Finding and Management of Abnormal Radioactive Material in Taiwan

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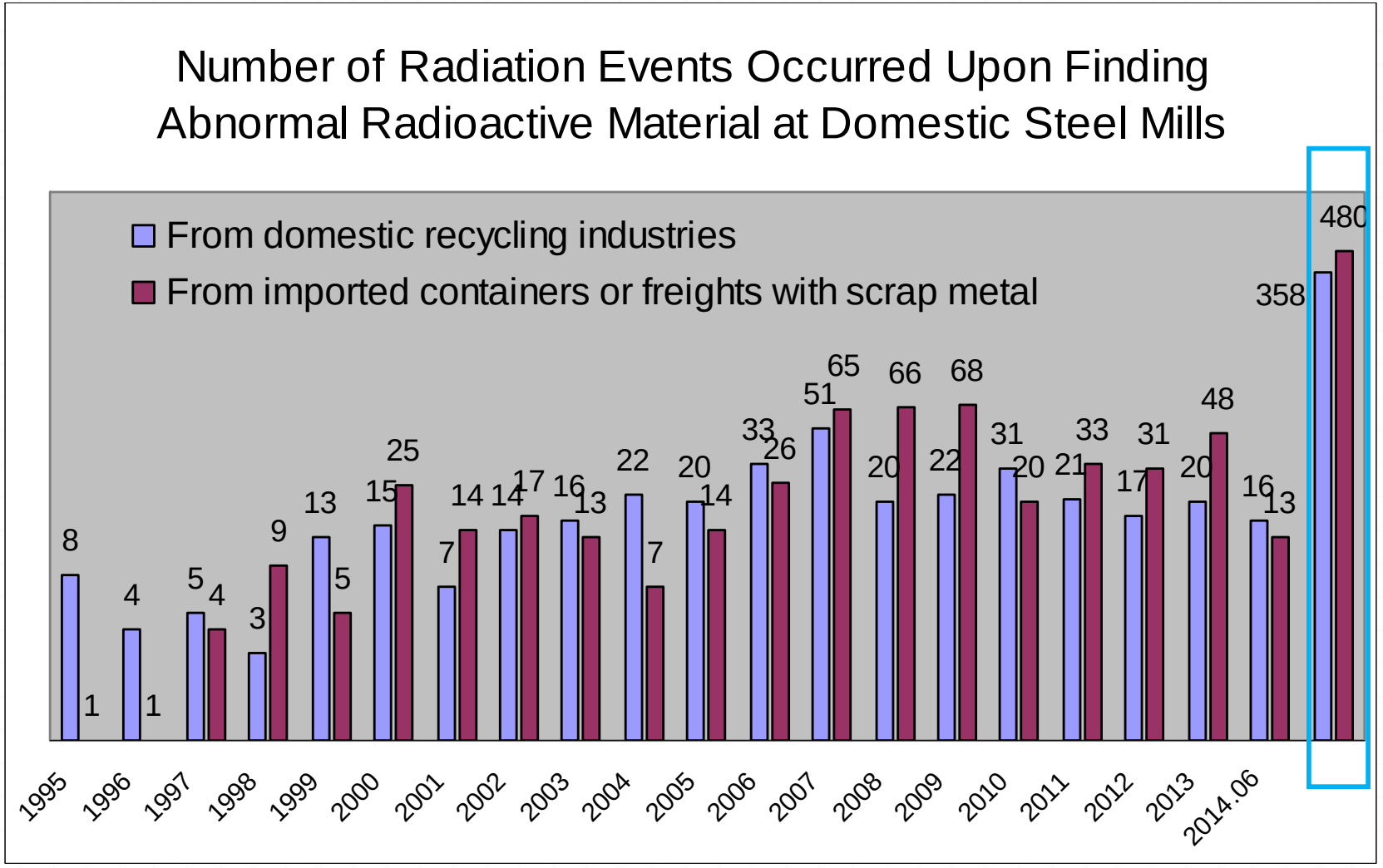
Department of Radiation Protection, AEC
July 1st, 2014

Establishing radiation detection system at steel mills

- In 1992, some apartments built during 1982-84 were first discovered containing ^{60}Co-contaminated steel rebar.
- For the purpose of preventing from mis-smelting of radioactive sources into steel-making processing, 19 iron and steel makers who own furnace(s) are required to install portal type radiation detectors(s) since 1995, to intercept radioactive sources contained in scrap metal and stop its entry into the steel mill.
- In case of imported scrap metal being detected containing radioactive sources, the scrap metal will be shipped back to its original export country.


Number of Radiation Events Occurred Upon Finding Abnormal Radioactive Material at Domestic Steel Mills
From domestic recycling industries
From imported containers or freights with scrap metal
8
1
4
1
5
4
3
9
13
5
15
25
7
14
14
17
16
13
22
7
20
14
33
26
51
65
20
66
22
68
31
20
21
33
17
31
20
48
16
13
358
480
1995
1996
1997
1998
1999
2000
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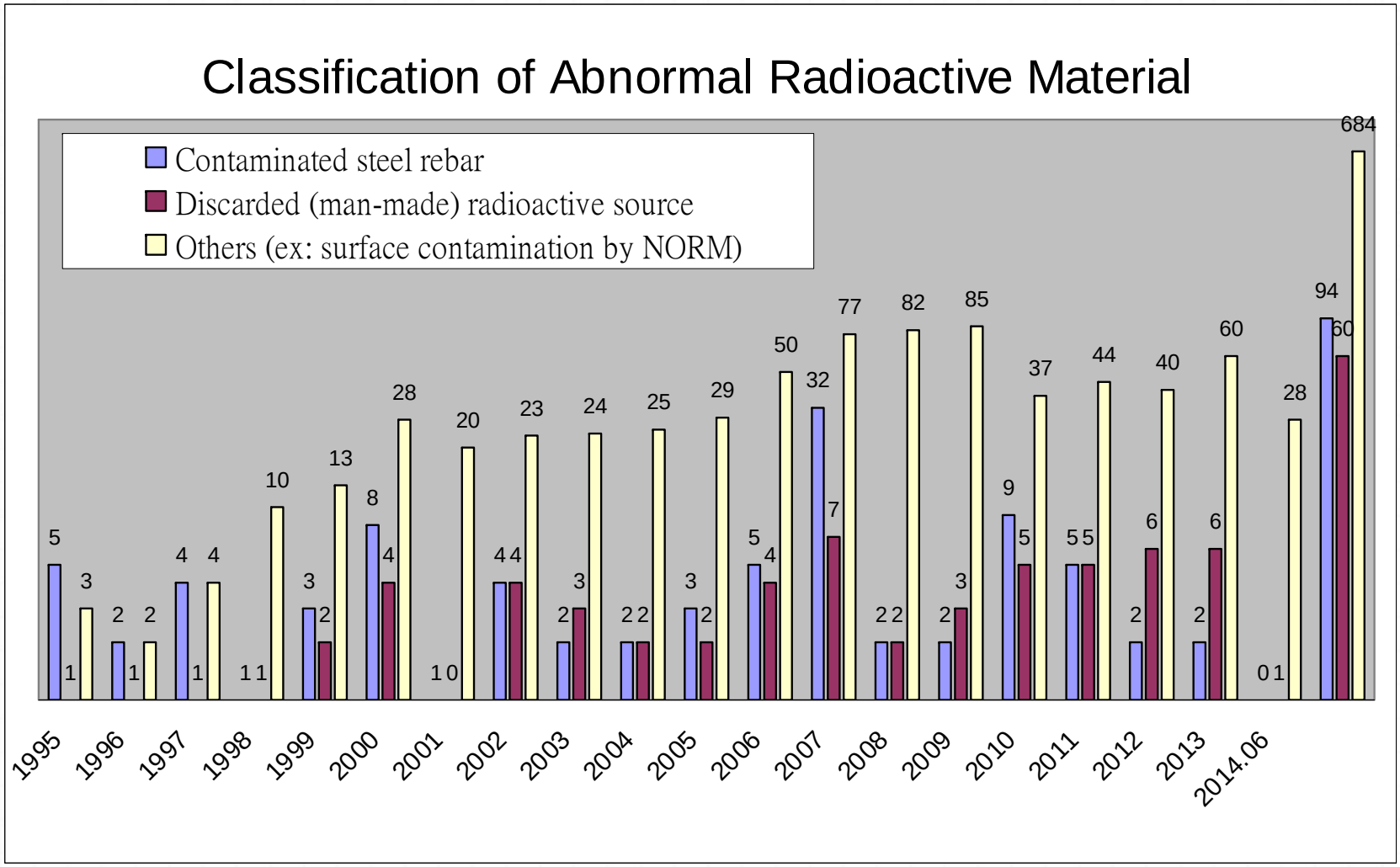
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014.06

Classification of Abnormal Radioactive Material



Contaminated steel rebar found at a steel mill

NORM contamination on the surface of scrap metal

Bare Cs-137 source found

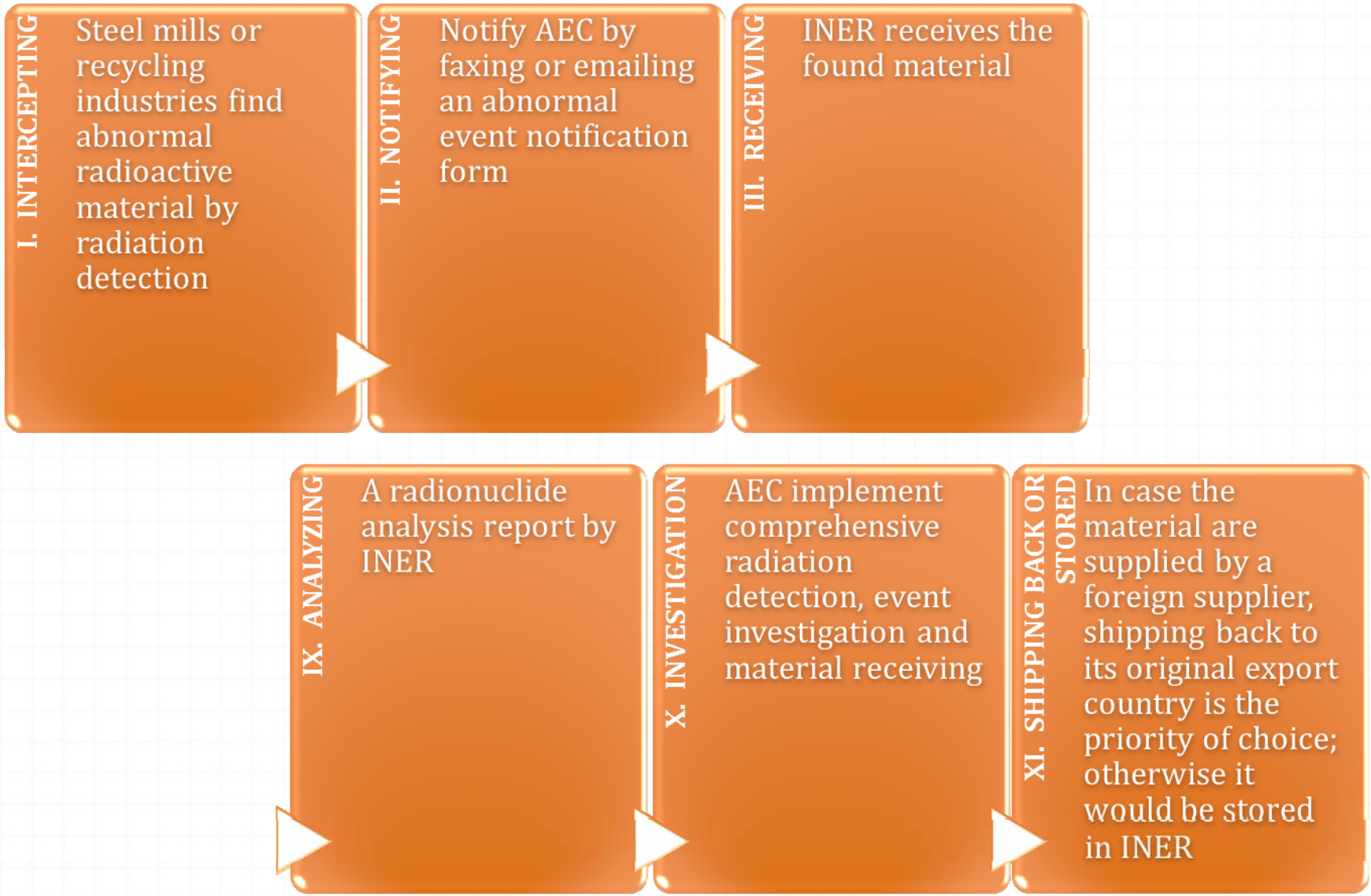
Cs-137 source with shielding

Other examples found very often at steel mills

Gauges containing Ra-226

scale contaminated by NORM

Guideline for managing abnormal radioactive material found



Case –
Tung Ho Steel Enterprise Corporation

Follow the Guideline to manage what found that radioactive

- ***Intercepting***:
  1. A truck with imported scrap metal was detected radioactive by portal type radiation detectors when entering the site.
  2. A site guide directed the truck to stop at a temporary area to unload the scrap metal, and put radiation signs and made controls for keeping personnel away from there.
  3. A piece of object was found 2 hours later by a qualified staff with a handy NaI detector.
  4. 13 uSv/hr was detected at the object surface, then it was stored temporarily on the on-site radiation storage room.
- ***Notification***: Tung Ho notified AEC by an email with description of finding history, detection results and photos.
- ***Receiving and analyzing***: INER took it back for detailed analysis, and found that it be a Cs-137 orphan source.
- ***Investigation***: Comprehensive detection and event investigation were implemented by AEC
- ***Shipping back***: due to an orphan source being found, AEC requested Tung Ho to ship the source back to its original country or supplier

Analysis Report For The Found Object

item	test results			organization
object type	Source			Institute of Nuclear Energy Research (INER)
radiation dose rate (μSv/h)	surface	at 30 cm	at 100 cm	
	35	2.6	0.5	
nuclide	Cs-137			
activity	100mCi on the sign			
size	45cm×45cm			
shape	Cylinder			
weight	57.63 kg			

SIMS GROUP GLOBAL TRADE CORPORATION
110 Fifth Avenue, Suite 700
New York, NY 10011-5514 USA
Phone 212-604-0710
Facsimile 212-604-0710
www.simsgroup.com

TO: Atomic Energy Council
80, Section 1, Chenggong Road,
Yonghe City, Taipei County 23452,
Taiwan

Date; March 19, 2010

AGREEMENT

We, SA Recycling, LLC, on behalf of **Sims Group Global Trade Corporation**, hereby agree to accept the return of the item containing radioactive material which was found at **Miaoli Works of Tung Ho Steel Enterprise Corporation** on October 27, 09'. We agree to import this subject material from Taoyuan, Taiwan to Atlanta, USA where it can be properly managed pursuant to all State and Federal laws. It is our understanding that the unit shielded and does not pose a threat to the public while in transport.

Disposing details as follows:

Description of subject radioactive material: Cesium 137 (Berthold Brand)
Weight: about 25kg / **Length:** about 45cm / **Width:** about 45cm
Place of export: Taoyuan Airport, Taiwan
Place of import: Atlanta Airport, USA
Place of disposal: Knoxville, Tennessee, USA
Disposed company: TOXCO Material Management Center
Discovered in Taiwan Container No. TRLU8115580
Date Material was delivered from USA: 9/18/09

Lindsay Maine 3/19/10
Lindsay Maine, Environmental Manager

- Prior to exporting the item containing radioactive material, it is necessary to get an agreement letter that guaranties to properly receive it, for ensuring that it wouldn't become an orphan source internationally.

SA recycling

482 Pier T Avenue - Berth 118
Long Beach, California 90802
Phone 562-628-8100
www.sarecycling.com

June 15th 2010

To whom it may concern:

This letter states that SA Recycling, LLC has received the following material on 4/17/2010 at Atlanta Airport

Description of material: Cesium 137 (Berthold Brand)

Weight: about 25kgs/ Length/ About 45cm/ Width: about 45cm

Place of Export: Taoyuan Airport, Taiwan

Disposal Company: Toxco Material Management Center

Discovered in Taiwan Container No.: TRLU8115580

The material is currently at TOXCO Material for disposal.

If you have any questions or concern, please feel free to contact me.

Silvana Jones
Logistics Manager
SA Recycling, LLC

- Usually we would get an inform letter from the receiver, saying that what the current status of the item containing radioactive material is. (ex. has been received and disposed in this case)

The Megaports Initiative

- Initiated by the US DOE.
- Any containers to be imported into the USA territory should be detected when transporting through the radiation portal monitors before leaving export ports.
- This is originally purposed on threaten deterring, anti-smuggling or anti-proliferation of radioactive material.

Radiation portal monitor as primary inspection

RIID

Ortec Detective

Personal radiation detector as secondary inspection

Detection mechanism at Megaports

Central alarm station

primary inspection

Secondary inspection

Current Status of Implementation

- In 2006, the USDOE equipped some radiation portal monitors and handy portable radiation detectors at the container terminals of the Port of Kaohsiung. Now they are the duty of Kaohsiung Customs.
- Besides antiterrorism task, Kaohsiung Customs uses the equipment to detect containers which are imported, exported or in transit.
- Ex. in response to the Fukushima Nuclear Accident, there have been some Japan-exported containers found slightly radio-contaminated.
- Therefore, it can be somewhat regarded as a subsidiary mechanism for intercepting items containing radioactive material into our land, helping for achieving that goal of well managing abnormal radioactive material in Taiwan.

WOW TAIWAN
TAIWANderful 台灣

Thanks for attention!!