EXHIBIT 5

Princess Cruise Lines Ltd.
Initial Report on Evaluation of Treatment Technologies for Achieving Alaska General NPDES Permit Limits for Ammonia, Copper, Nickel, and Zinc

Introduction

Princess Cruise Lines Ltd. (PCL) has contracted with Tischler/Kocurek (T/K) of Round Rock, Texas to conduct an evaluation of treatment technologies that can be used to comply with the interim and final limits for ammonia-nitrogen, copper, nickel, and zinc in the Alaska Department of Environmental Conservation's (ADEC) General NPDES Permit No. 2007DB0002. This report is submitted as part of the annual progress report required by Provision 1.9.12 of the General Permit.

ADEC's general permit for large cruise ships is unique when compared to all other point source individual and general NPDES permits issued anywhere else in the United States because it requires water quality-based effluent limits (WQBELs) for aquatic life water quality criteria for ammonia, copper, nickel and zinc to be achieved at the end-of-pipe, allowing for no mixing zone in the receiving water. The U.S. Environmental Protection Agency (EPA) has issued numerous guidance documents describing the scientific basis for mixing zones and how to establish them.[1] The Alaska Surface Water Quality Standards allow mixing zones for point sources discharges of municipal and industrial wastewater (18 AAC 70.240). However, as ADEC points out in the Fact Sheet for the General Permit, the August 2006 ballot measure added new provisions to the commercial passenger vessel environmental compliance (CPVEC) program that appears to prohibit ADEC from authorizing mixing zones for gray water and black water treated discharges. This prohibition of mixing zones is incorporated in the General Permit, effective in the 2010 season, in spite of the fact that ADEC has determined that the actual median mixing zone for a stationary cruise ship is a 22 to 1 (parts receiving water to parts effluent)(Table 6, Fact Sheet).

The reason for emphasizing that the General Permit does not allow mixing zones to attain WQBELs, while all point sources in Alaska and elsewhere do allow mixing zones, is that wastewater technologies to achieve some of the General Permit limits, specifically the limits for copper and nickel, are not demonstrated at full scale for even land-based point sources, not to mention vessels. Furthermore, some technologies, such as biological nitrification for ammonia removal, that are demonstrated to achieve the General Permit limits for fixed, land-based facilities are not readily transferred to ocean-going vessels because of physical and operating limitations. Therefore, this treatment technology evaluation will, by necessity, be based on T/K's assessment of not only the ability of a technology to achieve the General Permit limits, but also the potential for such technologies to be practical to install and operate aboard a large vessel.

Study Plan

[1] EPA (July 2006) *Compendium of Mixing Zone Documents*, EPA 823-R-06-003, Office of Water, Washington, D.C.

The evaluation of treatment technology consists of the following steps:

1. Review reports and research performed to date by PCL, including research by Hamworthy (manufacturer of advanced waste treatment units used by PCL) and data on existing vessel treatment systems and effluent quality;
2. Compile current technical literature and vendor data on treatment and control technologies for removal of ammonia, copper, nickel and zinc, supplemented by data and references from T/K's previous studies of such treatment technologies;
3. Evaluate the ability of available technologies to achieve the interim and final permit limits using full-scale operational data were available, pilot plant data, and lab-scale data and summarize this performance in spreadsheet-based tabulations;
4. Evaluate the potential of using available technologies onboard large vessels, especially considering space requirements and residuals generated (options evaluated will include storage of wastewater for onshore treatment);
5. Rank treatment technologies for the target pollutants based on their ability to achieve the interim and final permit limits, feasibility for onboard application, and cost[2]; and
6. Prepare a final report for Princess Cruises that will present the results of the evaluation. The report will cite all vendor materials and literature references used in the analysis. The report will be suitable for submittal to the regulatory agencies and separate appendices will be provided, as needed, to include key reference material. The report and appendices will be provided in electronic (pdf) format.

Preliminary Identification of Technologies

Steps one and two of the study plan are essentially complete. The treatment/control technologies that have been identified are listed below. Performance data is being compiled for these technologies from the technical literature and vendor data.

Ammonia

1. <u>Biological Treatment</u>
    a. Membrane bioreactor with nitrification/denitrification (upgrade of current biological treatment units)
    b. Immobilized nitrifiers (solid growth media)
2. <u>Physical/Chemical Treatment</u>
    a. Ion Exchange — zeolite resins
    b. Catalytic wet air oxidation (Co/Bi)
    c. Breakpoint chlorination/dechlorination

Metals

1. <u>Source Water</u>

[2] The costs of treatment technologies will be ranked using a relative scale. Specific costs estimates for technologies will not be performed.

a. Bunker water intake
    i. Reverse osmosis with reject discharge to shore or offshore
    ii. Ion exchange — synthetic polymers, zeolite resins
b. Evaporator product water
    i. Reverse osmosis with reject discharge to salt water
    ii. Ion exchange — synthetic polymers, zeolite resins

2. MBR-treated Effluent
    a. Chemical Treatment (dithiocarbamates) plus microfiltration
    b. Ion exchange — synthetic polymers, zeolite resin
    c. Reverse osmosis with reject storage, offshore or onshore discharge
3. Integrated treatment system effluent
    a. Catalytic enhanced wet oxidation plus
        i. Ion exchange
        ii. Reverse osmosis

Schedule

The schedule is dependent upon when information is received from vendors. A draft report is currently scheduled for March 1, 2009.

At the time of preparation of this report, literature data on the potentially applicable treatment technologies identified in the study plan has been assembled. Vendors of membrane, ion exchange, and chemical treatment equipment have been contacted to obtain data on the removal capabilities of each type of system. Their responses have not yet been received.