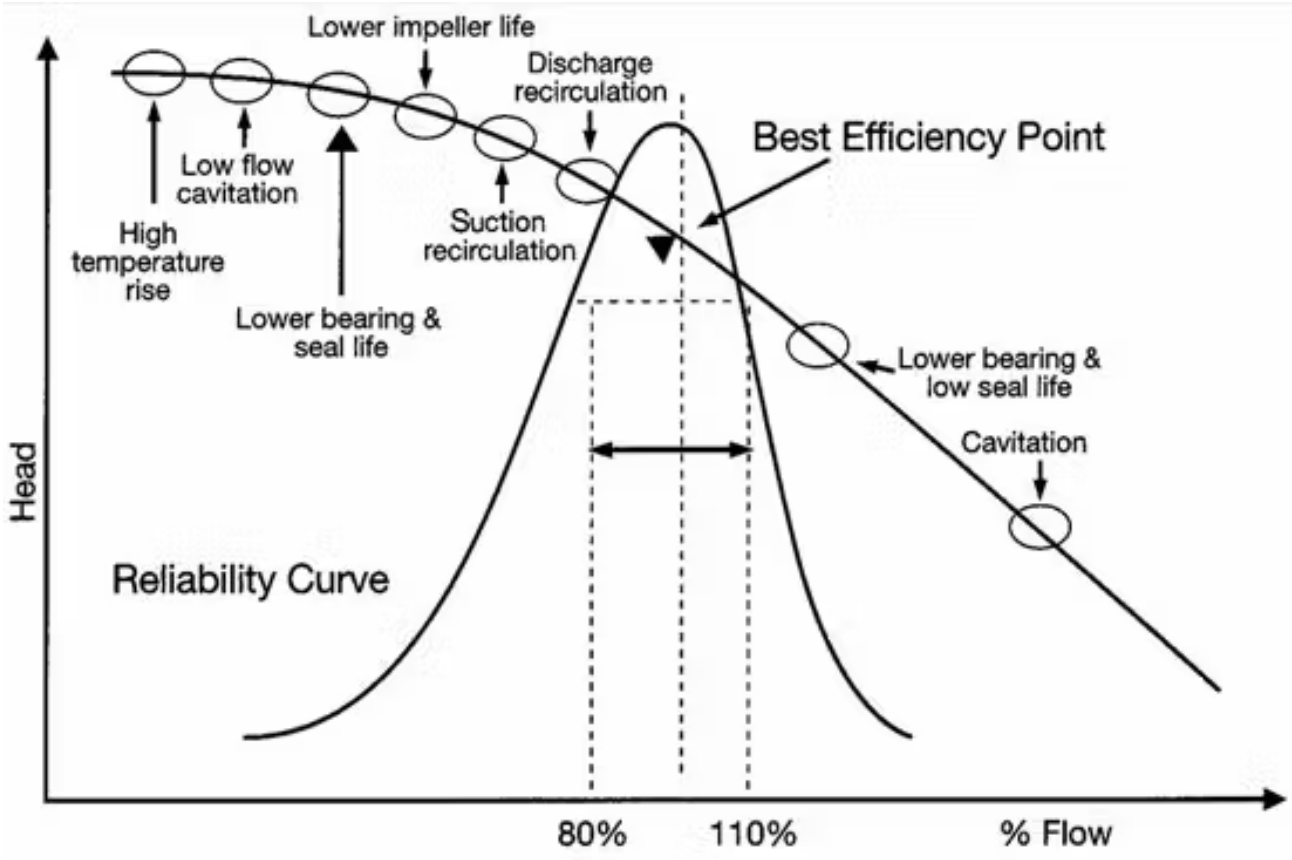
BARINGER-NELSON PUMP RELIABILITY CURVE



Barringer-Nelson curve (Source: Paul Barringer)

Paul Barringer and Ed Nelson are credited with creating the Barringer-Nelson curve. This curve plots sections on the curve in which a pump may see a specific reliability issue. The pump's best efficiency point (BEP) is also placed on the curve to provide context to the reliability issues the BEP point sits between. The primary takeaway from this curve is that the further a pump operates from BEP, in either direction, the more extreme the pump reliability concerns become.

The Barringer-Nelson curve also helps visualize that just because a pump is able to operate at a certain duty point on the curve doesn't mean that it is a good idea to do so. It is somewhat analogous to driving a manual car. One could drive at low speeds in high gear or high speeds in a low gear. While this is possible, it will cause reliability issues to the car's engine. This is why it is best to have a properly sized pump operating at or near BEP to not only maximize efficiency, but also avoid potential reliability issues such as:

- **High Temperature Rise:** Water unable to surpass static head, heats up as it recirculates in pump
- **Cavitation:** Extreme pressure variation in liquid that creates vapor implosions
- **Low Bearing & Seal Life:** Consequence of high radial thrust and/or high vibration
- **Low Impeller Life:** Consequence of high radial thrust and/or cavitation
- **Flow Recirculation:** Flow reversal leading to inefficiency and possibly cavitation