TITLE: Descale Header Clamp

SPONSOR: Steel Dynamics

PROPOSAL/SCOPE

Problem: A clamp to secure two water pipes together fails often, leaking large amounts of water under high pressure. These pipes see high pressure water flow that is used to blow scale off reheated steel bars. The nozzles/header for this system is changed out for the different sizes and shapes of bars, that is the reason the clamp is used instead of a fixed solution. Possible causes of the leak include:

1. Small misalignment in vertical standpipe
2. Bolted header downpipe out of spec, causing misalignment
3. Improper seal seating
4. Clamp not in spec
5. wear

The misalignments cause maintenance personnel to use a hammer to close the clamp and seat the header fully. This can cause tears in the seals or cause them to be unseated.

This clamp is manually operated, hinged on one side, with a threaded rod and nut to close the clamp.

Task: First evaluate the possible causes of the leak, this could entail measuring all pipes in service according to specs provided in prints and verifying center lines and elevations.

- If these are off, a trial of in-spec pipes would likely be run. If successful, a design to further secure the standpipe to minimize movement could be added.

The company is also looking to get away from this manual clamp and increase reliability. A complete redesign may be necessary.

This could include:

- Evaluation of forces on the pipe and clamp assembly from the water flow.
- Design and implementation of non-hands-on clamp.

The clamp could be actuated by means of hydraulics/fluid power or other means.

Considerations: High pressure water in this area is considered a safety concern.

Budget: