

## CASE STUDY

### Dissolved Air Flotation (DAF) System UPGRADE

**Type of facility:** Paper Mill, NH

**Date Inspected:** September, 2003

**Project Scope:** To improve the efficiency of a Krofta clarifier and reduce corresponding maintenance problems associated with the DAF.

**Overview:** A Specialty Kraft Paper Mill located in NH has been using a Krofta clarifier to remove Total Suspended Solids (TSS) from the Effluent water prior to discharge to the city. The system has used a recirculation pump with a pressure vessel as the air dissolving mechanism. The recirculation pump (w/a 40 HP motor) has been a significant maintenance problem. The seal would require replacement every 3-6 months, not to mention the other operational control problems. The DAF effluent averaged over 300 ppm TSS.

**Background:** Dissolved Air Flotation systems utilize dissolved air injected into the feed water stream to float suspended solids to the surface of a vessel where they can be removed. Various technologies have been developed to introduce microbubbles into the system. Most of these technologies use a recirculation pump with a pressurized vessel or tube. This technology does not provide an optimum microbubble and has historically caused significant maintenance problems.

**Process:** The Nikuni system uses a single pump system which venturi's atmospheric air into the suction side of the pump with the Mill effluent water. The discharge is pressurized, effectively dissolving the air into the water. The system is capable of 95%+ saturation, providing an exceptional efficiency. Often, the amount of air dissolved is 5 to 10 times that of other air dissolving technologies.

**Results:** The system was easily installed replacing both the existing (40 Hp) recirculation pump as well as the space consuming pressure tank with a (15 HP) Nikuni system. Immediately, the average TSS of the DAF effluent dropped from 300 ppm to 100 ppm. The Nikuni system has been operating for several years maintaining that average and no operational problems have occurred.

**Benefit:** The system provided better than a 9 month return on investment (ROI) considering just the electrical savings. If the calculations were to include the benefits to the papermaking process and the maintenance hours reduced, the payback would be considered several weeks.

**Other Applications:** The Nikuni system has been used to upgrade virtually every DAF-design style on the market. In every case, the system has provided significant benefits including one or more of the following:

- Reduced electrical costs
- Improved treatment performance
- Increased hydraulic capacity
- Reduced chemical consumption
- Lowered maintenance costs

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