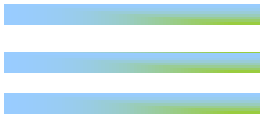


CASE STUDY

Bear Garden Generation Station

New canton, Virginia



JAMES RIVER
WATER
CLARIFICATION

STRINGENT WATER
QUALITY
REQUIREMENT

DEMINERALIZATION
& EDI SYSTEMS

COST
EFFECTIVE

Virginia Electric & Power Company

James River Treatment System for
Service Water, High Purity and
Cooling Tower Make-Up Water



Bear Garden Generating System

Water Treatment System for Cooling Tower Cycle Efficiency and Quality Boiler Feed

Background

To meet increasing demand, Virginia Electric & Power (Dominion Power) working with Fluor Corporation as its EPC contractor, has built a 580 MW, combined cycle, gas-fired power station 60 miles west of Richmond. Known as Bear Garden, the process required water with stringent high quality. A multistage water treatment system with both physical-chemical and reverse osmosis (RO), membrane treatment followed by electro deionization (EDI) has been selected to treat the combined influent surface water.

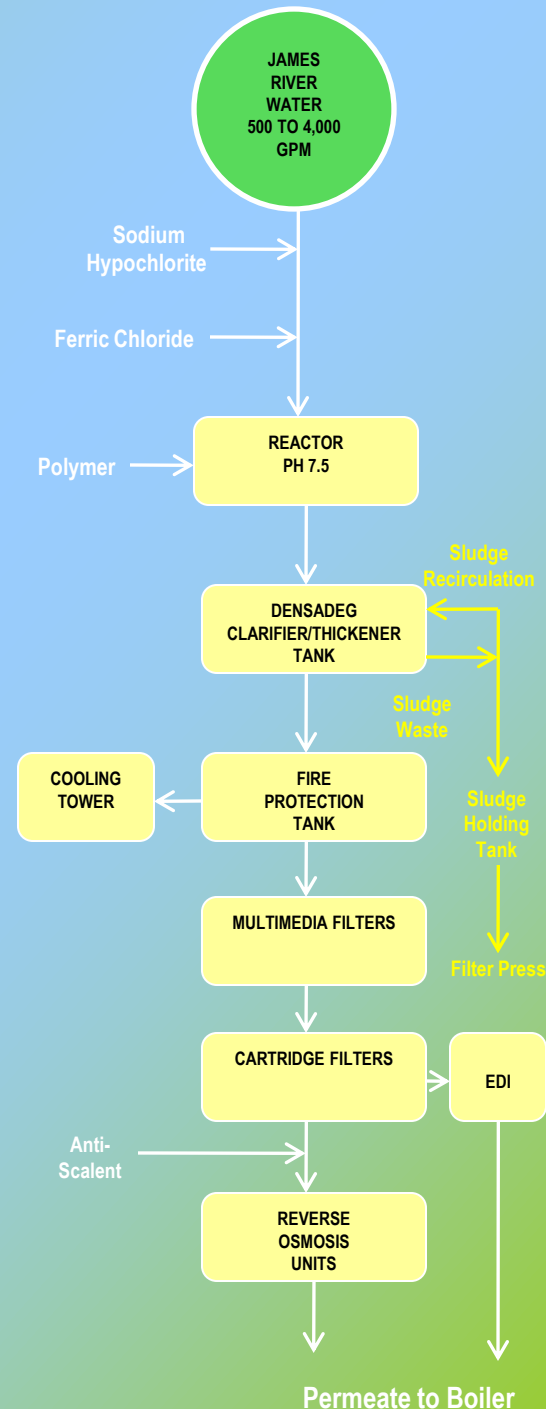
Customer Benefits

- The patented robust **DensaDeg®** clarifier/thickener was selected for the physical-chemical pretreatment because this clarifier is the most efficient solids contact clarifier in the world while occupying the smallest footprint.
- This clarifier offers superior removal efficiency of Turbidity due to its unique sludge recirculation dynamics.
- Reverse osmosis and EDI as redundancy are assuring the highest quality of feed water to the boiler with the best consistency.

Goals and Challenges

- Must meet very stringent Industrial Water Quality (See Table Below) with the influent coming from the James River.
- Clarification must work exposed to the elements all year long
- Design of a common control system for both Raw Water Treatment and High Purity Water System
- Must treat a variable flow rate range of 500 to 4,000 GPM

SYSTEM BLOCK DIAGRAM



PARAMETER	INFLUENT	DENSADEG EFFLUENT	RO EFFLUENT
TSS	50	<5	<0.1
Alkalinity (mg/L as Calcium carbonate)	70	10	<1
Fe (mg/L)	0.2	<0.05	<0.01
TOC (mg/L)	16	<3	<0.5
pH	5-8	6-9	6-9