

Industrial Process Modeling

Electric Generating Station, New Jersey

Project Characteristics:

- *Chemistry of the Steam Cycle*
- *Evaluation of Ethanolamine (ETA) Chemistry*
- *Regulatory Requirements*
- *Modeling of Organic Carbon and Oxygen Demand in the Waste Stream*

The Industrial Process Evaluation Program was initiated by Public Service Electric & Gas Company (PSE&G) for evaluating industrial processes at an electric generating station in southern New Jersey.

The purpose of the project was to evaluate the on-going use of ETA in the secondary steam cycle, and compare with different industrial alternatives to reduce the impact of the ETA in the waste stream. In addition, the regulatory concerns were addressed, and in particular, the effects of the ETA on the organic carbon and the total oxygen demand in the adjacent surface water bodies.

Woods Hole Group (WHG) completed a thorough study of the chemistry of ETA in the steam cycle and throughout the discharge process. ETA is removed from the secondary steam cycle as part of the normal cleansing process to maintain high quality steam water.

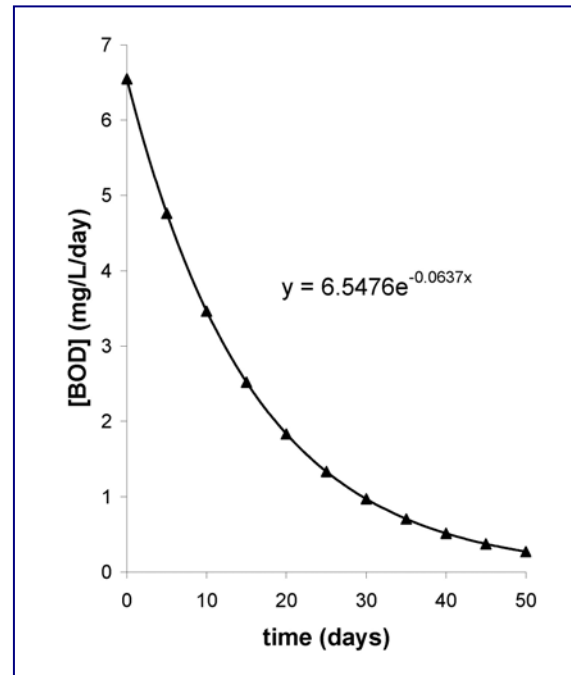
The chemical is discharged to process tanks, where it undergoes various industrial processes to reduce its concentration, whence it is discharged to the non-radioactive liquid waste stream. From there, the chemical is mixed with the once-through cooling water, and discharged into the receiving water bodies.

The effects of the ETA discharge on the receiving water body were modeled through consideration of nitrogenous and carbonaceous organic carbon loading, and their associated oxygen demand.

The resulting chemical modeling clarified the small role of such discharges to the ecology and chemistry of the river, and illustrated how the chemical could be used safely in this industrial application.



Salem Generating Station



BOD Decay Curve