Abstract

In this paper, the failure probability of corroded pipelines made by X60 steel grade is evaluated. For this complex real engineering failure problem, the burst corroded performance function is developed using an M5Tree model based on calibration with real burst test database. In addition statistical analysis of ILI-report data is conducted for best modeling of corrosion defects geometries (i.e. defects length and depth) based on Anderson-Darling statistic where different PDFs (i.e. Normal, Lognormal, Frechet, Gumbel, Weibull) were tested. Moreover, the effect of defects geometries on the failure probability of the case-studies were investigated for various operating regimes. Then the influence of distributions on the reliability analysis were also illustrated. Results indicated that increases in defects depth are strongly reduced the safety levels of this problem, where miss-selection of defects distributions could lead to conservatives results.