

February 8, 1973

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Directorate of Regulatory Operations, Headquarters

HIGH I-131 RELEASE RATE - OYSTER CREEK

This memo is forwarded for Headquarters' action. On January 29, 1973, I was notified by telephone by the New Jersey Department of Environmental Protection, which performs environmental measurements under the AEC/NJ State contract, that one of their air samplers in the environs of Oyster Creek had indicated unusually high I-131 concentrations. The sampler is located approximately 1-1/2 miles to the southeast of the Oyster Creek Nuclear Power Plant. The sampling time was from January 9 through 16, 1973. The observed concentration averaged over the period of approximately 5-1/2 days was 127 femtocuries per cubic meter. (The mpc for I-131 in the unrestricted area after applying a reconcentration factor of 700 is 143 femtocuries per cubic meter.) The State personnel indicated that this concentration was approximately a factor of 10 to 20 times higher than that normally observed.

I spoke to plant personnel on January 31, 1973, and they supplied the following information. The plant was started up on January 10 and was critical at approximately 7:30 a.m. The plant was at full power by January 13, 1973. The charcoal cartridge from the stack monitor was placed in service on January 10 at 8:00 a.m. and was removed and analyzed on January 13 at 10:35 a.m. Analysis of the cartridge indicated an average release rate for this period of 2.1 microcuries per second. Normal releases have been running approximately 0.1 to 0.2 microcuries per second. Plant personnel stated that the concentrations on the particulate filter, the radioactive noble gas concentrations, and the reactor water iodine concentrations had not been unusual during this period. Plant personnel also indicated that they hadn't seen an iodine "spike" like this during previous startups. A charcoal cartridge placed in service for a 24-hour period subsequent to the removal of the aforementioned cartridge indicated that the release rate was down by a factor of 10 (in the normal range). The meteorological conditions for the period in question were such that the wind blew toward the southeast with an average wind speed of approximately 14 miles per hour. Oyster Creek's Technical Specification 3.6.8.2 states that the ~~maximum~~ release rate shall not exceed 4 microcuries per second. Technical Specification 4.6.B(1)(g) states that in the event the iodine release rate exceeds 4% of the above limit that the charcoal cartridge in the stack monitor shall be pulled and analyzed twice a week. Based on the above, Oyster Creek is meeting its Technical Specification requirements.

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Using the release rate and the meteorological conditions existing at the time of the release, I calculated the concentration which might have been observed in the environs had the sampler been located at the ideal location for finding the highest concentration. The calculations indicated that the concentration observed by State personnel might have been exceeded by up to perhaps a factor of 5. This indicates that on a short time average, the 10 CFR 20 limits reduced by a factor of 700, may be exceeded occasionally. However, on an annual basis they should certainly not be exceeded.

The following is our analysis of the situation. Since it involves piecing together bits of information, we realize that it is subject to question. Based primarily on the time sequence involved and the findings during C. Pelletier's study at Oyster Creek, we think the most likely cause of the iodine spike would have been the running of the mechanical vacuum pump for several hours during initial startup. A likely source might have been iodine which had plated out on condenser tubes during normal operations and subsequently became available for release. We and the licensee think there is a possibility that the release limit of 4 microcuries per second may have been exceeded for a time shorter than the three-day sampling period which was observed by the charcoal cartridge.

Questions arising as a result of this exercise, for which we request some RO:HQ comments, are:

1. Was there any intent to allow the licensee to average his iodine release rate over a certain period of time, perhaps as long as three or four days? The three or four day period seems to be implied by Technical Specification 4.6.B(1)(g) which states that samples shall be taken twice a week if the licensee is running release rates greater than 4% of limits.
2. Are we on firm ground in asking the licensee to change and analyze his charcoal cartridges on a more frequent basis during the next startup to help identify the source of, and mechanism for, iodine activity being released to the stack, as we think he should? (This has been discussed with the licensee, and he is agreeable to doing this if he can still average his release over three or four days for the purpose of determining compliance with the Technical Specification release rate limit.)
3. If the licensee does change the cartridge more frequently, say daily, and upon analysis, the results indicate that the release rate has exceeded 4 microcuries per second, where does he stand then with respect to violating the Technical Specifications? May he simply include the high results for that one day with results for several days and time average over half a week, or must he report the high result as a violation of the limiting condition for operation?

4. Oyster Creek does not have an iodine monitor, as such, which would provide a readout in real time of the concentration going out the stack as one would have for the noble gases via the stack gas monitor. Vermont Yankee has an iodine monitor which looks at a fixed charcoal cartridge, although the usefulness of such a monitor with a high noble gas background is subject to some question. However, the question arises as to whether we should push Oyster Creek to incorporate such an iodine monitor in their stack monitoring system. We bring enforcement action to bear upon a licensee who exceeds his off-gas release rate, although if averaged over several hours, he may have been within his Technical Specification release limit. Are the iodine release rate limits of less significance than the off-gas release rate limits?
5. There is also some question as to the significance of the licensee exceeding a release rate limit for a few hours if the limit was based on annual average conditions and if averaged over a period of 24 hours the limit was not exceeded. (20.106 allows concentrations of effluents to unrestricted areas to be averaged over a period of up to one year. As one criterion for 24-hour notification, 20.403 allows averaging over a period of 24 hours of concentrations at a level of 500 times the limits specified in 10 CFR 20. As one criterion for a 30-day report, 20.405 specifies concentrations in unrestricted areas have to be in excess of 10 times any applicable limits set forth in this part or in the licensee's license.)

Although we are waiting for Headquarters' guidance in this matter, our interim position is that for subsequent startups in similar situations, this licensee should change the charcoal cartridge in the stack monitor on a more frequent basis than twice a week. We think that the cartridge should be changed before and after the mechanical vacuum pump goes into operation during the next startup to help identify the source of the activity. The licensee is agreeable to doing this but would not like to be placed in the embarrassing position of establishing that he is violating a Technical Specification through his cooperation with us on this matter. If our mobile van was available, this is an instance in which it probably would have been used.

We consider the above to be a generic problem. To make Technical Specifications covering this area more readily inspectable, we recommend that release rate limits be either identified as instantaneous limits thereby requiring a real time monitor; or if they are not instantaneous release rate limits, the period of time over which the release may be averaged should be designated, and the surveillance requirements in the Technical Specifications should be set at a frequency matching the time over which the release may be averaged.

We await your comment on these matters.

J. P. Stohr, Senior
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Special Programs Section

cc: J. G. Keppler, RO:HQ