

Brookhaven National Laboratory (BNL) Special Exposure Cohort

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Overview

- **Classes added to the SEC:**

January 9, 2010 - All employees who worked in any area at BNL in Upton, New York, from January 1, 1947 to December 31, 1979

June 10, 2012 - All employees who worked in any area at BNL in Upton, New York, from January 1, 1980 to December 31, 1993

Overview—cont.

- **Classes added to the SEC:**

Both classes were added due to the inconsistent availability of internal dosimetry records

- **Continued Review:**

- The Advisory Board's BNL Work Group was tasked with reviewing end date of December 31, 1993
- May, 22, 2012, Sanford Cohen & Associates (SC&A) issued report listing concerns with 5 specific cases

Review

- **Continued Review:**
 - The cases reviewed had at least some employment listed in the High Flux Beam Reactor, where tritium monitoring is required of routine employees
 - The concerns focused on tritium urinalysis and in-vivo records thought to be missing from the files of these 5 individuals

Review_{-cont.}

■ Continued Review:

- Dosimetry data was re-requested by NIOSH as BNL request responses have improved significantly since last responses were received
- Significant additional bioassay data was provided in these responses
 - The data thought to be missing was either found in these new submissions or,
 - Information confirming why monitoring was not required was identified

Review_{-cont.}

- Concern that tritium sample after 1992 is missing

HFBR BIOASSAY PROGRAMME 1992

The HFBR bioassay programme is based upon the D.O.E. Radiation Control manual, Chapter 5, section 521. Routine bioassay is mandated for any person with the potential for annual internal uptake equivalent >100 mrem effective dose equivalent. The following table indicates personnel working at HFBR who are currently enrolled in the HFBR bioassay programme. Included is the 6 month internal exposure, on what board the film badge is placed, to what group the person belongs and analysis on whether (based upon the above Radiation Control manual criteria, and whether there is potential for exposure >100 mrem/y) the individual should remain in the routine bioassay programme.

| NAME | GROUP/RETAIN | BOARD | H-3DOSE (mREM) |
|------------|-----------------|-------|----------------|
| | Ops. leader/no | XA | 10 |
| | HP/no | XA | 0 |
| | Physics/no | XA | 20 |
| | Secretary/no | XA | 0 |
| | RMG Support/no | XA | 0 |
| | RCG/no | XA | 0 |
| | RIG/no | XA | 0 |
| | RCG leader/no | XA | 0 |
| | DSC/no | XA | 0 |
| | HP/yes | XA | 30 |
| | Secretary/no | XA | 0 |
| | Janitor/no | XA | 0 |
| | HFBR Mgr./no | XA | 0 |
| | B120/no | XA | 0 |
| | Ops. support/no | XA | 0 |
| | CNF leader/no | XA | 0 |
| | RCG Sup./no | XA | 0 |
| | RIG leader/no | XA | 0 |
| Claimant A | B703/no | XA | 0 |
| | Ops.support/no | XA | 0 |
| | H2O Chem./no | XA | 0 |
| | CNF Sup./no | XA | 0 |

Review_{-cont.}

- Concern that tritium samples in 1995 are missing

BROOKHAVEN NATIONAL LABORATORY
SAFETY AND ENVIRONMENTAL DIVISION
Health Physics Group (Personnel Monitoring)
Individuals Dose for Period of Interest
01/01/95 - 10/30/95

| Claimant B | | | HFBR | | | |
|------------|-------------------|-------------|------------------|------|----------|----------|
| Date | # of Days Between | uCi/L Gross | uCi/L Prev Gross | mREM | EQN FLAG | DAY FLAG |
| 01/03/95 | 4 | 0.300 | 0.370 | 0.07 | - | - |
| 01/12/95 | 9 | 0.330 | 0.300 | 0.71 | - | - |
| 01/19/95 | 7 | 0.300 | 0.330 | 0.38 | - | - |
| 02/01/95 | 13 | 0.400 | 0.300 | 1.34 | - | - |
| 03/15/95 | 42 | 0.100 | 0.400 | 0.03 | - | * |
| 04/15/95 | 31 | 0.000 | 0.100 | 0.00 | * | * |
| 04/25/95 | 10 | 0.170 | 0.000 | 0.74 | - | - |
| 05/05/95 | 10 | 0.200 | 0.170 | 0.50 | - | - |
| 05/09/95 | 4 | 0.160 | 0.200 | 0.03 | - | - |
| 05/16/95 | 7 | 0.180 | 0.160 | 0.32 | - | - |
| 05/24/95 | 8 | 0.150 | 0.180 | 0.19 | - | - |
| 05/30/95 | 6 | 0.160 | 0.150 | 0.23 | - | - |
| 08/08/95 | 70 | 0.230 | 0.160 | 0.69 | - | * |
| 09/11/95 | 34 | 0.070 | 0.230 | 0.01 | - | * |
| 09/22/95 | 11 | 0.110 | 0.070 | 0.35 | - | - |
| 09/29/95 | 7 | 0.140 | 0.110 | 0.28 | - | - |
| 10/06/95 | 7 | 0.190 | 0.140 | 0.41 | - | - |
| 10/20/95 | 14 | 0.280 | 0.190 | 1.04 | - | - |
| 10/27/95 | 7 | 0.720 | 0.280 | 2.15 | - | - |
| 10/31/95 | 4 | 0.190 | 0.720 | 0.00 | * | - |
| 11/09/95 | 9 | 0.160 | 0.190 | 0.24 | - | - |
| 11/22/95 | 13 | 1.070 | 0.160 | 4.85 | - | - |

* EQN FLAG: Decayed previous H3 value exceeds current sample value. Current value is assumed to be residual component.

* DAY FLAG: Sample interval exceeds 29 days. Uptake is assumed to occur 1 day prior to sample.

Additional Issues

- Three additional issues from a 2011 review of the initial 83.13 petition arose involving:
 - Accuracy of reported neutron dose
 - How dose will be assigned to unmonitored individuals after the SEC period
 - Potential errors associated with transferring data between the different databases used over time

Additional Issues_{-cont.}

- Accuracy of reported neutron dose
 - SC&A/NIOSH technical call concluded that this was a Technical Basis Document (TBD) issue rather than an SEC issue
- How to deal with unmonitored individuals after the SEC period
 - NIOSH will assign ambient internal and external dose, per the TBD requirements, for unmonitored individuals after 1993 SEC end date

Additional Issues_{-cont.}

- Potential errors associated with transferring external dosimetry data between the different databases used over time
 - Most recent database (Health Physics Records System-HPRS) started in 1996
 - Data from previous database was not transferred electronically or manually to HPRS

Additional Issues_{-cont.}

- Landauer maintained previous external dosimetry database and was responsible for Quality Assurance/Quality Control
- All data from 1985 through 1995 is available in hard copy or microfiche
- 5 of 5 cases reviewed contain Landauer source document in the individual files for 1994 and/or 1995

Feasibility of Dose Reconstruction

- The external exposure data submitted in response to claims is very complete for the monitored population
- The internal exposure data submitted in response to claims is very complete for the monitored population after December 31, 1993
- The monitored population includes all of those that would have been expected to receive exposure over the history of operations at BNL

Feasibility of Dose Reconstruction_{-cont.}

- Site-specific and claimant-specific data available for BNL for the time period after December 31, 1993, are sufficient to allow NIOSH to complete dose reconstruction