

AFT Fathom™ Features Simplify Complex Model: Power Station Cooling Water System Redesigned

CASE STUDY

Cooling Water System
Power Generation Industry



Kiewit Power Engineers Lenexa, Kansas, USA Platinum Pipe Award Winner - Software Features and Model Creativity

Andy Fazel, lead mechanical engineer at Kiewit Power Engineers, used AFT Fathom to revise and redesign four separate cooling water systems into one common system for the auxiliary plant heat exchangers in the Brayton Point Generating Station, Somerset, Massachusetts, USA.

An existing service water system contained 9 pumps, each at different flow rates and pressures to supply cooling water to 13 heat exchangers in 4 different coal power units.

The system was redesigned to supply more cooling

“We were able to show the owner that during outages, we would be able to supply sufficient flow to all coolers.”



Service Water Pump

water using only 4 new pumps (2 operating with 2 in standby), while retaining the ability to use the existing pumps during outages in the new system. To make sure that these pumps would still be able to supply adequate flow to the system, 5 of the existing pumps were modeled. The piping was about 60% existing and 40% new.

Multiple converging new and old systems made the model a bit messy, but Fazel changed pipe colors and used annotations to denote which pipes supplied which systems, and which pipes were old and new (see Figure 1). The Notes field feature was used to keep track of drawing numbers, field collected roughness data, and loss components included. Valve throttling was used to adjust flow to different coolers.

What began in 1884 with two hardworking brothers has grown into a Fortune 500 construction, mining and engineering powerhouse. Kiewit's ethical, forward-thinking workforce continues to build upon the company's reputation of safe, high-quality engineering. Consistently ranked among the top five of the Engineering News-Record Top 400 Contractors, Kiewit is a leader in a variety of market sectors throughout North America and, most recently, Australia.

AFT Fathom Model – Color Codes
Green - Common to all units
Blue - Units 1 and 2
Orange - Unit 3
Black - Unit 4

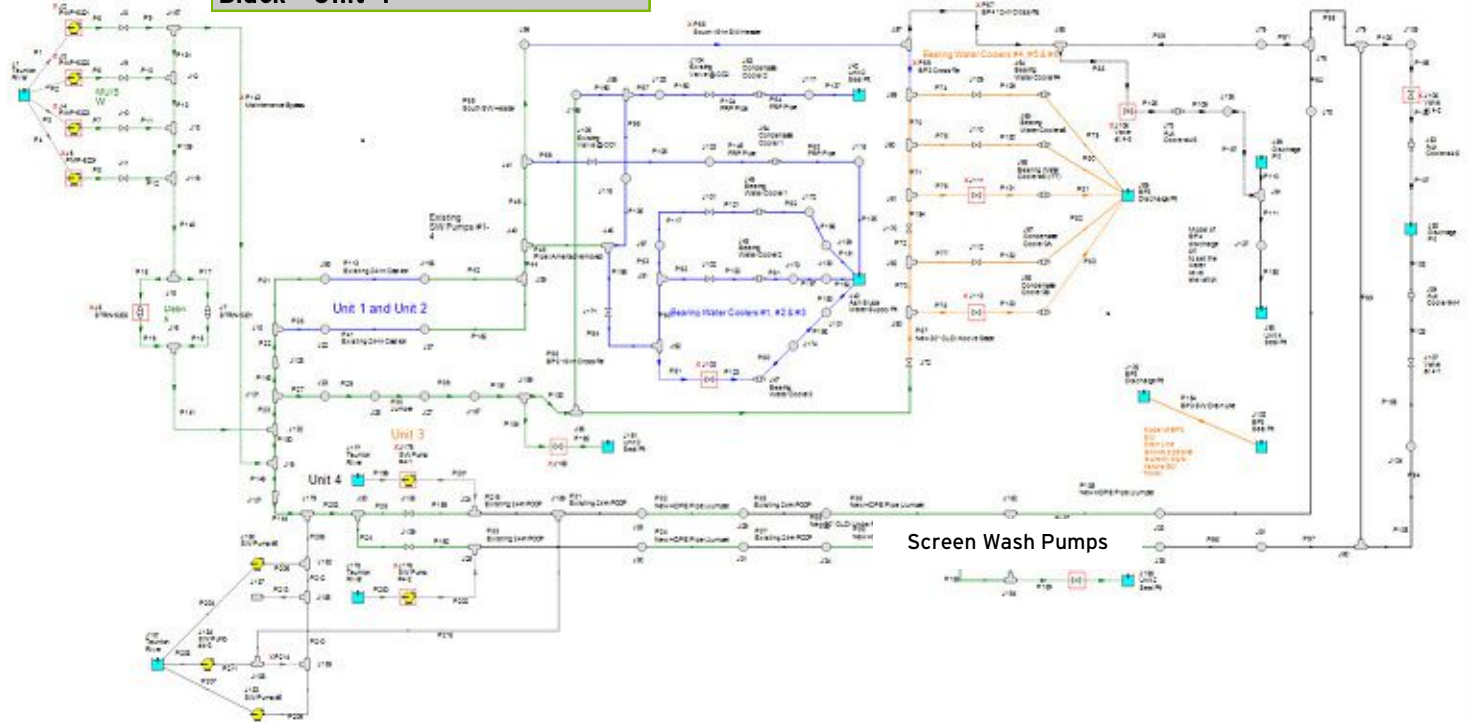


Figure 1 - AFT Fathom model of service water system at Brayton Point Generating Station in the northeast USA



Screen Wash Pumps



Pump Motors and Discharge Pipe