

Title: Generation of Machinery Deterioration Rates

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Abstract: The effects of deterioration on the resale value of machinery and indeed on the machinery replacement date are yet to be appreciated. Deterioration rates are usually assumed or at best determined by subjective methods as well as methods that are expensive like the popular machinery failure analysis. Most machinery replacement models do not include resale value in the build-up of cost, yet it is the value (component) that is adversely affected by deterioration. The need arises to find simple methods of obtaining reliable values for deterioration rates. This paper provides one of such methods. The first step is to ensure that the generated random numbers are reliable and should pass the statistical test of randomness. There are many ways of generating random numbers. The methods include the congruential, midsquare, manual and RAND table. The computer combines these methods in generating random numbers that are predictable, reproducible and possess the statistical attributes of randomness. In this study the computer is used to generate random numbers which are simple and statistically reliable. The next step is to find a way of converting these random numbers to obtain values for deterioration. The uniform (rectangular) probability distribution readily comes to mind. It possesses a probability density that has inverse value within a range of values and zero elsewhere. This property is exploited in conjunction with the useful life of the machine to convert the random numbers to obtain values for deterioration. This is simple, reliable and cost saving.

Keywords: Deterioration, machinery replacement, random numbers.