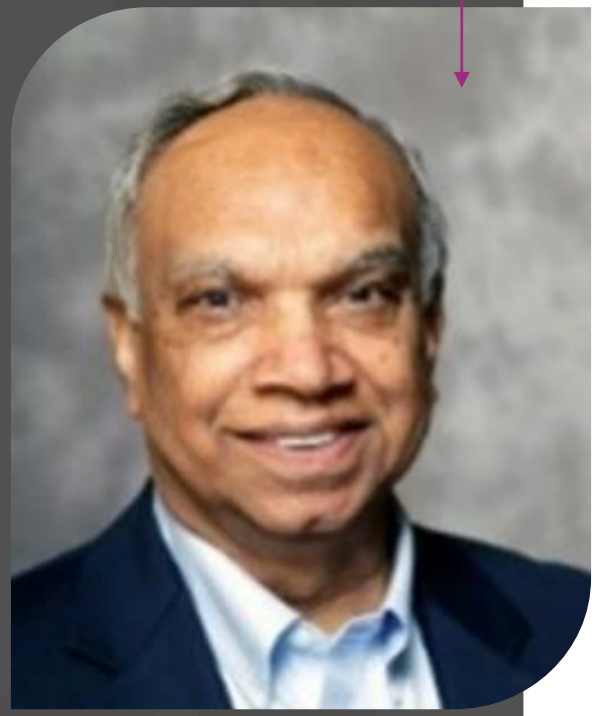
Exercises pages

Calculating /Specifying Reliability Requirements to Increase Uptime

TOOLBOX
SESIÓN



Calculating /Specifying Reliability Requirements to Increase Uptime

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CONGRESO DE MANTENIMIENTO & CONFIABILIDAD MÉXICO 16 EDICIÓN

RAM- Reliability, Availability & Maintainability

1) Reliability:

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2) Maintainability:

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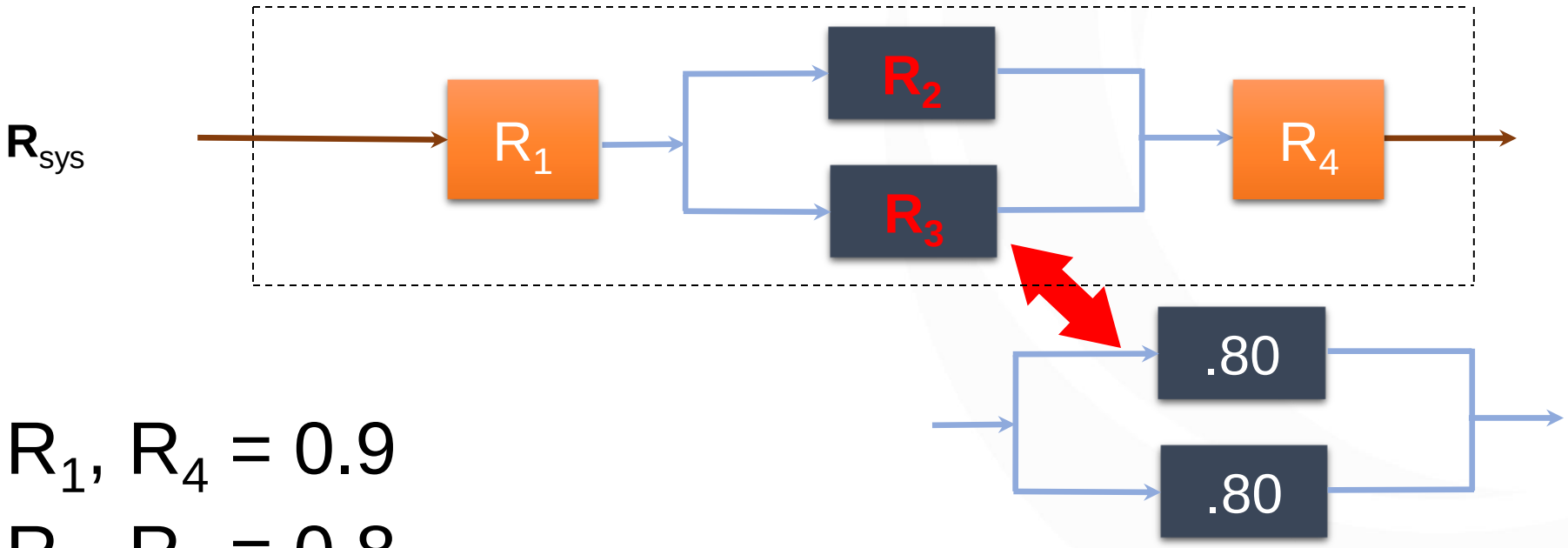
3) Availability:

Who owns Reliability?
Where defects get introduced?

1) .....
2) .....
3) .....
4) .....
5) .....
6) .....
7) .....

Assets in Series and Parallel …exercise 6.21

A system consists of four machines (R1, R2, R3 and R4) with Reliabilities of 0.9, 0.8, 0.8 and 0.9 respectively. What would be total system reliability?



$R_1, R_4 = 0.9$

$R_2, R_3 = 0.8$

Reliability RBD …exercise 6.21

Calculating Reliability ….. Example 11.1

- A plant’s air compressor system operated for 1000 hours last year. The plant’s CMMS system provided the following system data:
  - Operating time = 1000 hours
  - Number of failures, random = 10
  - Total hours of repair time = 50 hours
- What is this compressor system's expected reliability and availability if we have to operate this unit for 100 hours or 10 hours?

Exercise 11.1

Calculating Reliability ….. Example 11.2

- A plant's air compressor system is operated for 1000 hours last year. The plant's CMMS system provided the following system data:
  - Operating time = 1000 hours
  - Number of failures, random = 10
  - Total hours of repair time = 50 hours
- What is the expected **reliability** and **availability** of this compressor system if we have to operate this unit for 100 hours or 10 hours?

Exercise11.2

a) What would the MTBF value have to be if the reliability needed was 75% in order to meet customer expectations?

b) Based on the previously calculated MTBF value, what would the MTTR value have to be if the availability needed was 99% in order to meet customer expectations?

Exercise 11.2

Exercise # 170111

M&R – AM Words Primer: Connect Words (Left) to Definition (Right)

1. Asset
2. Asset Management
3. Benchmark
4. Capacity Assurance
5. Competence
6. Criticality
7. Defect
8. Defect Elimination
9. Gemba
10. Paradigm Shift
11. Variance
12. Bottleneck

- A standard measurement or reference that forms the basis for comparison
- An item or thing with a potential value that an organization owns and has a use for or creates value
- An organizational process to maximize value from an asset during its life
- A Japanese word for workplace, where value is created
- The ability to apply knowledge and skills to achieve intended results.
- The difference between the expected value and the actual value
- A ranking of assets according to potential operational impact
- A condition that causes deviation from design or expected performance and leads to failure
- The identification of a nonconformance and its removal
- A change from one way of thinking to another
- Any resource whose capacity is less than the demand placed on it
- A new, positive name of maintenance