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The concept of improving the reliability of non-destructive testing equipment.

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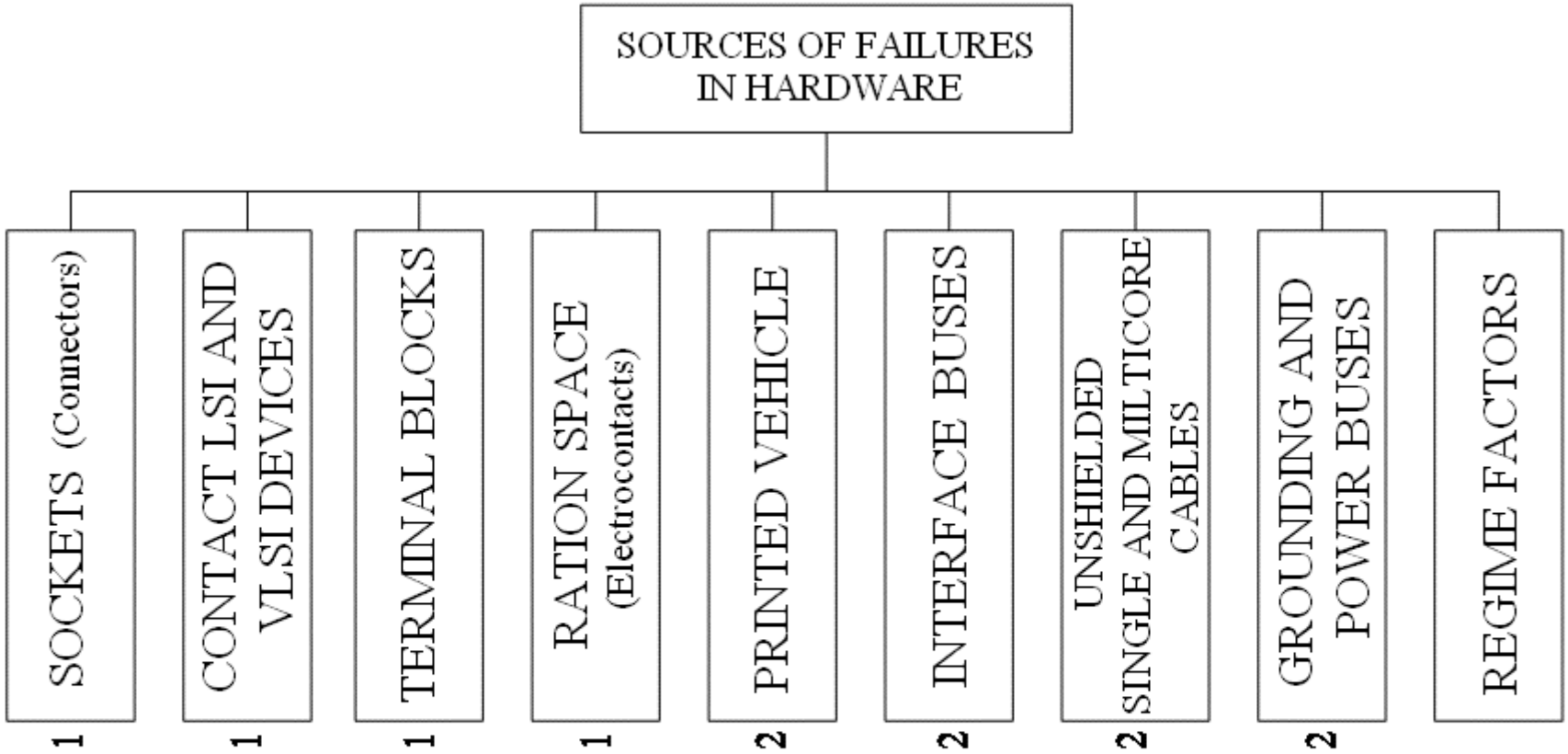
Moscow 2010

Sources of failures in hardware



1 – connection point communication lines
2 – communication lines

Figure 1. Sources of failures in hardware

Existing methods and means of detection and registration failures

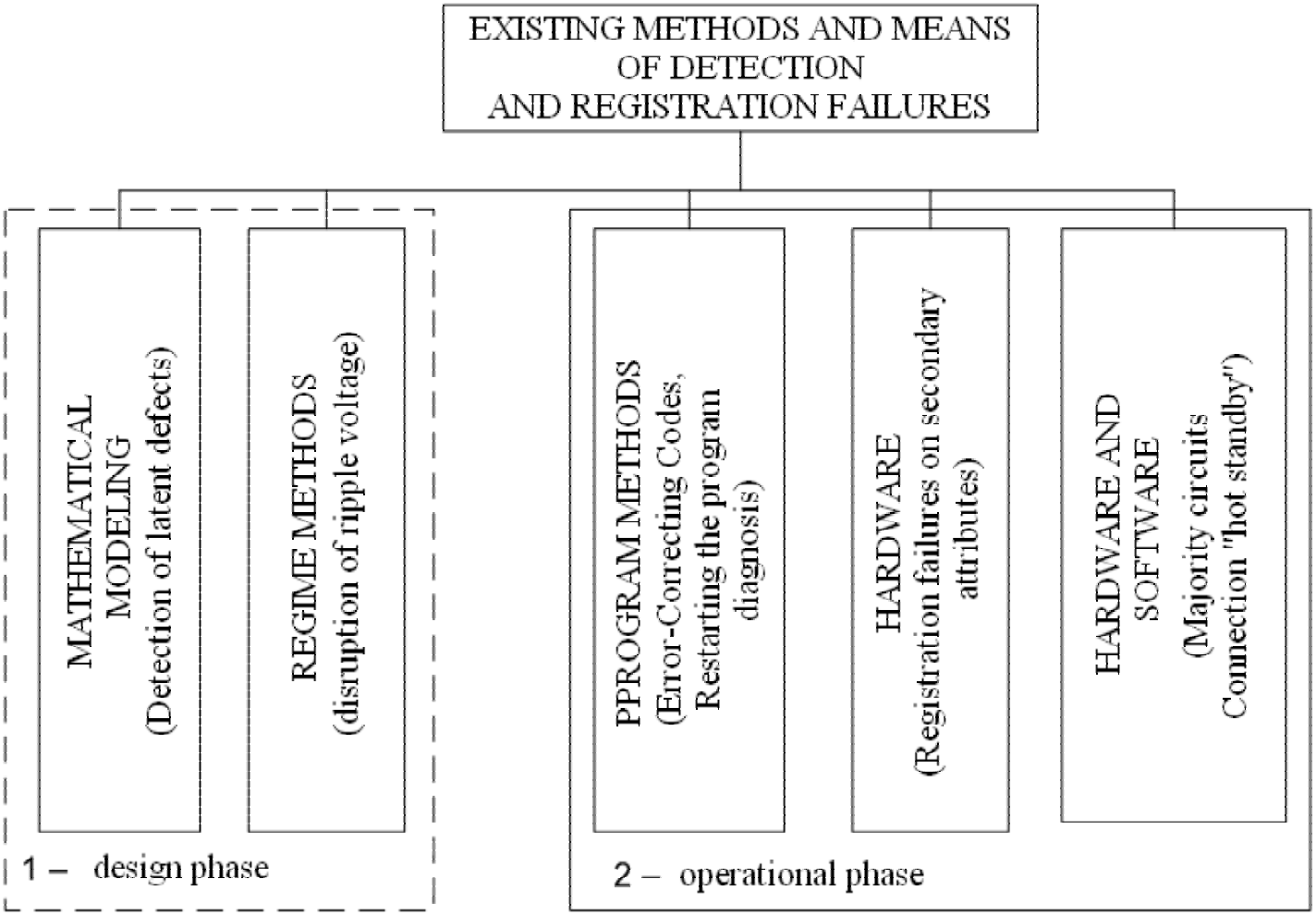


Figure 2. Existing methods and means of detection and registration of a hardware failure

Methods of detection and registration of sources of failures

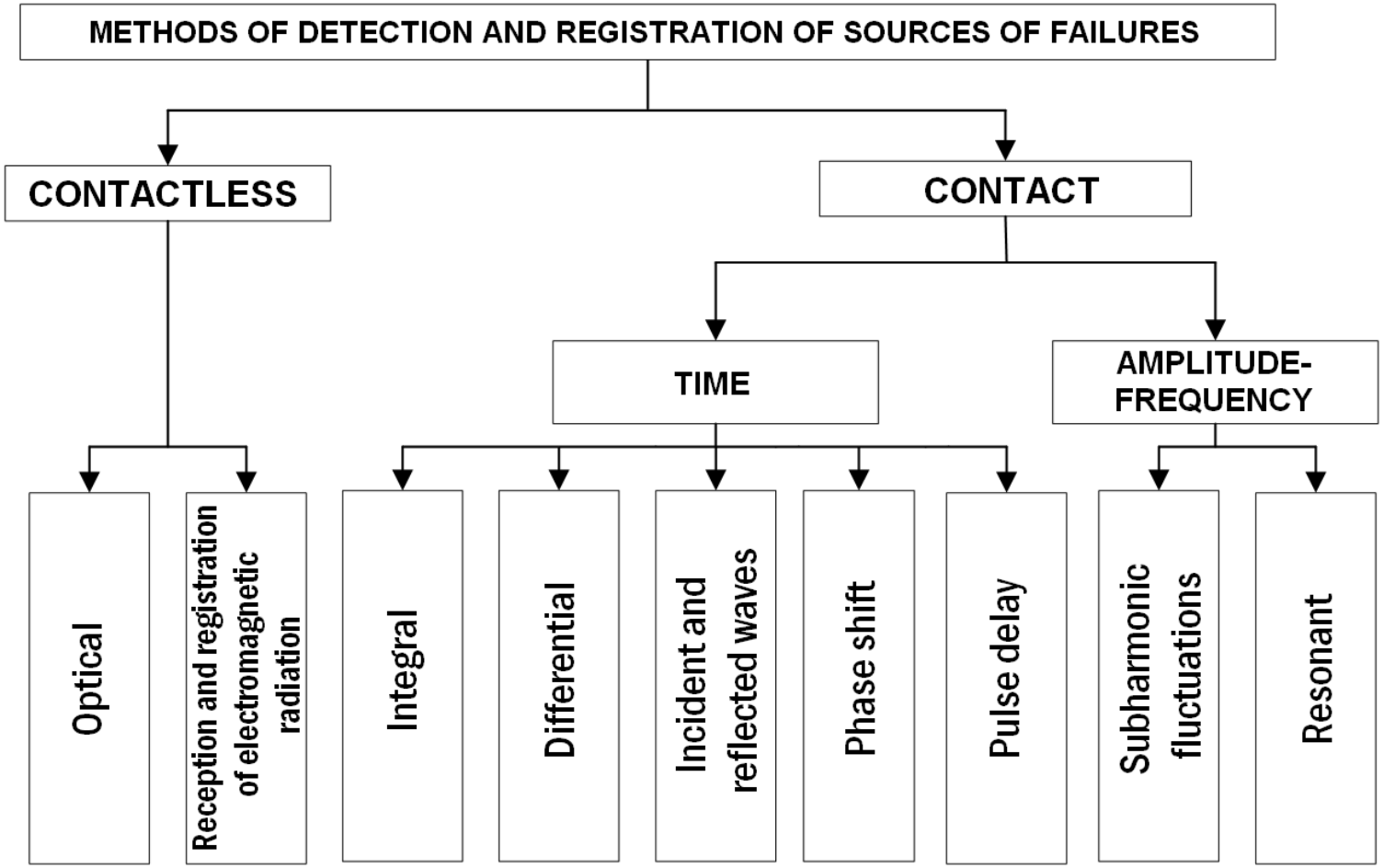


Figure 3. Classification of methods of detection and registration of sources of failures

Electromagnetic communication failures and interference

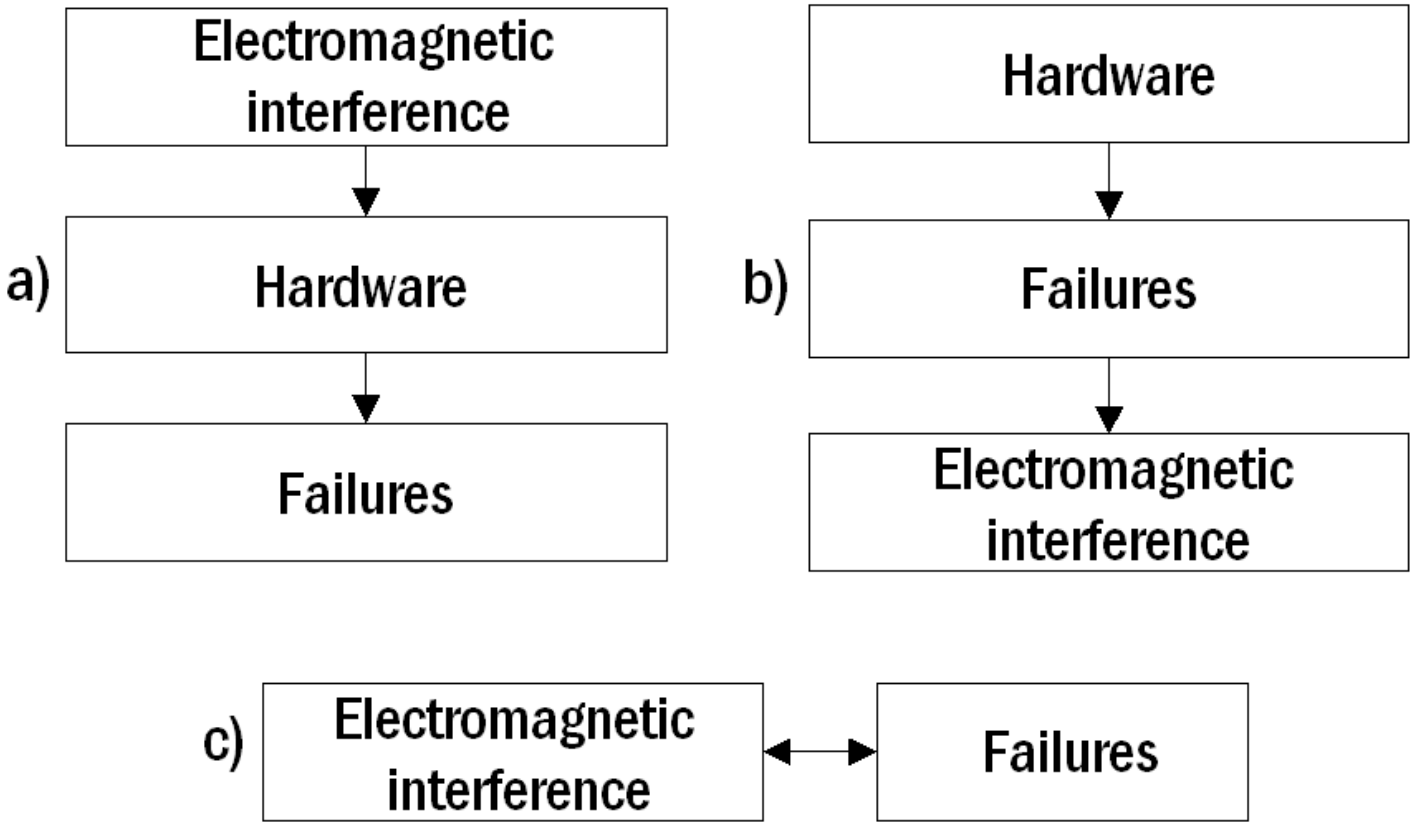


Figure 4. Electromagnetic communication failures and interference: a) interference - as a source of failure, b) failure as a source of electromagnetic interference, c) a bidirectional link between electromagnetic interference and failure

Connector conditions

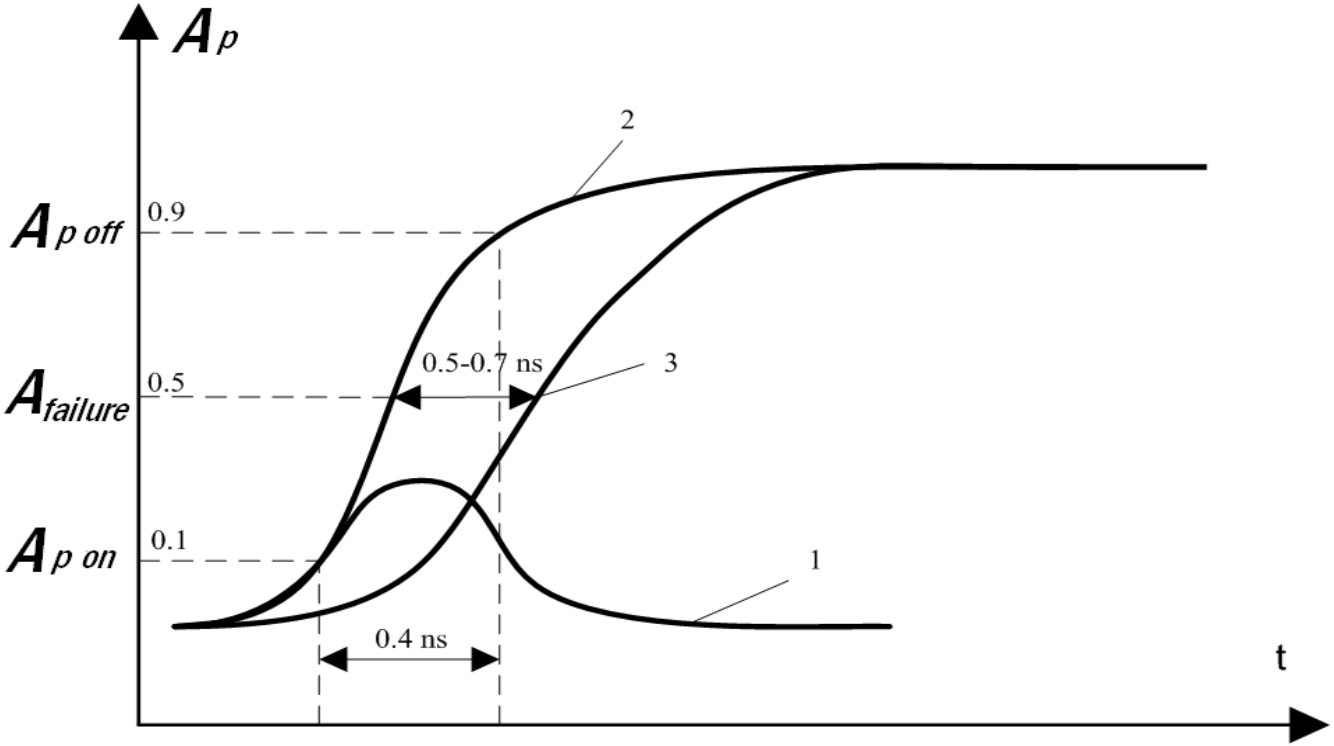


Figure 5. Three conditions of a connector in picosecond range:
1 - on state;
2 - off state;
3 - failure state.

Model of the connector as a set of «n» of resonant circuits

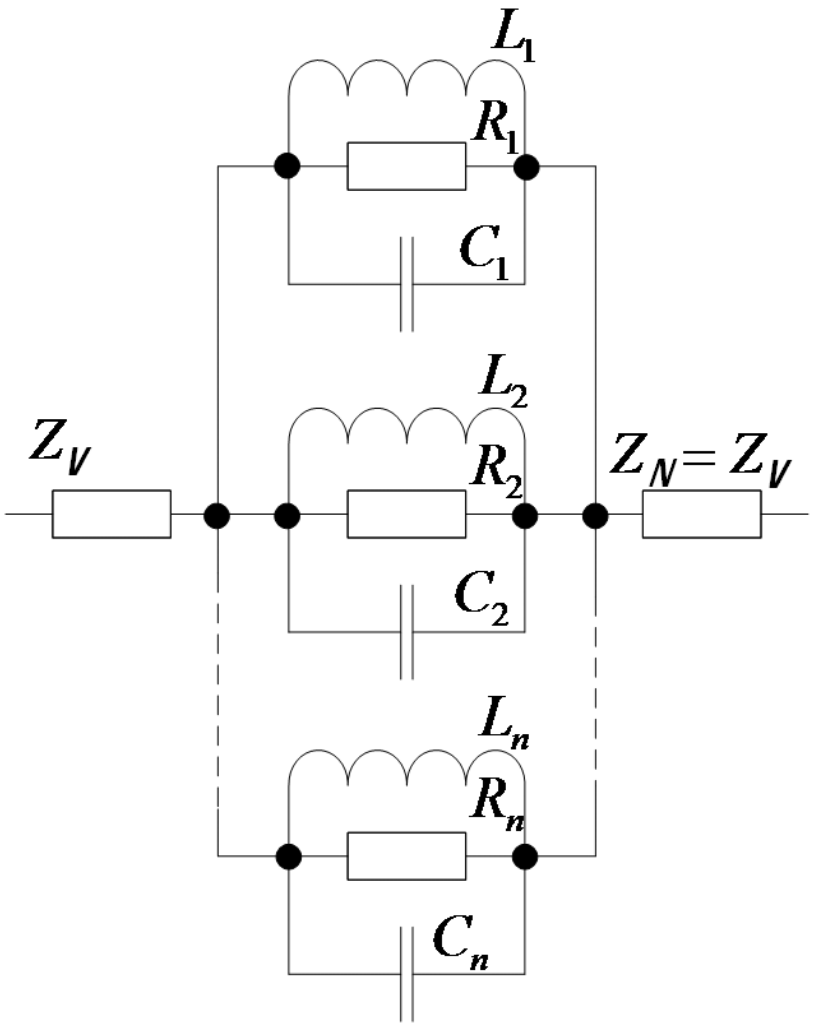


Figure 6. Model of the connector as a set of «n» of resonant circuits

Connector in the failure state

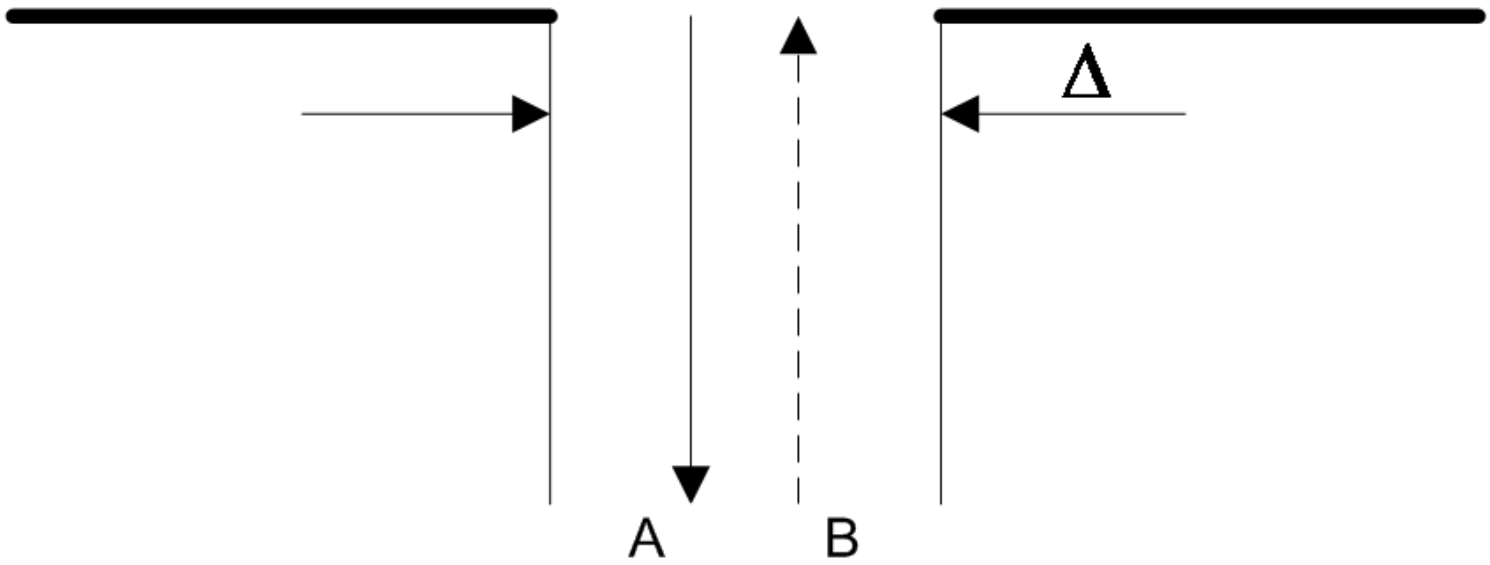


Figure 7. Connector in the failure state (microgaps Δ) in the emitter mode (A) and in receive mode (B) electromagnetic fluctuations

Registration mode "failure"

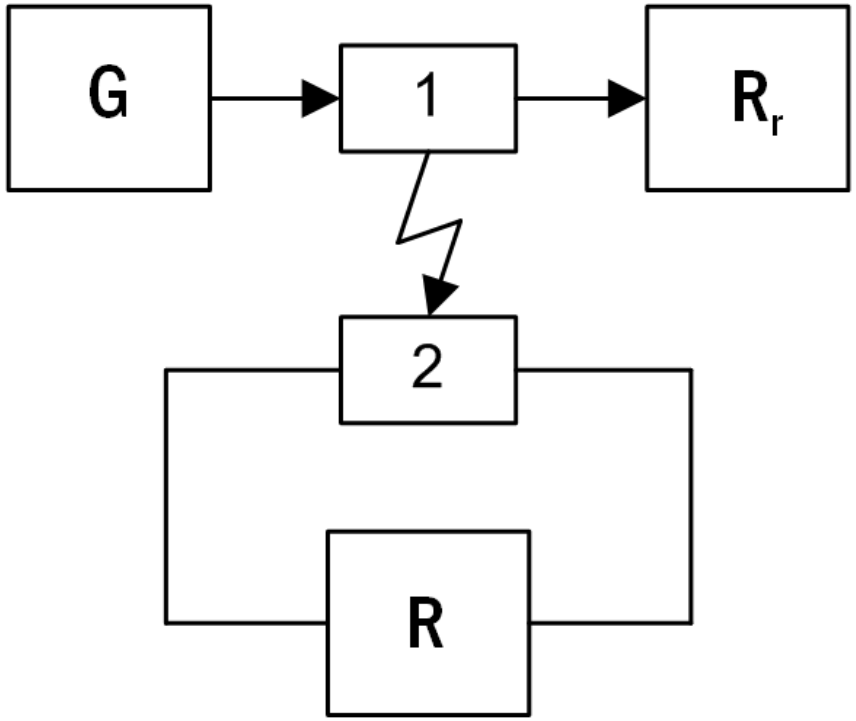


Figure 8. Registration mode "failure" connector (G - generator; R_r- receiver; R - registrar; 1,2 - connector or communication line in the failure state)

Connector-emitter and connector-receiver in the failure state

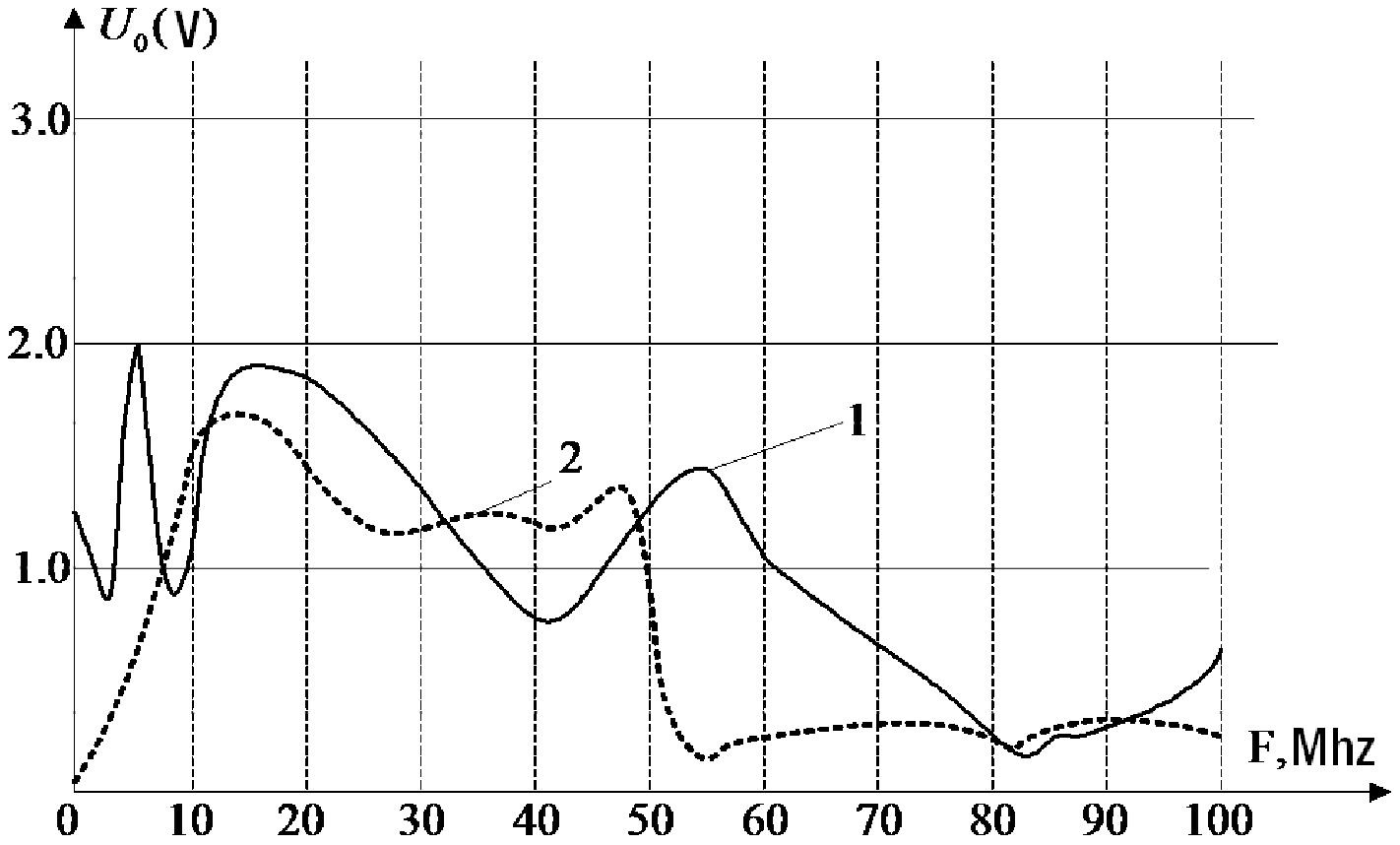
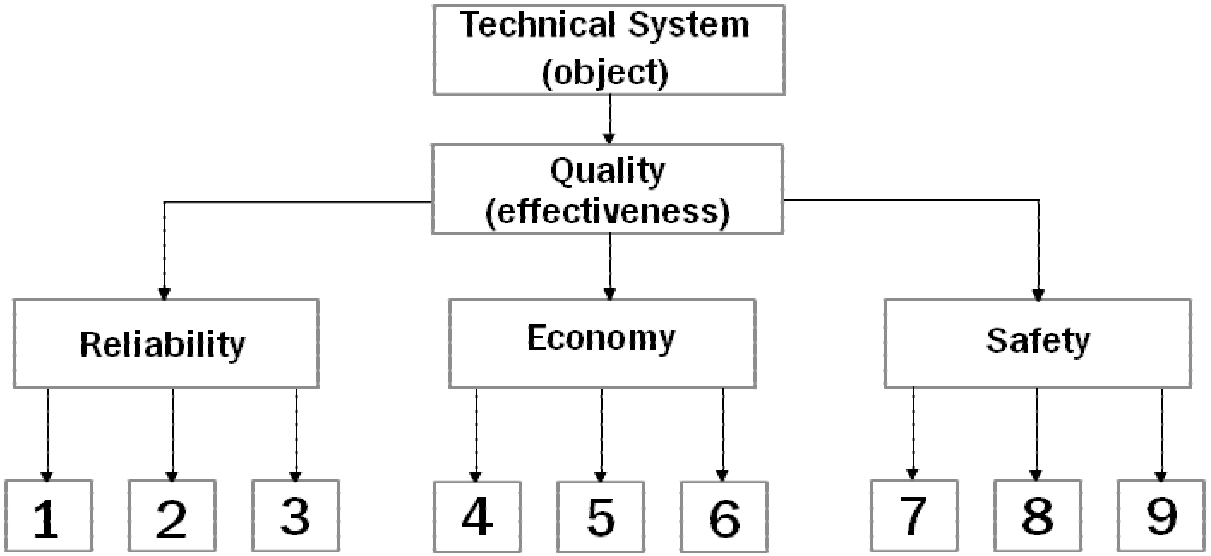


Figure 9. Connector-emitter (curve 1) and connector-receiver (curve 2) in the failure state («δ-locality» included state connector-emitter)

Basic properties of technical systems



1 - Non-failure
2 - Maintainability
3 - Durability
4 - Cost price
5 - Profit
6 - Profitability
7 - Social and individual risk
8 - Ecological risk
9 - Technical and economic risk

Figure 10. Basic properties of technical systems

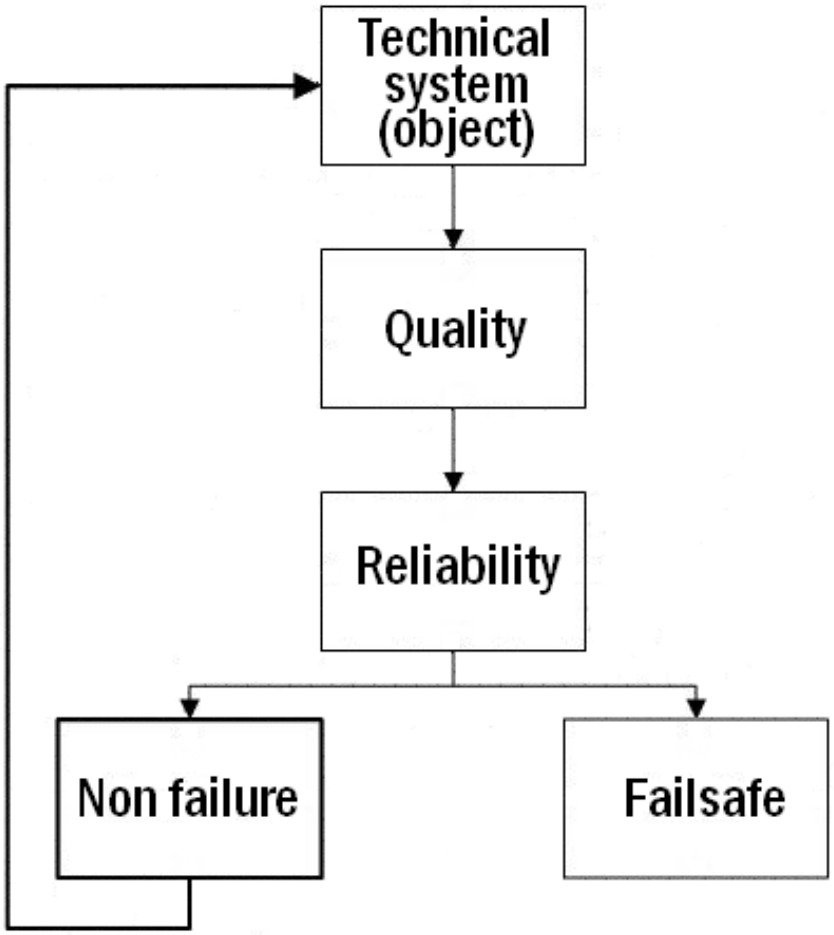


Figure 11. New property of technical systems - «non failure» and its relationship to existing structure.

Report is finished.
Thank you for your attention!

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