

S.No.	Project	Problem	Execution Details
1.	<p>1. Vindhyachal Super Thermal Power Project, Vindhya-Nagar, Sidhi, M.P India</p> <p>Kahalgaon Super Thermal Power Project, Kahalgaon Bhagalpur, Bihar India</p>	<p>Problem Area : Automatic Control System Item Name: Automatic Control System Modules Supplier : Russian make No of modules : 40</p> <p>Problem :</p> <ol style="list-style-type: none"> 1. The O.E.M. was not supporting the supply of spares. 2. The IC's (Micro Circuits) used were not inter-National generic IC's 3. The module is like a "Black Box", the device parameters are not transparent. 4. Components sourcing addresses were not available. 5. The literature was not adequate to understand the details of the module. 	<p>Solution Provided : This was the most challenging reverse engineering job. The following are the execution details.</p> <ol style="list-style-type: none"> 1. Reverse engineering methodology was adopted. 2. The module functional details, voltage & other Electrical parameters data was collected. 3. The data collected was synthesized and suitable circuits were designed 4. The circuits were assembled & tested for Conformity to the functionality and electrical parameters. 5. Modifications & fine tuning of the circuits was carried out till they match with the data of original equipment. 6. Detailed engineering & documentation was carried out . 7. Modules were productionised and tested initially in lab environment. 8. After successful lab testing, they were tested in field and in plant environment. 9. This process was used for developing all the Automatic Control Modules.

ADVANTAGES:

Black box to open book: The electronic hardware which was in the form of black box i.e hidden and non-transparent, has been converted to open book, and total transparent technology.

Standard International Generic Components:

International generic components were used, Hence sourcing & procurement is made easy.

No-customised (Made to order) components:

Customised components / transformers or Inductive components were replaced by standard components available in market off the shelf.

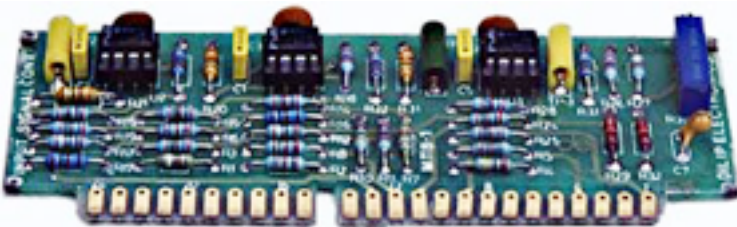
Latest art of technology : Wherever possible and required the latest technology was used, maintaining the original mechanical, electrical and environmental specification in tact.

Improvisation: Functional / Sectional wise test points were provided to help diagnostics at sub module / module level.

Self Reliance : Total long term self reliant solution was achieved.



Obsolute Electronics



Re-engineered Solution

2. 1. Kahalgaon Super Thermal Power Project, Bhagalpur, Bihar India

Problem Area: Turbo-Generator Vibration Monitoring System
Instrument : Vibration Voltage to mA Converter
Supplier : Russian

Solution Provided :
 1. Most compact precision galvanic amplifier with integral power supply unit was designed

2. Vindhyachal Super Thermal Power Project,

Vindhyanagar, Sidhi, M.P India

Problem : This is a precision galvanic isolation amplifier with separate power supply unit. These instruments were giving regular maintenance problem due to the following.

2. Optical isolation technique was employed in place of inductive coupling to avoid custom made transformer procurement problem
3. Total number of connections were reduced from 32 to 7 numbers
4. The connections were made through quick connect & disconnect terminals to avoid soldering & de-soldering problem with mother board.

1. The amplifier module was soldered to the mother board with 22 pins. Hence for every testing & repair of this amplifier, it's de-soldering & soldering from mother board was a compulsory pre-requisite, with this the copper pads & tracks were becoming weak & defective during every maintenance, causing further deterioration in performance & reliability
2. Secondly, the power supply unit was a separate unit and connected to the Amplifier through ten flexible wires. Hence for every testing & repair, these connections are to be de-soldered and the power supply unit is to be dismantled from amplifier unit. This was also causing deterioration in connectivity and associated problems.
3. Custom made inductor coils were used, which were difficult to procure & replace

ADVANTAGES:

Reliability : Improvement in reliability was achieved due to improvement in modular integrated design, connectivity & compact packaging.

Maintainability : Easy and quick replacement of modules due to quick connect & disconnect terminals.

Better Technology : Improved optical isolation technique is employed.

Compactness : Compact amplifier with built-in power supply unit is designed.



Obsolete Electronics



Re-engineered Solution

