Comments of Rick Sands
To
New Jersey Department of Environmental Protection
Oyster Creek Generating Station
Draft NJPDES DSW Permit NJ0005550
Public Hearing - February 24, 2010

I would like to thank the Department for this opportunity to testify with regards to Oyster Creek Generating Station and specifically with respect to closed-cycle cooling.

My name is Rick Sands; I am a Principal Engineer at URS Corporation. URS is one of the largest engineering consulting firms in the United States and is ranked by Engineering News Record as the number two firm in providing engineering, procurement, and construction services to the power industry in the United States.

With respect to Oyster Creek Generating Station I was the Project Director for the URS report entitled "Determination of Cooling Tower Availability-Oyster Creek Generating Station" (March 2006). This report investigated retrofitting Oyster Creek with closed-cycle cooling. At Oyster Creek closed cycle cooling is synonymous with cooling towers, as there is no other closed-cycle cooling technology available. The report concluded that the installation of cooling towers would cost approximately $700 - $800 million, based on the methodology set forth in the U.S. EPA's Phase II rule under Section 316(b) of the Clean Water Act. While the Phase II rule was subsequently suspended by the EPA

following the U.S. Second Circuit Court of Appeals decision in the Riverkeeper case, the costing methodology is still a valid means of estimating the costs of cooling towers. URS determined, based on the US EPA methodology, that cooling towers were unavailable at Oyster Creek Generating Station. This determination was based on the cost of installing cooling towers and significant uncertainty whether the plant could obtain the necessary air permits to construct cooling towers.

The issues of the cost and availability of cooling towers at Oyster Creek will be covered comprehensively in Exelon's written comments to be filed by March 15, 2010. My testimony today focuses on correcting misperceptions that cooling towers can be constructed at Oyster Creek for significantly less than the URS estimate of $700 - $800 million. These misperceptions are based on generic costing methodologies that do not take into account the site-specific features of Oyster Creek. Therefore, I will briefly review the site-specific nature of retrofitting cooling towers at Oyster Creek, the conceptual model that URS developed for cooling towers at Oyster Creek, and an update of this conceptual model which will also provide new information to the Department. Additionally, I will discuss air emissions and the ability to permit cooling towers at Oyster Creek under the Prevention of Significant Deterioration requirements of the Clean Air Act. The Department, in the NJPDES fact sheet, provided no analysis regarding the availability of cooling towers and their determination. The Department did not address the key questions

required in making the Best Professional Judgment determination of the Best Technology Available. This is in stark contrast to the current permit issued in1994 when the Department determined that cooling towers were not the Best Technology Available.

Costs of Closed-Cycle Cooling

In Senator Smith's December Senate environmental hearings, and in comments and articles, varying cost estimates for closed-cycle cooling towers at Oyster Creek have been presented by environmental organizations, financial analysts and others. These cost estimates have ranged between $50 million and $300 million and are significantly lower than URS' estimate of $700 million to $800 million. We believe the major difference between the URS estimate and these other estimates is the absence of site-specific data in the other estimates. Because of the very specific site constraints at Oyster Creek anyone estimating the costs of closed-cycle cooling towers would require specific site knowledge in order to make a credible estimate.

Site-Specific Factors

In developing a conceptual model for Oyster Creek the first major consideration was plant security. According to plant security personnel cooling towers would pose a security risk if ground fogging occurred. Additionally, cooling towers could not interrupt the line of sight or they would have to be placed within the security perimeter. Using these factors, URS' conceptual model required cooling towers to be within the security perimeter and

eliminated the use of mechanical draft cooling towers which, during certain climatic conditions, would cause ground fogging. Because of these security requirements our conceptual model relied on hybrid plume-abating towers which, by design, eliminate fogging. We have recently learned that an installation of hybrid towers in the marine environment in New England is not functioning correctly because of corrosion. Therefore we no longer conclude that hybrid towers are an available technology. This would require a change in the conceptual model and would most likely result in natural draft cooling towers becoming the selected technology. A natural draft cooling tower would be significantly more intrusive because of its large presence and it's 500 to 600 foot. high.

Location of Cooling Towers

In designing a cooling tower retrofit the optimal location for the cooling towers and the most cost-effective location is adjacent to, or in immediate proximity to, the once- through intake and discharge structures. Oyster Creek's layout does not allow for placing cooling towers close to the intake or discharge point. There is no available land close to either the intake or discharge points. This land is fully occupied by the nuclear generating plant or is not owned by Exelon. The closest available space is north of the station, requiring approximately 1 mile of cooling system piping, consisting of two 12-foot diameter pipes each being approximately 1/2 mile long.

Not being able to locate cooling towers near the intake and discharge structures therefore requires very large diameter piping to be routed through the existing plant. The optimal

route intersects numerous critical nuclear infrastructures including passing directly next to a low-level radioactive waste tank. Additionally, because of this location and the associated piping and pumping requirements, there is a difference in pressure between the current system and the retrofit with a cooling tower. Because of this difference in pressure existing piping will need to be reinforced and water boxes connected to the condensers will need to be replaced. The replacement of the water boxes in the turbine building is difficult and would be performed in a radiological environment which will require an extended outage to complete.

Air Emissions

A cooling tower at Oyster Creek will evaporate a significant amount of salt water. This evaporation results in air emissions which contain fine particulate matter referred to as PM 10 and PM 2.5. Based on URS' initial calculation approximately 261 tons of particulate matter will be released from the cooling tower each year. A screening model of the air emissions indicated an exceedance of the applicable air standards for particulate matter. Based on the initial screening model there is a question of whether air permits can be attained without a variance from ambient air quality standards.

Oyster Creek is close to Brigantine National Wildlife Refuge and the Forsythe National Wildlife Refuge. Both are Class I areas. The National Park Service will determine

whether cooling tower emissions from Oyster Creek cause exceedances of air quality standards resulting in additional haze/visual impact.

Other potential local impacts associated with closed-cycle cooling towers at Oyster Creek would be the visual impact to the community and the potential for salt draft/salt deposition from the cooling towers which may, impact homes, cars and vegetable gardens.

Other Permitting Issues

Installation of a natural draft cooling tower may require local zoning approval and a demonstration of consistency with New Jersey's coastal zone management regulations which regulate the amount of impervious space allowed. Additionally, another factor that has not been taken into consideration is the increase in CO2 emissions caused by the loss of carbon-free nuclear generation, and the additional parasitic load of the cooling towers and pumps. This loss in electric generation will be compensated for by additional generation from fossil burning facilities therefore causing an increase in greenhouse gases.

Cost Estimates at Other Plants

The only recent northeast generating facility in a marine environment that has been required to retrofit with closed-cycle cooling towers is the coal-fired Brayton Point Generating Station in Massachusetts. In August of 2009 the reported cost estimate for the retrofit was $620 million for a natural draft cooling tower system which is currently under construction. Taking into account the respective circulating water flows of each plant (Brayton Point is twice that of Oyster Creek), the type of generation station (Oyster Creek

is a nuclear plant, and the EPA uses a cost factor of 1.8 for nuclear plants relative to fossil plants such as Brayton Point) and the site-specific features of Oyster Creek, we believe that the Oyster Creek estimate is supported by the Brayton Point experience to date.

As an additional point of reference, PGE now estimates that the cost of closed cycle cooling at its Diablo Canyon nuclear plant is $2 billion per cooling tower.

The Department's Determination

The Department, in its fact sheet for the Oyster Creek drift permit, did not address any of the issues raised in the 2006 URS report on cooling tower availability. The only issue addressed by the Department in the fact sheet was the length of amortization available to Exelon. The Department did not address any of the other environmental impacts, did not determine whether there was any net environmental benefit, or consider the facility's ability to incur the costs. The Department did not address any questions regarding whether cooling towers could be permitted, did not take into consideration NRC safety and licensing requirements, or the timeframe required to permit and design and construct these towers. Until all of these issues are reviewed and addressed by the Department, the Department has not exercised its Best Professional Judgment, nor can it conclude that cooling towers are available to Oyster Creek Generating Station.

Thank you very much for the opportunity to testify.