

Oceanographic Forecasting and Monitoring as an Aid to Nuclear Power Production

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Diablo Canyon Power Plant

The Diablo Canyon Power Plant is located in San Luis Obispo County, California, on a thirteen-mile stretch of open coastline. The cooling water system intake structure for the plant is located in a small man-made cove that is protected from most storm-generated waves by two jetties. The cooling water flow for the entire plant at full power is approximately 1,734,000 gallons per minute, or 2,496,960,000 gallons per day. The coastline around the plant supports a rich community of kelp and seaweed. Most of the kelp and seaweed undergo annual loss of plant material that can produce large quantities of debris. This process reaches it's peak during the winter months when large storm-generated waves help detach the material from the seafloor. Large seas can also move the debris into the plant's Intake Cove where it can impact the operations of the cooling water system. Large 'balls' of debris are pushed into the intake structure forebay. The quantity of the debris can be so large that it overwhelms the clearing capacity of the traveling screen system. Wave surge has also damaged the traveling screens causing loss of generation.

As part of a comprehensive program to both manage the quantity of algal debris and insure that it does not affect plant operation, a system to monitor sea conditions and provide early warning of severe storms was developed. Over the past twenty years this program has continued to evolve, employing a number of new technologies that have enhanced our ability to predict the timing of storms and wave height, period and direction. As a part of the program a daily weather forecast is produced for the power plant. To date this program has proven very effective at preventing generation loss.