

Recycle of Industrial Waste Water and Surface Water



System Summary:
648 dizzer®5000 MB Modules
in 9 Racks

Location

Ukraine

OEM/System Integrator

GE Water

Enduser

Chemical Industry

Plant Capacity

48,000 m³/day

Market/Industry

Chemical Industry Complex

Application

RO pre-treatment

Feed water source

Industrial Wastewater

Surface Water

Commissioning Date

January 2005

Overview

Industrial wastewater is potentially a valuable resource for large plant complexes, and if not re-used, can incur significant disposal costs. In addition, surface run off from rainfall can become contaminated on an industrial site, and requires treatment before discharge.

This case profile describes an installation at a large chemical plant complex in the Ukraine, at which RO has been used for some years to provide water for re-use from mixed waste sources. However, the original conventional pre-treatment resulted in high chemical cleaning frequency, downtime, and high RO replacement rates.

In 2004, pilot trials were conducted by inge to evaluate whether UF could treat the variable feed at the site. Based on the successful pilot results, inge was selected to provide their UF Multibore® technology for the facility. The system has operated well since start-up, significantly improving the performance of the RO.

Treatment Objectives

Prior to the installation of the UF system, the feed caused significant problems for the RO, with high use of cleaning chemicals, and frequent RO replacement. The objective of the UF system was to provide a consistent RO feed, with turbidity < 0.1 NTU and SDI < 3, whilst coping with the variability of the blended feed source.

The Process Flow Diagram for the system is shown in the figure. The run off from the site varied widely in turbidity with season and weather conditions. This was blended with a variety of waste sources in a feed pond, then flocculated and clarified prior to the UF system.

Performance

The design flux for the UF system is 80 l/(m²h). The system has achieved stable performance, consistently providing an RO feed with SDI < 3. Since start up in January 2005, no fibre breaks have occurred, and membrane integrity has been maintained, despite the difficult nature of the feed.

Chemical usage has been low, with an occasional caustic CEB at pH 12, followed by an acid CEB at pH 2.5. Chlorine disinfection has not been used, and there has been no requirement for CIP.

Customer Statement:

„Conventional treatment was found to be unable to cope with the variability of the wastewater feed, and caused problems for the RO. Since the UF has been installed, consistent RO performance has been achieved.“

Alexander Ososkov
Regional Manager, GE Water

Process Flow Diagram

