

CERTIFICATION EXAM REFERENCE MATERIAL

Useful equations and definitions

Payback Period = net cash flow (NCF) > 0 = NCF year 1 + NCF year 2 + NCF year 3

$$ROI = \frac{\text{net income}}{\text{cost of investment}}$$

$$NPV = \frac{R_t}{(1+i)^t} = \frac{R_0}{1} + \frac{R_1}{(1+i)^1} + \frac{R_2}{(1+i)^2} \dots$$

Where

t = time of the cash flow

i = discount rate

R_t = net cash flow

Design capacity = maximum output that can be achieved

Actual capacity = output that is actually achieved

$$\text{Utilization} = \frac{\text{Planned production time}}{\text{All time}}$$

$$OEE = \text{Availability} \times \text{Performance} \times \text{Quality}$$

$$TEEP = \text{Availability} \times \text{Performance} \times \text{Quality} \times \text{Utilization} = OEE \times \text{Utilization}$$

$$LPO = \text{maximum capacity} - \text{actual output} = (1 - TEEP) \times \text{maximum capacity}$$

Glossary of acronyms

ACR – Asset Criticality Ranking	MoC – Management of Change
API - American Petroleum Institute	MRO – Maintenance, Repair and Operation
BOM – Bill Of Materials	MTBF – Mean Time Between Failures
CBM – Condition-Based Maintenance	MTTF – Mean Time To Failure
CEO – Chief Executive Officer	MTTR – Mean Time To Repair
CM – Condition Monitoring	NDT – Non Destructive Testing
CMMS - Computerized Maintenance Management System	NPV – Net Present Value
DCF – Discounted Cash Flow	ODR – Operator Driven Reliability
EVA - Economic Value Added	OEE – Overall Equipment Effectiveness
FFT – Fast Fourier Transform	OEM – Original Equipment Manufacturer
FMEA – Failure Modes Effects Analysis	PM – Preventive Maintenance
FMECA – Failure Modes Effects Criticality Analysis	PMO – Preventive Maintenance Optimization
FRACAS - Failure Reporting, Analysis and Corrective Action System	RBD - Reliability Block Diagram
IEC - International Electrotechnical Commission	RCA – Root Cause Analysis
IR – Infrared Thermography	RCFA – Root Cause Failure Analysis
IRR – Internal Rate of Return	RCM – Reliability Centered Maintenance
ISO – International Standards Organization	ROI – Return On Investment
KPI – Key Performance Indicator	RONA – Return On Net Assets
LCC – Life Cycle Cost	RTF – Run To Failure
LPO – Lost Profit Opportunity	TEEP - Total Effective Equipment Productivity
	TPM – Total Productive Maintenance
	VA – Vibration Analysis