TIME & FREQUENCY SOLUTIONS www.timefreq.com

Case Study
Dung Quat Oil Refinery, Vietnam

The Challenge

We were approached regarding a requirement for a Master Clock System for a brand new Oil Refinery Plant in Vietnam, run by PetroVietnam and the first of its kind.

They needed a standard time source for date and time stamping events in the refinery sub-systems involved with processing, electrical, safety and emergency events.

The proposed Master Clock System was also required to synchronise the various sub-systems:

- Distributed Control System (DCS)
- Entrance Control Processor
- Electricity Management Control System (EMCS)
- Analogue and Digital Slave Clocks
- Synchronous Digital Hierarchy (SDH) Data Transportation Network
- Closed Circuit Television (CCTV) Server
- Local Area Network (LAN) Server

The Solution

We supplied a M211 High Capacity Modular Time & Frequency System to serve as the central master clock; this supplied a feed to 10 x M210 Modular Tiime & Frequency Systems.

The M211 Master Clock was configured with a relevant selection of modules from our range - this enable TFS to provide numerous configuration combinations for diverse applications, tailored to customers' individual requirements so that unnecessary costs are eradicated:

The ten M210 Modular Timing Systems taking a feed from the M211 Master Clock act as buffer units, which in turn feed into the various control sub-systems and clock displays. They also were equipped with relevant odules to enable interface with the sub-systems.

In addition, we supplied eight M355 LED Digital Time Displays and eight M385 Analogue Clocks, all of which are driven by an RS-422 signal from the M210 buffer units.

The Result

- Increased efficiencies in the oil refinery processes through a proper synchronised control system and electricity management system.
- Improved security due to the accurately synchronised CCTV system and entrance control.
- Data transmission via the SDH is improved with high accuracy G.811 frequency synchronization of the SDH system.
- Consistent time stamps for information captured by the computer servers which are essential for monitoring, control and audit purposes.

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M211
Modular Time & Frequency System

Configuration for Dung Quat

M211 Time & Frequency System modules:

• **Long Distance Antenna System** – provides a stable GPS time input overcoming any signal loss experienced when routing the GPS L1 carrier over long cable lengths to the master clock system.

• **Octal Serial Module** - provides 8 output channels for time data and status, each of which can be configured to provide either an RS232 or RS422 Interface via a 62 way density and a half socket.

• **Intelligent 5-channel Timecode Module** - generates five independent timecode outputs. Intelligent data processing is achieved through an on-board CPU.

• **Telecom Frequency Output Module** - provides three 2.048MHz outputs for use with E1 Megasteam systems. The frequency outputs are locked to the received time broadcast signal and conform to CCITT Recommendation G.703.

• **NTP Time Server Module** - provides the functionality of a Stratum 1 Time Server effecting time distribution via Local or Wide Area Networks.

Power backup

In addition to the modules, the M211 cahssis was fitted with a Dual Power Supply 230V AC +/-10%, 48 – 62Hz – to provide backup in case of power outages.

M210 Time & Frequency Systems modules:

• **Octal Serial Interface with Precision Time Input Module** - provides seven fully independent serial outputs and a single independent serial input specifically configured for the receipt of accurate time synchronisation messages, offering a high level of functionality within a single option slot of the chassis.

• **Intelligent 5-channel Timecode Module**, IRIG-B Time code Output**,** or **NTP Time Server Module** (as per M211)

M211 High Capacity Modular Time & Frequency System

M210 Modular Time & Frequency System

M355 LED Time Display [6-digit]

M385 Analogue Clock

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