



# ASQ CRE Prep course

Lesson II. A. 4. b.

Poisson Process Models

Repair System Terminology

The background image is an aerial photograph of a coastal landscape. On the left, a green, rocky cliff rises from the ocean, featuring a small white lighthouse at its peak. A long, thin line of approximately 20 small, white, irregular markers or buoys extends from the cliff out into the dark blue sea. The sky above is a mix of light blue and white, with scattered clouds.

The words we use matter

# **REPAIRABLE SYSTEM TERMINOLOGY**

**Part:** An item not subject to disassembly or repair that is discarded once it fails.

**Socket:** A position in a circuit or in a unit of equipment that must hold a particular type of part in order to function.

**System:** A collection of two or more  
sockets and their associated parts,  
connected to perform some function(s).

**Nonrepairable System:** A system that is completely replaced and discarded once it stops performing satisfactorily.

**Repairable System:** A system that, after failing to perform at least one of its required functions, can be restored to performing all its required functions satisfactorily by some method other than replacement of the entire system.

# Rate of Occurrence of Failures

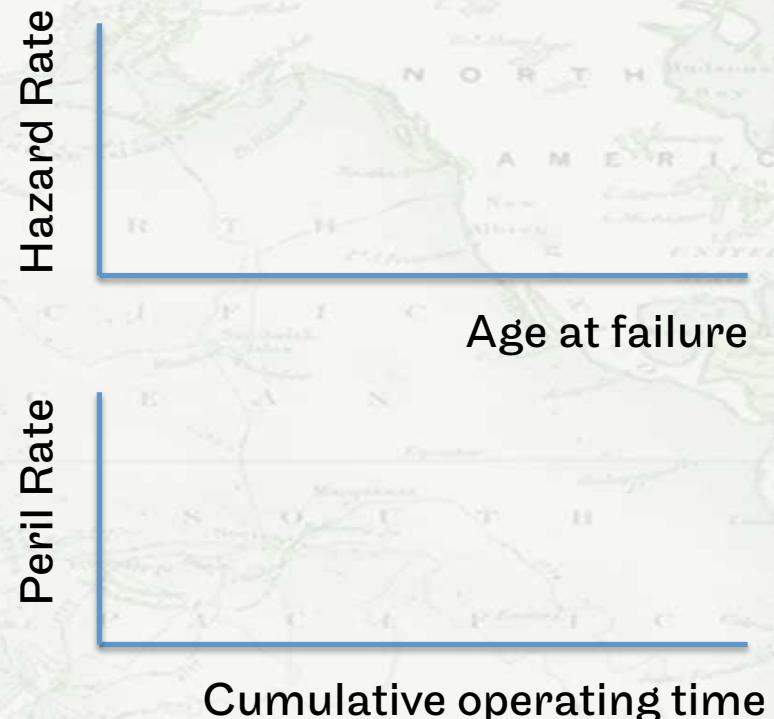
## ROCOF or Peril Rate $m(t)$

- **Expected number of failures up to time,  $t$**

$$m(t) = \frac{d(E[N(t)])}{dt}$$

# Hazard Rate v Peril Rate

- **Hazard Rate over time shows risk of failure (non repairable systems)**
- **Peril Rate over time shows risk of repair events (repairable systems)**



What are traits of  
exponentially  
distributed times to  
failure



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Non-Homogeneous Poisson Process