

Case study #	2.5
Title	Damage of 2-Mbit/s HDSL system
Type of trouble	Damage.
Source of trouble	Mistakes in bonding.
System affected	2-Mbit/s HDSL system using copper pair cable.
Location	Telecom centre.
Keywords	Damage, short circuit, mistakes in bonding.
Version date	2004-01-01

System configuration

In 1998, a new 2-Mbit/s HDSL (high bit rate digital subscriber line) system using paired copper cables was put into use by an operator after a pilot-use period. In the summer of 1999, several damages to it occurred. Analysis revealed that all the damaged systems had remote power feeding, and that the damage was caused by a short circuit in a protection component. The immediate action was to change existing equipment in exposed areas to local power feeding when possible, and start discussion with the manufacturer on future action.

Tests revealed that the origin of the damages was 50-Hz induction or earth potential rise voltages rather than lightning transients. The manufacturer decided to re-design the protection inside of the equipment to fulfil enhanced level power induction and earth potential rise requirements of Rec. ITU-T K.20. Systems having this new design were installed for pilot use in spring 2000 and they worked properly all of summer 2000. However, too many systems of the original type were again damaged in 2000. Maybe there were cases where the instruction to change to local power supply was followed. A field survey also revealed another reason: improper earthing of the equipment. A practical example is shown in Figure 2.5-1.



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Figure 2.5-1 – System configuration (An example of mistakes in bonding)