



Metropolitan Edison Company  
Post Office Box 480  
Middletown, Pennsylvania 17057  
717 944.4041

May 11, 1981  
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U.S. NUCLEAR  
REGULATORY COMMISSION  
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TMI Program Office  
Attn: L. H. Barrett, Deputy Director  
U. S. Nuclear Regulatory Commission  
c/o Three Mile Island Nuclear Station  
Middletown, Pennsylvania 17057

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)  
Operating License No. DPR-73  
Docket No. 50-320  
Submerged Demineralizer System

During discussions with members of your staff we have been requested to provide the following information:

"Provide the SDS radiation protection program to the NRC. This program should address the following points (among others):

- a. Evaluation of worker health and safety.
- b. Instrument calibration program.
- c. Instrument locations.
- d. Training of HP personnel."

This letter responds to that request.

Our Radiation Protection Program to support SDS operations is not a new Program; it consists of the selective application of various radiation protection procedures that currently exist for the implementation of our Radiation Protection Plan. Therefore, we are administering to radiation protection for SDS operations in the same manner that we administer to radiation protection for any other work evolutions in a radiation field or where the possibility of radioactive contamination may exist.

Process radiation monitoring is discussed in the SDS System Description Document, to be submitted to you in the near future. Process monitoring is intended to provide information concerning the radionuclide status of the process and is not considered to directly contribute to the Radiation Protection Program. Because process radiation monitoring is adequately addressed in the System Description Document, it will not be addressed in this document.

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Radiation monitoring equipment, exclusive of process radiation monitoring equipment, will be used in support of SDS operations. This equipment will consist of the following:

1. Portable survey instruments.
2. Air monitors and samplers.
3. Counting equipment.

The portable survey instruments are those that are used routinely for the performance of area surveys. These instruments will be used to perform area surveys and to locate "hot spots" (if they exist) and "shine" areas (if they exist). Since these instruments are acceptable to support normal plant operations, they are acceptable to support SDS operations.

Two particulate air activity monitors will be employed during all aspects of SDS operation, i.e., feed tank filling operations, processing operations, vessel change-out operations, vessel movement operations, cask loading operations, sampling operations, etc. One monitor will be located in the vicinity of the cask loading pit and the other monitor will be placed on the shield installed over the "A" Spent Fuel Pool. Both monitors are provided with local indication of particulate air activity and are equipped to provide an alarm to audibly notify personnel in the area of an increased indication of airborne particulate radioactivity level. One of the monitors, manufactured by Eberline, is a Model AM-3. The other monitor, manufactured by the Victoreen Instrument Company, provides the capability for monitoring not only airborne particulate activity, but also iodine and noble gas activity. All three channels of the Victoreen instrument will be in continuous operation to provide real-time information regarding airborne radioactivity levels. Additional AMS-3 particulate monitors may be used if deemed necessary or to replace either of the above-mentioned instruments in the event that non-repairable failure occurs. Furthermore, should one or both instruments be out of service for one hour or more, hourly grab samples will be taken during SDS operational periods and analyzed to determine the presence of airborne radioactivity. In the event that the Fuel Handling Building becomes a high airborne radioactivity area during operation of the SDS, SDS operations will be terminated and continuous monitoring would be initiated.

These airborne activity monitors do not initiate any automatic control function; they provide an audible alarm to inform personnel of the increase in airborne activity levels. Should an alarm be received, personnel without adequate respiratory protection would be evacuated from the area.

AMS-3 monitors are calibrated quarterly and source checked weekly. The Victoreen air monitor will be calibrated annually. Both instruments will be visually checked on a daily basis to verify operability.

Since tritium is contained in the water used as shielding in the pool and in the water to be processed, a tritium air sampling program has been initiated. This program is conducted with samplers which bubble air through a water-filled container. After the desired volume of air has been bubbled through the water, the water is sent to the chemistry lab for tritium analysis in a liquid scintillation detector. The sampler may be operated as a continuous sampler, or it may be used as a short-term grab sampler. As a sampler, this equipment has no alarm nor real-time readout capability.

A tritium sampler will be installed on the SDS off-gas monitor stream. This monitor will operate continuously to sample the effluent stream and provide the data to determine the amount of tritium released to the environment.

The SDS operating area will be equipped with tritium air samplers. One will sample the air over the pool, the second will sample in the vicinity of the pool wherever personnel protection requirements or current tritium indications dictate. Initially, more samplers may be used to obtain data to characterize the behavior of tritium in the SDS pool area. For example, data taken during the recent transfer of processed water into the pool indicated that periods of water transfer should be covered with more than two samplers to aid in determining the reason for airborne tritium levels. After the behavior of tritium during SDS operation is well understood, it may be possible to adequately monitor tritium levels with one tritium air sampler over the pool.

The sensitivity for these samplers is dependent upon the volume of air sampled, the volume of water in the sampler, and the analytical capability of the Chemistry Lab. The lab capability is  $6.6 \times 10^{-6}$  uCi per milliliter of water in the sampler. If the sampler contains 100 ml of liquid and 1000 ml of air were bubbled through the sampler, the LLD would be  $6.6 \times 10^{-7}$  uCi/cc or about 13% MPC. The LLD can be decreased by increasing the amount of air bubbled through the sampler.

The bioassay program for tritium will be conducted in accordance with RCMP 4238. Any individual suspected of having an internal uptake, particularly integrated exposures to airborne tritium greater than 2 MPC-hours on one day or 10 MPC-hours in one week, will be subject to the bioassay for tritium.

Monitoring for tritium in the Model Room or at EPICOR II will not be done routinely. The Model Room handles processed water in a closed system which will prevent tritium from being released to the area. EPICOR II is also a closed system, but is also remotely operated such that personnel would not be in the vicinity of the system during operation. In the event of a large spill of processed water, tritium monitoring would be considered. Presently available information would indicate that a spill would not result in significant airborne tritium activity if the area were reasonably well ventilated.

Training for radiological protection personnel in support of SDS operations will be conducted. The training program is a formal one and consists of classroom training as well as personnel familiarization with SDS by conducting system walk-downs.

Classroom training will consist of a five hour lecture that includes philosophy of system design and design operational concepts. SDS radiological controls requirements will be included. The classroom training phase will be conducted through the use of prepared lesson plans. Upon completion of the classroom training written examinations will be administered to measure training effectiveness.

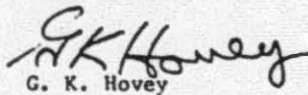
Health physics and radiation protection shift manning will be staffed by at least one person knowledgeable of radiation protection requirements while the SDS is in operation and while significant SDS operational evolutions are in process. His function is to monitor general area radiation levels and to obtain swipe samples for the determination of area contamination. These evolutions are defined as:

1. Feed tank filling operations.
2. Vessel movements.
3. Process sampling.
4. Cask loading.

In addition to this full-time dedicated person to support SDS operations, additional trained personnel will be available to assist on an "as-needed" basis. Significantly our Radiation Protection staff has been increased by eight personnel since March 1, 1981 to support SDS operations.

Should you wish to discuss this matter further, please contact Mr. L. J. Lehman, Jr. of my staff.

Sincerely,

  
G. K. Hovey

GKH:LJL:lh

cc: B. J. Snyder