International Telecommunication Union

ITU-T Study Group 5

Equipment Resistibility

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Rapporteur, Questions 4 and 13

Workshop on:
"EMC, safety and EMF effects in telecommunications"

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Introduction

- Protection of an installation may require a combination of:
  - Lightning protection for the building
  - Protection on incoming lines
  - Resistibility of equipment
  - Earthing and bonding of installation
- This presentation is about resistibility and protection of equipment

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Introduction

- Background on why Q1 active
- SG 5 role in equipment protection
- Relevant Recommendations
- Resistibility and protection
- Damage
- SG 5 Objective
- Using Recommendations

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Background on why Q1 active

- In the last study period it was revealed that:
  - Damage was occurring from lightning and power induction
  - Damage costing operators many millions of dollars per annum
  - 80% of operators used different requirements
  - The access network was a problem

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SG 5 role in equipment protection

- SG 5 is unique in overvoltage protection
  - Ensures coordination of the equipment and external protection
  - Considers installation practices and their effect on resistibility requirements

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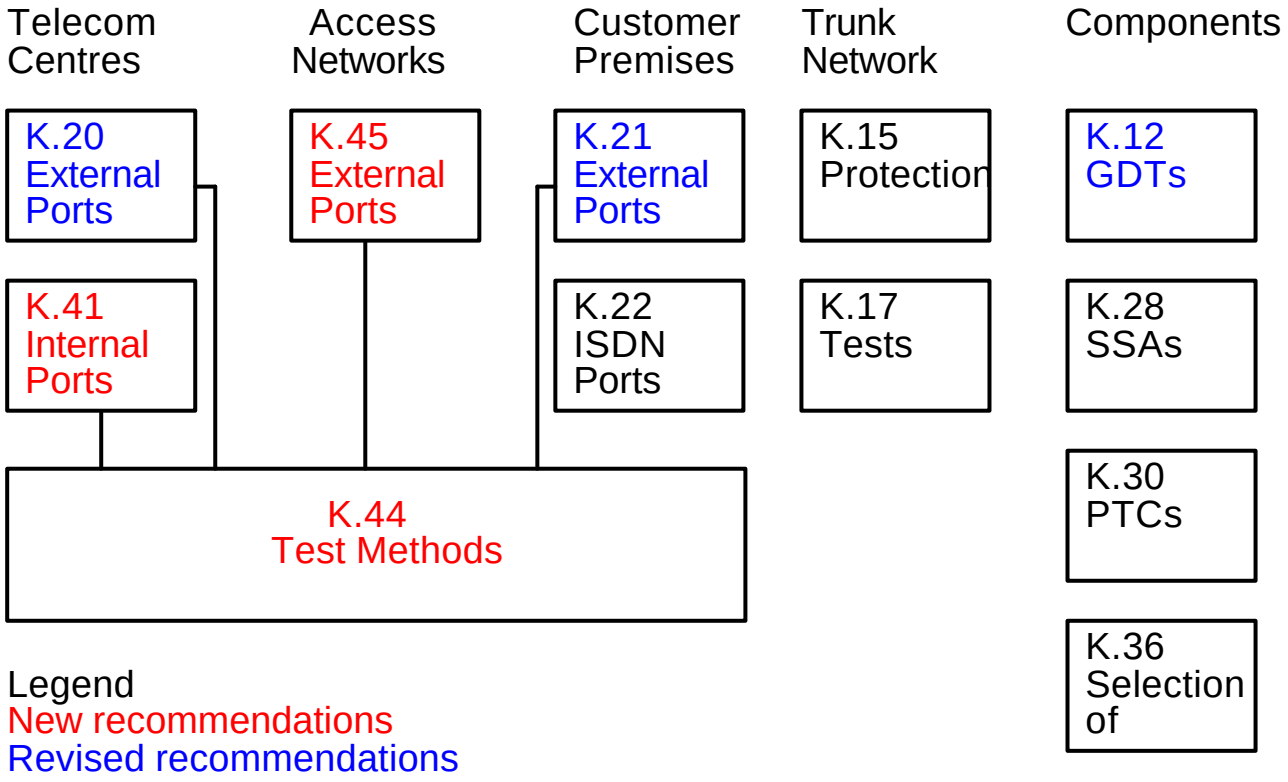
Relevant Recommendations



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Resistibility and protection

- Preventing equipment damage may require a combination of resistibility and protection
  - Resistibility is
    - The ability of the equipment to withstand an overvoltage or overcurrent

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Resistibility and protection (cont)

- Protection is
  - The addition of primary protection to prevent damage from larger surges
    - Need to check that the protector operates and protects the equipment

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Resistibility and protection (cont)

- Primary protection maybe installed by the operator and have to work with many types of equipment
  - Requires coordination of resistibility and component recommendations
  - Nominal firing voltage of primary protector may vary due to local regulations eg 230, 250, 350 or 600 V

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Resistibility and protection (cont)

- A manufacturer's equipment has to work in many operators environments
  - Need a single environment requirement so that manufacturers do not need multiple designs
- SG 5 agreed to have both a "basic" and "enhanced" requirement

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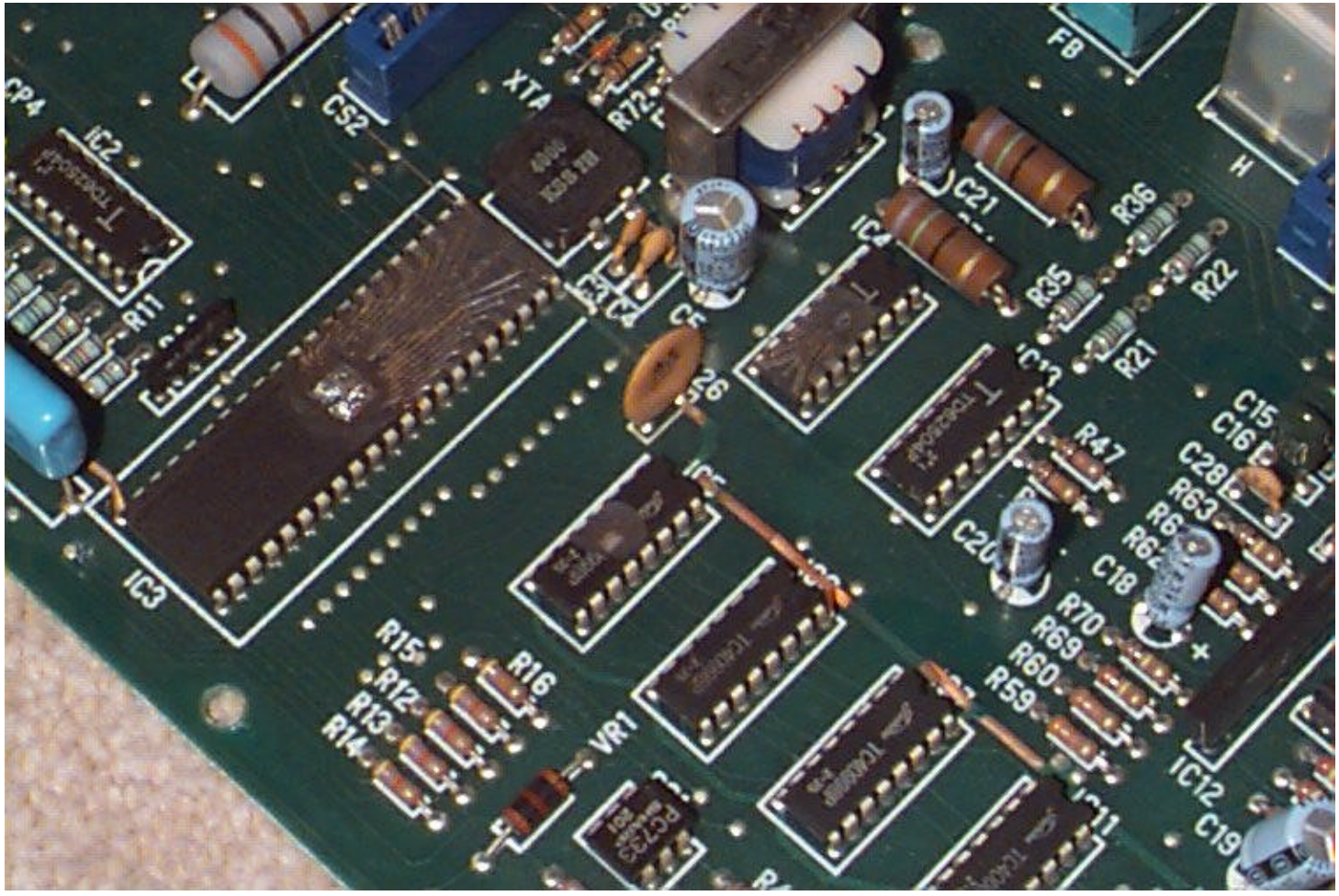
Damage



Visible damage

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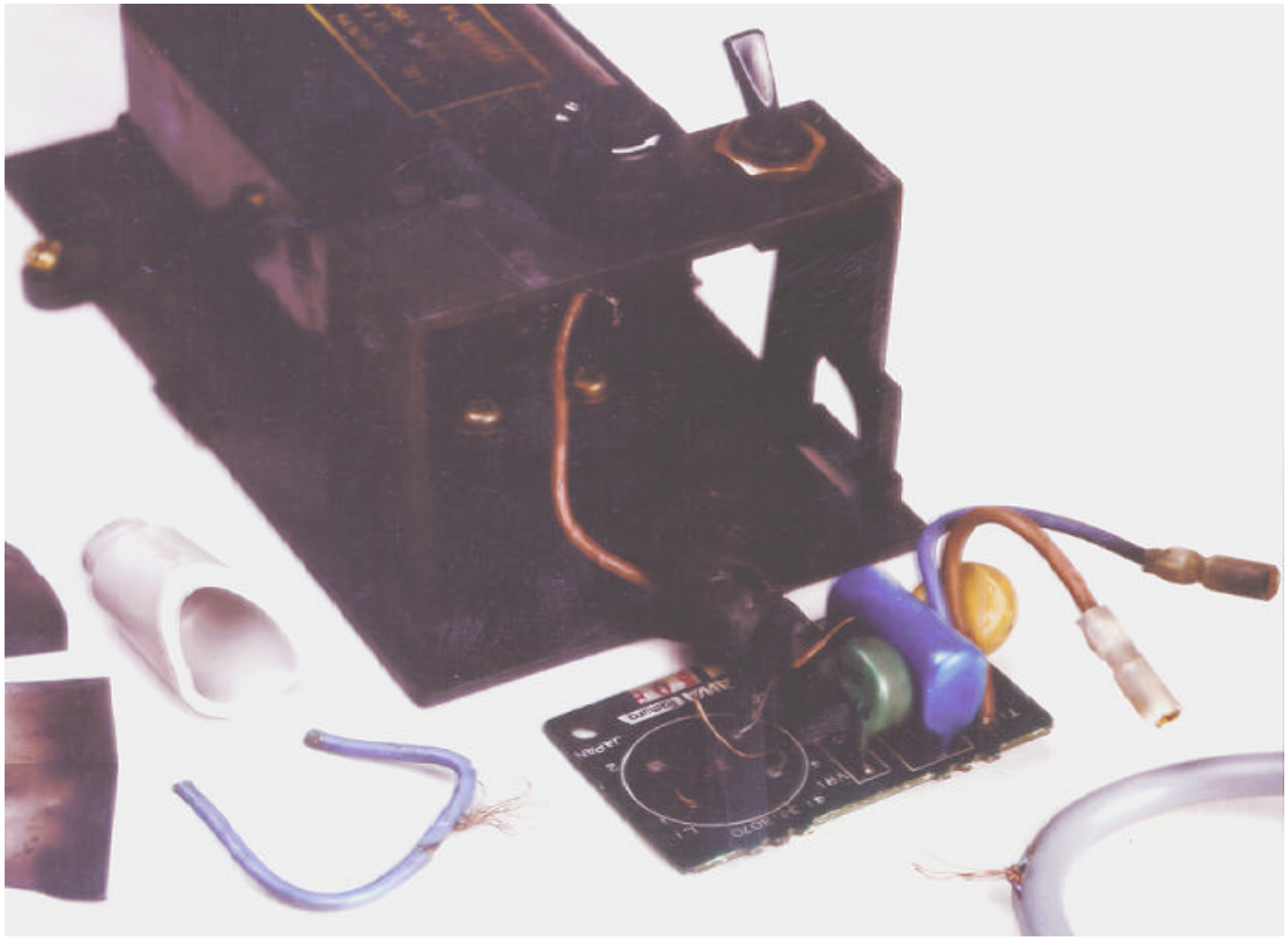
Damage (cont)



Visible damage

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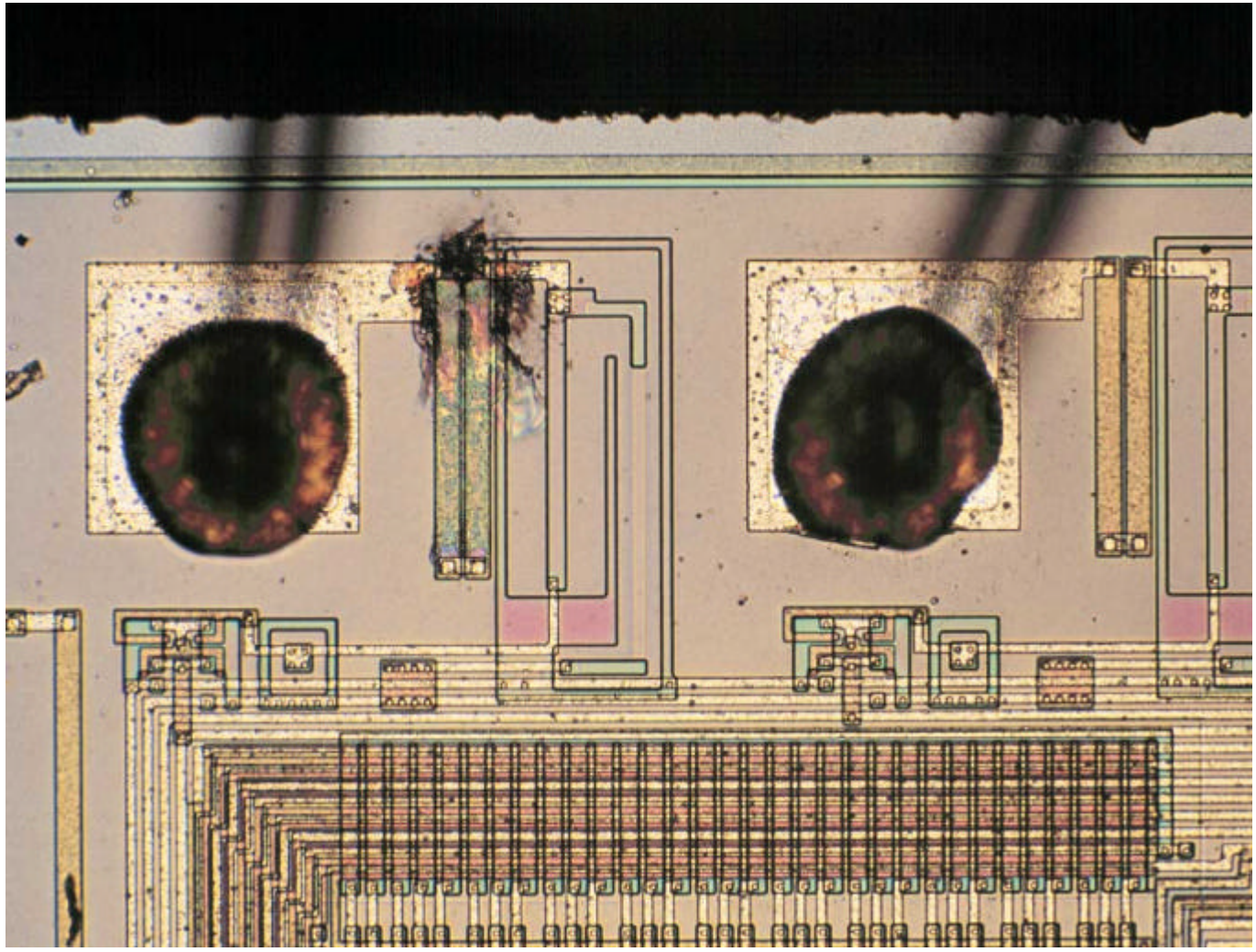
Damage (cont)



Concealed damage

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SG 5 Objective

- Reduce damage due to overvoltages through:
  - Requirements for resistibility
    - Prepare new ones as required
    - Revise existing ones as required
  - Testing

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Revision of Recommendations

- Recommendations are revised as a result of feedback
  - Q10 “Methodology for solving electromagnetic problems in telecommunications installations” will provide information on field damage
  - Contributions are used by members to propose changes

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Laboratory testing

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Using Recommendations

- Example of specifying requirements for equipment in a telecommunication centre
  - K.20 for external ports including
    - Symmetric pair
    - Coaxial
    - Dedicated power feed
    - Mains power

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Using Recommendations (cont)

- K.41 for internal ports
- The operator or Administration needs to choose either the Basic or Enhanced requirement

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Using Recommendations (cont)

- Enhanced requirement may be chosen for one or more of the following reasons
  - Damage is occurring
  - High levels of power induction
  - High grade of service requirements

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Using Recommendations (cont)

- The operator will also need to decide when to install primary protection
  - Recommendation K.11 provides guidance on when to install primary protection
  - More important to protect pairs with more than one service or important services

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Using Recommendations (cont)

- When power induction damage is occurring
- When lightning damage is occurring

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Question time

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