TECHNICAL BULLETIN

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Reference: Atwood & Morrill FREE FLOW REVERSE CURRENT VALVE®	

Subject: Free Flow Check Valves - Preventative Maintenance **Bulletin No. 1.0** 08/10

APPLICATION Turbine Extraction Check Valves.

PURPOSE The purpose of this bulletin is to alert Power Plants equipped with ATWOOD & MORRILL® Turbine Extraction Check Valves of a potential for turbine damage and to make specific recommendations to prevent this from occurring.

BACKGROUND There have been two reported incidences of turbine damage due to reverse flow that could have been prevented by the installed A&M® Turbine Extraction Steam Check Valves. Upon investigation by WVC, it was discovered that in the first failure the installed valves had received no systematic inspection or maintenance in several years. During disassembly and inspection of the valves, it was discovered that severe corrosion had caused the valves to bind to a point where they could not close.

In the second failure, investigation revealed that important internal parts of the valve had been fabricated by someone other than WVC. The parts were neither machined nor installed properly with the result that the valve could not close.

Since the entire reason for installing ATWOOD & MORRILL® Check Valves is to protect your turbines, any compromise of these valves should be taken very seriously. In both of the reported failures, routine systematic inspection of the valves and the installation of the correct parts, when required, would have prevented serious turbine damage.

RECOMMENDED PREVENTATIVE MAINTENANCE

The frequency (or periodicity) suggested are minimums.

MONTHLY

Exercise the valves utilizing either the test feature on the air cylinder or manually move the lever arm. Exercising the valve demonstrates that it is operating freely.

EVERY TWO YEARS:

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1. Replace the air or oil cylinder seals unless a history of very high operating temperatures indicates more frequent replacement.

2. Remove the cover to visually inspect the internal condition of the valves. Perform a paper test between the seal and disc as outlined in the Instruction Manual.

EVERY FOUR YEARS:

Completely disassemble the valves and visually inspect the internal condition of the valves. Carefully inspect the shaft and bushings for indications of wear, corrosion and damage:

- Check the disc arm for bending or wear in the post area
- Check disc post for straightness and excessive wear
- Replace the air cylinder can or cylinder liner if so equipped
- Replace the gasket and packing
- There are three areas within the valve to inspect for signs of wear: between the shaft and the two bushings and between the disc arm and the disc post.
- If signs of wear are visible, record the dimensions as a bench mark to assess the wear rate of internal valve components. This will help determine how often to replace components or disclose wear patterns which should be investigated further.

EVERY EIGHT YEARS:

Completely disassemble the valves as described above and replace shaft, bushings, split rings and shaft dog if so equipped.

SUPPORT SERVICES AVAILABLE:

Weir Valves & Controls can offer assistance to our customers in this important preventative maintenance effort:

1. Repair Kits
2. Recommended Spare Parts List
3. Duplicate Service Manuals
4. Field Service Engineers

CONCLUSIONS ATWOOD & MORRILL® turbine protection check valves have been around for so long they are often forgotten and neglected. These valves play a vital role in protecting turbines against reverse steam flow on turbine trip and, in certain cases, water induction. Neglect, as well as improper parts and assembly, has resulted in turbine damage in two separate documented incidences. Following the recommendations contained in this bulletin will mitigate against future turbine damage of this nature.

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