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THREE MILE ISLAND NUCLEAR STATION - DOCKET No. 50-289

Supplemental Testimony on Fogging and Icing from Cooling Towers

By

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Contention 6

It is contended that the plant should not be operable if and at such times when the cooling towers create any fog or icing that would create a hazard to vehicular and aircraft traffic. It is further contended that the applicant should be required to establish a cooling system by the use of the cooling towers that would minimize chlorination but would be the most efficient system as the state of the art will allow.

My testimony addresses possible fogging and icing from operation of the Unit 1 natural draft cooling towers, and possibly resulting hazard to vehicular and aircraft traffic. The remainder of the contention is addressed by supplemental testimony of Dr. J. D. Buffington and Dr. Joseph E. Draley.

The Regulatory Staff (Staff) has presented its assessment of the effects of operation of natural draft cooling towers at the plant in Section V.A. 3, pp. V-4 to 10, of the Final Environmental Statement (FES). This supplemental testimony expands the information and detail with respect to the material covered in the FES.

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As discussed and referenced on page V-7 in the FES, plumes from natural draft cooling towers rarely if ever descend to the ground in areas of level terrain. In all of the literature on this type of cooling tower, there is only one reported occurrence of this phenomenon.^{1/} This almost total lack of actual or reported ground level fog is in contrast with most theoretical analyses, such as that done by the Applicant.^{2/}

Because experience at operating cooling towers indicates a very low probability of surface fog, I have concluded that the plume from the cooling towers will pose no hazard to automobile and other surface transportation in the vicinity of the plant due to fogging and icing from the cooling towers. Also, I concluded that there will be no fogging or icing at ground level on the runways of the Harrisburg International Airport. It should be remembered that this is a region with frequent dense natural fog; the mean number of days with dense fog (visibility less than 0.25 miles) is 21 days per year.^{3/}

Photographs taken during periods of natural fog at power stations with natural draft cooling towers usually show that the plume from the cooling towers rise well above and is separated from the ground-level fog layer (for example, see Reference V-16 in the FES). Thus, natural draft cooling tower plumes usually do not merge with or augment natural fogging conditions.

^{1/} Ref. V-7 in the FES.

^{2/} Ref. V-12 in the FES.

^{3/} Climate of Pennsylvania, U. S. Department of Commerce Publication No. 60-36, March, 1971.

As indicated in the FES, the visible plume from the cooling towers could interfere with air traffic in the area. As indicated in Figure 2.6-1 in the Applicant's Environmental Report, the prevailing winds at the Site are from the west through northnorthwest (about 38% of the time). When the winds are from this direction, the cooling tower plumes will not cross the air traffic lanes for takeoffs and landings at the Airport.

For winds from the SE to SW (which occur about 28% of all hours), the plume will be blown towards the takeoff corridor, but not the landing approach. Under almost all weather conditions, this plume will evaporate completely before reaching this flight path and no problem is expected.

A cooling tower plume a mile or more from its source is in fact a cloud very similar to naturally occurring ones. Thus, the plume will generate an interference to aircraft similar to that created by natural clouds. Experience with operational cooling towers indicates that the base of these extended visible plumes is usually well above the tower tops. Thus, even with long (greater than 2 miles) plumes and southerly air flow, cooling tower operation should cause no significant problems to aircraft operating under instrument flight rules.

Airplanes operating under visual flight rules (ceiling 1000 feet or more above grade, visibility equal to or greater than 3 miles) will

be forced to fly around the plume, if there is any plume in their path.

The western bank Susquehanna River channel is a flight path for light aircraft operating under VFR conditions. Aircraft flying along this route will be forced to fly around or over the plume whenever plumes greater than one mile in length exist with easterly winds.