



**Oil Analysis & RCM  
Get Married!**

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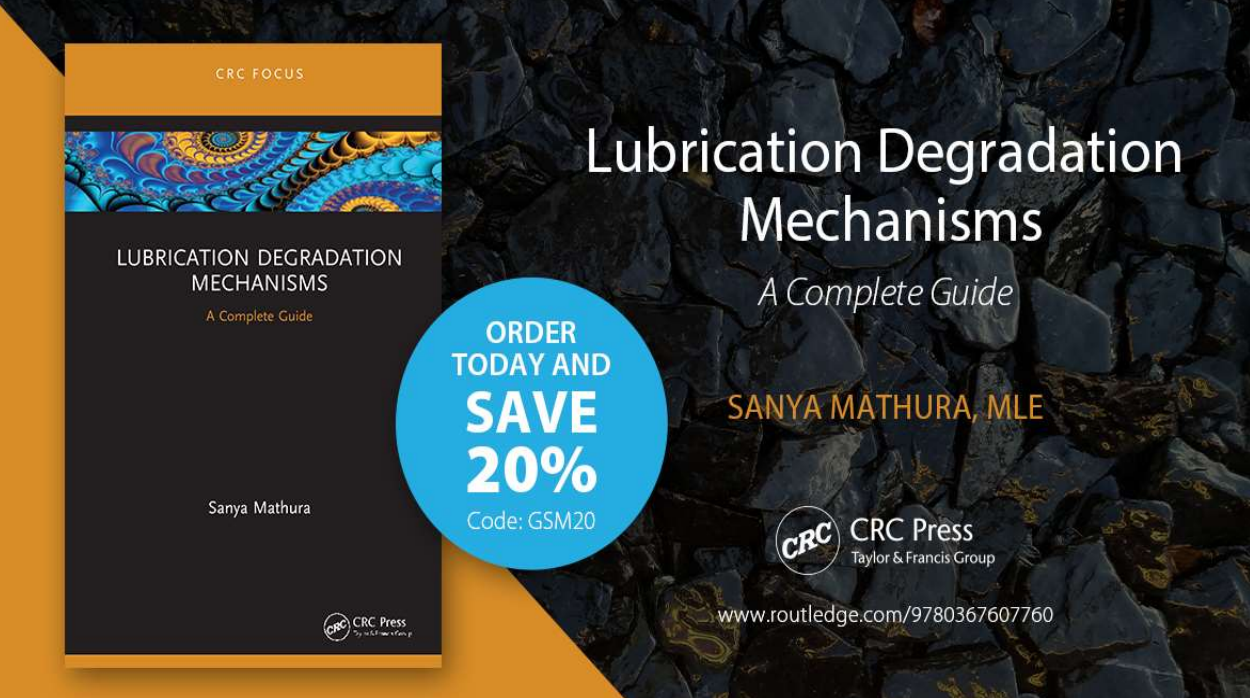
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LUBRICATION SOLUTIONS

**Oil Analysis**

What tests should be done?

How often to do them?

1



CRC FOCUS

LUBRICATION DEGRADATION MECHANISMS  
*A Complete Guide*

Sanya Mathura

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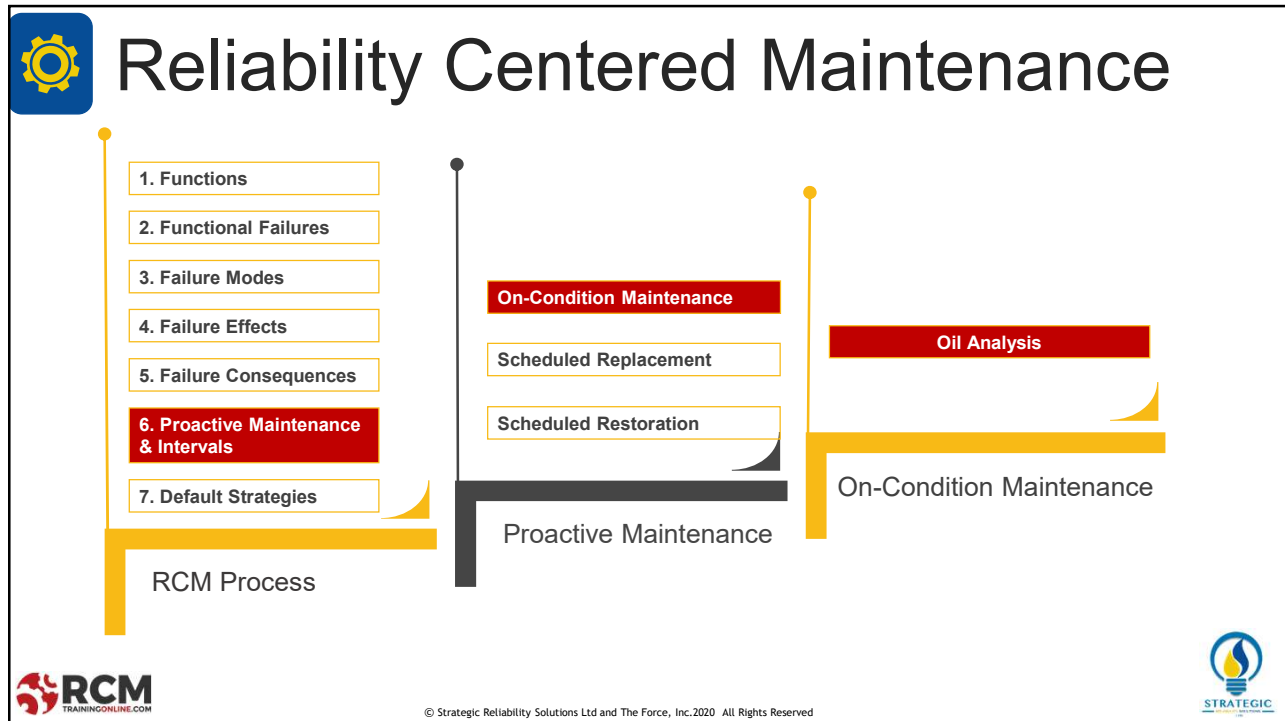
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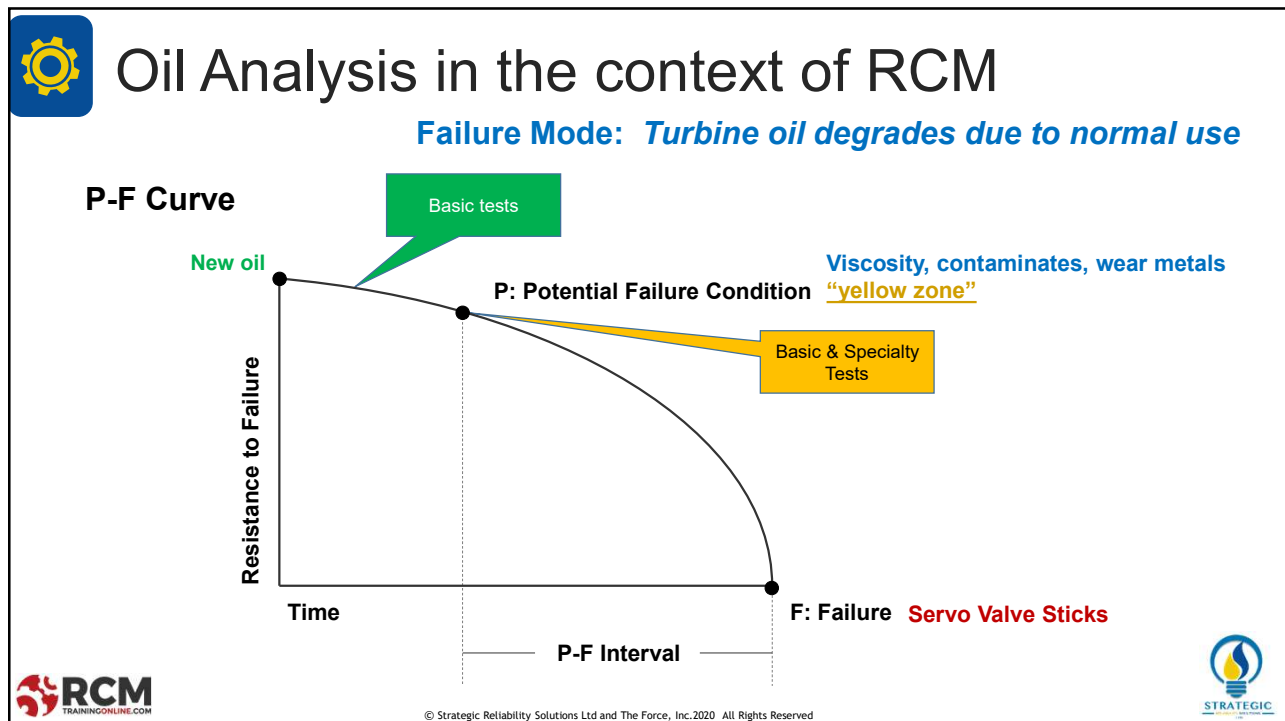
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# Turbine oil – Basic monthly tests

**Viscosity ASTM D445**  
Trend and monitor changes to Viscosity of  $\pm 5\%$

**Concentration of Additives, Metals & Contaminants**  
Presence or Absence of any of these items can indicate that degradation is occurring within the lubricant.

**Presence of Water**  
Can promote degradation.  
Range of 200 – 600ppm (0.2 – 0.6%)

**TAN / TBN ASTM D664 / D2896**  
Increases in TAN of 0.3mgKOH/g or Decreases of 50% of TBN value can indicate the presence of acids as by-products of degradation mechanisms.

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# Turbine oil – Specialty tests

**RPVOT (Rotating Pressure Vessel Oxidation Test)**

- Result given in minutes
- <25% needs to change

**RULER (Remaining Useful Life Evaluation Routine)**

- Result given in % of Amines & Phenols
- <25% needs to change

**MPC (Membrane Patch Calorimetry)**

- Result given in number range
- 0-15 Good, 15-20 – Monitor, 25-35 – Abnormal, >35 Critical

**QSA (Quantitative Spectrophotometric Analysis)**

- Measures the varnish potential rating (1-100)

**Qtrly, Semi-Annual, Annual**

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# Determining Sampling Frequency

- 01 Evaluate the Criticality of Operation**  
What does criticality mean to you?
- 02 Establish Maintenance trends**  
Look at Oil top ups & previous failures
- 03 OEM Oil Drain Intervals**  
Observe OEM ODIs
- 04 Create Lube Routes**  
Group similar tests or equipment

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# Guided Example - Turbines

**P-F Curve**

Resistance to Failure

Time

New oil

Baseline Sample – 24-48 hrs (Basic test)

Basic tests, Monthly

P: Potential Failure Condition

Basic Test, 2 weeks

Specialty Tests, Monthly

F: Failure **Servo Valve Sticks**

P-F Interval

**Assumptions**

- Critical equipment
- OEM ODI: 5 yrs
- Semi Annual top up

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# Questions?

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# Thank You for Watching!

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