



Direct Line Telephone System

Project Taiwan High Speed Railway

REFERENCE



ms NEUMANN ELEKTRONIK GmbH

Efficient solutions for information and safety

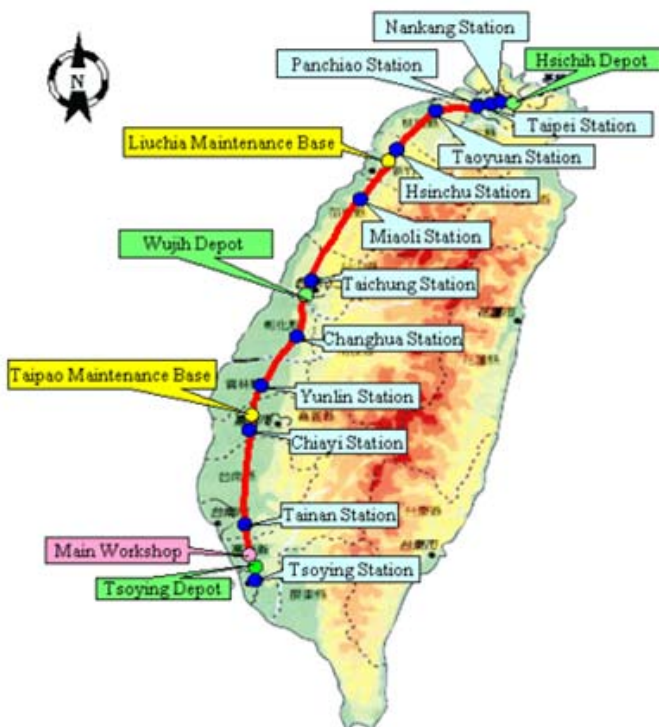
Highest safety level

The primary purpose of this project is to enhance safe, reliable and comfortable communication along and on the new railway line of the Taiwan High Speed Railway. The communication system consists of voice, video and data communication.



It runs approximately 345 kilometers from Taipei to Kaohsiung and is divided into 3 zones: Taipei Station to Miaoli Station, forming the northern area, Miaoli Station to Yunlin Station the central area and from Yunlin Station to Tsoying Station the southern area.

The railway line is presently under construction with its completion scheduled in October 2006.



Communication & safety

The Direct Line Telephone System (DLT) enables emergency and dispatcher calls to be made from the Wayside, Tunnel areas, Passenger Stations, SCH (Signal and Communication Houses), IS CER (Signal and Communication Equipment Room), SCER, Provided Later Stations and Electrification System Buildings to the OCC, and from the Yard Areas to the Depot Control Room – all

throughout the Taiwan High Speed Railway (THSR). Transmissions between the various locations are carried by the Data transmission System (DTS) backbone.

Keeping the highest safety standards, the communications system will be managed by a centralized control system.



The Solution



A Data transmission network provides to serve the operation control centre, maintenance control centre, all passenger stations and the depots. The capacity of the network is expandable to accommodate the future expansion of the high speed railway.

The DLT (Direct Line Telephone System) System itself is composed of two major types of equipment, the "DLT Controller" commonly known as the MDK (Multifunction digital Communication System) and the user terminals. Both are supplied with either a variable configurati-

on or type in accordance with the loading or the environment requirements for the location they are to be deployed in.

The equipment of the projected DLT consists of 20 DLT Controllers/MDK, 1100 direct line telephones plus 6 Voice Recorders.

MDK - versatile, multi purpose system

The MDK is a microprocessor controlled "Direct Line Telephone Exchange" based on a PCM system with a data transfer rate of 2.048 Mbit/s. The specific DLT design package features a modular architecture with standardized plug-in units capable of supporting a number of communications interfaces including - but not limited to - ISDN & analog/digital telephony type connections.

Redundant

This MDK deployed on the THSR is able to handle connections for the DLT system via redundant routes and can accordingly select substitute predetermined connections in the event of a breakdown of either an exchange or trunk line.

Alarm and status information

The MDK also provides alarm and status information to the PMC (Plant Monitoring & Control) System via an Ethernet TCP/IP connection over the local station LAN, providing the PMC system with valuable information on the status of the DLT network that can be accessed by an operator using the PMC system.

Hotline

A Hotline function available at the OCC from the operator console Telephone GUI, is provided by leased line from the fixed network operator. The telephone connection is direct from OCC MDK to the required destinations, such as the Fire Department, Police Station, Taiwan Power Company, Hospital, Taiwan Weather Forecast Center, and Disaster Prevention Rescue Control Center via the CB interface module.

Management system software

From the display an operator is able to identify easily the origins of any call, emergency or otherwise, indicated by a flashing icon(s) on screen for the relevant phone as well as an entry in the 'Events' window, all incoming calls are also accompanied by an audible notification.

The DLT MMI display also indicates the System status and status of User Terminals (Wayside / Platform DLT, Telephone Console and Standard DLT etc), it displays the status of Local Loops, Trunk Lines and User terminals as well as enabling the operator to carry out alarm surveillance.

Recording System

All incoming and outgoing calls to the telephone handsets on the communications consoles are recorded and logged by the DLT Voice Recording System with date and time index.

Voice Recorder Equipment

Innovative Multi channel voice recorders are provided in both the OCC and the depot control rooms enabling the automatic real time recording of all DLT, AT, PA and Radio messages to the control areas. The Voice Recorders at each site are located in either secure places and they feature password protected access control. Configurations differ at the OCC and Depot in accordance with the channel requirements for monitoring at the particular location with the OCC recorder allowing up to 48 channels to be recorded and the depot 16 channels – both units allow 24/24 recording.

User terminals

Wayside emergency telephones are installed along both sides of the tracks including viaducts, tunnels and embankments with the maximum distances between emergency telephones being 3,000 meters on viaducts and embankment and 500 meters in tunnels. These telephones are suitably rated for the environment and hence are provided without cabinet and can be

mounted on either poles or brackets. According to environmental requirements the Junction Boxes supplied for the direct line telephones are equipped with handles on the doors to prevent vandalism and unauthorized access.



Reliability



Maintenance priorities are stated in terms of safety, availability and reliability. It involves monitoring, collecting and evaluating data directly from the MDK.

As part of the maintenance routine, interchangeability of components is vital in order to reduce the 'Spares' inventories required to maintain the DLT system.

The MDK Racks are fed from the local 48VDC UPS backed distribution boards in the equipment rooms. Via separate breakers/fuses power is distributed to the MDK sub racks,

call generator, Wayside/Platform DLT and the "PC Service" module. All modules are protected against short circuits, overload currents and over voltages through the selection of the appropriate breakers/fuses.

The EMC/EMI standards for the DLT system and the accompanying components are adhered to according to the European Norms, e. g. EN61000-6-2, EN50121-4, EN50081-2, EN55022.

Equipment

- 20 MDK
- 23 Management operator's communication consoles
- approx. 50 communication units (telephone + MTSD)
- approx. 900 user terminals (NES 92-based FE)
- approx. 100 ZB telephones
- 6 documentation recorders



Acronyms

GUI	Graphical User Interface
ISCER	Intermediate Signal and Communication Equipment Room
MDK	Multifunction digital communication system
OCC	Operation Control Centre
PMC	Plant Monitoring & Controlling System
PCM	Pulse Code Modulation
SCER	Signal and Communication Equipment Room
SCH	Signal and Communication Houses
THSR	Taiwan High Speed Railway