From:	Jim McLucas
To:	Kathleen Truesdell;
CC:	
Subject:	Steam Seals
Date:	Wednesday, July 28, 2010 6:48:53 PM
Attachments:	Figures 5 and 6.pdf

Kathleen -

The following language and attached figures are excerpts from a GE document on steam seals. The portions I've provided are specific to the D-11 steam turbine.

D Series Turbine
Figure 5 shows the direction of sealing steam flows during turbine startup conditions for typical D
series combined cycle turbines. Figure 6 shows the direction of sealing steam flows above the turbine
self-sealing point.
In Figure 6, the flow of steam from the HP section end packings and the RH section inlet end
packings have been reversed, and steam flow in excess of that required to seal the LP end packing is
dumped to the condenser. At the same time, steam flow from the outside source has been shut off by
the steam seal feed valve.

I also found the following on the internet. It includes a little more text, but is generic and not specific to the GE D-11 steam turbine, however, the basic concepts are the same.

http://articles.compressionjobs.com/articles/oilfield-101/167-steam-turbines-control-back-pressure-condensing?start=5

Without an auxiliary boiler, the startups are much longer. Plants that don't have auxiliary boilers typically will fire the combustion turbine at a low load and wait until the HRSG starts making steam and then can seal the

steam turbine shaft. One the seals are made, the condenser can then be evacuated (i.e. a vacuum is pulled to remove all of the air). Up until that point, the condenser cannot be evacuated as air will leak into the turbine and condenser through the steam turbine seals. Water cooled plants have small condensers that can be evacuated fairly quickly. Air-cooled condensers, on the other hand, take a very long time to evacuate.

Please let me know if you have any more questions on this topic or others. I should have final response to you on the transient condition sometime tomorrow.

Thanks!

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