

Ocean Science/Environmental Technology

Title: *Enhanced Surface Cooling of Thermal Discharges (UMD 07-05)*

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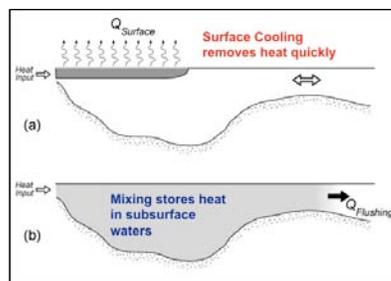
Applications: An improved method of disposing cooling water, for use by companies that provide wastewater treatment equipment and/or services to utility companies, or by the utilities themselves.

Benefits:

- Increased heat transfer across water surface, reducing overall heat load stored in receiving water body.
- Reduced overall surface area and volume impact of heat discharge to receiving water body by as much as 90%.
- Localization of environmental impact to the surface layer of the body of water.
- Significant cost savings over closed cycle alternatives, such as cooling towers.

Technology Description: Enhanced Surface Cooling is a cost-effective way to minimize the negative impact from industrial discharges of waste heat from power plants and other industrial facilities into a poorly flushed natural water body. The method improves direct heat transfer to the atmosphere, thereby limiting environmental impact to the receiving water body. Electric utilities generally depend on the use of cooling water throughout the power generation cycle. There are generally two approaches to remove waste heat from a power plant's operation, including the use of a cooling tower, which allows heat to evaporate through steam into the atmosphere, and the discharge of heated water directly to a body of water, which can lead to increased thermal pollution. This invention provides a new method for waste heat discharges into poorly flushed water bodies. In cases where there is a limited replacement of water within the receiving water body, diluting the effluent through efficient mixing only serves to move heat away from the surface and into longer-term storage at depth. In these cases, it is more efficient to limit mixing, and to spread the discharging fluid in a thin layer across the surface in order to take advantage of the natural air-water heat exchange mechanisms. A reduction in effluent mixing can be accomplished through specific modifications to outfall design.

Patent Status: This technology is the subject of an allowed U.S. patent application.



Enhanced Surface Cooling keeps thermal pollution isolated, while more quickly removing heat.

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