Comprehensive Technical Proposal
For Lightning Protection of Railway Data Equipment
(A proposal given to Chinese Railway Ministry in 2008.)

Hopewell is the DEHN & SOHNE General Agent in China. Company employs 160 people of which 30 are senior engineers.
“Problems with the existing lightning protection:
Lightning protection work has not been done in a systematic and comprehensive way. They have not been installed in a coordinated fashion.”

一、信号设备系统防雷的必要性

1. 雷电对铁路信号设备的严重危害
   ☆ 首先是设备损坏所造成的直接经济损失。
   ☆ 其次是影响铁路车辆运行，带来的间接经济损失和社会影响。
   ☆ 再次是设备受损和重要数据丢失，带来以后列车运行中的安全隐患。

2. 原有防雷工作存在的问题
   ☆ 已做了大量工作，但不够系统也不全面
   ☆ 防雷设备元件分散安装，独立作用，无法起到系统防雷作用
   ☆ 分散接地没有采取等电位连接，达不到系统防雷的效果

二、雷电分析

1. 雷电基础
2. 雷电分类
   直接雷击（10/350us） 感应雷击(8/20us)
3. 雷击过电压入侵信号设备途径原理分析
   配电线路引入雷击
   信号线路引入雷击
   雷电电磁场
   地电位反击

“Lightning Protection Analysis
You must understand the difference between:
10/350 direct lightning
8/20 indirect lightning”
To do a comprehensive lightning protection you need to provide overall system protection. Main protection system is the lightning protection zone system.

LPZ0
LPZ1
LPZ2
LPZ3

This identifies the different types of railway equipment and specifies the associated “Zones” of each.
This slide shows the spark gap protectors recommended for installation at Zone 0 + the others

(Translation: The modules in our boxes are manufactured by Dehn Germany; DC protectors are provided by Germany; models are DEHN GUARD VA series.)