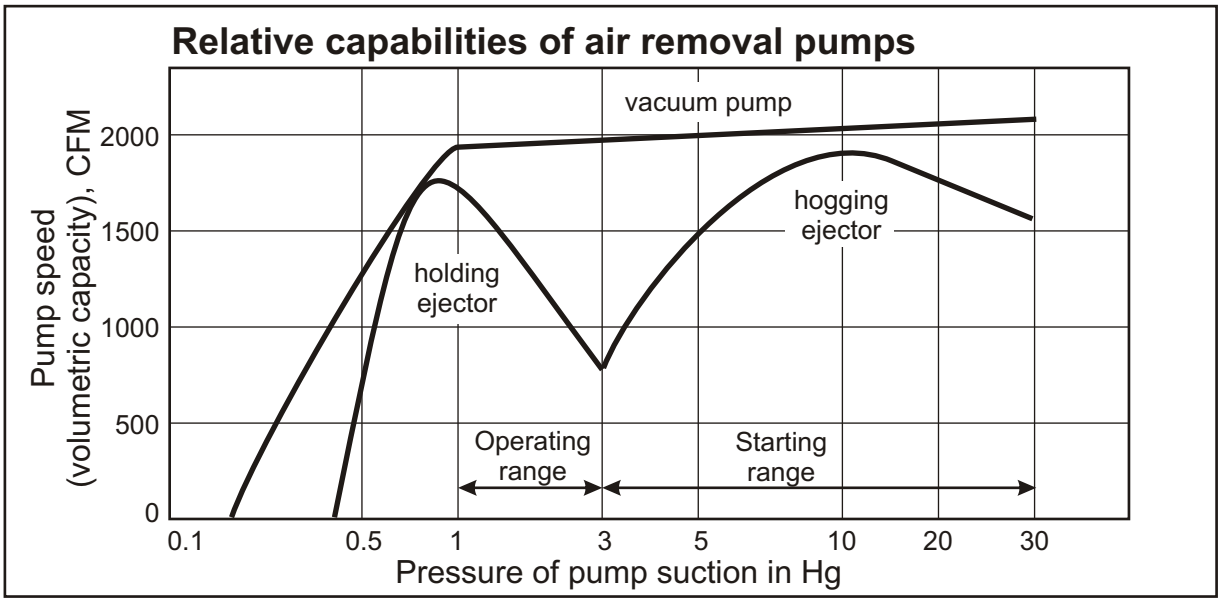
CAN I IMPROVE MY PULL-DOWN TIME?

QUESTION:

I want to use an older power plant for peaking service and would like to bring it on line quickly. I use steam ejectors to hog [evacuate] the condenser and therefore I have to wait for the steam pressure to get high enough to operate them efficiently. Can I improve my pull-down time with a mechanical vacuum pump?.

ANSWER:

The answer is almost always a resounding **'Yes'**. If you check out the Standard Handbook for Mechanical Engineers [Baumeister & Marks, 7th Edition published in 1966], page 9-93 has a graph which nicely compares the performance of ejectors versus vacuum pumps on condenser service.



An ejector is a 'mass-moving' device that is designed for one narrow operating range, and it decreases in performance on either side of its design point. That's why an additional, larger hogging ejector is generally designed to have peak performance at 10”HgA, whereas the holding ejector is generally designed for 1”HgA. A mechanical vacuum pump, on the other hand, is a 'volumetric' device which moves larger amounts of air at higher pressure [lower vacuum] and can evacuate higher volumes more quickly.

Also, the electrically driven vacuum pump can be turned on immediately. The only limiting factor may be the time to effectively seal the turbine glands with steam.

Vacuum pumps used for hogging service are usually single-stage devices because they are only required to operate down to about 5”HgA. It makes sense to seriously consider purchasing a unit that will also operate in the holding range. The ejectors can be kept in place to act as back-up.

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