

**Zhou, H., Liu, M., Wang, Y.-Y., and D'Eletto, D.,** Considerations on the Use of the Pneumatic Hammer for HDD Pull-Back Assistance, Proceedings of the 10th International Pipeline Conference, 2014, Calgary, Alberta, Canada, Paper no. IPC2014-33541

## **Abstract**

Horizontal directional drilling (HDD) is a trenchless technique which has been frequently used to install underground pipelines due to its minimal impact on surrounding areas. In some circumstances, pneumatic hammers (or pipe rammers) are needed to assist HDD pull-back. The repeated impacts from the hammer can free a stuck pipeline during HDD pull back and facilitate the HDD installation. However, the operation of the hammer may plastically deform the pipe and/or induce fatigue flaw growth in girth welds which can negatively affect the integrity of the installed pipeline.

Compared with the relatively large number of studies and guidelines on HDD, there are few studies on the application of the pneumatic hammer for the pull-back assistance. This paper describes the key considerations for using the pneumatic hammer in the HDD pull-back. The topic covered in the paper includes: (1) identification of key issues for integrity assessment; (2) realistic estimation of impact loads; (3) assessment of potential integrity threats; and (4) operation monitoring and documentation.

### **Keywords**

Pipeline, Trenchless construction, HDD, Ramming, Impact, Stress wave