From: Giacinto, Joseph
Sent: Tuesday, May 25, 2021 2:07 PM
To: AdvancedReactors-GEISDocsPEm Resource
Subject: NRC - Cooling Tower Air Quality Impacts in New Reactor EISs
Attachments: NRC 2021 Cooling Tower.pdf

Cooling Tower Air Quality Impacts in New Reactor EISs

North Anna ESP

Fogging and most salt deposition would occur within 300 m of the tower. Salt deposition would extend out about a mile. Visible plume could be out to about 3 miles. Impacts are SMALL.

Clinton ESP

No specific numbers given, although it references the LR GEIS and indicates that salt deposition impacts would extend out about 1500 m (1 mile) from the tower. Impacts are SMALL.

Grand Gulf ESP

No specific numbers given, although it references the LR GEIS and indicates that salt deposition impacts would extend out about 1500 m (1 mile) from the tower. Impacts are SMALL.

Vogtle ESP

Longest plume would be 9.7 km (6.0 mi). Fogging and icing would be infrequent. Maximum salt deposition would be at about 490 m (1600 ft) from the NDCT towers. Impacts are SMALL.

North Anna COL (NUREG-1917)

No significant change from ESP

Calvert Cliffs COL

No numbers or specific analysis are provided for fogging, icing and plume. These were apparently addressed in detail in a State review, which is referenced in our EIS. Impacts are SMALL.

STP COL (NUREG-1937)

(5.7.2, pg 5-70) On the basis of the analysis presented by STPNOC in the ER and the review team's independent evaluation of that analysis, the review team concludes that atmospheric impacts of UHS cooling tower operation would be minimal. Plant would rely mostly on a cooling reservoir, with a smaller helper tower. Fogging wouldn't be an issue and icing is not discussed. Plume average length in winter is 0.4 mi; less in summer. Salt deposition rates are less than 10 lb/ac/mo at 0.3 mi, and around 1 lb/ac/mo at 0.8 mi. Impacts are SMALL.

Summer COL

Plume average length in winter is 0.74 mi; less in summer. No cases of fogging or icing were identified in the analysis. Maximum salt deposition was 0.28 lb/ac/mo at 3280 ft from the tower. Impacts are SMALL.

Vogtle COL

No significant change from ESP

Comanche Peak COL

The longest plume would be 3.86 mi. Fogging and icing could occur within 1.5 mi of the towers. Maximum salt deposition would be 137.3 kg/km^2/mo at 100 m from the towers. Impacts are SMALL.

Levy COL (NUREG-1941)

(5.7.2, pg 5-87) On this basis, the review team concludes that the impacts of operation of LNP Units 1 and 2 on air quality from emissions of criteria pollutants, CO2 emissions, cooling-system emissions, and transmission-line impacts would be SMALL, and no further mitigation would be warranted. Longest plumes would be about 5000 m (about 3 mi). Ground level fogging would be within 1000 m of the towers. Icing isn't mentioned. Maximum on-site salt deposition rate would be 10.75 kg/ha/mo, and maximum offsite would be 6.81 kg/ha/mo. No distances are provided. Impacts are SMALL.

Fermi COL (NUREG-2105)

(5.7.1, pg 5-96) On the basis of the analysis presented by Detroit Edison in the ER and the review team's independent evaluation of that analysis, the review team concludes that atmospheric impacts of cooling tower operation would be minor and that no further mitigation is warranted. Average plume length in winter is 1.5 mi; less in summer. Fogging and icing are not expected to be an issue. Maximum salt deposition would be 0.0002 kg/ha/mo during the winter between 14,436 and 30,840 ft east-northeast of the NDCT. Plume shadowing and other lesser affects are expected to have minimal impacts. Impacts are SMALL.

Lee COL

In winter, 20% of plumes are 3.7 mi or longer, with the longest about 6.2 mi; averages are much less in summer. Ground-level fogging is likely to be infrequent and no icing events were predicted. The maximum estimated solids deposition rate for each tower is 0.0103 kg/ha/mo and occurs 200 m north of the towers. Impacts are SMALL.

Turkey Point COL (NUREG-2176)

(5.7.2, pg 5-101) On the basis of the analysis presented in the ER and the review team's independent evaluation of that analysis, the review team concludes that atmospheric impacts of Turkey Point Units 6 and 7 cooling towers would be minimal. Median winter plume would be 250 m, with the longest plumes (infrequent) being over 10,000 m. Fogging is infrequent and icing is not expected. Salt deposition could be as high as 105 kg/ha/mo near the makeup-water reservoir, but less than 10 kg/ha/mo offsite. Impacts are SMALL.

Bell Bend COL

The median plume is 0.64 mi during the winter; less in summer. Ground-level fogging or icing is likely to be infrequent because of the height of the natural draft cooling towers and the resulting plume. Maximum deposition of salts from cooling-tower drift would be 0.018 lb/ac/mo during the fall season at a downwind distance of 3,937 ft to the east-northeast of the towers. Impacts are SMALL.

PSEG ESP

The EIS evaluated both MDCT and NDCT, so there's quite a few numbers. But most plumes would be less that 1 mi in any case. Fogging could extend as far as 3609 ft, although the majority of cases would be less than half that distance. No icing events were predicted. Plume shadowing would mostly occur on site. Beyond 9,843 ft, the average plume shadowing frequency would be less than 145 hours per year, about 3.3 percent of the 4,380 daylight hours, which would be insignificant in terms of effects on agricultural production. Regarding salt deposition, for MDCT the maximum seasonal impact would occur during the winter, with 1.31 kg/ha/mo at 2,297 ft east of the towers. Impacts from NDCT would be even lower. Impacts are SMALL.

Clinch River ESP (NUREG-2226)

(5.7.2, pg 5-49) On the basis of the analysis presented by the applicant in its ER and the staff's independent evaluation of that analysis, the staff concludes that atmospheric impacts of cooling-tower operation at the CRN Site would not be noticeable and that no further mitigation would be warranted. Most plumes are under 1000 ft, although plumes as long as 5600 ft are possible in winter. The modeling predicts no fogging or icing hours at any distance from the towers. Impacts of plume shadowing would be minor. The SACTI model predicted maximum deposition rates of 6276 kg/km^2/mo annually at 328.1 ft (100 m) west of the towers. At distances of 984.3 ft (300 m) and greater, annual average salt deposition rates are all below 1,000 kg/km^2/mo. Finally, at distances of 1,968.5 ft (600 m) and greater, the annual average deposition rate is below 100 kg/km^2/mo. Most impacts from salt deposition would be limited to the CRN site.