



Statistical Methods for Estimating the Minimum Thickness Along a Pipeline

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Pipeline integrity is important because leaks can result in serious economic or environmental losses. Inspection information from a sample of locations along the pipeline can be used to estimate corrosion levels. The traditional parametric model method for this problem is to estimate parameters of a specified corrosion distribution and then to use these parameters to estimate the minimum thickness in a pipeline. Inferences using this method are, however, highly sensitive to the distributional assumption. Extreme value modeling provides a more robust method of estimation if a sufficient amount of data is available. For example, the block-minima method produces a more robust method to estimate the minimum thickness in a pipeline. To use the block-minima method, however, one must carefully choose the size of the blocks to be used in the analysis. In this paper we use simulation to compare the properties of different models for estimating minimum pipeline thickness, investigate the effect of using different size blocks, and illustrate the methods using pipeline inspection data.

Keywords: Block minima; Estimation; Extreme value; Maximum likelihood