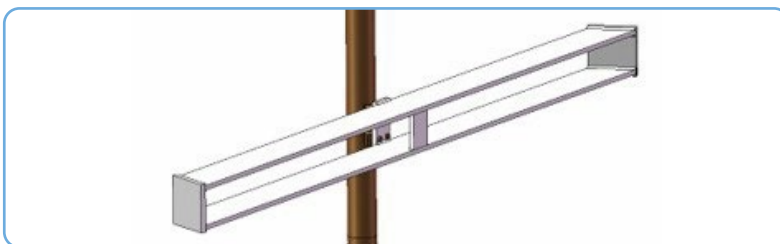


Redesigned seismic supports on safety-related pump alleviate installation challenges

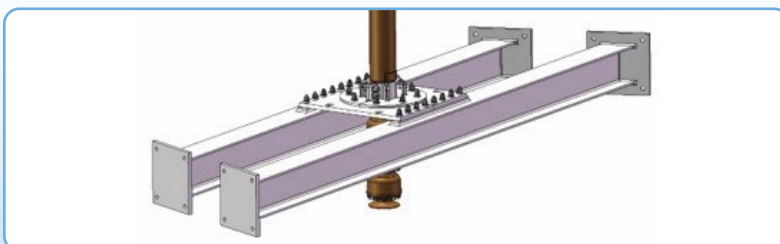
A difficult vertical turbine pump install is negated with Hayward Tyler's engineering and design expertise

A nuclear power plant was having a difficult time re-installing their vertical turbine pumps after recent maintenance. The original seismic design, which had been in place for more than 30 years, was increasingly difficult to line up and install. The original support had very limited adjustability once the pump was installed and the fasteners were located under the support's top beam, making them difficult to reach and assemble. The site contacted Hayward Tyler to redesign the seismic supports in order to alleviate the installation issues, while still complying with all the necessary nuclear requirements.

Hayward Tyler held technical meetings with site staff to evaluate the current design and better understand the difficulties the maintenance personnel was having. This included discussing the current method for fixing and troubleshooting ways to make it more ergonomic. With this knowledge, a new design was created that allowed for much easier installation. The new design incorporates multi-directional adjustments that allow much greater flexibility on alignment. Additionally, the method for securing the support to the pump was moved to a more ergonomic position, allowing the maintenance personnel to access the bolts from a standing position.



Original seismic support



Redesigned seismic support

Project Summary

SITE / LOCATION:

Nuclear Power Plant

SCOPE OF WORK:

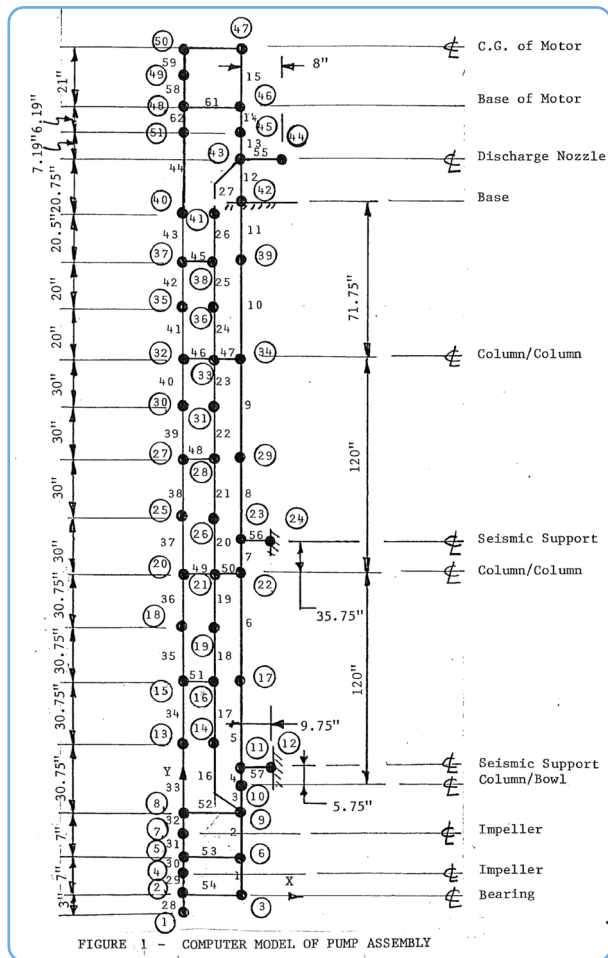
- Site survey and local investigation
- Evaluate existing installation configuration
- Review pump installation method
- Redesign seismic support
- Provide new seismic stress report
- Ensure design meets:
 - Original Customer Spec.
 - ASME B&PV SIII, CI3 1977 w/ winter addenda 1977 and 1978
 - All fault conditions
- Professional Engineer (PE) stamp design
- Manufacture new supports

BASIC PUMP DESIGN DETAILS:

- Design Code: ASME B&PV SIII, CI3 1977 w/ winter addenda 1977 and 1978
- Model: 6x8 VSN3
- Application: Essential Screen Wash Pump
- Rated Head: 290ft
- Rated Flow: 450USgpm
- Pump RPM: 3560
- Liquid: Seawater

Hayward Tyler engineers evaluated the design against the original specification and ASME nuclear codes to ensure the new design allowed the pump to perform during normal, upset, emergency, and faulted conditions. This included analyzing the stress and deflections during these events. The design passed and the necessary design report was produced and stamped by an in-house Professional Engineer.

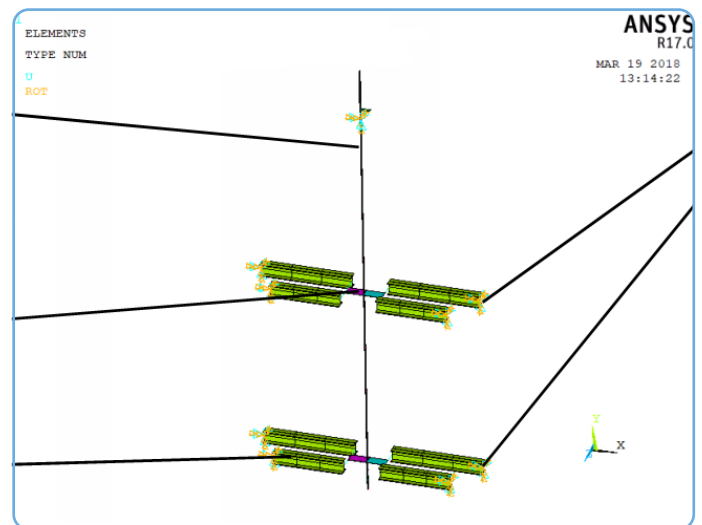
These supports were manufactured by Hayward Tyler and supplied to the site where they were successfully installed, resulting in a time savings of approximately 10 hours per pump change over.



Original seismic analysis (circa 1981)

Project Pump Data Sheet

Service	Emergency Screen Wash Pump
Quantity	4
Codes and Standards	
Design	ASME B&PV III, CI3 1977 w/ winter addenda 1977 and 1978
Pump Details	
Pump Type	Vertical Turbine
Pump Size and Model	6x8 VSN
Fluid Pumped	Deminerlized Water
Operating Temperature (° F)	83
Rated Flow (USgpm)	450
Specific Gravity	1.025
Rated Head (ft)	290
Analysis	
Analysis Type	Seismic-Static/Dynamic
Stress Calculations	ASME B&PV Section III and VIII, Stamped, Safety Related
Programs	ANSYS, Solidworks



New seismic analysis



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