Materials

- Water at 60F
- 60% efficient pump
- 10-in schedule 40 steel pipe

Summary & Analysis

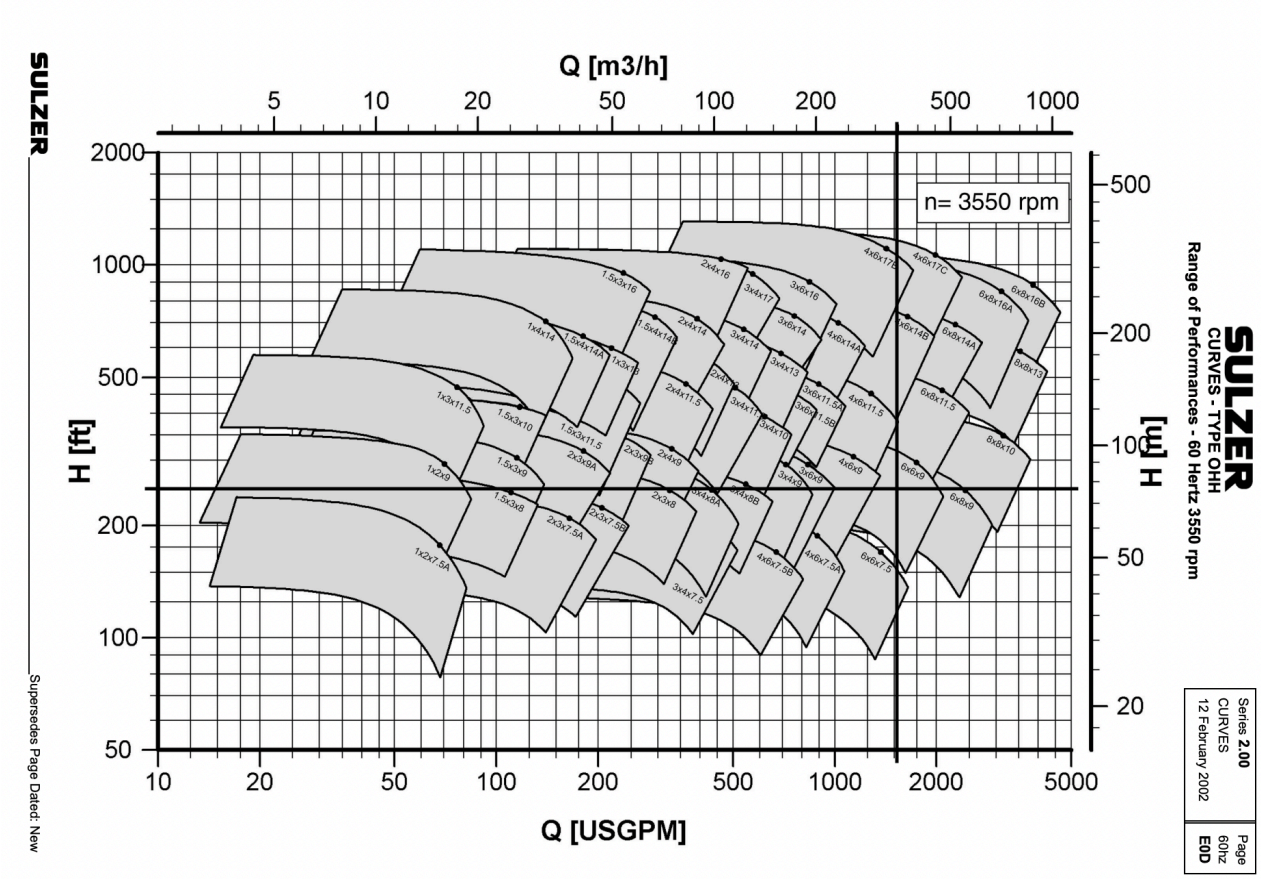
The calculations for Rx and Ry determine the reaction forces acting on the pipe system, which are essential for ensuring structural stability. Rx, the horizontal reaction force, accounts for forces generated by pressure differences between the pump outlet and the elevated tank inlet, as well as the momentum flux from the fluid flow as it changes direction. This force is necessary to maintain horizontal equilibrium and prevent lateral movement of the pipe system. Ry, the vertical reaction force, balances the weight of the water in the pipes, along with any vertical contributions from pressure or flow-induced momentum changes. It ensures vertical stability, preventing sagging or displacement due to gravity and dynamic forces. Together, Rx and Ry guide the design and placement of supports to prevent structural failure and ensure safe operation under the system's operating conditions. These values are critical for selecting appropriate support systems, such as anchors or brackets, to counteract both static and dynamic loads.

C

Purpose

The purpose of the last question is to introduce us to the selection process for pumps with certain criteria.

Drawings & Diagrams



Sources

- My notes
- Sulzer chart
- Applied Fluid Mechanics 8th Edition, Robert L. Mott & Joseph A. Untener
- Canvas Module slides

Design Considerations

- Constant properties
- Incompressible fluid
- Isothermal Conditions
- Steady state
- Newtonian Fluid

Data and Variables

Volumetric Flow Rate	Q = 1520 USGPM
Pump Head	hA = 261 ft

Procedure

- Used the pump head and flow rate to locate the best pump accordion to the Sulzer chart
- Found the specific chart to the desired pump and took necessary data from it