



ASQ CRE Prep course

Lesson II. A. 4. b.

Poisson Process Models

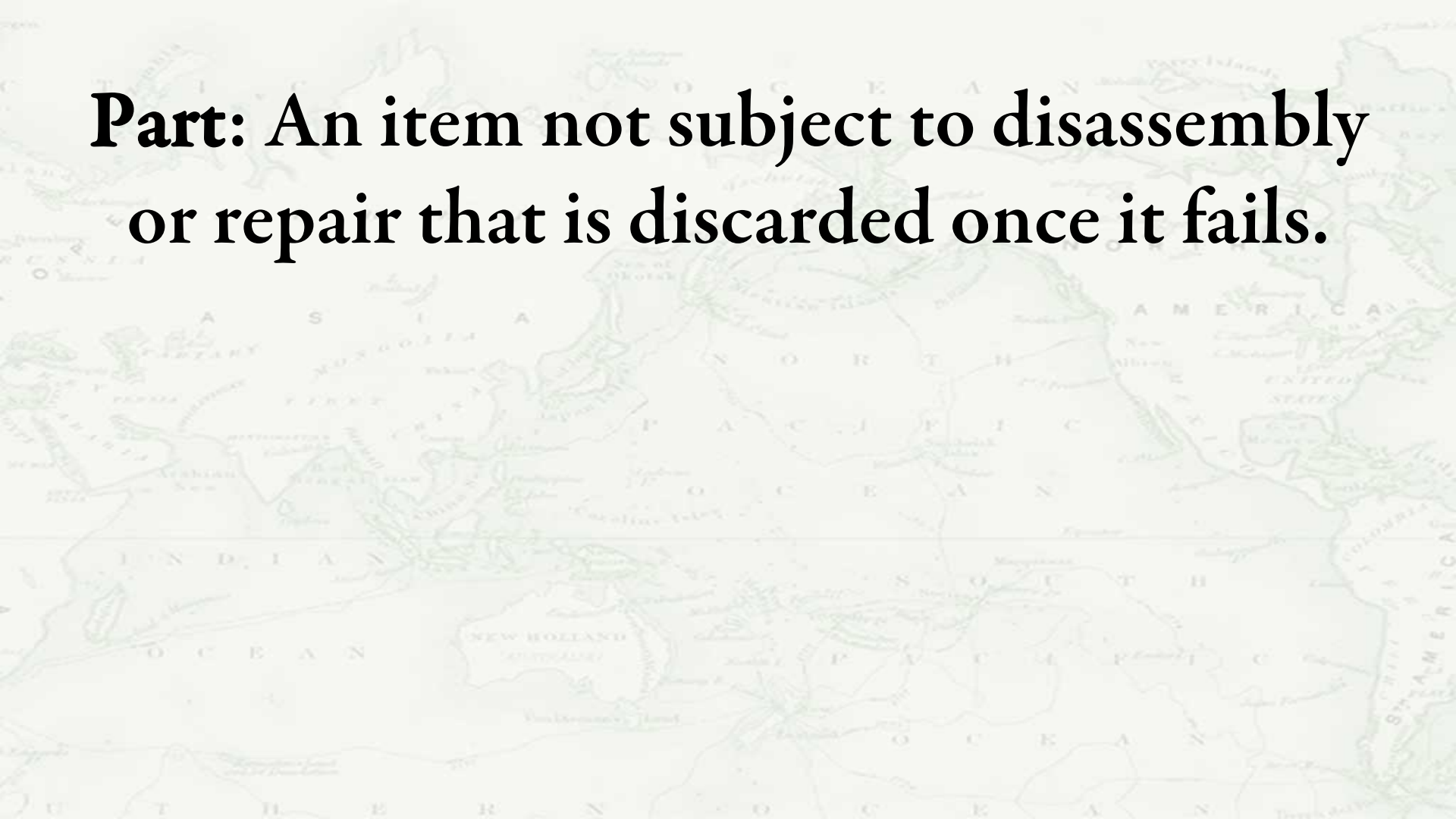
Repair System Terminology

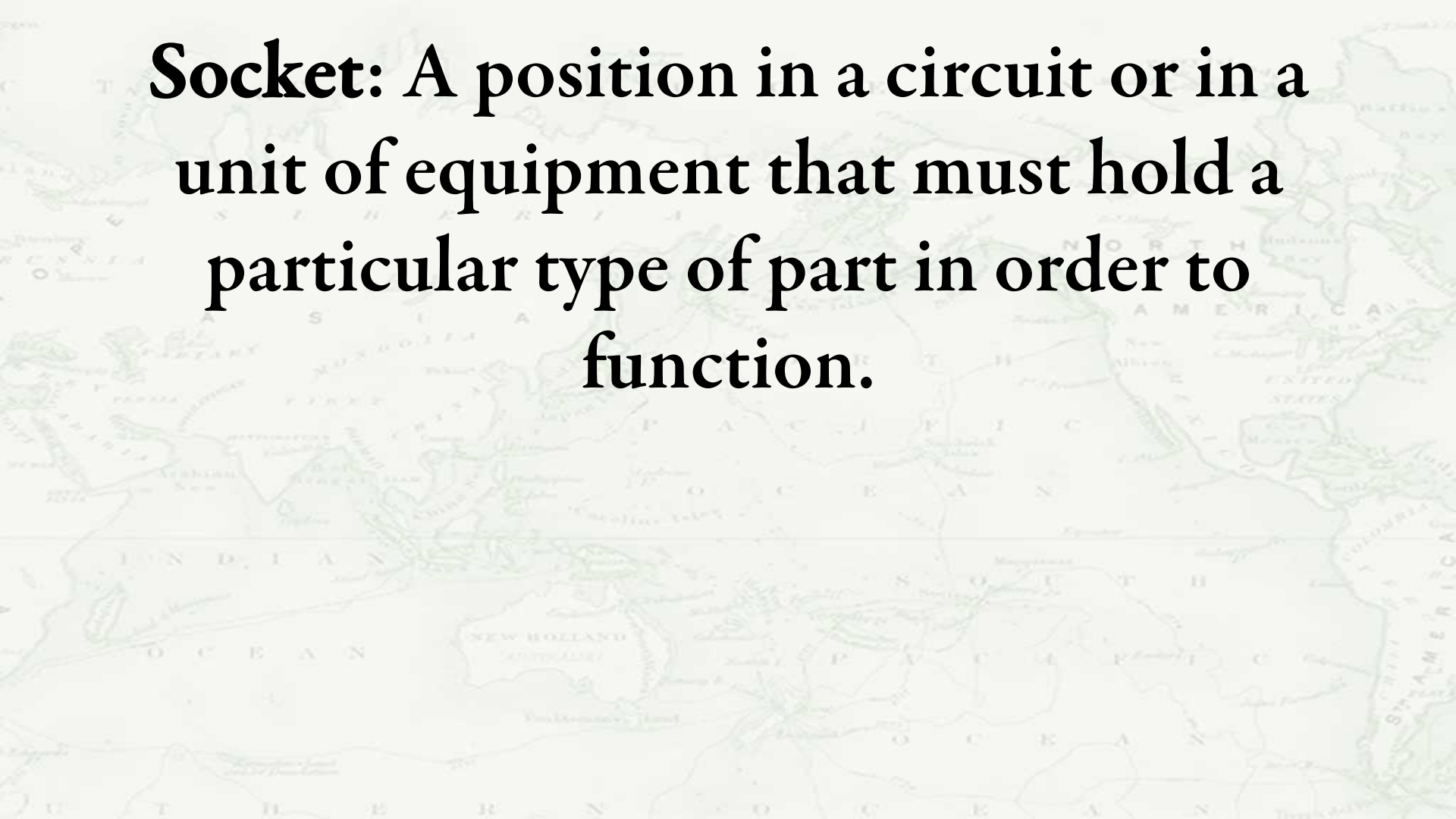
An aerial photograph of a rugged coastline. In the foreground, a large, dark, rocky peninsula juts out into the sea, with some green vegetation on its top. Further out, a small, isolated island features a white lighthouse. The ocean is a deep blue, with white foam from breaking waves visible around the rocks and islands. The sky is filled with soft, white clouds.

The words we use matter

REPAIRABLE SYSTEM TERMINOLOGY

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

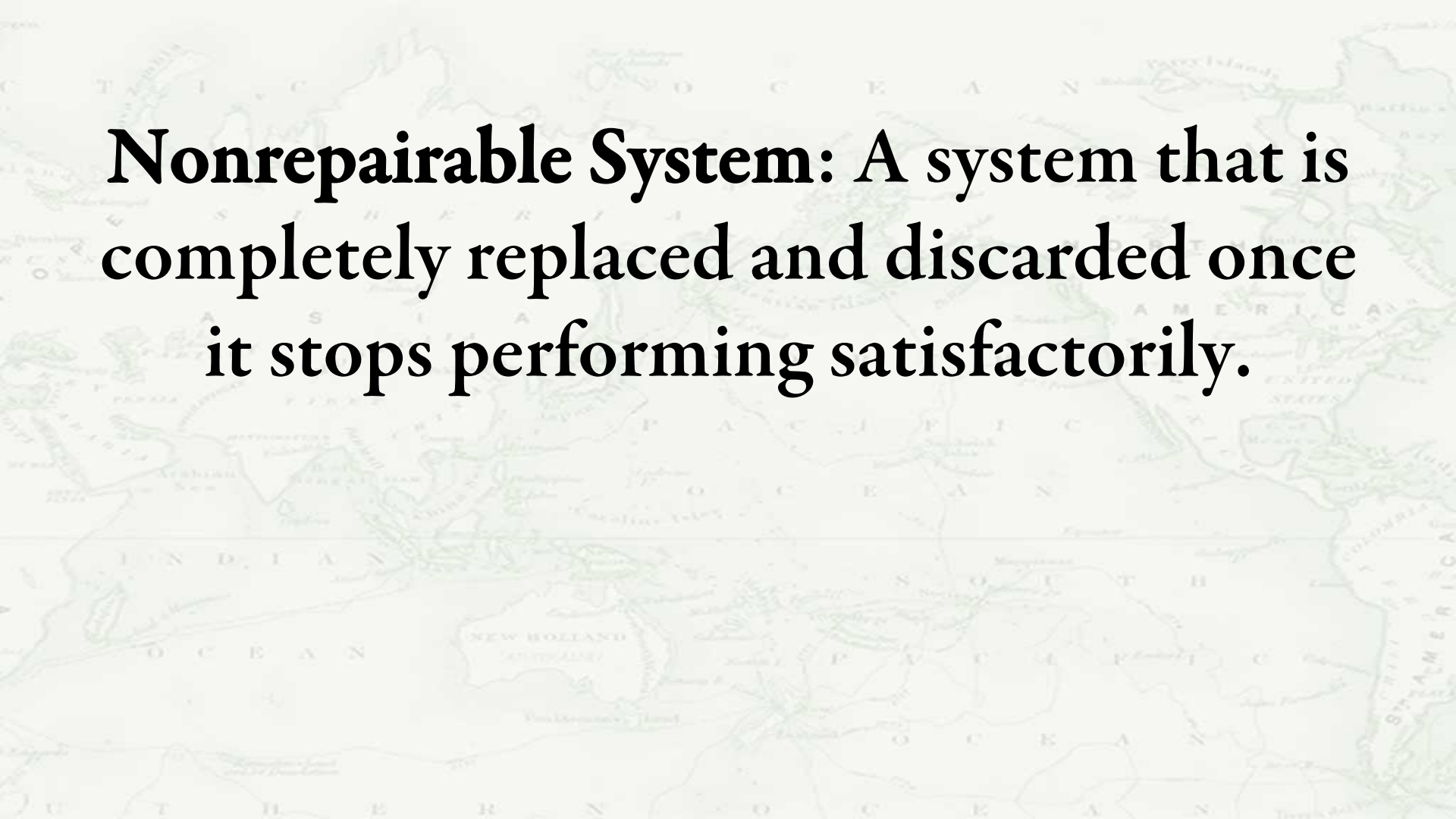




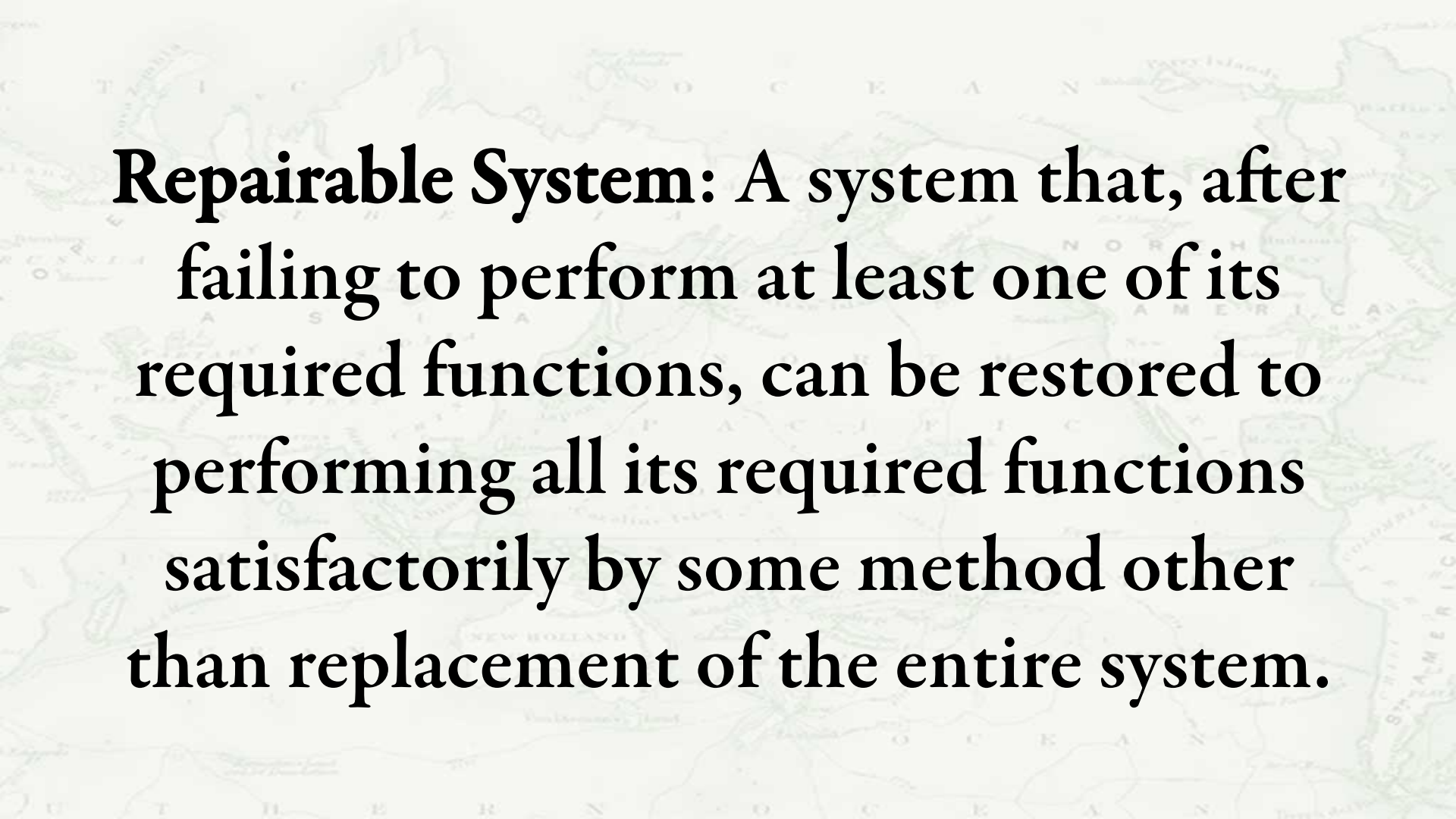
Socket: A position in a circuit or in a unit of equipment that must hold a particular type of part in order to function.



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.

A faint, light green map of the Pacific Ocean and surrounding landmasses, including North America, South America, and parts of Europe and Africa, serves as the background for the text.

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 times shows risk of repair events (repairable systems)**

Hazard Rate



Age at failure

Peril Rate



Cumulative operating time

What are traits of
exponentially
distributed times to
failure



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Lesson II. A. 4. c.

Poisson Process Models

Non-Homogeneous Poisson Process