Development of the Hanford Site Profile

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Purpose of Meeting

• Discuss the Hanford Site Profile.
• Describe how the Site Profile is used.
• Ask for suggestions and information.
• Document concerns and issues.
• Answer questions.
Energy Employees

Occupational Illness

Compensation Program Act

(EEOICPA)
Department of Labor

Department of Health and Human Services – NIOSH

Oak Ridge Associated Universities Team
ORAU Team

- Oak Ridge Associated Universities
- Dade Moeller & Associates
- MJW Corporation
- Sub-contractors
ORAU Program Goals

- Protect claimant privacy.
- Build trust and confidence.
- Process claims accurately and efficiently.
- Avoid conflicts of interest.
Dose
Reconstruction
Occupational Radiation Dose

Occupational Medical Dose

Occupational Environmental Dose

Internal Dose

External Dose
Site Profiles Support
Dose Reconstruction

• Used by dose reconstructors.
• Provide site-specific technical information.
• Minimize interpretation of data.
• Living document.
General Information

• Completed Site Profiles can be seen at [http://www.cdc.gov/niosh/ocas](http://www.cdc.gov/niosh/ocas).
• Comments are encouraged and should be sent to the NIOSH Docket Office.
• Meetings are being held with union representatives to encourage input.
Developing the Site Profile

• Document written by subject experts.
• Document reviewed by NIOSH and ORAU Team.
• Document approved for use by NIOSH and ORAU.
Developing the Site Profile

- Hanford Site Profile team was established in April 2003.
- Team leader is Ed Scalsky.
- Sections were written by different authors.
- Rev. 00 was completed October 15, 2003.
- Revisions are in progress.
Contents of Site Profile

• Purpose and Scope
• Site Description
• Occupational Medical Dose
• Occupational Environmental Dose
• Occupational Internal Dosimetry
• Occupational External Dosimetry
Purpose and Scope

• Used in reconstructing radiation doses to workers at Hanford Site.
• Covers the time from 1942 to the present.
• Uncertainties in data evaluated also.
• Claimant-favorable assumptions used.
Site Description

- Brief description of the facilities and processes on the site over the years
- Radioactive materials present
- Potential internal exposure routes
- Potential external exposure routes
Hanford Site

- Reactors – nine production, seven R&D
- Chemical separations – REDOX, PUREX
- Fuel fabrication
- Waste handling
- Radionuclides – Pu, U, Th, Np, $^3$H, FP
Occupational Medical Dose (X-rays)

- Frequency of chest X-rays
- Equipment and techniques used
- Organ dose calculations
- Uncertainty in dose
- Dose reconstructor instructions
Occupational X-rays

• Employer required
• Annual requirement through 1959
• Equipment used changed over time
• Older equipment had higher doses
• Not included in DOE dose record
Occupational Environmental Dose
(for Unmonitored Workers)

- Internal dose from on-site radioactive materials in the air
  - On-site releases to air
  - Annual intakes from air concentrations
- Occupational external dose
  - Ambient radiation
- Uncertainty
- Dose reconstructor instructions
Environmental Dose

- Unmonitored workers
- Internal component
  Intake from inhalation of radionuclides
- External component
  Submersion in radioactive cloud – $^{41}$A
  Radiation sources in soil, waste pits, buildings, etc.
- Not included in DOE dose record
Occupational Internal Dosimetry

- Methods and practices
- Sources of exposure
- Minimum detectable activity (MDA) for:
  - Whole Body Counting
  - Bioassay
- Reporting levels
- Uncertainty
- Dose reconstructor instructions
Internal Dosimetry

- Bioassay program started in 1947
- *In vitro* urinalysis for Pu, Am, Cu, tritium, U, FP, Sr, Pm, Po, Np
- *In vivo* counting
  - Whole body counter – 1959
  - Thyroid counter – 1956
  - Chest counter – 1967
Occupational External Dosimetry

- Methods and practices
- Sources of exposure
- Adjustments to recorded dose
- Minimum detectable levels (MDLs)
- Uncertainty
- Dose reconstructor instructions
External Dosimetry

- Dosimeter technology
  - Beta/photon – 1944 to present
  - Neutron – prior to 1950 to present
- Calibration
- Exchange frequency
- Workplace radiation fields
- Exposure geometry
In Conclusion

• Developing a usable Site Profile is an important task.
• Site Profiles are living documents.
• Additional information is being sought and will be used when it adds to the document.
• Send comments to NIOSH Docket Office
NIOSH Docket Office

You can contact the Docket Office at:

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