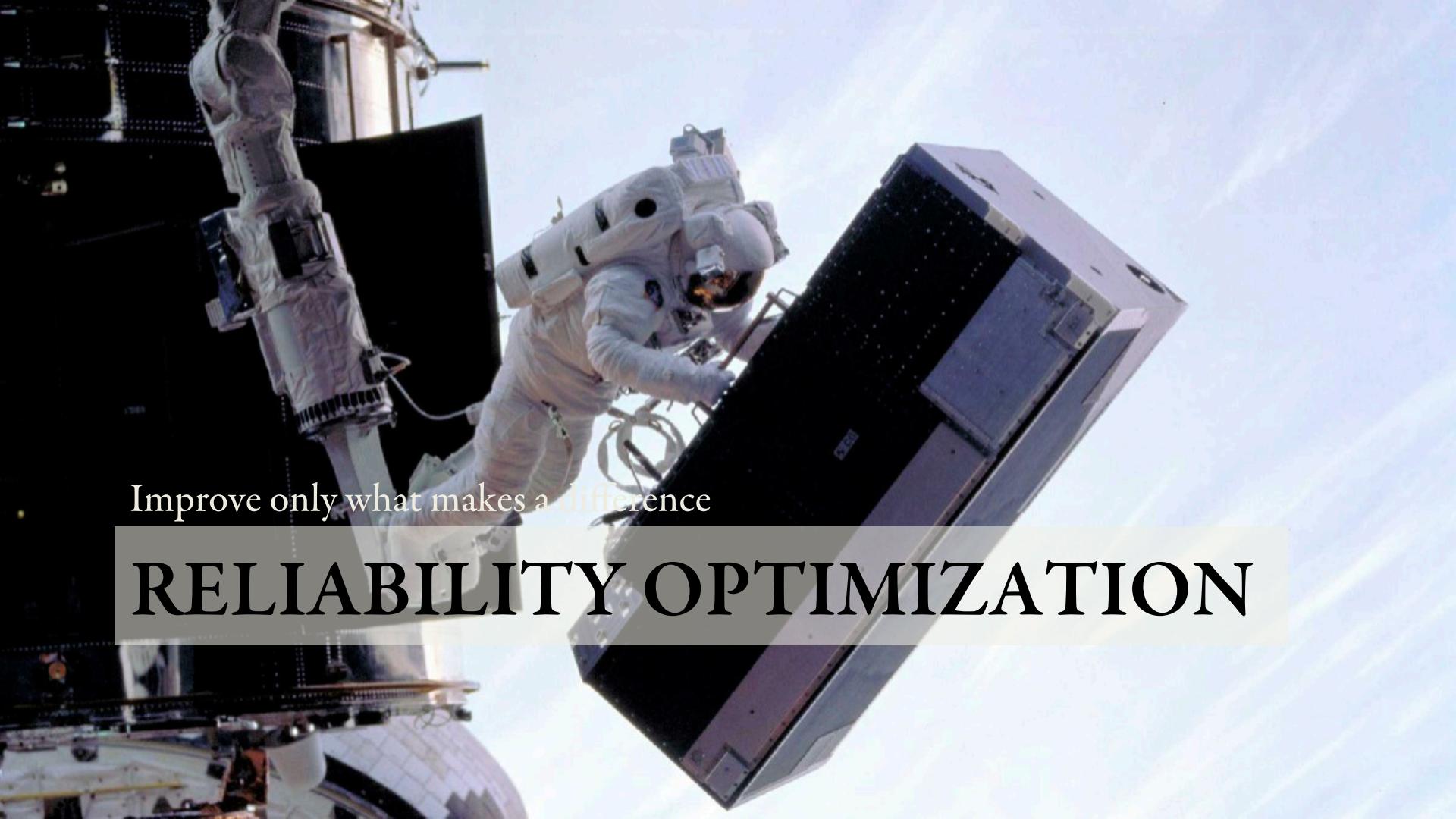# ASQ CRE Prep course

Lesson III. A. 9.

Reliability Optimization

Improve only what makes a difference

# RELIABILITY OPTIMIZATION

# Simple Example

**Compressor $R_1$ = 0.98**

**Combustor $R_2$ = 0.90**

**Turbine $R_3$ = 0.97**

**System goal of 90% reliable**

# What do we change?

## How good does R₂ have to be?

$$R_T = R_1 \times R_2 \times R_3 = 0.98 \times 0.90 \times 0.97 = 0.856$$

$$R_2' = \frac{R_T'}{R_1 \times R_3} = \frac{0.90_T}{0.98 \times 0.97} = 0.947$$

# How about Redundancy

$$R_T = R_1 \times \left(1 - (1 - R_2) \times (1 - R_2)\right) \times R_3$$

$$R_T = 0.941$$

More on modeling in next chapter

# ASQ CRE Prep course

Lesson III. A. 10.

Human Factors