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### Improving the reliability design of mechanical systems such as refrigerator

**Seongwoo Woo**

Ethiopian Technical University, Ethiopia

To enhance the lifetime of mechanical system such as automobile, new reliability methodology—parametric Accelerated Life Testing (ALT)—suggests to produce the Reliability Quantitative (RQ) specifications—mission cycle—for identifying the design defects and modifying them. It incorporates: (1) a parametric ALT plan formed on system BX lifetime that will be X percent of the cumulated failure, (2) a load examination for ALT, (3) a customized parametric ALTs with the design alternatives and (4) an assessment if the system design(s) fulfil the objective BX lifetime. So we suggest a BX life concept, Life-Stress (LS) model with a new effort idea, accelerated factor and sample size equation. This new parametric ALT should help an engineer to discover the missing design parameters of the mechanical system influencing reliability in the design process. As the improper designs are experimentally identified, the mechanical system can recognize the reliability as computed by the growth in lifetime, LB and the decrease in failure rate. Consequently, companies can escape recalls due to the product failures from the marketplace. As an experiment instance, two cases were investigated: 1) problematic reciprocating compressors in the french-door refrigerators returned from the marketplace and 2) the redesign of Hinge Kit System (HKS) in a domestic refrigerator. After a customized parametric ALT, the mechanical systems such as compressor and HKS with design alternatives were anticipated to fulfill the lifetime—B1 life 10 year.