PROJECT AT
JAYPEE CEMENT LTD.
(SIDHI, MADHYAPRADESH)

WIRELESS COMMUNICATION FOR
STACKER-RECLAIMER APPLICATION

BY
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NETWORK DIAGRAM

NETWORK FOR LIMESTONE SITE

- Limestone Stacker-Reclaimer
  - 1 Stacker and 2 Reclaimers
- Allen Bradley PLC
  - SLC 5/3
- Siemens PLC
  - S7-400
- Make: Prosoft
  - Model: RLX-FHS
  - 2.4GHz wireless modem
- Make: Prosoft
  - Model: 5105-DFCM-PDPS
  - DF1 to Profibus converter
- Towards CCR
  - Through Fiber optic
CHALLENGES:

- Wireless communication between two different protocols.
- Real time moving application.
- Interlocking of machines was done wirelessly so system must have to be extremely reliable.
- Harsh climate operations.
- Line of sight issues between remote radios and master radio.
PROJECT DETAILS:

- Application was to control the moving machine that is Stacker- Reclaimers in material handling section remotely at control room (CCR).
- Plant was having 2 pairs of material handling sections to prepare and handle stockpile of raw material required for process of cement formation.
- Considering Limestone network, machines are moving in the field to and fro on the tracks having length of about 600 meters.
- For controlling and monitoring of these machines PLC (SLC 5/3 make: Allen Bradley) installed on machines have to be communicated with Siemens PLC (S7-400) installed in Load controlled centre 1 (LC 1) in front of the field.
- SLC 5/3 is having protocol DF1 whereas S7-400 is having Profibus.
- SWTPL wireless devices successfully established the wireless link between moving machines and the protocol converter module (Make: Prosoft) in the LC1.
- Further ahead Data communication is established between both PLCs using Protocol converter module and from there communication is done with PLC in CCR through fibre optic.
- Now coming to Lignite network, communication was having problems of line of sight. That is master radio was not having direct line of sight with remote. This was because both machines of Lignite section were in concrete shed and there were heighted plant building were coming in between CCR and lignite site.
- This problem was solved installing stand alone repeater on a heighted building such it was having clear line of sight with both Master antenna and remote antenna and through communication was established.

SYSTEM INTEGRATION DETAILS:

- **Prime Bidder:** Sofcon Solutions Pvt. Ltd.
- **Wireless installation:** Sheetal Wireless Tech. Pvt. Ltd.
- **End Customer:** Jaypee Cement Ltd., Sidhi, Madhya Pradesh.
- **Type of system:** Wireless communication between raw material handling section and control room involving protocol conversion.
- **Operating Frequency:** 2.4 GHz (Unlicensed band)
- **Maximum distance of wireless communication link:** 800 meters for each machine.