	* DEAERATOR	FEEDWATER TANK
OPERATING CHARACTERISTICS	Normally pressurized at approximately 5 to 10 psig. Removes oxygen and carbon dioxide from make-up water & cooler returning condensate via engineered exhaust vent. Often includes vent condenser to capture lost energy as harmful gasses are released to atmosphere. ASME - Section VIII - Code Vessel	Non-pressurized vented tank equipped with steam pre-heater to reduce oxygen and carbon dioxide from make-up water and cooler returning condensate. Most are non-code vessels and are often fabricated of stainless steel to resist corrosion from released gases.
OXYGEN LEVELS	O2 levels vary depending upon Deaerator type and quality of steam provided. Most common provides for .005 CC/Liter (7 ppb) maximum oxygen content.	** Can normally reduce O2 levels to about 5 to 10 ppm w/steam pre-heat temperatures to about 170° to 190°F.
NOMINAL OPERATING TEMPERATURE	Maintains Temperatures to approximately 227° F of liquid in tank	Should maintain between 170° & 190° F max temperature of liquid in tank.
RISKS ASSOCIATED	Lower risk due to higher levels of mechanical deaeration and lower use of chemical to completely remove oxygen. If chemicals fail to deliver, the negative impact is not as great since O2 removal is nearly complete, measurable and caught before damaging effects.	Higher O2 levels expected due to lower operating temperatures requiring additional treatment to achieve zero oxygen, longer time to raise water temperatures under heavy load conditions. Temps over/undershoot presenting challenge to proper water chemistry.
THERMAL SHOCK	Higher/stable operating temperatures in Deaerator means less risk of thermal shock to the boiler(s) via feedwater temperature as the Delta can approach operating temperature of the saturated steam in boilers.	Though normal operating temperatures do not pose thermal-shock concern, a rapid shift in load change or tank drain event could pose a challenge to quick temperature recovery, adequate O2 removal. Make-up valve size does become more critical.
MAINTENANCE	Maintain in accordance with manufactures recommendations and inspect internally for weld cracks, piping, quick connections etc. External inspection as directed by ASME code, NBIC and local jurisdiction. May include removal of any insulated product to expose weld joints, seems and fittings. Annual cleaning may include, replacement of sight glass and/or gaskets, manhole/handhole gaskets and cleaning of pump suction strainers, scrape, flush and clean tank internals inspecting integrity of tank, controls and wiring.	Maintain in accordance with manufactures recommendations with internal & external visual inspections annually for weld cracks, joints, piping and fittings. Annual cleaning may include, replacement of sight glass and/or gaskets, manhole/handhole gaskets and cleaning of pump suction strainers, scrape, flush and clean tank internals inspecting integrity of tank, controls and wiring.
LIFE CYCLE COSTS	First cost is substantially higher, however over the life of the vessel a Deaerator can actually have lower cost of ownership to much reduced oxygen scavenger required daily vs. the feedwater tank. Ask your boiler supplier to provide a payback analysis for an ROI review.	Lower first cost however review of chemical quantities required to ensure oxygen removal must factor into decision. Theoretically, it takes approximately 8 ppm of sodium sulfite as Na2SO3 to scavenge 1 ppm of dissolved O2: Increased chemical required may lead to greater tank & strainer maintenance. Steam pre-heater releasing oxygen via a sparge tube in the vessel, therefore tank & internal materials should be fabricated of stainless steel for longevity.