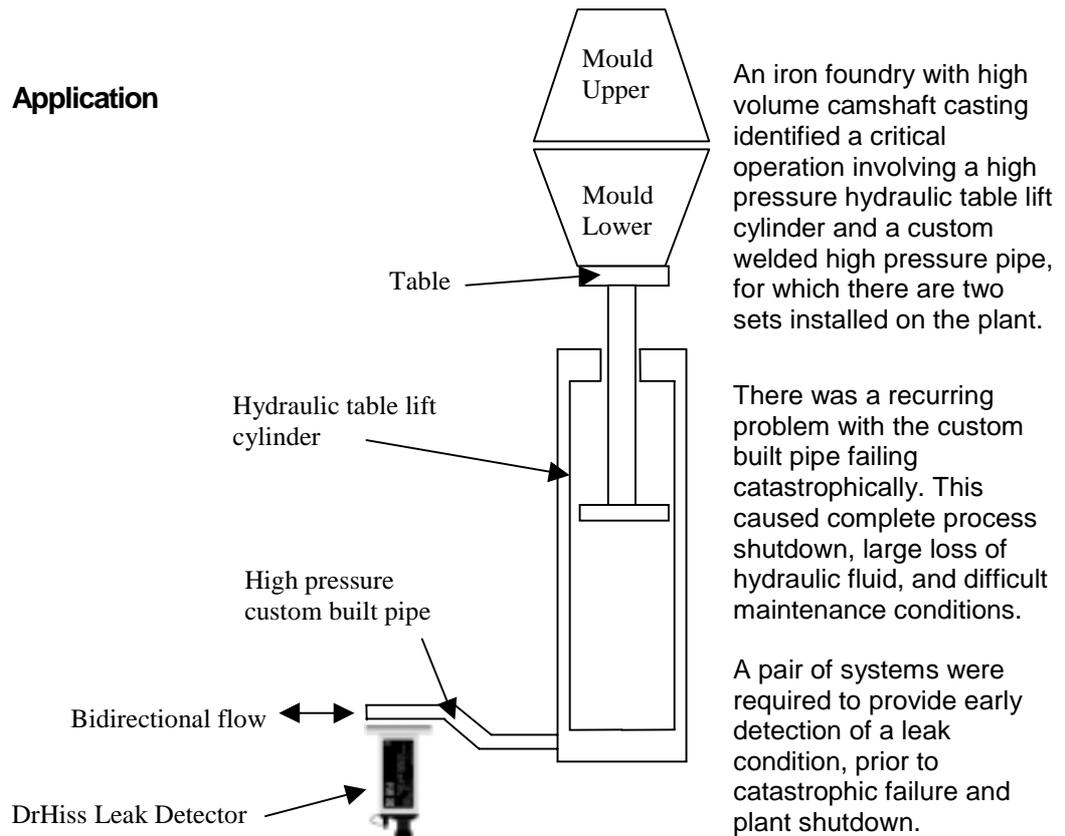# DrX Application Note

DrX All fluid and vibration related variants

Subject Blocking operational noise

Note Ref. AN270.02

Process noise versus failure indication

Many industrial operations have an inherent amount of noise associated with them. For example, leak detectors on a compressed air system could not differentiate between a leak and a power tool in operation in close proximity. The validity of a leak detector in such a case would be the indication of leaks when nothing is being used, or continual alarm is being displayed – a certain amount of knowledge about the application and the working environment is always necessary.

This application note presents a method for avoiding false alarms due to the normal operation of a plant.

Application

An iron foundry with high volume camshaft casting identified a critical operation involving a high pressure hydraulic table lift cylinder and a custom welded high pressure pipe, for which there are two sets installed on the plant.

There was a recurring problem with the custom built pipe failing catastrophically. This caused complete process shutdown, large loss of hydraulic fluid, and difficult maintenance conditions.

A pair of systems were required to provide early detection of a leak condition, prior to catastrophic failure and plant shutdown.

Solution

The leak detection was fulfilled by using E2L's "DrHiss" Fluid Leak detectors. These are ultrasonic based listening devices filtered to detect extremely high pitched ultrasonic emissions, typical of those emanating from microscopic cracks prior to catastrophic fatigue failure.

However, the normal operation of the equipment also creates ultrasonic emissions so a control unit must be supplied to avoid alarming whenever a valve is open or a ram is actuated. Fortunately a leak situation will cause a constant emission so a time filtering mechanism can achieve the desired alarm condition.

The duration of the hydraulic ram's travel was determined to be about 7 seconds. During this period we would expect the DrHiss to alarm due to the normal noise associated with this operation. However, once the operation is complete any ultrasonic noise would be due to a leak. Consequently a simple time-delay relay can be utilised to avoid giving false alarms.

Normal operation

Ram Position

Time

Normal operation   *Leak situation*

DrHiss Output

Time

Time – Delay Relay

Delay

Time

DRX SERIES