

**MEASUREMENT OF RESIDUAL STRESSES INSIDE 50 MM INNER  
DIAMETER PIPES USING A MINIATURE GONIOMETER HEAD**

**M. Belassel<sup>1</sup>, J. Pineault<sup>1</sup> and M. Brauss<sup>2</sup>**

<sup>1</sup>Proto Manufacturing Ltd., 2175 Solar Crescent, Oldcastle, Ontario, Canada.

<sup>2</sup>Proto Manufacturing Inc., 1980 E. Michigan Avenue, Ypsilanti, MI, USA

e-mail: proto@protoxrd.com

**Abstract**

Stress corrosion cracking (SCC) and thermal fatigue of pipes can be accelerated by the presence of tensile residual stresses. The presence of such residual stresses can not be easily determined non-destructively. The proposed paper will report an interesting methodology and instrument head with forward x-ray tube capable of measuring inside a 50 mm pipe up to 8 m deep. The technique employed is a single exposure technique suitable for such application where the accuracy and the precision of the instrument used is evaluated.