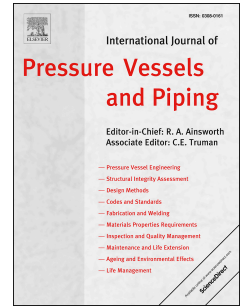


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Correlations between creep parameters and application to probabilistic damage assessments

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## Correlations between creep parameters and application to probabilistic damage assessments

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### Abstract

This work formalises an approach for identifying and implementing correlations in probabilistic creep crack initiation assessments. The methodology is based on partitioning data obtained from uniaxial creep test results into subsets according to temperature and stress. This work is focused on 316H stainless steel and is concerned with identifying correlations between creep deformation, creep ductility and rupture life. However, the methodology can be implemented to identify correlations for any material and any combination of properties. An implementation method is also presented for sampling correlated parameters in Monte-Carlo simulations using the Spearman rank order correlation. This is followed by a discussion of the key effects that incorporating correlations might have on probabilistic creep damage results. While a degree of correlation between ductility and creep deformation exists, it was found to be uncertain. Conducting post-assessment sensitivity analyses based on uncorrelated parameters is suggested as a means for providing focus as to which correlations are most important for the assessment results.

*Keywords:* Creep, damage, correlations, sensitivity analysis, Monte-Carlo, probabilistic

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