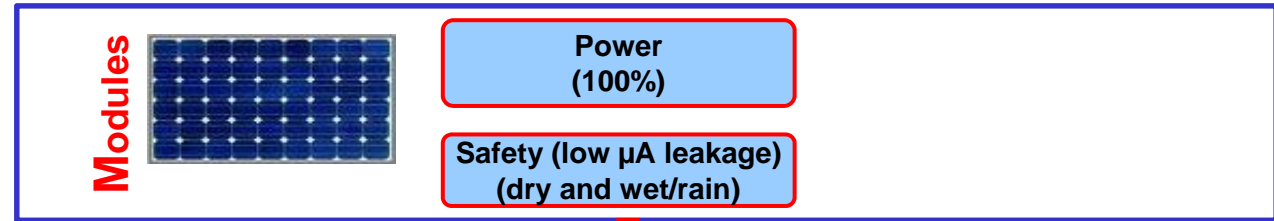

Developments in Accelerated Lifetime Testing

Mani G. TamizhMani
Arizona State University

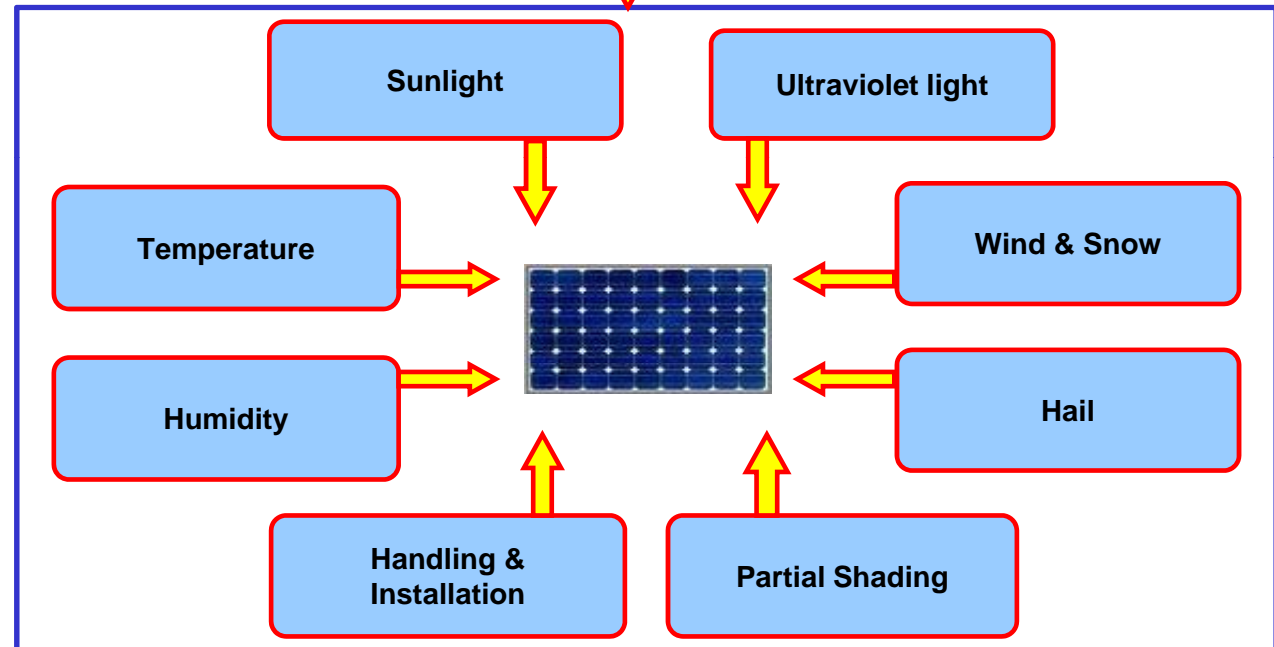
manit@asu.edu

Accelerated Testing: Concept

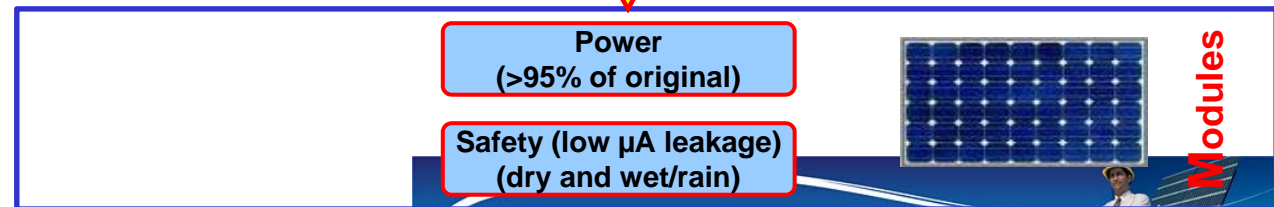
Pre-Stress Tests



Accelerated Stress Tests



Post-Stress Tests



Accelerated Testing: Classification

- **Qualification Testing**
- **Comparative Testing**
- **Lifetime Testing**



Used for Qualification and Market Introduction

(Major Stress Tests: **Fail**, for example, if >5% power drop)

TC200

DH1000

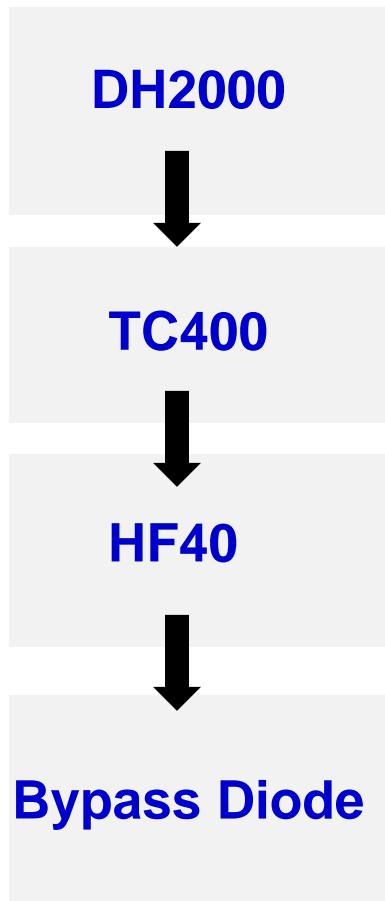
HF10



Accelerated Testing: Comparative Testing

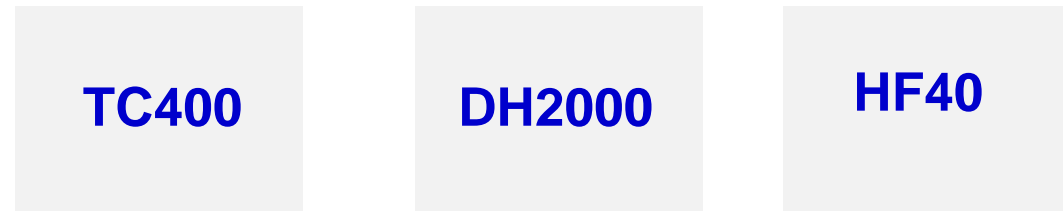
Used to select one design among qualified designs
(Major Stress Tests: **Stop**, for example, when >20% power drop)

Sequential Testing



vs.

Extended Testing



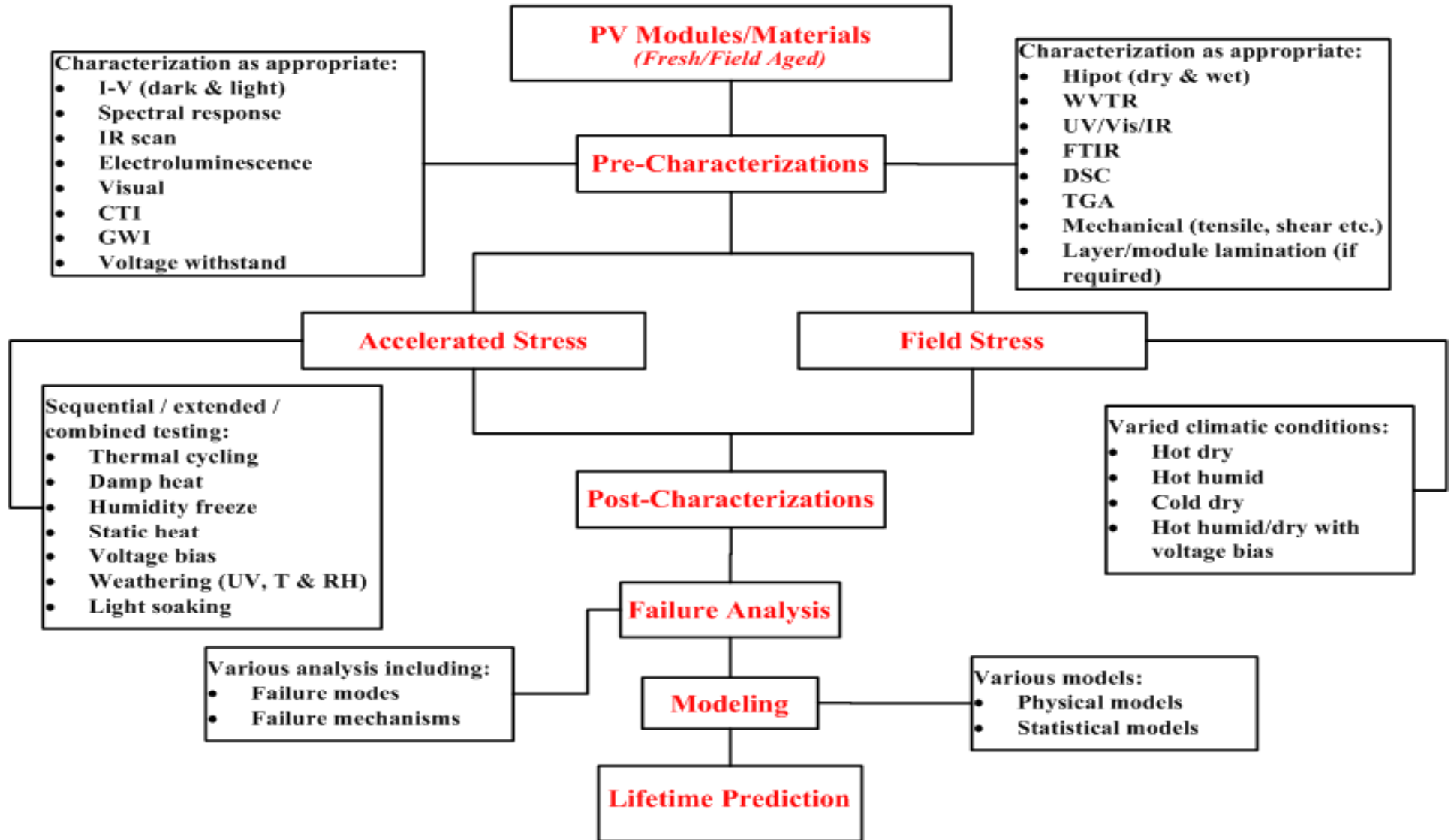
Sequential	Extended
Multi-variable & variable preconditioning	Single-variable & No variable preconditioning

Accelerated Testing: Lifetime Testing

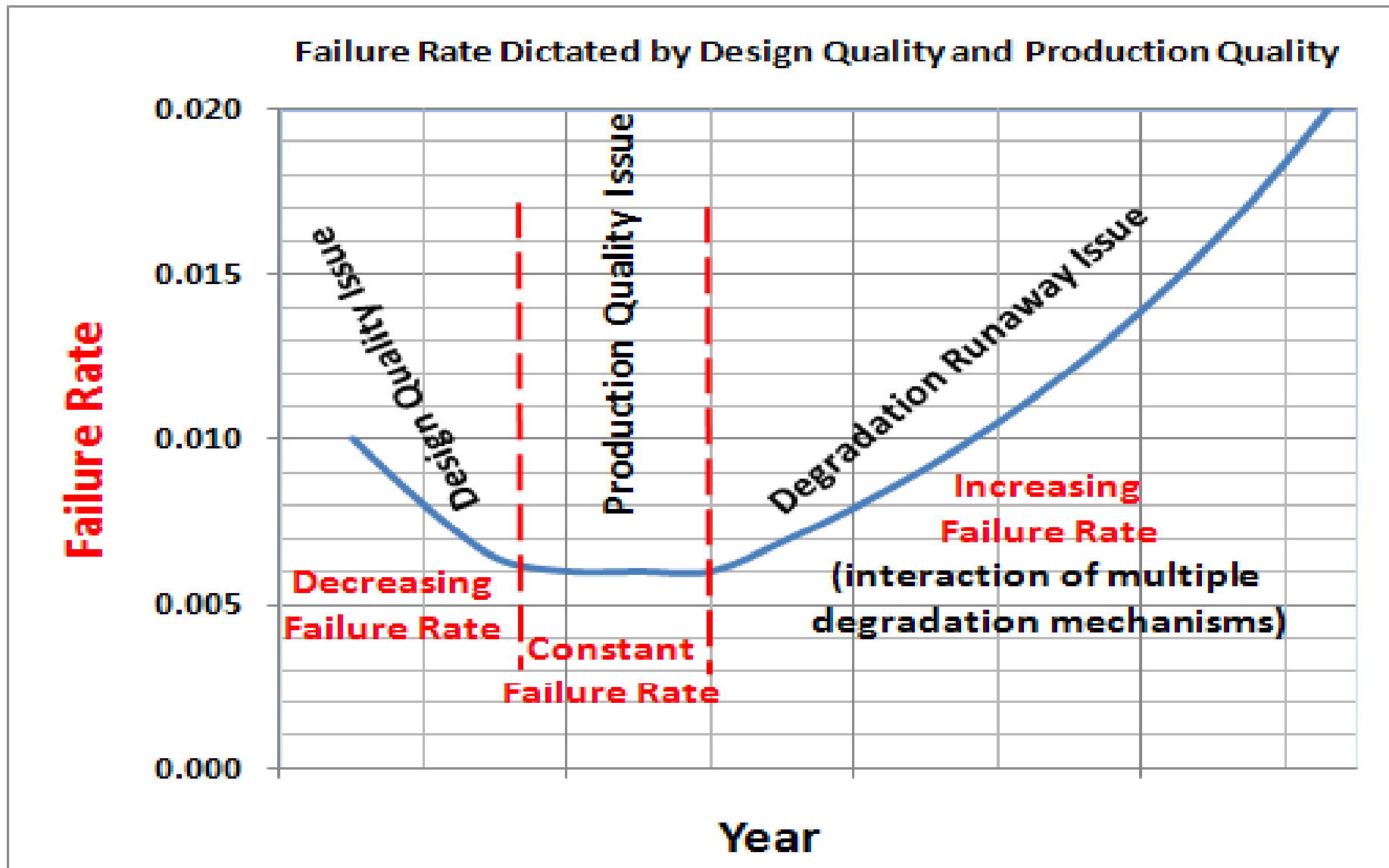
Used for Lifetime Determination

PV Module Lifetime Research Program

@ ASU Photovoltaic Reliability Laboratory (ASU-PRL)



Field Failures vs. Time



Field Failures vs. Time: Influence of QT, CT and HALT

