THE MILLSTONE POINT COMPANY

A NORTHEAST UTILITIES COMPANY

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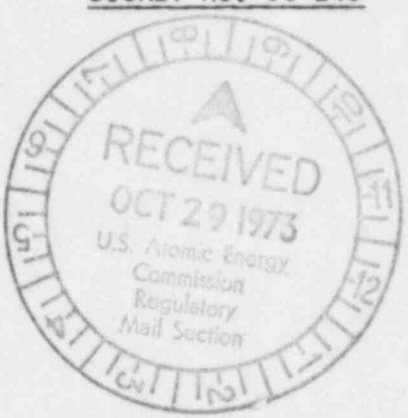

Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Directorate of Licensing
Office of Regulation
U.S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Ziemann:

In response to your letter dated August 2, 1973 additional information on our experience regarding personnel radiation exposure associated with the Millstone Unit No. 1 feedwater sparger repair work is hereby submitted.

1. Two hundred eighty five (285) personnel (plant and contractor) were involved in the feedwater sparger repair work. Of this total fifteen (15) were health physics monitors. All exposure received during this project is classified as "special maintenance". The total exposure received during the project was 266.250 man/Rem and the average exposure was 0.934 Rem per man. The following table lists exposures in the format given in the technical specifications.

Exposure Increment (mRem)	Personnel
0-100	32
100-500	57
500-1250	89
1250-2500	106
over 2500	1 (2750)

10/31

2. A variety of techniques were employed to reduce personnel exposure.

   All incoming personnel were given a health physics training lecture before being allowed access to the work area. The training or indoctrination lecture included a discussion of radiation, contamination, shielding, protective clothing, personnel monitoring equipment and exposure limits. Respiratory equipment training was given to personnel whenever appropriate.

   Access to the work area, fifth floor of the reactor building, required a radiation work permit and was limited to only those personnel performing a specific work function. The fourth floor of the reactor building served

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both as a protective clothing dressing and shift "wait" area. Protective clothing consisted of full coveralls, hood, canvas shoe covers, rubbers, cotton gloves and rubber gloves. Additionally, plastic pants, shoe covers and jumpers were worn to supplement cloth protective clothing whenever grinding of "wet" work was being performed. Shoe covers were removed by personnel as they left the vessel cavity and approached the step-off pad. The spread of contamination was controlled by decontamination and step-off pad changes. Respiratory protection was used any time grinding operations were performed. Additionally, a ventilation hose or flexible duct was lowered into the work area. This duct was coupled to a portable ventilation assembly which included a blower, absolute filter and a charcoal absorber to control airborne contamination. Air samples were taken during grinding operations.

The fifth floor was conspicuously posted to warn personnel of high radiation zones; continuous health physics monitoring was provided on the floor. The fifth floor was cleared of all unnecessary personnel during the transfer of any highly radioactive components, i.e., the moisture separators. Components of this nature were stored in the equipment pool which was roped off and posted. After removal, the feedwater spargers were stored in an isolated and segregated area of the floor. This area was also posted.

Job preparation and planning took place on the fourth floor with the aid of a mockup feedwater sparger.

Prior to working on the sparger repair, the walls of the reactor vessel were hydrolazed to remove loose contamination. After each washing, there was a two hour hold period to allow the crud to settle in the vessel water. A marked reduction in radiation fields accompanied the washings. Surveys in the vessel prior to washing gave a general radiation level of 700 to 1000 mrem/hour. After washing, these fell to between 300 and 400 mrem/hour. An aluminum service platform, supported by four cables at 90° points, was lowered into the vessel to an elevation three feet below the spargers. Lead blankets were also used to cover the spargers and the perimeter of the service platform. These precautions allowed personnel to work with general radiation fields reduced to 80 to 150 mrem/hour.

Dose rate instruments equipped with audio alarms were placed on the work platform. Readout recorders were placed on the fifth floor. Additionally, frequent radiation surveys were made in the work area to augment the fixed instrumentation. Thus the health physics monitor was constantly aware of radiation levels in the work area. This allowed stay time calculations to be made prior to entry.

Air activity in the work area was sampled with a continuous air monitor located on the fifth floor. As a supplement to these monitors, a survey consisting of radiation, contamination and air activity measurements was conducted prior to the start of each shift.

Personnel entering the cavity were issued TLD's, in addition to film badges and high range dosimeters, which were read at the end of each shift providing health physics with a continuous radiation exposure record.

3. Specific procedures and techniques aimed at reducing personnel exposure, to as low as practical on similar projects, could include:

   a) indoctrination of all personnel with regard to the principles of radiation protection, i.e., time, distance, shielding,
   b) decontamination of the work area,
   c) erection of temporary shielding,
   d) access control to radiation areas and,
   e) remote measurement of radiation fields,
   f) protective clothing and
   g) respiratory equipment.

   Additionally, any radioactive equipment removed to obtain access to the work area should be placed in a well segregated area to prevent unnecessary exposure to the work crew.

   The breathing atmosphere in the work area must be kept free of airborne radioactive contaminants. This can be accomplished with a ventilation duct and a portable blower-filter assembly. Since repairs of the sparger involved contract personnel with little or no radioactive work experience, constant monitoring of work crews is highly recommended.

4. The Feedwater sparger repair work was performed with adequate training and job preparation; it is not felt that additional measures would have had a significant effect in reducing total man Rem exposure.

Very truly yours,

THE MILLSTONE POINT COMPANY

D. C. Switzer
President

DCS/smb