



**KelairPumps**

# PumpAction..... Issue 55 Nov 08

## Case Study

### Dresser-Rand turbines steam ahead

Sales Engineer  
Frank Molinaro VIC

Many single-stage steam turbines supplied in the 1950s and 60s are still in operation, particularly those installed in oil refineries.

In the last 40 years, there have been significant improvements in technology for speed governors for turbines. The American Petroleum Institute specification API611 has also been modified to increase the safety aspects of over-speed safety trip systems for steam turbines.

A major Victorian-based multi-national petroleum refinery has five installed Coppus (now owned by Dresser-Rand) steam turbines and trip systems and was experiencing a number of issues namely;

1. The throttle valve was not

fully shutting off steam to the turbine and as a result the turbine could not be fully stopped.

2. Steam would discharge to the atmosphere when operated. As these turbines



were being supplied with medium to high pressure steam this was a safety concern to on-site workers.

3. Trip accuracy would be between 2-5% of set point.

These problems caused sig-

nificant plant safety issues which were solved by fitting Dresser-Rand mechanical over-speed trip valve upgrade kits to the existing turbines. This new design is fully compliant with the current API611 4th edition.

One of the turbines had the original flyball-type governor. Flyball governors are a very old design and are just too maintenance-intensive and relatively inaccurate.

Flyball governors do not comply with NEMA A speed control specifications and as a result do not comply with the current API611 standards.

This particular turbine was converted to a Woodward TG13 mechanical/hydraulic governor to NEMA A specification making it fully compliant with API611 4th edition.

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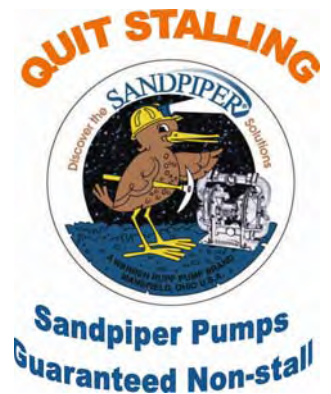
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## Installation Guidelines For Air-Operated Double-Diaphragm Pumps

### FILTER, REGULATOR, LUBRICATORS

1. An air filter should be placed on the air line to every air-operated double diaphragm pump (AODDP) to ensure pipe line debris does not enter the air valve, (scale, tape, dirt, rust, water and oil).
2. A moisture separator (preferably coalescing type) with automatic moisture trap will also help to eliminate unwanted moisture that can lead to pump icing when air quickly expands in the air distribution sys-

tem.

3. An air pressure regulator on the air line allows pump control by air supply pressure adjustments.
4. A needle valve can be utilised to control air volume and thereby pump speed.
5. In AODDPs with lubricated air valves, an in-line lubricator should be installed.

i. Only small amounts of lubrication are required. One drop every 5 to

10 minutes of operation time should be sufficient in most applications. **Do not over-lubricate.**

ii. NOTE THAT SANDPIPER PUMPS ARE LUBE-FREE AND ARE NOT TO BE LUBRICATED.

6. Refer to the pump manufacture and / or the Instruction Manuals for oil specifications.

### CONNECTIONS

1. Flexible connections should be used on both suction and dis-

**Installation Guidelines For Air-Operated Double Diaphragm Pumps (Cont.)**

charge to protect the pump from forces created as pipe expands axially and radially when heated. It also helps eliminate vibrations from pipework.

2. Isolation valves on the inlet and outlet pipework will allow for pump isolation without completely draining lines for maintenance purposes.

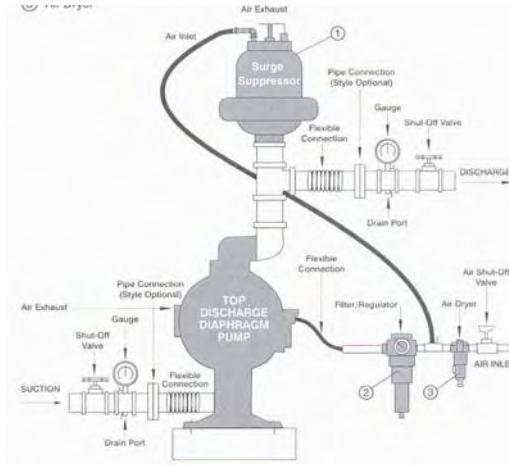
**GAUGES**

1. When possible, pressure gauge mounts should be installed on both the inlet and discharge piping.
2. The gauges will simplify any trouble-shooting that may be required.

**SURGE DAMPENER**

1. An automatic surge dampener on

the discharge side will protect your process system by:



- Creating a more laminar flow
- Minimising pipe strain
- Reducing pulsation stress to inline equipment

- Reducing water hammer
- Absorbing acceleration head

A surge suppressor would also be useful on the suction side, particularly with installations having longer pipe runs.

**FOOT PADS**

1. Pads should be used under the feet of permanently installed pumps.
2. Pads can help prevent damage caused by vibration experienced under some application parameters.
3. Pads made from soft elastomeric materials are suggested.

**Case Study**

**Bornemann Twin Screw pumps positively preferred**

Sales Engineer  
Michael Charnley WA

An oil and gas customer approached Kelair with an application to pump light crude.

The pumps would have to deliver a varying flow against a constant discharge pressure. For this reason the customer preferred positive displacement pumps but wanted to avoid the pulsation of reciprocating-type pumps.

The pumps also had to meet the requirements of API676.

While rotary positive displacement pumps were ideal for the application the customer did not at first think this would be possible on

account of the low specific gravity and low viscosity of the liquid.

However, on consultation



with the manufacturer regarding the very light nature

of the liquid, we selected Bornemann W3.1zk.30 Twin Screw pumps running at 1450rpm at 50Hz

The pumps could deliver the required flow and head across the required flow range through the use of a variable-speed drive.

While the original enquiry required double mechanical seals, we were able to use single mechanical seals as the seal area of the twin screw pump only ever sees suction pressure. The mechanical seals were monitored as per the customer's requirement.

The complete pump assemblies were supplied in accordance with API676.

**Sandpiper Features and Benefits**

- Non-stalling guarantee
- Cross-drilled technology, to eliminate stalling
- ESADS (Externally Serviceable Air Distribution System, allowing repair of pump without removing from pipeline
- Fully-bolted design, minimising repair time and reducing maintenance cost
- Lubrication-free, eliminates requirement for lubricators, reducing initial cost and maintenance cost

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