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How to select Good quality meters and its acceptance (Evaluation of Meter)

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A specifically designed programme for

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Afghanistan

Agenda

- What is Quality?
- What is reliability?
- Identifying need for meters
- Specification
  - Standards requirements
  - Specific requirements
  - Software requirements
  - Implied needs

Agenda

- Assessment of supplier
  - Evaluating sample
  - Evaluating supplier capability
    - Technical knowledge
    - Infrastructure
    - After sale support
  - Evaluating supplied lot
  - Continuous evaluation of supplier

What is Quality?

$$Q = \frac{P}{E}$$

- P = Performance
- E = Expectation

Quality, cost, profit

Many people think that quality costs more money. But these costs are the costs of doing it right first time .

Quality in the long run results in increased profitability.

For electricity meter it is more important as a utility get revenue through meter

For example if we use the right product first time , we save all the costs of rework, scrap, repair, cost of new meter installation etc.

We save the revenue lost while meter was not working.

(Life Cycle Cost)

What is Reliability?

- The **probability** (a value between 0 and 1) that an item will perform its **intended function** for a **specified time interval** under **stated condition**
  - It is number and hence quntitative

Identifying need for meters

- Type of Consumers
- Maximum and minimum load
- Number of consumers
- Type of installation – indoor / outdoor
  - Environmental conditions
- Accuracy class
- Voltage rating
- For CT/PT operated meters
  - Matching with secondary ratings
  - Ratio : pre commissioned or secondary commissioned

Specification

- Standards requirements
  - Any Afghan standard?
  - IEC standards

Specific requirements

- S/w features
- H/w features
- Tamper logging features
- Box
- TTB
- Reading method

Evaluating sample

- Type Tests
  - From Accredited lab with international reputation
  - Must cover all tests in standards
- S/w feature compliance test
  - ISO 9001 certified
  - Experience in metering system implementation
- Reliability specification
  - Test to fail
  - MTBF
- Field trial

Evaluating supplier capability

- Technical knowledge
  - Knowledge of technology used
  - Development centre
  - Solution provider
- Infrastructure
  - Manufacturing capacity
  - Test facilities
- After sale support
  - Training support
  - Failure support
  - S/w support

Evaluating supplied lot

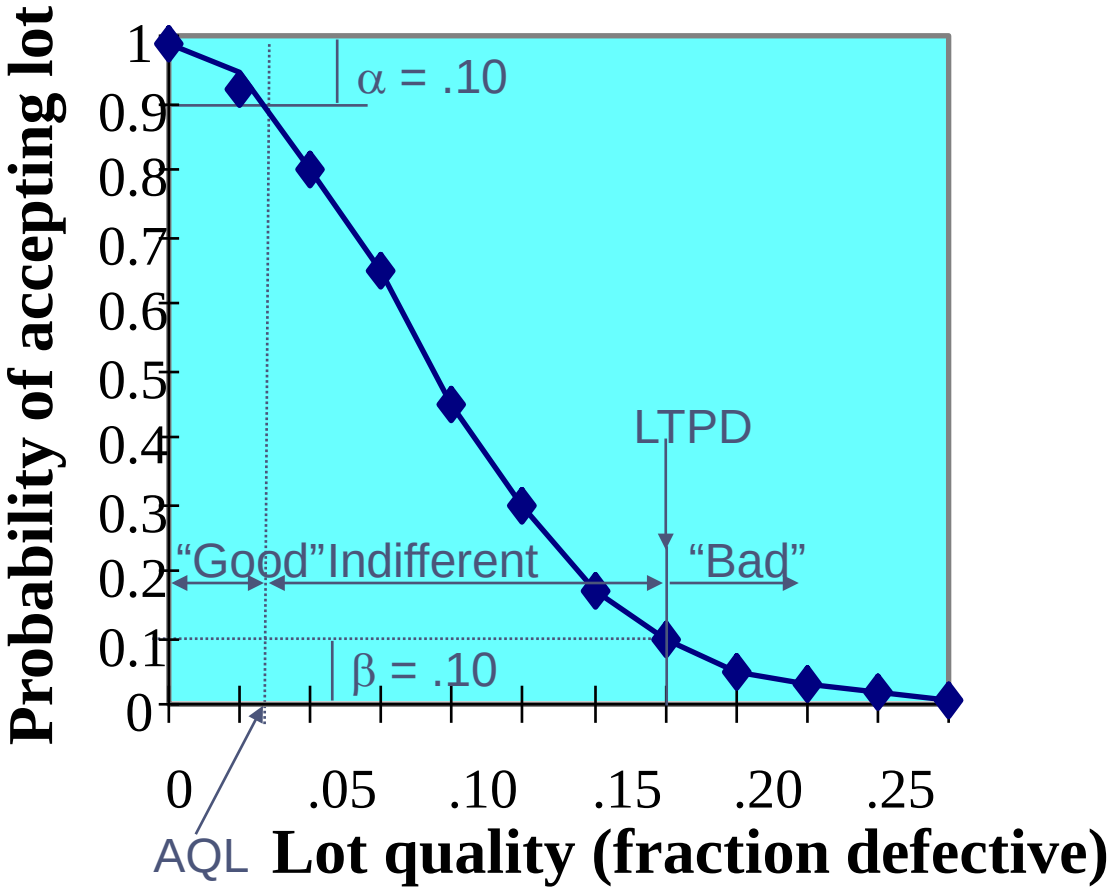
- Inspection at manufacturers site
  - Manufacturing test results (Routine tests)
  - Error spread
  - Equipments used during manufacturing and calibration
- Random Sampling
- Acceptance Test on samples
- Select 3 random samples out of every 10000 for complete type test

Selecting right sample

- What is sampling?
  - Variations in manufacturing process
    - Pressure cooker example
- Random Sampling

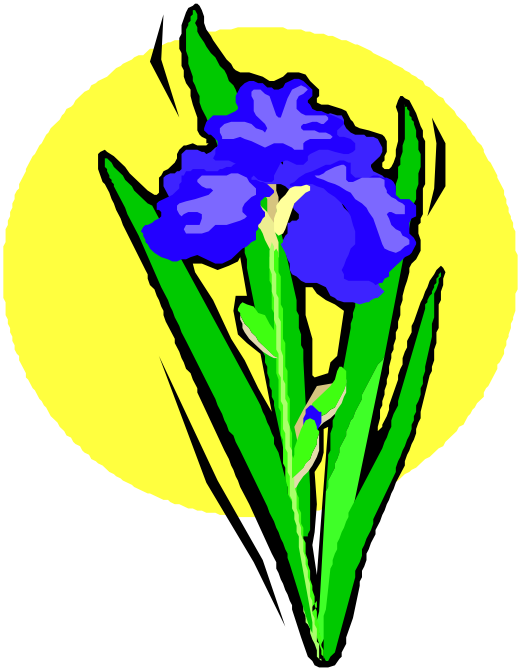
Risk in Sampling

- Suppliers risk
- Buyers risk



Continuous evaluation of supplier

- Ask for design changes
  - Any major change in design needs proper validation and verification
- Complete type test for each lot or periodic interval
- Maintaining ISO 9001 system
- Failure data monitoring and MTBF calculation
  - IEC 62059 series of standards



Thanks