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OEE Practitioner – Body of Knowledge

1. Introduction to OEE
2. What OEE Means
3. Why OEE Is Used

- OEE as a structured way to measure equipment-related losses
- How OEE helps reveal hidden or accepted losses
- Using OEE to identify whether the main issue is:
  - Downtime
  - Speed loss
  - Quality loss
- OEE as a common language between production, maintenance, engineering, quality, and management

4. OEE as an Improvement Tool

- Using OEE to:
  - Identify the biggest losses
  - Prioritize improvement work
  - Focus resources
  - Track corrective actions
  - Support daily management

5. OEE and Business Outcomes

- Relationship between OEE and productivity
- Relationship between OEE and usable capacity

6. OEE, Lean, TPM, and Continuous Improvement

- How OEE supports Lean by identifying waste and flow interruptions
- How OEE supports TPM by measuring equipment-related losses
- Introduction to the Six Big Losses:
  - Breakdowns
  - Setup and adjustment
  - Minor stops
  - Reduced speed
  - Defects
  - Startup losses

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- How OEE supports continuous improvement through measurement, root cause analysis, countermeasures, and standardization

7. OEE Data Collection Fundamentals

- Treating OEE data collection as an engineering measurement system
- Core data needed for OEE
- Importance of defining and capturing inputs consistently

8. Defining the Measurement Boundary

- Determining whether OEE is measured at:
  - A single machine
  - A production cell
  - A line
  - A value stream
- Measuring the constraint, pacemaker process, or bottleneck
- Special considerations for line-level OEE

9. Planned Production Time

- Definition of planned production time
- What is typically included in OEE
- What is typically excluded from OEE
- Treatment of breaks, lunches, changeovers, preventive maintenance, no material, no operator, and no demand
- Importance of standardizing time definitions

10. Core OEE Data Streams

- Time data:
  - Shift time
  - Downtime
  - Changeover time
  - Running time
  - Idle, starved, and blocked time
- Production count data:
  - Total count
  - Good count
  - Reject count
  - Rework count
  - Product or work order information
- Quality data:

  - Scrap
  - Rework
  - Startup rejects
  - Defect reason
  - Disposition

11. Ideal Cycle Time and Performance Standards

- Importance of product-specific ideal cycle times
- Using valid standards for Performance calculations
- Avoiding outdated ERP standards, average historical speed, or unrealistic nameplate speeds
- Validating standards through engineering data, time studies, PLC data, trials, and demonstrated capability

12. Loss Classification and Reason Codes

- Availability losses
- Performance losses
- Quality losses
- Building a practical loss tree
- Using a two-level reason-code structure:
  - Main loss category
  - Specific reason

13. Automatic vs. Manual Data Capture

- Automatically captured data:
  - Machine running status
  - Stop status
  - Fault signals
  - Cycle counts
  - Speed
  - Alarms
  - Downtime timestamps
- Manually captured data:
  - Downtime reason confirmation
  - Root cause detail
  - Scrap reason
  - Operator comments
- Combining machine data with human context

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14. Practical Minimum Data Set

- Production run data
- Downtime event data
- Production count data
- Calculation output
- Example OEE calculation using:
    - Planned production time
    - Downtime
    - Run time
    - Availability
    - Performance
    - Quality
    - OEE

15. Data Quality and Validation

- Equipment state precedence rules
- Product mix and routing context
- Avoiding incorrect averaging of OEE percentages
- Time validation
- Count validation
- Standard validation
- Common data capture errors

16. Operator Interface and Daily Management

- Designing simple and usable operator interfaces
- Prompting operators in real time
- Reviewing unclassified or high-impact events
- Treating OEE data as operational evidence
- Using OEE in shift and daily review routines

17. OEE Data Architecture

- Machine, PLC, and sensor data
- Edge device or SCADA layer
- MES or OEE platform
- ERP or scheduling system
- Quality system
- CMMS integration
- BI and reporting layer