Hanford Beryllium

Program Development and Lessons Learned

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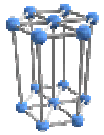
Hanford  Beryllium History

- Beryllium use at Hanford began in early 1950's
- Used primarily in 5% beryllium alloy in braze rings for fuel rods
- Also used in ceramics and metals
- Virtually all beryllium usage was discontinued by 1986

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Previous Studies

- DOE initiated a study by Stone and Webster in 1988
- They concluded that nearly all past beryllium exposures had been below OSHA PEL (2 µg/m^3)
- No known cases of beryllium sensitization or berylliosis
- No current exposure to beryllium

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Recent Events

- Issuance of DOE N 440.1
  - Raised concern level, but Hanford was not covered by N 440.1
  - Began looking into beryllium
- December 1997 Events
  - Health Conference at Richland
  - Preliminary study on beryllium
  - Distorted newspaper article
  - Raised DOE, employee concerns

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- Decided to rapidly implement beryllium program in Dec. 1997
- Initial program focus
  - Employee education
  - Historical beryllium facility list
  - Procedure to estimate past employee exposures to beryllium
  - Medical surveillance program
  - Multi-contractor task force

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Employee Education

- Needed to quickly disseminate accurate beryllium information
- Also needed to gather information from employees regarding where they had worked
- Decided to use several different vehicles to accomplish both of these objectives

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Education Tools

- Immediately set up “beryllium hot-line” to field employee questions
- Issued letters to all employees on beryllium and planned actions
- Developed employee questionnaire to obtain employee information on beryllium exposure
- Put together list of common beryllium questions and answers

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Education Methods

- Held series of meetings across site to discuss beryllium questions
- Put articles in site newspaper to provide accurate information
- Set up beryllium web site with all employee letter, Q&A, employee questionnaire, beryllium facility list
- Had H&S professional contact each person who called hotline

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Lesson Learned #1

- Communicate, communicate, communicate!
- Even if information is incomplete
- Even if information is uncertain
- Use as many mechanisms as possible
- Respond individually to individuals with problems or concerns

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Beryllium Facility List

- Initially very little information on where beryllium was used
- Worked with DOE-RL to develop initial facility list
- Used as many sources as possible
  - Employee interviews
  - Past sampling data
  - Previous beryllium report
  - Historical documents

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List Development

- Took several months to assemble information on facilities
- Had to work with several contractors
- Gathered information on where, when and how beryllium was used
- Prepared a 1-2 page “fact sheet” for each facility where beryllium was thought to have been used

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Fact Sheet Information

- Date, Facility, Contractor, Preparer
- Past Operations
  - Where was beryllium used, form
  - Period of beryllium usage in facility
  - Summary of area monitoring data
  - Summary of personal monitoring data
  - Engineering controls utilized
  - Maximum estimated exposure

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Fact Sheet Info (cont)

- Current Operations
  - Is facility still present?
  - If beryllium still present in facility?
  - Current operations in facility
  - Maximum estimated exposure
- Basis for above information
- Comments on past or current operations and beryllium levels

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Fact Sheet Summary

- Generated beryllium facility fact sheets for total of 54 facilities
- Took about 2 1/2 months to finish
- Though incomplete and subject to change, it provides a single place to look for beryllium questions
- Used to estimate past employee beryllium exposure levels
- Will be used to plan work

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Lesson Learned #2

- Assemble all available beryllium information into one document
- Make it available to all employees (I.e., put it on the internet, address http://www.hanford.gov/safety/beryllium/index.htm)
- Effort spent in preparing such a list will pay off later when questions arise about beryllium usage

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Exposure Estimation

- Many concerned employees with potential beryllium exposure
- Needed procedure to estimate actual exposure
- Beryllium fact sheets helped, but only estimated maximum exposure
- Needed additional information to accurately estimate individual beryllium exposure levels

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Need for Information

- Problems in obtaining historical employee information
  - Many contractors over past 50 years
  - Information difficult to obtain on which jobs employee worked on
  - Limited information available due to security, both then and now
  - Decided that information from employees would be most useful

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Questionnaire Info

- Name, ID, Date, Hire Date
- For each facility on suspect list
  - Dates, locations worked in facility
  - Nature of beryllium activities
  - Activities performed by employee
  - Respiratory protection worn
  - Control measures used
- Checklist of symptoms for chronic beryllium disease

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Assessment Process

- IH reviews each questionnaire
  - Compares info to that obtained on beryllium facility fact sheets
  - Initial assessment is the maximum estimated potential exposure
  - Reduced based on questionnaire
    - Type, length of work performed
    - Distance from beryllium operations
    - Engineering controls used

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Exposure Categories

- Exposure risk determined
  - High - >2.0 µg/m^3 (OSHA PEL)
  - Significant - 0.2 ➡ 2.0 µg/m^3 (OEL)
  - Low - 0.01 ➡ 0.2 µg/m^3 (~LOD)
  - None - <0.01µg/m^3
- Exposure risk used for placement in medical surveillance program for previously exposed workers
- Employees notified by letter

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Lesson Learned #3

- Determine procedure for assessing former worker exposure
- Document procedure used
- Involve employees in exposure assessment procedure
- Communicate results to employees with letter providing information and listing options