

Title: Control Room Infiltration Measurements, Task B-66

Lead Responsibility: Division of Site Safety and Environmental Analysis

Lead Assistant Director: R.H. Vollmer, Assistant Director for Site Analysis

Task Manager: R.W. Froelich, Environmental Projects Branch 2

1. Problem Description

A key parameter affecting control room habitability under the conditions described in General Design Criteria 19 and Standard Review Plan 6.4 is the magnitude of control room air infiltration rates. Current estimates of these rates are based on data relating to buildings that are substantially different than typical nuclear power plant control room buildings. Additional experimentally-measured air exchange rates of operating reactor control rooms are needed to develop an improved data base. This task will support the following requirements:

- Criterion 19 of Appendix A to 10 CFR Part 50 (General Design Criteria for Nuclear Power Plants) requires that control rooms be accessible and habitable under both normal and accident conditions.
- Safety Standard Review Plan 6.4 Habitability Systems and SRP 9.4.1 Control Room Area Ventilation Systems specify a review of the control room habitability systems with respect to the functional performance required to maintain a habitable control room area in the event of postulated accidents.

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2. Plan for Problem Resolution

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a. Planned Staff Approach

DSE has a technical assistance contract with the National Bureau of Standards to conduct field measurements of control room infiltration. DSE functions as overall test manager and arranges for control room selection and availability and NBS test operation. DOR will provide contacts with operating plant personnel and will assist in conducting the experiments. At this time, tests have been conducted at the following control rooms:

Beaver Valley

Cooper

Browns Ferry

Two additional tests are planned for FY 1978 to complete the experimental measurements program. Control rooms to be used for these tests will be selected in consultations between DOR, DSE, NBS and utility management.

b. Description of the End Product of the Task Force

(1) A NUREG report, to include the following:

(a) A description of the control room infiltration tests, detailing test procedures, techniques used, and experimental results.

(b) A tabulation of control room physical parameters (e.g., volume, penetrations) and measured air exchange rates.

(c) Empirical relationships that may be used to predict infiltration rates as a function of control room physical parameters.

(2) A staff position paper addendum to SRP 6.4 outlining the procedures and assumptions/criteria to be used to predict air infiltration rates.

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3. NRR Technical Organizations Involved

a. Accident Analysis Branch (DSE) - 3 man-months

(1) Select candidate control rooms, contact licensees, and arrange for control room tests.

(2) Establish test procedures and test parameters (in consultation with EEB).

(3) Coordinate test scheduling with NBS and licensees.

(4) Direct test operations at licensee control rooms.

(5) Evaluate test data

(6) Prepare final report (NUREG) and staff position paper (SRP 6.4).

b. Environmental Evaluation Branch (DOR) - 1 man-month

(1) Provide technical assistance in establishment of test procedures and test parameters.

(2) Participate in test operations at licensee control rooms.

(3) Assist DSE in evaluation of test data.

c. Environmental Projects Branch 2 (DSE) - 1 man-week

(1) Provide project management

4. Technical Assistance Requirements

DSE has a technical assistance contract with the National Bureau of Standards to conduct these measurements. As of December 31, 1977, \$44,690 had been expended. Additional funds to be expended in FY 1978 are estimated to be \$15,000. Other than these funds, it is not expected that technical assistance funding or confirmatory research funding will be required in direct support of this task.

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5. Interactions with Outside Agencies

AAB will act as the contact with applicants to arrange for control room availability, and with NBS to arrange for conducting the measurements.

6. Assistance Requirements from Other NRC Offices

No offices other than Nuclear Reactor Regulation will be involved in this task.

7. Schedule for Problem Resolution

| | <u>Schedule (Months)</u> | <u>Expected Com- pletion Date</u> |
|-------------------------------------|------------------------------|---------------------------------------|
| a. Development of Task Action Plan | | January 1978 |
| b. Approval of Task Action Plan | | February 1978 |
| c. Select Control Room #1 | 1 | February 1978 * |
| d. Select Control Room #2 | 3 | April 1978 * |
| e. Conduct Tests at Control Room #1 | $\frac{1}{4}$ | April 1978 |
| f. Conduct Tests at Control Room #2 | $\frac{1}{4}$ | May 1978 |
| g. Receive letter reports from NBS | 2 | June 1978 |
| h. Issue draft report for comments | 2 | July 1978 |
| i. Issue NUREG report | 3 | October 1978 |
| j. Issue supplement to SRP 6.4 | 3 | October 1978 |

* See item 8 "Potential Problems."

8. Potential Problems

Selection of the remaining two control rooms and scheduling tests at these locations is a significant potential problem in completion of this task. Experience has shown that ongoing plant activities (e.g., forced and scheduled outages, other test commitments) limit opportunities for testing and can affect conduct or completion of scheduled tests. These problems may affect completion of schedule items 7.c. and 7.d. Once the control room measurements have been completed, the remainder of the task action plan schedule should be firm. No significant problems in coordinating schedule activities with NBS personnel are anticipated.

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