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Qatargas Pulse-Chlorination System

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Abstract

To maintain reliable and efficient operation of seawater cooling water systems, the typical industry practice is chlorination, generally through continuous dosing and periodic shock dosing. Due to concerns regarding potential environmental effects on the local marine environment, the Qatar Ministry of Environment (MoE) has set the residual chlorine limit in cooling seawater discharges at 0.05 mg/L. To comply with these regulatory requirements, Qatargas has implemented Pulse-Chlorination (P-C) as its antifouling strategy.

P-C is a cost-effective intermittent dosing regimen recognized as the European Union (EU) Best Available Technology (BAT) for biofouling mitigation of once-through cooling seawater systems. It combines optimal fouling control with minimal chlorine discharge, while retaining safe and reliable plant operations. It has been successfully implemented worldwide through on-site implementation and field tests at industries ranging from oil and gas facilities to conventional and nuclear power plants.

The implementation of P-C at Qatargas has been successful, with significant improvements in both fouling mitigation and substantial reductions in the discharge of total residual oxidants (TRO/residual chlorine). In 2009, Qatargas' implementation of P-C was recognized with an award in the 'Excellence in Environmental Technology' category at the RESCO Offshore Arabia Conference.

This paper will present the Qatargas chlorination regime and highlight how P-C enhanced environmental and operational performance of Qatargas' seawater cooling water system.

Key words: Pulse Chlorination, Bio-fouling, Total Residual Oxidant

Introduction

To maintain reliable and efficient operation of seawater cooling systems, a biocide is typically added to the seawater to prevent settlement and growth of marine fouling species. Chlorination of the seawater with periodic shock dosing is a typical industry practice in coastal areas to prevent both macro and micro fouling. However, this practice is not based upon ecotoxicological data of targeted species, but rather post-hoc observation of antifouling efficiency or performed as an attempt to meet the discharge limits of residual biocide concentrations. Therefore, opportunities exist for science-based decisions to optimize site-specific biocide dosing regimens that enable cost-efficient and reliable fouling control while complying with stringent regulatory discharge limits.