

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 28, 1994

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: Roger Zavadoski

SUBJECT: Trip Report on Ventilation/Filtration Systems in Buildings 559 and 707 at the Rocky Flats Plant

1. **Purpose:** This report documents the results of a DNFSB staff visit to the Rocky Flats Plant to conduct a review of the ventilation/filtration systems in Buildings 559 and 707. This review was conducted by R. Kasdorf and R. Zavadoski of the DNFSB staff during the period of March 21-23, 1994.
2. **Summary:**
 - a. The scope of this review included the ventilation/filtration systems at Buildings 559 and 707.
 - b. Recent failures to meet operational safety requirements (OSR) at Buildings 559 and 707 were reviewed. These failures are more important considering the unreviewed safety question determination for other buildings at Rocky Flats where all stages of filtration are not required to be periodically ascertained.
3. **Background:**
 - a. The DNFSB staff had previously reviewed the ventilation/filtration systems at the Rocky Flats Plant during the period October 18-20, 1993. At the time and through subsequent correspondence (letter, Conway to Grumbly, February 1, 1994) the staff pointed out that the filter testing being conducted was inconsistent in that some facilities (e.g. Buildings 707 and 559) required filter testing of each stage of filtration while others (e.g. Buildings 371 and 771) required testing of only the final stage. All facilities assume full credit for all stages in their Safety Analysis Reports.

4. Discussion/Observations:

- a. The staff reviewed testing results from tests of the filtration systems in Buildings 559 and 707. The acceptance criteria and removal efficiency assumed in the SAR is 99.95%. Several stages were reported to have failed this criteria.
 1. For Building 707, plenum 102:
 - (a) On December 12, 1993, the third stage had a reported efficiency of 99.31417%.
 - (b) On December 6, 1993, the fourth stage had a reported efficiency of 97.927%.
 - (c) On January 12, 1994, the second stage had a reported efficiency of 99.604%.
 2. Building 559:
 - (a) Plenum 302, November 11, 1993, the first stage reported efficiency was 99.88%.
 - (b) Plenum 301, November 16, 1993, the first stage reported efficiency of 99.56375%.
- b. The failures reported are not catastrophic and are exacerbated by the test method employed. Presently the Rocky Flats Plant determines filter efficiency by determining penetration of Dioctylphthalate (DOP) particles as they traverse the downstream face of each High Efficiency Particulate Air (HEPA) filter during a test. The highest penetration observed on a particular filter is recorded for the entire filter. This method was once endorsed by the ANSI N510 standard, "Testing of Nuclear Air Treatment Systems." The current method in ANSI N510 floods the entire stage and measures DOP concentration downstream of the entire stage.

Facility personnel described the changes being incorporated into the test procedure to minimize the effect of the current scanning method. A shroud will be utilized over each filter (as allowed by current standards) which will minimize the effect of minute local penetrations. Current flooding techniques, which are more efficient and test the stage as a whole, are difficult to backfit into plenums which were not designed for them. The current standards apply only to a single mounted stage; several plenums at the Rocky Flats Plant have back to back mounting of HEPA filters.

- c. The Rocky Flats Plant is formally considering the applicability of an unreviewed safety question to those plutonium facilities that do not test all stages of HEPA filtered exhausts. The compensatory actions for the facilities affected by this determination is still under review.
 - d. Filter test personnel stated that the filtration systems in buildings where work with uranium was performed are not currently tested. There are currently no approved SARs for these buildings. The filter test personnel were not aware of whether the safety bases for these buildings relied on HEPA filtration.
 - e. During a tour of Building 707, building personnel indicated that the dehumidification systems for Zone II supply air had been disabled. The building personnel were not aware of whether an engineering evaluation had been done. Since plutonium is stored in some Zone II area vaults, humidity may be of concern.
 - f. Facility personnel also mentioned that they are:
 - 1. Continuing their shelf-life studies for HEPA filters; and
 - 2. Increasing the sealing gasket thickness from 1/4" to 3/8" on all future orders of HEPA filters.
 - g. The DNFSB staff walked down the ventilation/filtration systems in Buildings 559 and 707. In general, the housekeeping appeared acceptable and improved over past observations.
5. **Future Staff Actions:** The DNFSB Staff will continue to review the ventilation/filtration systems at the Rocky Flats Plant. When available, the USQ determination and related compensatory measures will be reviewed by the DNFSB staff. The staff will follow-up on the question of testing filtration systems in the uranium building and the need for dehumidification in the Building 707, Zone II air supply.

CONCURRENCE/RECORD NOTE PAGE

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RECORD NOTES:

1. DOE Classification review completed on: 6/7/94(date).
2. The staff believes this trip report should be forwarded to DOE for information. The staff will prepare a cover sheet should the Board agree to forward.
3. By signing this concurrence, the ADs agree to support the future review efforts outlined in paragraph five of the report to the extent they are consistent with overall DNFSB priorities and staff availability.
4. OGC has reviewed for release to the public reading room on 9/13/94 by SA Stegura (signature/date).

DNFSB: RZ:sam. 4/14/94. 208-6407

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Sent to Mike Leggett for classification on 4/28/94.

Revised/Finalized on 9/13/94 by Sue Megary (secretary). Received word to prepare for public record on 9/13/94.