Dr John Crocker

1971, BSc in Mathematics from University of Sheffield,
1997, MSc in Logistics Engineering from MIRCE Centre, University of Exeter,
2001, PhD in Logistics Engineering from MIRCE Centre, University of Exeter.

- Chartered Engineer
- Fellow of the Operational Research Society
- Director of the Operational Research Society
- Ex District Director and Chapter Chairman Society of Logistics Engineers
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His career has been spent in developing mathematical models of the operation of systems in real life scenarios in order to help improve the management of those systems. “Maintenance is the management of failures to achieve system functionability at an affordable cost”. The better one can predict system failures and their causes, hopefully, the better they can be managed. Failure phenomena have many causes ranging from the atomic level through human factors to external factors which can neither be controlled nor predicted (such as volcanic ash ingestion or bird strikes).

Dr Crocker's main areas of interest are in developing an understanding of how failure mechanisms and component design influence the time to failure distribution parameters and using this knowledge to improve maintenance and support policies with a view to minimising in-service costs. Stringent quality control throughout the manufacturing process should produce components which are as nearly identical as physics will allow. Those in the same engine are operated in almost identical conditions so one would expect their times-to-failure when caused by intrinsic mechanisms to have relatively low variance. In-service data rarely supports this hypothesis but this could be for many reasons; the question is if these contaminating factors could be eliminated would the variances be reduced to the expected levels. Resulting from this, the next question is how can these factors be eliminated or, at least, reduced.

If the times-to-failure for any given mechanism exhibit low levels of variance then this should lead to better forecasts when maintenance will be required. This can then be used to better manage the maintenance facilities and to identify which components should be replaced prematurely to reduce the number of engine removals whilst holding down the costs of their recoveries. If this is done, the number of failures is likely to be reduced which will lead to there being less data upon which to base these policies. We can use simulation modelling to help identify and quantify the potential benefits and hence put a ceiling on how much should be spent on improving data capture and integrity.