

STEAM TURBINE ROTATION

By Sydney Gross

When specifying a turbine or certain turbine components, it is essential to identify the rotation. By this, it is meant the direction that the rotor spins in the casing. There are only two choices but a mistake will most definitely be costly. While this may sound like common-sense, anyone involved in turbomachinery, from the design and manufacture to the end user, can cite examples where a misinterpretation has resulted in an embarrassing discovery. To avoid being the face with egg, one should not only understand the conventional identification but also employ steps to carry through a clear understanding to all parties, from design to maintenance, what is the correct machine rotation and part orientation.

To begin with, there is a convention for identifying steam turbine rotation. The turbine is designated either clockwise (CW) or counter clockwise (CCW) as viewed in the direction of steam flow. Alternate ways to describe the same orientation are; looking at the inlet or high pressure end or as viewed from the governor end. The CW or CCW is the simple part. It's the orientation of the viewer that usually results in trouble. Often, the orientation is assumed and not specified. But beware, it is not always standard. One should verify the orientation and/or identify it in the description when specifying at every step.

Although the above discussion pertains to the machine

as a whole, equal attention must be given to individual components that are rotation sensitive. When designing, specifying or purchasing items such as bearings, always verify the rotation and ensure that it is specified on the drawing and/or documentation. Be sure that you understand the direction of view on parts drawings and models. It may not seem possible but even rotor assemblies, nozzles and diaphragms have been built with the wrong rotation.

You may have been meticulous in observing the rotation during design and manufacture but once the part gets to the field it is possible to install it backwards? It is always good practice to mark the rotation of the turbine on the parts with an arrow. Bearings and rotation sensitive seals should be marked. If possible, the parts should be designed such that they can only be assembled one way. The exterior of the turbine should always be marked to ensure that the rotor is not turned in the wrong direction and that parts are assembled correctly. It is equally important when disassembling equipment to mark the orientation on the components so that they go back together the same way.

Remember, identify the rotation and orientation, verify rotation throughout design and manufacture, mark parts with an arrow and make it so they can only be assembled one way. If you remain vigilant, you may not have any stories to share.

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