DOE Subpart H Report

Gustavo A. Vázquez, AU-22
U.S. Department of Energy

Sandra Snyder
Pacific Northwest National Laboratory

Annual NESHAP Meeting on Radiological Air Emissions
Baltimore, MD
July 16, 2014
NESHAPs Subpart H
Requirements

• Dose to a maximally exposed individual (MEI) member of the public must not exceed 10 mrem in a year.

• Dose to a member of the public must be estimated using CAP-88, or other EPA-approved model or method.
NESHAPs Subpart H Requirements (cont’d)

• Continuous sampling of emissions is required for facilities that may exceed 1% (0.1 mrem/yr) of the dose limit for a member of the public.

• Stack emissions measurement methods and quality assurance requirements specified in the regulation must be implemented.
• Annual report of site radiological air emissions due to EPA by June 30.

• Unmonitored and diffuse sources as well as monitored stack sources must be included.
EPA Approved Dose Models

• CAP88-PC
  – V 1.0 (1992) – DOS-based
  – V 2.0 (1999) – Windows-based
  – V 3.0 (2007, revised in 2013)
  – V 4.0 (2014)-production release version

• COMPLY (1989)
Radionuclide Air Emissions Reported by DOE Facilities

• Radionuclide emissions are reported by source type (point or diffuse).

• Emissions of radon and unplanned radionuclide releases, although not specifically regulated under Subpart H, are also reported.
2012 DOE Air Emissions by Source Type

- **Stack**: 39,371 Ci (83%)
- **Diffuse**: 6,741 Ci (14%)
- **Unplanned**: 5 x 10^{-3} Ci (< 0.0001%)
- **Radon**: 1,577 Ci (3%)
Radionuclide Air Emissions
Summary of DOE Site Reports

Emissions are summarized by *radionuclide category*:

– Tritium
– Noble gases
– Transuranics
– Other radionuclides
2012 DOE Point Source Emissions by Radionuclide Category

- **Tritium**: 17,488 Ci (44%)
- **Noble Gas**: 12,769 Ci (32%)
- **All Other**: 9,114 Ci (23%)
- **Transuranic**: 0.007 Ci (<0.1%)
2011 and 2012 Comparison DOE Point Source Emissions by Radionuclide Category

2011
40,800 Ci

Tritium
28,788 Ci
71%

Noble Gas
4,482 Ci
11%

All Other
7,504 Ci
18%

Transuranic
<0.1%

2012
39,400 Ci

Tritium
17,488 Ci
44%

Noble Gas
12,769 Ci
32%

All Other
9,114 Ci
23%

Transuranic
<0.1%
DOE-wide summaries of air emissions and estimated doses from 2003-2012 are shown in the following graphs by:

– Source type

– Radionuclide category
Number of DOE Sites Reporting Radionuclide Air Emissions

- Stacks
- Diffuse Sources
- Unplanned Releases
- Radon
DOE Site Point Source Emissions by Radionuclide Category

POINT SOURCES

Emissions (Ci/year) vs. Year

- Total
- Tritium
- Noble Gas
- Transuranic
- Other
DOE Site Point Source
Emissions by Radionuclide Category

DIFFUSE SOURCES

Emissions (Ci/year)

- Total
- Tritium
- Noble Gas
- Transuranic
- Other

Years: 2003 to 2012
• Reported dose to the MEI is for point sources and may have diffuse contribution estimate included.

• MEI dose at some sites is entirely from diffuse sources.

• The following graphs present estimated dose to the MEI for routine emissions from point and diffuse sources during 2003-2012
MEI Dose from Diffuse Sources Only 2003-2012
Supplemental Information

• Dose to individual members of the public from radon and from unplanned releases.

• Estimated collective dose to the population within 50 miles of DOE facilities is also included in most DOE sites’ annual reports.
Total Collective Dose from DOE Site Air Emissions 2003 - 2012

2003-2012 Total: 400 person-rem
Total Collective Dose from DOE Site Air Emissions 1998 - 2012

1998-2012 Total: 619 person-rem
Collective Dose by Program Office

![Chart showing collective dose by program office for CY08, CY09, CY10, CY11, CY12 across different categories such as NNSA, EM, LM, SC, and Other/Mult.]
Compliance Status

• In CY 2012, all DOE facilities were below the annual 10 mrem/yr regulatory standard for dose to the offsite MEI

• DOE facilities are currently in compliance with Subpart H radionuclide emissions monitoring requirements
Current Significant Items

• CAP88 PC V4.0 software production version available for use but not for compliance purposes - January 2014
Thank You!