

## ADDITIONAL REFERENCES

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# Comment

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This paper provides valuable service to those interested in reliability theory and its applications. The material in this paper, together with a cursory reading of some of its references leads me to conclude that:

1. Any serious student of reliability (and also biometry) cannot afford to overlook the *Soviet Journal of Computer and System Sciences* or its predecessor *Engineering Cybernetics*.

2. Soviet researchers appear to be more knowledgeable about the developments in reliability in the West than their Western counterparts, particularly those in the United States, and that this is true even when it pertains to the work of such distinguished scholars as Gnedenko, Belyayev, Solovyev, Ushakov, Kordonskiy and Kartashov. The above is particularly disturbing—I too am guilty of it—because English language translations of *Engineering Cybernetics* and the *Soviet Journal of Computer and System Sciences* have been available for quite some time.

3. The unclassified Soviet research in reliability attempts to address technically difficult problems with a tendency to emphasize mathematical detail, many times at the cost of relevance and sometimes at the cost of elegance.

4. Unlike what is currently happening in Great Britain, Western Europe and the United States, the conspicuous and noteworthy absence of a Bayesian perspective on reliability has left the Soviet researchers working in a frame of reference that is reminiscent of an era prevalent in the midseventies and before. Thus for example, it should be the theory of extreme values for *exchangeable* random variables that should be used for system reliability modeling rather than Gnedenko's development for independent and identically distributed (iid) random variables. With

Belyayev's venture into an investigation of the behavior of posterior densities of parameters in reliability models, a welcome thaw in the above state of affairs appears to be looming on the horizon. However, given Belyayev's orientation, this work emphasizes the mathematics of weak convergence of stochastic processes and in so doing loses some of its pragmatic appeal.

5. That there seems to be a dearth of Soviet literature addressing the important topics of *component dependencies* in multicomponent systems, the reliability of *multistate systems* and *measures of importance* of coherent systems. The latter appear to be widely used in the nuclear reactor industry (cf. Barlow, Fussell and Singpurwalla, 1975), and the former two are a challenge to all researchers in reliability. Given the Soviet engineer's affinity for Zadeh's (1965, 1973) *possibility theory* and *fuzzy logic*, it is surprising that the above concepts have not been explored by them for application in multistate reliability theory.

Rukhin and Hsieh's claim that the Soviet literature on reliability emphasizes probability modeling over inference has truth to it; however, this is also the case in the West, wherein the number of papers in the former overwhelms those in the latter. To appreciate this point, one has simply to scan journals such as the *IEEE Transactions in Reliability*, the *Journal of Applied Probability*, *Operations Research*, *Stochastic Processes and Their Applications* and the *Naval Research Logistics Quarterly*. The fortunate situation in the West is that journals that are predominantly statistical in orientation, such as the *Journal of the American Statistical Association*, *The Annals of Statistics*, the *Journal of the Royal Statistical Society*, *Biometrika* and *The American Statistician*, recognizing the importance of the role of statistical inference in reliability problems, have been receptive and supportive of papers in reliability. It is my hope that *Statistical Science* will also continue to uphold this fine tradition. A possible reason for the above sense

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