through even the most sensitive radiation detection devices.

Twenty-four accidental radioactive material smeltings have occurred in the United States since 1981 and hundreds more have been discovered before they were melted. (See Attachment)

The increase in contaminated scrap is directly proportional to: (1) the number of radioactive devices licensed by the Nuclear Regulatory Commission ("NRC") over the last few decades; and (2) the NRC's failure to adequately track and control the safe disposition of these sources. According to 1993 NRC data, there were more than 550,000 radioactive sources in the United States, including: (a) 22,000 specific licensees; (b) 2,300 gauge licensees; (c) 31,600 general licensees; (d) 456,000 10 C.F.R. § 31.5 devices; and (e) 42,000 gauges. (*Radioactive Material in Metal Scrap*, Joel O. Lubenau, Nuclear Regulatory Commission)

The exact number of radioactive devices in the scrap metal supply is unknown. The NRC estimates that 15 sources are lost in the United States each year, but SMA member company experiences show that far more untraced or lost sources exist in the North American scrap supply. One major scrap broker discovered more than 300 radioactive sources mixed with scrap metal between 1990 and 1993. Moreover, the NRC concluded that: (1) total yearly reports of contaminated scrap metal has skyrocketed since 1988; and (2) the actual number of reported discoveries of radioactive sources in scrap metal represent only the "tip of the iceberg." *Lubenau* at 13.

The absence of adequate regulations governing the issuance of licenses, and the sales, transfers, and disposal of licensed devices is painfully apparent.

Under the current regulatory framework, there is an ***economic disincentive*** for individual scrap dealers to identify lost radioactive sources before they are shipped in scrap to steel companies. Due to the high costs for proper disposal of a radioactive source the current regulatory system creates an incentive for the finder of a lost source to conceal rather than identify a radioactive source. As a result, sources are often sent to scrap processors or to EAF facilities.

STEEL COMPANY PREVENTATIVE MEASURES

SMA companies with melt shops operate sophisticated radiation detection systems to monitor incoming scrap at their truck and rail entry stations. They have implemented handling systems and safety procedures in the event a source is discovered. As most licensed sources are contained in lead containers that shield the radioactivity, not even the most advanced detection systems can detect all the radioactive sources entering a plant. Technology alone is insufficient to solve the problem. Any solution must combine the efforts of the regulating agencies, the steel industry, and the scrap industry.

POTENTIAL HEALTH EFFECTS

Despite their use of the best equipment to detect shielded sources, EAF companies have become the innocent victims of the lost source problem. Most of the 24 accidental smeltings of radioactive material have involved scrap metal containing cesium-137 sources, an Atomic Energy Act material. When a cesium-137 source is melted, it contaminates equipment (including the EAF, baghouse, and duct systems), baghouse dust, and the surrounding facility. Radioactive melts can pose potentially serious threats to workers, the surrounding community, and the environment. **Only by sheer luck have there been no injuries or fatalities as a result of inadvertently melting of a radioactive source.**

In one instance in Florida, a teletherapy unit was discovered prior to melting that was rated for 5,000 curies of cobalt-60. Had the unit contained its rated quantity of cobalt-60 and been melted, it would have subjected melt shop workers to a lethal dose of radiation, and the radiation would have spread for more than a mile.

ECONOMIC EFFECTS

There are devastating economic consequences if a radioactive source is melted in an EAF. The resulting downtime and cleanup costs have a major negative economic impact on steel companies.

Available data from five SMA companies indicate that the costs associated with decontaminating a facility after a radioactive melt range between $2 million and $4 million. The costs of disposing and storing radioactive EAF dust range between $3 million and $15 million. Due to the time a facility must cease steel production, the melting of a radioactive source can cost $5 million to $13 million in lost revenues. Thus, the total costs associated with melting a radioactive source typically exceed $10 million per melt and can be as high as $24 million per melt. In contrast, a licensee that illegally disposes of a radioactive source faces a fine equivalent to a speeding ticket, assuming the source can be traced back to the licensee, which cannot be done if a source is melted.

REGULATORY JURISDICTION

Contaminated EAF dust poses a problem that falls under both the Environmental Protection Agency ("EPA") and the NRC jurisdiction. EAF dust is already an EPA listed hazardous waste ("K061") that is regulated under the Resource Conservation and Recovery Act ("RCRA"). When EAF dust is contaminated, it is also considered a low-level mixed hazardous waste, and this falls under both EPA and NRC jurisdiction.

A regulatory gap exists for the disposition of radioactive contaminated EAF dust. Under current EPA and NRC regulations, radioactive EAF dust: (1) cannot be processed at a typical High Temperature Metals Recovery ("HTMR") recycling facility, which is the preferred method most commonly used for recycling EAF dust; and (2) cannot be stabilized and disposed of in a lined RCRA hazardous waste landfill.

Consequently, six U.S. steel producers are temporarily storing on-site approximately 25,000 tons of low-level radioactive EAF dust for which there is no cost efficient recycling, treatment, or disposal option. These facilities are unfairly exposed to potential citizen suits or enforcement actions because they typically are forced into the untenable position of having to store a RCRA hazardous waste (K061) on-site without being able to obtain the necessary RCRA storage permits. Until an appropriate regulatory solution is developed so that facilities can economically recycle, treat, and/or dispose of EAF dust with low levels of radioactivity, a growing number of U.S. steel producers will accumulate and have to store low-level radioactive K061 on-site, despite the fact they are operating state-of-the-art detectors. This makes no economic or environmental sense.

PRE-MELT RECOMMENDATIONS

This problem must be addressed now. Regulatory solutions to the radioactive scrap metal problem must be divided into two separate areas: (1) preventive "pre-melt" recommendations designed to prevent radioactive sources from entering the scrap stream and to remove radioactive sources currently in the scrap stream; and (2) "post-melt" solutions designed to assist EAF facilities that accidentally melt a radioactive source to decontaminate their facilities and dispose of contaminated EAF dust.

The NRC, EPA, Department of Energy ("DOE"), the Institute of Scrap Recycling Industries ("ISRI"), and the steel industry should initiate joint efforts to assure more effective control of radioactive sources. The EPA and NRC need to develop a coordinated and flexible approach to regulate low level mixed waste and establish a scientifically supported risk-based threshold for regulating a waste as "radioactive."

SMA has urged the NRC to impose licensing fees which could be rebated when proof is obtained that licensees have properly disposed of licensed radioactive sources. Moreover, the NRC should implement an incentive program under which scrap processors would have financial incentives rather than incur financial penalties for identifying sources in the scrap stream.

The high cost of disposal creates an incentive for those who discover contaminated scrap metal to avoid notifying the appropriate authorities and to pass the contaminated scrap down the scrap stream. A scrap dealer who identifies radioactive material inherits the costs of appropriate disposal, unless the material can somehow be traced back to the licensee. EAF steel producers and their workers will continue to be the victims of radioactive melts, until, the NRC implements a program that encourages dealers and processors to remove radioactive sources from the scrap stream.

POST-MELT SOLUTIONS

Currently, EAF dust containing more than 2 pCi/g of cesium-137 cannot be recycled in a conventional high temperature metals recovery ("HTMR") facility. However, there is concurrence among health physicists who have studied the issue that EAF dust with less than 50 pCi/g of cesium-137 can be safely recycled. It should not be subject to more stringent regulations than those applicable to wastewaters containing similar levels of cesium-137 which is allowed to be discharged from a NRC-licensed facility to a totally "unrestricted area."

A risk assessment report prepared for the SMA, including a comprehensive health assessment, supports an exemption under which EAF dust containing up to 100 pCi/g of cesium-137 could be stabilized to meet stringent leachate standards and landfilled in a hazardous waste landfill that meets all applicable requirements under RCRA (*i.e.*, double liners and leachate collection systems). SMA has urged the NRC to provide guidance that all EAF dust containing up to 50 pCi/g could be recycled by HTMR, and all EAF dust containing up to 100 pCi/g could be stabilized and disposed in hazardous waste landfills subject to RCRA's land disposal restrictions. The current alternative is to leave the dust in storage facilities behind steel plants.

DOE mixed waste facilities should accept contaminated EAF dust for treatment and disposal. DOE already has a program to properly dispose of radioactive ferrous scrap derived from government owned or licensed facilities. Until an adequate solution is found to remove radioactive material from the scrap metal stream and until regulations are implemented allowing radioactive EAF dust to be treated and disposed of at hazardous waste facilities, the NRC, EPA, and DOE should negotiate jointly a program under which DOE would accept radioactive EAF dust for treatment and disposal at DOE facilities.

The Steel Manufacturers Association urges the NRC-State Working Group to support our proposed remedies to solve a serious problem in our industry.

Table 1. Worldwide smeltings of radioactive sources.[a]

No.	Year	Metal	Location	Isotope	GBq
1	—[b]	Au	unknown, NY	^{210}Pb	unknown
2	83	Fe	Auburn Steel, NY	^{60}Co	930
3	83	Fe	Mexico[c]	^{60}Co	15,000
4	83	Au	unknown, NY	^{241}Am	unknown
5	83	Fe	Taiwan[c,d]	^{60}Co	0.37–0.74
6	84	Fe	U.S. Pipe & Foundry, AL	^{137}Cs	0.37–1.9
7	85	Fe	Brazil[c]	^{60}Co	unknown
8	85	Fe	TAMCO, CA	^{137}Cs	56
9	87	Fe	Florida Steel, TN	^{137}Cs	0.93
10	87	Al	United Tech, IN	^{226}Ra	0.74
11	88	Pb	ALCO Pacific, CA	^{137}Cs	0.74–0.93
12	88	Cu	Warrington, MO	Accel	unknown
13	88	Fe	Italy[c]	^{60}Co	unknown
14	89	Fe	Bayou Steel, LA	^{137}Cs	19
15	89	Fe	Cytemp Spec, PA	Th	unknown
16	89	Fe	Italy	^{137}Cs	1,000
17	89	Al	Russia	unknown	unknown
18	90	Fe	NUCOR, UT	^{137}Cs	unknown
19	90	Al	Italy	^{137}Cs	unknown
20	90	Fe	Ireland	^{137}Cs	unknown
21	91	Fe	India[c]	^{60}Co	7.4–20
22	91	Al	Alcan Recycling, TN	Th	unknown
23	92	Fe	Newport Steel, KY	^{137}Cs	12
24	92	Al	Reynolds, VA	^{226}Ra	unknown
25	92	Fe	Border Steel, TX	^{137}Cs	4.6–7.4
26	92	Fe	Keystone Wire, IL	^{137}Cs	unknown
27	92	Cu	Estonia/Russia	^{60}Co	unknown
28	93	Fe	Auburn Steel, NY	^{137}Cs	37
29	93	Fe	Newport Steel, KY	^{137}Cs	7.4
30	93	Fe	Chaparral Steel, TX	^{137}Cs	unknown
31	93	Zn	Southern Zinc, GA	DU	unknown
32	93	Fe	Kazahkstan[c]	^{60}Co	0.3
33	93	Fe	Florida Steel, TN	^{137}Cs	unknown
34	94	Fe	Auburn Steel, ~~NY~~ IL	^{137}Cs	0.074
35	94	Fe	U.S. Pipe & Foundry, CA	^{137}Cs	unknown

Notes

[a] See Appendix for references.
[b] Multiple cases have been reported. The earliest occurred about 1910.
[c] Contaminated product exported to U.S.
[d] At least one contamination incident occurred in this time frame resulting in contaminated plumbing fittings exported to the U.S. There have been reports of contaminated structural steel used in buildings in Taipai, Taiwan, that were built in this time frame (Marley 1993).

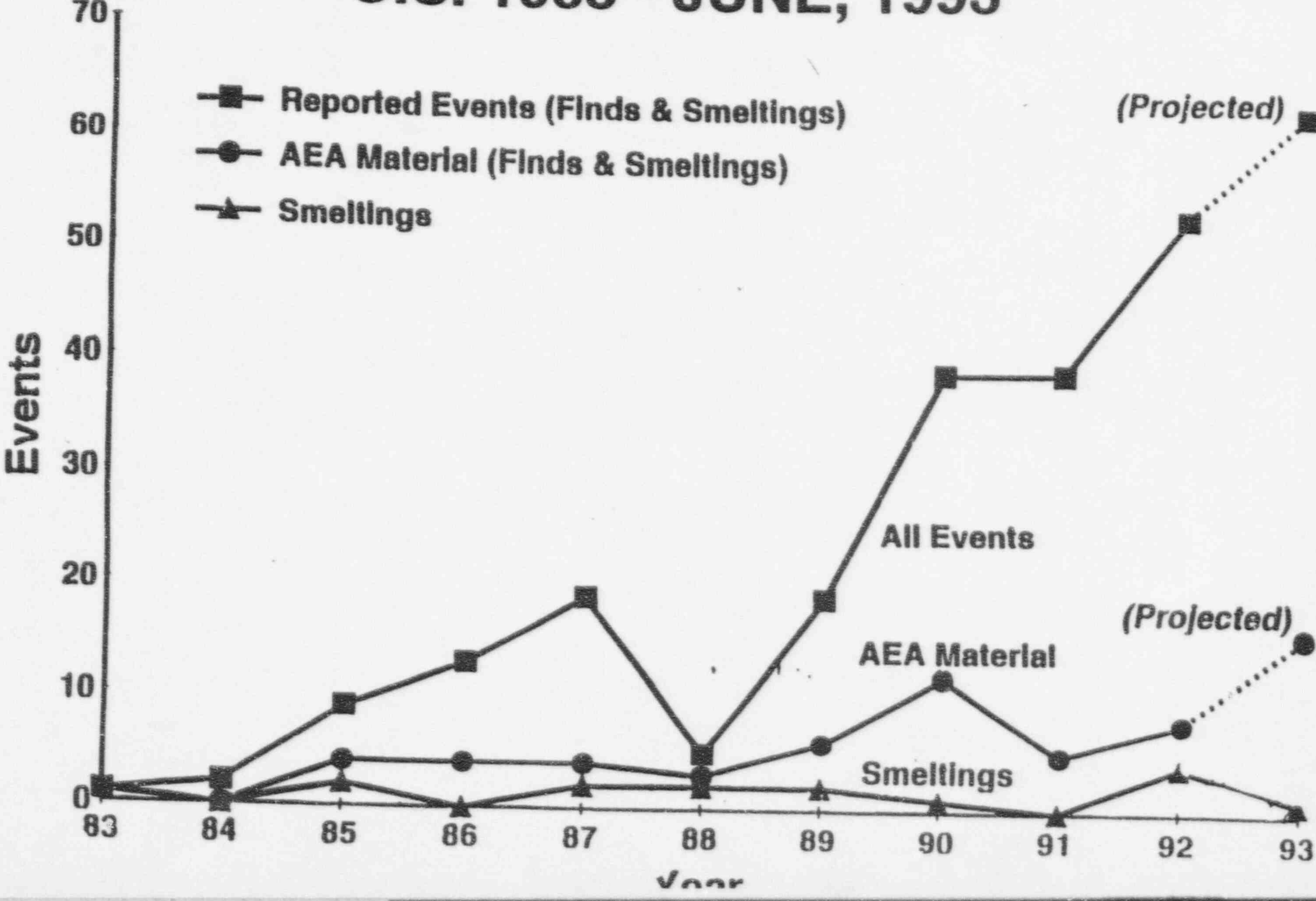
source of radioactive contamination of gold was discovered in the U.S. in 1983 when gold contaminated with ^{241}Am was found. The origin of the ^{241}Am was never determined.

In 1983, a New York steel mill operated by Auburn Steel Company discovered that it had accidently smelted about 930 GBq (25 Ci) of ^{60}Co (Bradley et al. 1986). An in-plant nuclear measuring gauge responded abnormally as the contaminated steel was processed and thus gave the initial indication to the mill workers that there was a problem. The plant had also become contaminated. Fortunately, all of the contaminated steel products were isolated at the plant and radiation exposures to the mill workers from the contaminated facility and products were minimal. Decontamination and radioactive waste disposal costs totaled $4,400,000 [1983 costs].

A more serious contamination event involving ^{60}Co contamination of iron and steel products began unfolding in late 1983 when a ^{60}Co teletherapy unit was removed from storage in Ciudad Juarez, Mexico, disassembled and sold to a scrap yard (Marshall 1984; U.S. NRC 1985). As a result of the scrapping, the ^{60}Co source was breached resulting in the dispersion of 6,000 1 mm diameter × 1 mm long pellets, each containing about 2.6 GBq (70 mCi) of activity. Eventually, metal scrap contaminated by the ^{60}Co was transferred from the scrapyard to steel mills and iron foundries in Mexico, where they were smelted with the steel scrap, causing contamination of the plants and their products. Some of these products, reinforcing bars (rebar) and cast iron table pieces were exported to the U.S. All of the rebar in the U.S. estimated to be between 450 and 850 Mg (500 to 930 tons) was returned to Mexico except for a small amount imbedded at construction sites where exposures and resultant health effects were considered to be unlikely or insignificant. About 2,500 cast iron table pieces were found to be contaminated and these were returned to Mexico for disposal.

Worldwide, there are 35 reported cases where radioactive materials were accidentally smelted, as a result of the radioactive material being mixed with the metal scrap (Table 1; see Appendix for a list of references for the 35

RADIOACTIVE MATERIAL IN METAL SCRAP
U.S. 1983 - JUNE, 1993



Source: Radioactive Material in Scrap Metal (With Focus on Atomic Energy Act Material

JOINT AGREEMENT STATE-NRC WORKING GROUP TO REVIEW THE REGULATION OF DEVICES CONTAINING RADIOACTIVE MATERIALS (Working Group)

Draft Agenda

October 24 - 26, 1995

Co-chairs: Robert Free, Texas Dept. of Health
Joel Lubenau, NRC Office of Nuclear Materials Safety and Safeguards

Members: Martha Dibblee, Oregon Dept. of Human Resources
Robin Haden, North Carolina Dept. of Environment, Health and Natural Resources
Rita Aldrich (alternate), New York State Department of Labor
Lloyd Bolling, NRC Office of State Programs
John Telford, NRC Office of Nuclear Regulatory Research

Liaisons: James Yusko, Chairman, Resource Recovery and Radioactivity Committee, Conference of Radiation Control Program Directors
James Richardson, NRC Nuclear Attache, International Atomic Energy Agency

Tuesday, October 24, 1995

8:30 - 9:15 am	Call to Order Co-chairs
9:15 - 9:45 am	Introductory Remarks Carl Paperiello, Director, NRC Office of Nuclear Safety and Safeguards
9:45 - 10:15 am	Break
10:15 - 11:30 am	Overview: Radioactive Materials in Recycled Metals James Yusko
11:30 - 1:00 pm	Lunch
1:00 - 2:00 pm	NRC Reglatory Approach for Radioactive Materials in Devices John Telford Office of Enforcement Representative
2:00 - 3:00 pm	Alternative Approaches By the Agreement States

Encl. 3

Lloyd Bolling
Robin Haden
Martha Dibblee
Robert Free

3:00 - 3:30 pm	Break
3:30 - 4:45 pm	Opportunity for Public Comment: Who are the Stakeholders?
	Co-chairs
4:45 - 5:00 pm	Agenda Planning for Wednesday
	Co-chairs

Wednesday, October 25, 1995

8:00 - 8:30 am	International Perspectives
	Jim Richardson
8:30 - 10:00 am	Discussion: Working Group Charter and Meeting Schedule
	Co-chairs
10:00 - 10:30 am	Break
10:30 - 11:30 am	Discussion: Public Workshop Planning
	Co-chairs
11:30 - 1:00 pm	Lunch
1:00 - 2:00 pm	Discussion: Public Workshop Planning
	Co-chairs
2:00 - 3:00 pm	Opportunity for Public Comment
	Co-chairs
3:00 - 3:30 pm	Break
3:30 - 4:45 pm	Discussion: Communications, Working Group Tasks, Assignments and Milestones
	Co-chairs
4:45 - 5:00 pm	Agenda Planning for Thursday

October 26, 1995

8:30 - 10:30 am	Wrap-up Discussions:	
		Charter and Meeting Schedule
		Public Workshop
		Communications, Tasks, Assignments and Milestones
	Co-chairs	
10:30 am	Adjournment	

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

Joint Agreement State-NRC Working Group
To Evaluate Control and Accountability of Licensed Devices

CHARTER

Scope

A working group of Federal and State regulators is to evaluate current regulations concerning the control of and accountability for generally and specifically licensed devices and develop recommendations for alternative regulatory approaches, as appropriate, taking into consideration the costs of any recommended changes. A part of the effort should be devoted to defining a method of measuring the effectiveness of the current and proposed programs.

Background

On June 20, 1995 the Commission approved a staff plan to contact the Organization of Agreement States (OAS) to form a working group (WG) to evaluate current regulations concerning generally and specifically licensed devices.

The Problem

Inadequate control of licensed devices by licensees has lead to radioactive materials being included in metal scrap intended for recycling. Inadvertent smeltings of radioactive materials in mills have occurred resulting in contamination of mills, mill products and byproducts. Subsequent costs for each incident that required decontamination, waste disposal and mill shutdown have totaled as much as $ 23 million. While exposures to radiation from radioactive sources in metal scrap in the U.S. have been minimal, significant radiation exposures of workers and the public resulted from incidents which occurred in Mexico and in Estonia, in the latter case causing one death. "Near-misses" have occurred in the U.S.: In 1994-95 an unshielded 14 GBq (370 mCi) ^{137}Cs source was found buried at a scrap yard in Illinois, a 12GBq (330 mCi) ^{137}Cs became separated from its shielded holder when the holder went through a shredder at a scrapyard in Kentucky, and ^{137}Cs contamination of soil was found at a scrapyard in Michigan.

Encl 4.

While various types of radioactive material have been found in metal scrap, the principal source of concern are devices such as nuclear gauges. Under NRC regulations specifically licensed gauge users are subject to annual fees and a schedule calling for inspections every 5 years while general licensees are not subject to fees nor to routine inspections.

The Task

The task of the WG is to assess the current regulatory programs for generally and specifically licensed devices and determine the baseline for regulating these devices. The assessment should address the question of whether there is an adequate level of assurance that these devices are properly controlled and accounted for by licensees, and that they do not present unacceptable levels of risk of exposure to radiation to workers and the public or financial risk to the metal recycling industry. An integral part of this assessment is to determine how to measure the success or failure of a regulatory program. The WG should examine regulatory alternatives including the costs of the alternatives for device vendors and users, the regulating agencies and other potentially affected groups and provide a recommendation to the Commission.

The Issues

Seven issues were identified by NRC staff that require a coordinated Agreement State and NRC review, i.e. addressed by the WG:

1. NRC and Agreement State Compatibility -- NRC and Agreement State regulations need to be compatible since approximately 2/3 of the devices are used by Agreement State licensees and loss of a device will often have effects in States other than the licensing State.

2. Cost and Fee Considerations -- There are various options for licensing devices that would provide better control and accountability. The cost of implementation to the NRC and Agreement States and the appropriate cost recovery method need to be considered.

3. Radiation Exposure Savings -- The savings in radiation exposures resulting from better control over, and accountability for, devices need to be considered in the selection of the method for licensing of devices.

4. Device Design -- Currently, the design requirements for generally licensed devices are more stringent than those for specifically licensed devices. The safety impact of using a different licensing method, which may rely on administrative controls rather than the design of the devices, must be evaluated.

5. Changes That Affect All Devices Versus Only Newly Acquired Devices -- Since there are currently about 1.5 million generally licensed devices in NRC and Agreement States, changes in the licensing of devices need to address both new requirements for devices currently possessed by licensees and newly acquired devices.

6. Device Disposal -- Options for the disposal of devices need to be delineated. Many current general licensees may wish to dispose of the devices rather than be subjected to increased regulation.

7. Device Identification -- Added requirements to ensure that methods of identification are used that could better withstand harsh, unexpected environments. Such requirements may enhance the ability to identify devices that are disposed of or improperly transferred.

In addition to these issues the WG should also answer the following question which is central to evaluating both the present regulatory program and any contemplated changes:

How can the success (or failure) of a regulatory program for ensuring adequate control and accountability of licensed sources be most effectively measured?

Committee Organization and Operations

Joel O. Lubenau, Senior Health Physicist, NMSS/IMNS/SCDB and Robert Free, Branch Administrator, Emergency Response and Incident Investigation, Texas Bureau of Radiation Control have been named WG co-chairs by the NRC and OAS respectively. Other OAS members are Martha Dibblee, Manager, Radioactive Materials Program, Oregon Radiation Protection Services, J. Robin Haden, Chief, Radioactive Materials Section and Rita Aldrich, Principal Radiophysicist, New York State Department of Labor (alternate). Other NRC members are Lloyd A. Bolling, Office of State Programs and John L. Telford, Office of Nuclear Regulatory Research.

The Conference of Radiation Control Program Directors, Inc. (CRCPD) has tasked its E-23 Committee on Resource Recovery and Radioactivity to review the issue of radioactive materials in metal scrap and develop recommendations. The committee has worked closely with the metal recycling industries and State and Federal agencies to develop guidance particularly for educational efforts and protective measures. The WG co-chairs will request the CRCPD to designate an E-23 representative to serve as liaison to the WG.

The International Atomic Energy Agency (IAEA) has reported on the problem of assuring adequate controls and disposal of "spent" radiation sources, i.e., sources that are no longer needed or usable. The NRC co-chair will request the NRC Nuclear Safety Attache assigned to the U.S. Mission to the UN System Organizations (James Richardson) to serve as liaison to the WG.

The co-chairs will be jointly responsible for developing a work plan for the WG, monitoring progress, preparing minutes of WG minutes and drafting a report of the WG's work and recommendations. Secretarial, logistical and travel support for WG meetings will be provided by the NRC. WG meetings are not subject to the requirements of the Federal Advisory Committee Act (FACA) but they will be publicly announced in advance through the NRC Public Meeting Notice System. Maximum use will be made of other appropriate media, e.g., professional and trade newsletters, to announce meetings to as broad an audience as possible. WG meetings will be open to the public and will be held in the Washington, DC area. NRC will fund the travel and per diem costs for the OAS co-chair and two additional OAS members. The CRCPD liaison is welcome to attend all meetings but NRC will not fund the travel costs.

Persons attending WG meetings will be welcome to provide comments to the WG for its consideration in either written form or orally at times specified by the WG co-chairs. A public workshop will be held to enable stakeholders to participate more directly in this process. The WG will be responsible for developing a plan for the workshop. NRC will provide the logistical and associated funding support for the workshop. The workshop will be held in the DC area.

Targets and Milestones

Meetings of the WG are blocked out as follows:

Meeting	Week of	Notes
Initial	Oct 23, 1995	Scheduled for October 24-26, 1995.
2nd	Dec 11, 1995	
3rd	Jan 15, 1996	Public workshop
4th	Mar 11, 1996	Review draft WG report
5th	Apr 15, 1996	Finalize WG report

Other key dates:

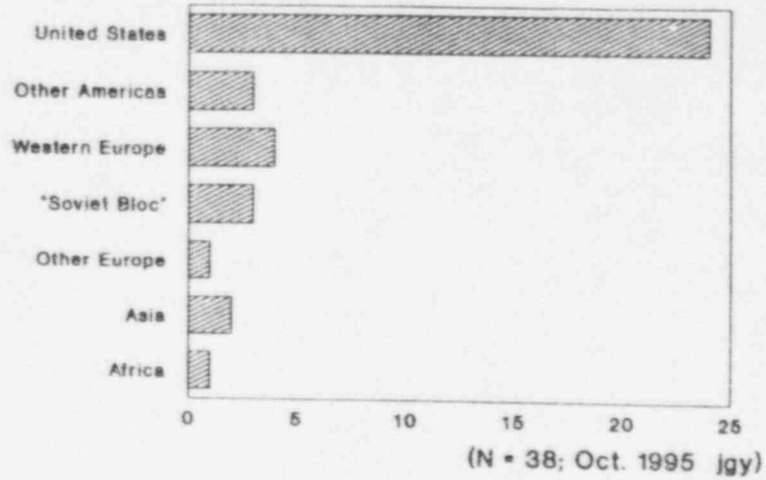
Date	Activity
April 14-19, 1996	IRPA Congress
May 5-10, 1996	CRCPD Annual Meeting
June 24, 1996 (Target date)	NRC staff report to the EDO
July 21-25, 1996	HPS Annual Meeting

Smelting of radioactive materials
(global summary)

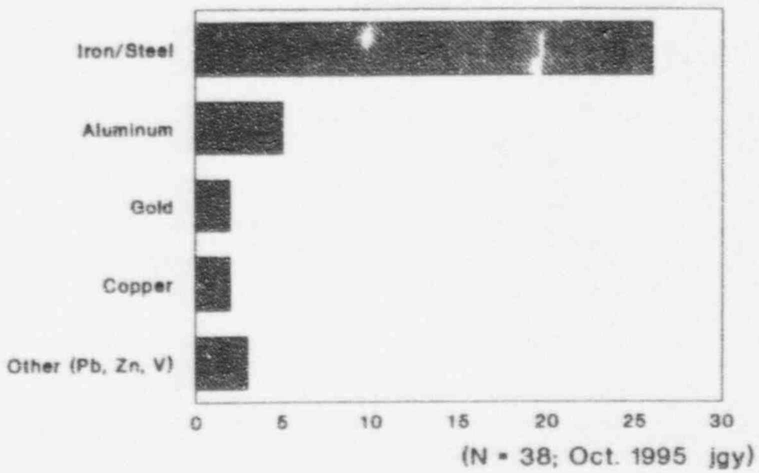
- Since 1983, thirty-eight (38) confirmed instances of accidental smelting of radioactive materials
- Of these, twenty-four (24) occurred in the U. S., 14 reported foreign events (Mexico, Taiwan, Brazil, Italy(3), Ireland, India, Russia, Estonia Kazakhstan, South Africa, Bulgaria, Canada)
- 9 Co; 20 Cs; 3 Ra; 1 Acc.; 2 Th; 1 U; 1 Am; 1 ?
- 26 in steel mills; Al-5; Cu-2; Pb-1; Zn-1; Au-2; V-1
- most US events discovered monitoring byproducts (slags or dross or flue dust)

(revised October, 1995)

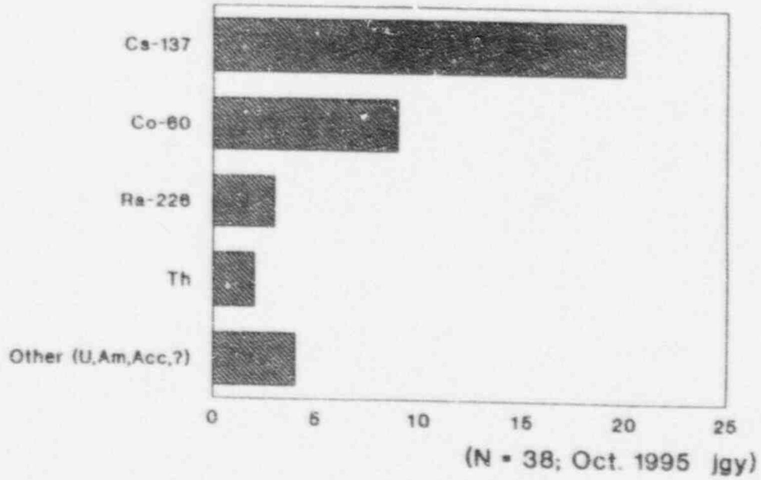
World-wide Smeltings of Radioactive Sources



World-wide Smeltings of Radioactive Sources



World-wide Smeltings of Radioactive Sources



Attachment 5

Summary of contaminating events 1983-1987

Year & location	Material, quantity	Source
1983 - New York	Co-60 - 25 Ci	IR? Rx?
1983 - New York (Au)	Am-241 - unknown	unknown
1983 - *Mexico*	Co-60 - 400 Ci	TeleRx
1984 - Alabama	Cs-137 - 10-50 mCi	gauge?
1984 - *Taiwan*	Co-60 - 10-20 mCi	Gauge
1985 - *Brazil*	Co-60 - (unk)	Furn. wall
1985 - California	Cs-137 - 1.5 Ci	Gauge
1987 - Tennessee	Cs-137 - 25 mCi	Gauge
1987 - Indiana (Al)	Ra-226 - 20 mCi (?)	Gauge
7 Fe; 1 Al; 1 Au	Co-60: 4; Cs-137: 3 Ra-226: 1; Am-241: 1	

(revised September 1991)

Summary of contaminating events 1988-1990

Year & location	Material, quantity	Source
1988 - Missouri (Cu)	Acc. produced - unk	unknown
1988 - California (Pb	Cs-137 - 20-25 mCi	Gauges
1988 - *Italy*	Co-60 - (unk)	unknown
1989 - Louisiana	Cs-137 - ~500 mCi	gauge?
1989 - *Italy*	Cs-137 - ~30 Ci	unknown
1989 - Pennsylvania	Thorium - (unk)	charge
1989 - *U.S.S.R.* (Al)	unknown	unknown
1990 - *Ireland*	Cs-137 - (unk)	gauge
1990 - *Italy* (Al)	Cs-137 - (unk)	gauge ?
1990 - Utah	Cs-137 - (unk)	gauge
Fe: 6; Al: 2; Cu,Pb:1	Co-60: 1; Cs-137: 6 Acc.: 1; Th: 1; ?:1	

(revised September 1991)

Summary of contaminating events 1991-1992

Year & location	Material, quantity	Source
1991 - *India*	Co-60 - ~350 mCi	unknown
1991 - Tennessee (Al)	Thorium - (unk)	unknown
1992 - Kentucky	Cs-137 - ~325 mCi	unknown
1992 - Virginia (Al)	Ra-226 - (unk)	unknown
1992 - Texas	Cs-137 - ~200 mCi	gauge?
1992 - *Russia* (Cu)	Co-60 - (unk)	unknown
1992 - Illinois	Cs-137 - (unk)	unknown
Fe: 4; Al: 2; Cu: 1	Cs-137: 3; Co-60: 2 Ra-226: 1; Th: 1	

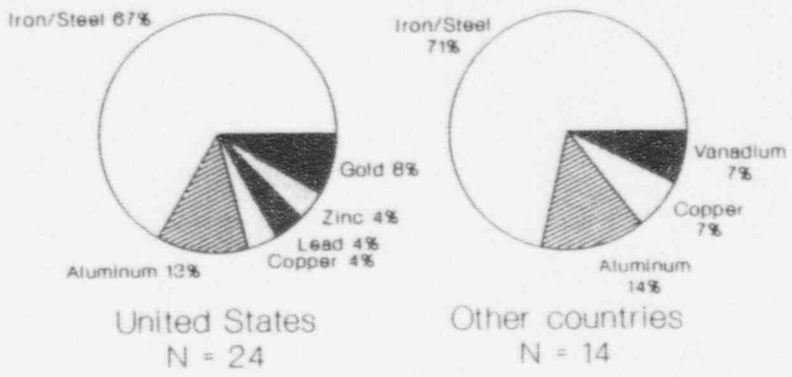
(revised January, 1993)

Summary of contaminating events 1993-

Year & location	Material, quantity	Source
1993 - Georgia Zn	U dep. - (unk)	U castings
1993 - New York	Cs-137 - ~1 Ci	gauge?
1993 - Kentucky	Cs-137 - ~200 mCi	gauge?
1993 - Texas	Cs-137 - unknown	unknown
1993 - *Kazakhstan*	Co-60 - <20 mCi	unknown
1993 - Tennessee	Cs-137 - unknown	gauge?
1993 - *South Africa* V	Cs-137 - unknown	unknown
1994 - Illinois	Cs-137 - ~25 mCi	gauge?
1994 - California	Cs-137 - unknown	gauge?
1994 - *Bulgaria*	Co-60 - ~15 mCi	gauge? wall
1995 - *Canada*	Cs-137 - <~10 mCi	gauge?
Fe: 9; Zn: 1; V: 1	Cs: 8; Co: 2; U: 1	

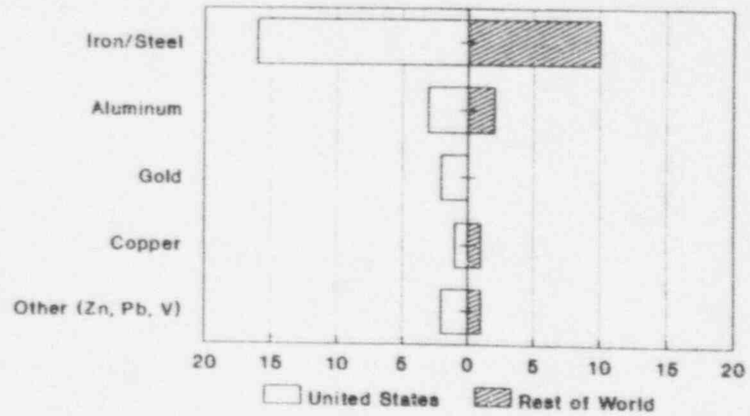
(revised October, 1995 jgy)

Global Smeltings of R/M
by affected industry



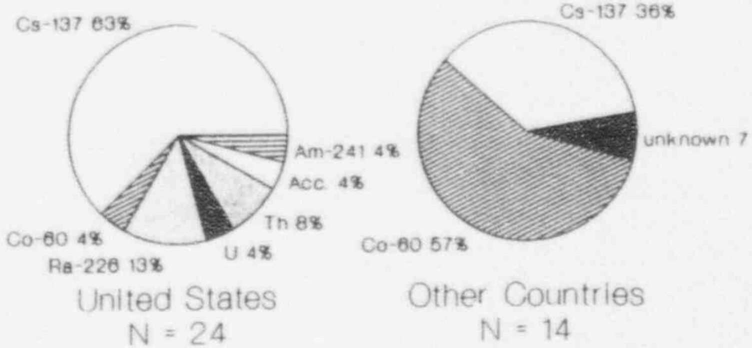
N = 38; October, 1995 JGY

Reported Radioactive Smeltings
(by Industry)



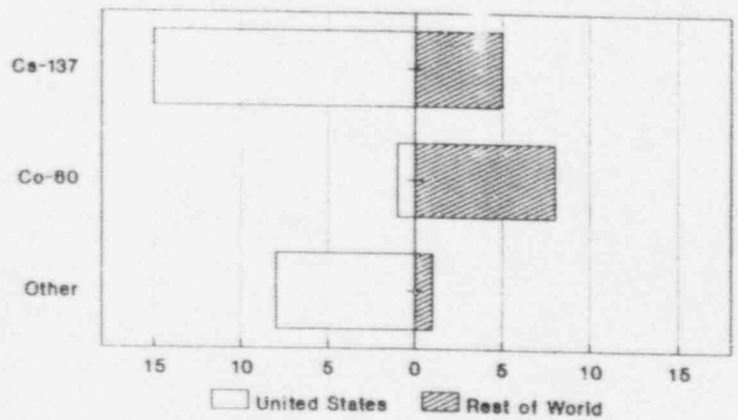
(N = 38; October, 1995 jgy)

Global Smeltings of R/M
by material smelted



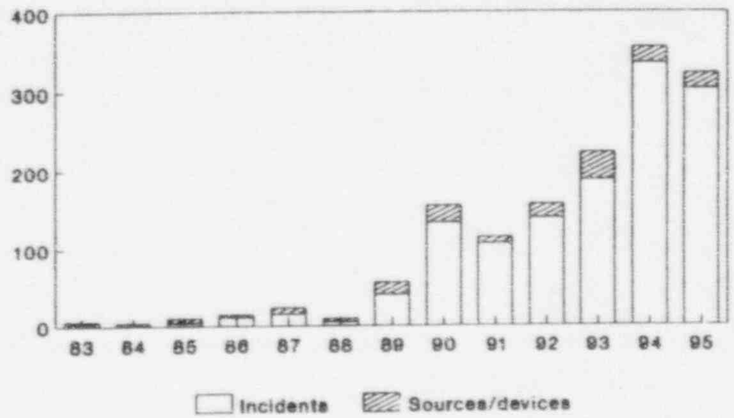
N = 38; September, 1995

Reported Radioactive Smeltings
(by Radioactive Material)



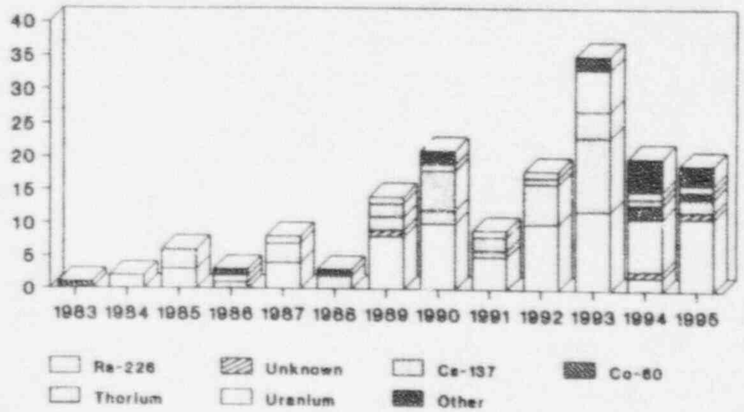
(N = 38; October, 1995 jgy)

Detections of sources/devices found in scrap shipments



Revised October 12, 1995 JGY

Sources, devices found in metal scrap, 1983 - date



N = 162; 10.12.95 JGY

Monitoring metal/scrap for radioactivity

- Primary concern was for protection against large sealed sources
- Monitoring disclosed a secondary problem -- NORM in metal scrap

Standards are needed for:
✓ detection (threshold) limits
✓ use of materials

Likely pathways for radioactive materials smelted in steel making furnaces

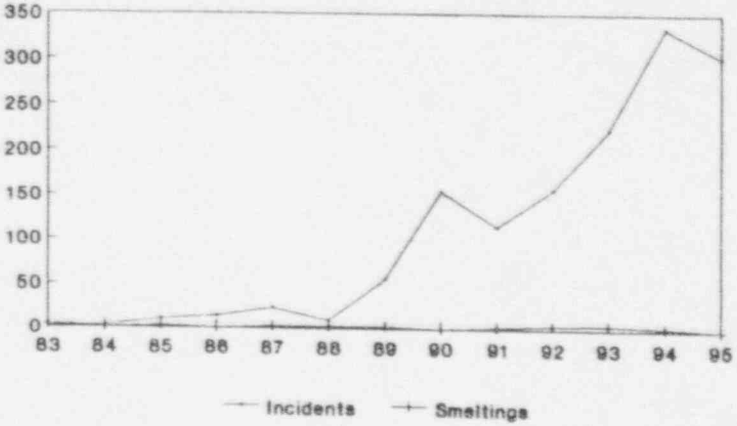
Elements	*Pathway*
Cesium, Lead, Polonium	Flue dust
Cobalt, Iridium	Steel
Radium, Americium, Strontium Plutonium, Uranium, Thorium	Slag

Discoveries of radioactivity in metal scrap (selected cases)

- reported/documented U.S., Canadian cases only
- Time span: January, 1985 - October, 1995
- 1409 events (1385 discoveries, 24 US smeltings)
- How discovered:
  - stationary monitors - 1343 (95.3%)
  - hand surveys - 30 (2.1%)
  - warning labels - 11 (~0.8%)
  - unknown - 24 (~1.7%)
  - other - 1 (~0.1%)

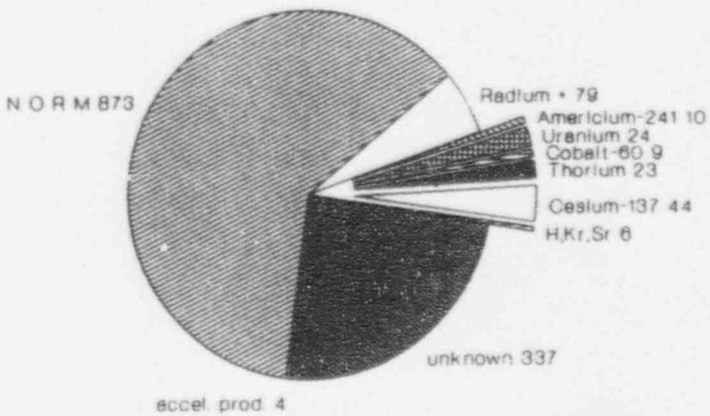
(revised October 12, 1995) JGY

Detections, Smeltings of Radioactivity in Scrap ('83-date



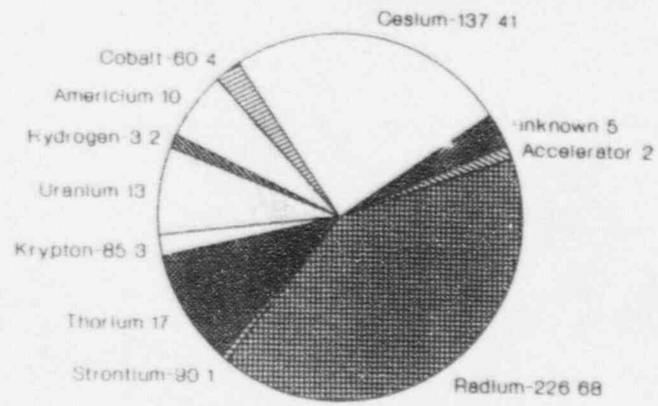
Revised October 12, 1995 JGY

Discoveries of radioactivity in metal scrap (continued) thru 10.12.95



(N=1409; revised October 12, 1995 JGY

Sources or Devices found in metal scrap (thru 10.12.95)



(N = 166; revised October 12, 1995 JGY

Impacts of radioactive materials in scrap

For mills and scrapyards

For government (i.e., taxpayer)

For workers

Impacts of radioactive materials in scrap

For mills and scrapyards:

- Costs to install monitors ($5k-$50k/unit)
- Costs to segregate, evaluate, return scrap
- Costs to decontaminate and dispose ($$$); loss of interim revenue ($$); ? profits

Impacts of radioactive materials in scrap

For government (i.e., taxpayer):

- Costs to respond to incidents
- Diversion from "normal" agency operations
- Loss of public confidence in agency ability to control radioactive materials
- Loss of credibility in (radiation) safety

Impacts of radioactive materials in scrap

For workers:

- Radiation exposure from feed scrap
- Radiation exposure from products and by-products (if smelted)
- Radioactive contamination from breached, dispersed rad. materials

Although these are not known to have occurred in the U.S., they ARE possible

Lessons learned from monitoring

1 - Monitor incoming scrap AND outgoing product and waste products

2 - Don't throw technology at a problem and expect it to be solved

3 - Know the capabilities AND limitations of your instrumentation

Lessons learned (continued)

1 - Monitor incoming scrap AND outgoing product and waste products

- Most U.S. smeltings detected by monitoring flue dust or slag
- Detection and alerting occur quickly - before materials leave the plant
- May require rerouting of traffic

Lessons learned (continued)

2 - Don't throw technology at a problem and expect it to be solved

- Make sure equipment is operating properly, "on", not disarmed
- Check operational performance periodically
- Keep records [illegible] when alarms occur

Lessons learned (continued)

3 - Know the capabilities AND limitations of your instrumentation

- Weak photon emitters difficult to detect, even normally
- Neutron sources need special meters
- Hand held survey meters may lack sensitivity of larger monitors

Recent activities
(steps in solving the problem)

- Conference of Radiation Control Program Directors, Inc., established E-23 Committee on Scrap Metal Contamination
- members are from state agencies with "resource persons" from other interested groups or organizations
- industry input is *vital*

E-23 Committee charge:
(Scrap Metal Contamination)

- Develop standard response and event notification protocol for use by state agencies and industries when monitors detect radioactivity in metal and scrap
- Develop a recommended national system for documenting and reporting incidents involving facilities in several states
- Develop guidance for disposition (use, disposal, etc.) of metal scrap, for use by agencies and industries

ISRI & E23

- E23 members participated in ISRI seminars
- E23 members provided testimony to ISRI Processing & Equipment Committee
- ISRI/PEC issued draft of "Radioactivity in the Scrap Recycling Process" 1/92
- E23 reviewed draft procedure; continue to work closely with ISRI

DOT E10656 Exemption

- Allows designated SRCP members to approve shipments of scrap metal containing unknown amounts of unidentified radionuclides
- Done on case-by-case basis
- Requires notification of SRCP at receiving destination, so that off-loading can be monitored
- Radiological risks to be satisfactory: non-dispersible & low radiation levels

Recent E-23 Activities

- On September 23, E-23 committee members met with EPA (& DOT, NRC, SMA, API, etc.) to discuss plans for a possible workshop on Radioactive Contamination of Metal Scrap
- Possible topics for this workshop include:
  - ✓ Characterizing Incidents & Causes
  - ✓ Technology Exchange for Pollution Prevention
  - ✓ Characterizing Problems from Smelting RAM
  - ✓ Cost Considerations to Prevent the Problem
  - ✓ Federal, State, and Industry Activities
  - ✓ Industry Recommendations for Solving the Problem

Recent E-23 Activities (continued)

- E-23 continues to urge EPA to develop guidance for the disposition of Naturally-Occurring Radioactive Materials (NORM) [most detections involve NORM; at present few states have regulations, a national standard is needed]
- At follow-up E-23 committee meeting, committee will contact manufacturers of certain sources and devices, to promote better inventory, accountability of generally-licensed sources

Work Remaining

✓ NORM regulations needed, in more states
- yet these don't address all R/M found

✓ Need to determine "acceptable" levels if radioactivity found in metal scrap
- depends on metal, process
- depends on radioactive material
- depends on metal product

✓ problem is international
- need for compatibility, uniformity

Good News & Bad News

✓ Good News: protective measures *can* detect radioactivity in metal scrap

- Bad News: protective measures *do* detect radioactivity in metal scrap

REGULATORY APPROACH FOR GENERAL-LICENSE DEVICES

- Section 81 of the Atomic Energy Act (AEA) authorizes the Commission to issue both general and specific licenses.

- General Licenses for byproduct material first appeared in the Commission's regulations in February 1956; 10 CFR Part 30 was amended. Three general licensees were provided "without the filing of applications with the Commission or the issuance of licensing documents to particular persons..."

- Currently the Commission's regulations include eight general licenses in Part 31, one general license in Part 35, and eight general licenses in Part 36.

- The Commission's regulatory approach includes granting a general license to own, receive, acquire, possess, and use byproduct material when contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing light or an ionized atmosphere.

- The Commission's regulatory approach also includes requiring of the vendors that the devices are constructed with inherent radiation protection features and may be used safely by untrained persons; provided that they are adequately labeled, used in the manner for which they are intended, and repaired and serviced by trained personnel.

- In addition, the Commission's regulatory approach includes requiring the vendors to furnish a copy of the general license containing the stated restrictions and limitations to persons to whom the devices are transferred; and to file a quarterly report on all transfers of the devices to generally licensed persons.

- In 1962 the Commission's regulatory approach was extended to the Agreement States.

- In 1965 a "universal" label was adopted to be used in all States.

Attach 6