



**Detailed
Engineering**

| Design | Analysis | Audits | Training |

Defines, designs and delivers technology enabled business solutions for the companies. We provide a complete range of services by leveraging our domain, business expertise and strategic alliances with leading technology providers.

VB Engineering is trusted for the quality of its services in power system engineering and planning attained through its in-house expertise and commitment to business objectives of its client. As a broad based technical professional consulting firm, we offer a wide range of services to help our clients to maintain a competitive edge in their respective markets.

Services

- ❖ Design
- ❖ Analysis
- ❖ Audits
- ❖ Training

Products

- ❖ Neplan
- ❖ Bluesol
- ❖ Flexsim
- ❖ Edgecam
- ❖ Eca 3g
- ❖ Win rar
- ❖ Solidworks

Design

- ❖ Cad Drawing Preparation
- ❖ 3D Drawing Preparation
- ❖ Isometric Drawings
- ❖ Optimal Floor Planning
- ❖ S L D Preparation

Analysis

- ❖ Stress Analysis
- ❖ Displacement Analysis
- ❖ Arc Flash Analysis
- ❖ Load Flow Studies
- ❖ Short Circuit Studies
- ❖ Relay Coordination Studies
- ❖ Harmonic Analysis

Audits

- ❖ Arc Flash Audit-NFPA70E
- ❖ Energy Audit
- ❖ Electrical Safety Audit
- ❖ Lightning Arrestor Audit
- ❖ HAZOP Study
- ❖ Earth Pits Audit
- ❖ Thermography Audit

Training

- ❖ Electrical Safety Training
- ❖ CAD Training
- ❖ GIS Training

Certifications

- ❖ Arc Flash
- ❖ Solidworks
- ❖ Flexsim

"A perfect blend of Safety and Engineering I ever received"



SHAILESH AHALE
PM, FMC INDIA

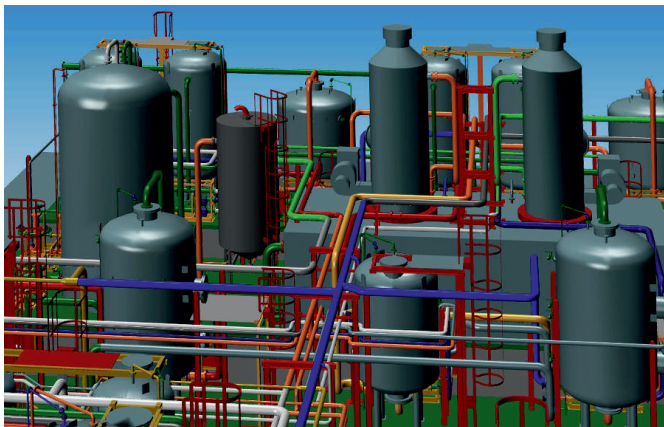


Time to Engage with India's Top Industrial Digitisation Partner

Plants are more complex and more integrated. Companies bring new processes and products to market more quickly.

We partner with our customers to maximize process performance and deliver measurable improvements in efficiency, resource conservation, product safety, and plant sustainability.

VB engineers design & develop P&ID drawings, process flow diagrams, 3D models, Building Information Modelling (BIM), and electrical wiring diagrams



Process development reimagines a system design to prevent errors before the system is built. The work will produce modified process criteria that can be

Our in-house design engineering and detailed engineering team combine flexibility with technology, innovation, expert analysis and complete solutions, giving client's customizable and adoptable options for their project. Concept to detailed design, development, 3D simulation, Detailed Engineering and validation and optimization activities, VB delivers solutions tailored to client requirements for every milestone of the design.

Our multi-disciplinary design, engineering and consulting services in various streams provide Conceptual/Feasibility Studies, Front End Engineering Design (FEED) and Detailed Engineering as a combined package at SPOC solution.

- **Process Engineering**
- **PFD & P&ID Creations**
- **Piping Engineering**
- **3D Model Creation**
- **3D Simulation**
- **Isometric Drawings preparation**
- **Lean Simulation studies**
- **Structural Analysis**
- **Instruments & Controls Engineering**
- **Finite Element Analysis (FEA)**
- **Computational Fluid Dynamics (CFD)**



Load Flow Studies

Objective :

- Is your plant running in happy loading Condition?
- Are you aware of the present load distribution in your system?
- Has the load in your plant undergone any changes after installation?
- Is your connected load, drawing more power?
- Regular power factor failures?
- Any overheating of device/equipment?

Get your load flow studies done today to achieve optimum power usage with negligible line losses by improving the reliability and efficiency of the system.

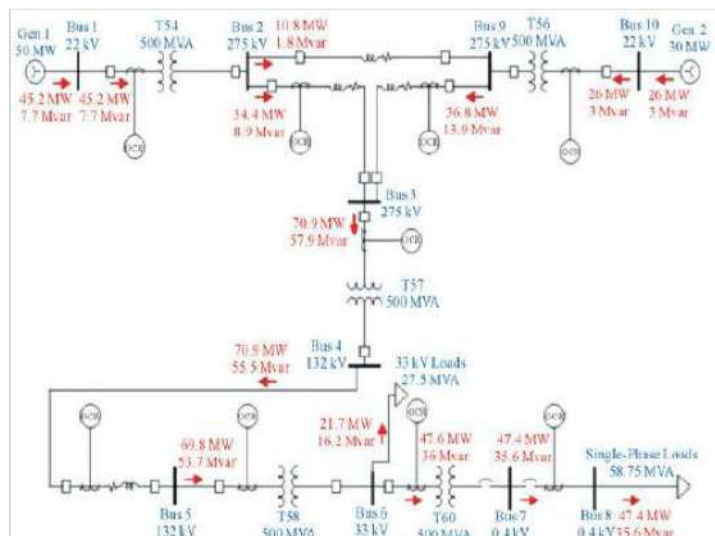
Load Flow studies help you for planning future expansion of power systems as well as determining the smooth operation of existing systems. By performing the study you can know the loading condition of the system and performance of the cables, circuit breakers and other electrical devices.

Methodology :

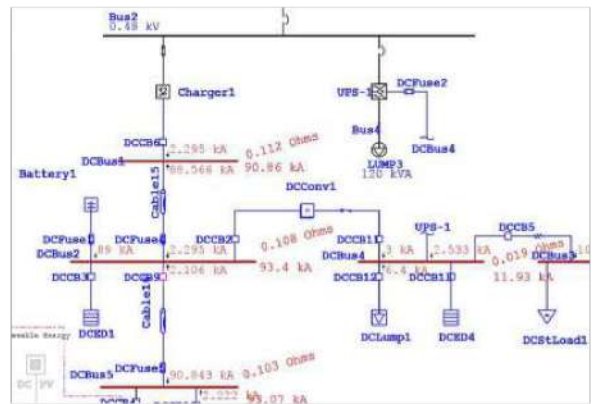
- Plant visit for Data collection.
- SLD building.
- Running the load flow analysis with respect to loading conditions.
- A detailed report on the voltage drops and line losses.

Highlights :

- Loading effects will be reported with proper solution(over loading and under loading).
- Overheating of cables and devices due to operating conditions will be eliminated.
- Decrement in life of equipment and components will be improved.
- Optimization of component or circuit loading with rated network parameters.



Short Circuit Studies



Objective :

- Is the protection given adequate against short circuit hazards?
- Did your device/equipment exploded or burnt in the event of fault?
- Have you ever calculated the available short circuit currents?

Short circuit accident is not just a casual one. It costs very badly. With today's high fault currents, it's more important than ever to protect electrical equipment from extremely high current levels. Otherwise, the equipment may explode as it attempts to interrupt the fault.

Short circuit study will help you avoid extensive equipment and system damage and personnel injury because of under-rated equipment in the event of a fault.

Methodology :

- Plant visit for Data Collection.
- SLD Building.
- We calculate the maximum fault levels at various locations.
- We evaluate the application of breakers and fuses.
- Report and Recommendations for the equipment's/devices

Highlights :

- You will know whether the equipment is properly rated for the fault current it is experiencing during a short circuit.
- Reduces the risk, a facility could face and help avoid catastrophic losses.
- Increases the safety and reliability of the power system and related equipment.
- Evaluates the application of protective devices and equipment.



"Most feasible and economical engineering solutions I have witnessed"



Vinod Ram
Head EHS, HARSCO INDIA

Harmonic Analysis

Objective:

- Are you experiencing any voltage or current distortions?
- Is your capacitor bank sufficient to maintain power factor?
- Do you observe fluctuations in your power profile?
- Ever observed your equipment performance not optimal?
- Thought of checking your harmonic levels?

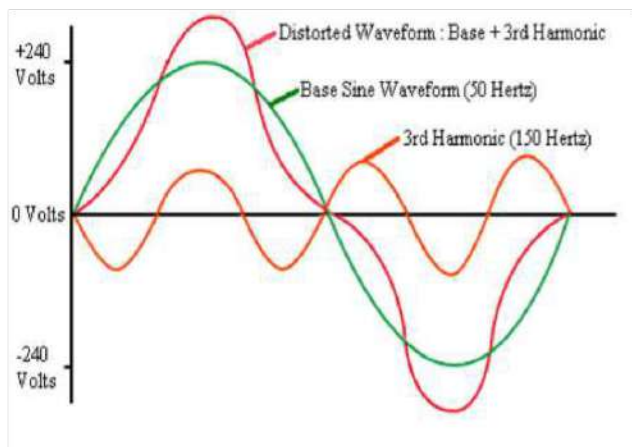
Harmonic analysis will find a solution for you. We help you find out the harmonic distortion and order of harmonics in the system and also suggest Power factor improving methods to reduce the TOD penalties. With the new technologies in the market we can monitor or detect the harmonics regularly in the system. Our services include remedial actions including necessary filters design and supply.

Methodology:

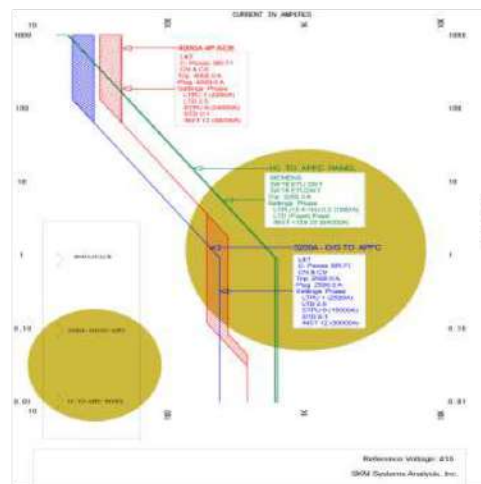
- Plant visit for data collection.
- Field monitoring program.
- Data analysis.
- List of non-linear loads across the distribution transformer.
- Capacity of installed capacitor bank/APFC panel and its location.
- Report preparation.
- Filter design and supply.

Highlights:

- Based on the audit findings and detailed analysis, the power quality audit report is prepared and verified to be in accordance with IEEE-519:1992 standards.
- Also the power quality issues if observed are highlighted and the audit findings is submitted.
- Based on the final observed data across the measured feeders, the recommendations/proposal for the harmonic filter implementations are derived and submitted.
- Harmonic mitigation techniques will be suggested.



Relay Coordination Studies



Objective:

- Are you experiencing any nuisance tripping in your plant?
- Have your protective devices failed to isolate during fault conditions?
- Are your upstream and downstream devices are functioning on time, have you observed any deviations?
- Not sure about the relay settings and tripping values of protecting devices?

By performing Relay Coordination studies, we will solve the nuisance tripping, maintain the coordination between the protective devices and to give the proper relay settings and tripping values to the protective devices.

Methodology:

- Plant visit for data collection.
- Preparation of SLD with library.
- Performing short circuit calculations at each and every feeder.
- Detailed study of the protection in hierarchal manner.
- Recommendations of new settings/devise for better protection and coordination.

Highlights:

Proper application and coordination of over-current relays and other protective devices is vital in a system requiring reliable electrical Service. VB Engineering expert engineers bring the critical experience needed for the proper application of ANSI and NEC requirements to equipment protection.

In addition to relays that respond to short circuits, low voltage breakers, differential, power, under voltage, out-of-step, and other special protective relays often need to be set.

Arc Flash Audit-NFPA70E

Objective :

- Did you ensure the safe working environment?
- Are you in compliance with OSHA and NFPA 70E?
- Have you ever done the risk assessment of electric shock and arc flash?
- Are you aware of hazard prone severity in your plant at the event of arc flash?
- Are you aware of the PPE levels for arc flash?

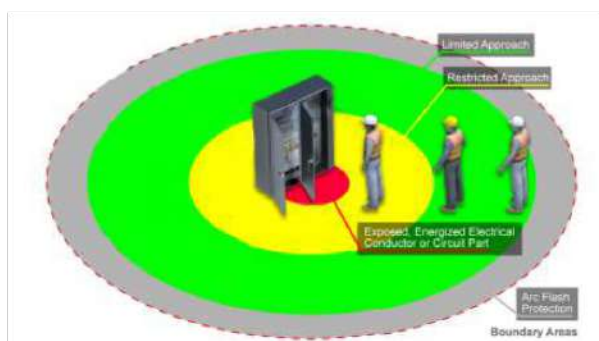
The most hazardous situations are when someone is working on or near energized equipment, the equipment doors may be open, working close to electrical components, conductors, and connections. By performing this analysis, you will know the standard protective measures and precautions/preventions to be followed against arc flash for the safety of employees.

Methodology:

- Plant visit for data collection.
- SLD building.
- Data analysis and documentation.
- Label preparation and installation.
- Training for employees.

Highlights:

- The arc flash intensity (incident energy release) will be calculated at every electrical bus and protective device
- The safe distance (arc flash boundary) from where the persons will not be harmed by an arc flash will be calculated.
- PPE levels will be defined for every exposure location, describing in detail i.e. what PPE needs to be worn in order to avoid injuries
- By conducting this analysis, an organization will be able to reduce exposures, reduce the need to wear heavy (cumbersome) PPE.
- Provides knowledge to select the best possible PPE for electrical workers -both qualified and unqualified.
- Ensures a safe work environment in compliance to the applicable articles and NFPA 70E



Electrical Safety Audit



Objective :

- Have you ensured your workers safety?
- Is electrical Safety in you practice?
- Ever Checked the electrical hazards in the system?
- Have you identified any overloading of cables, transformers and motors?

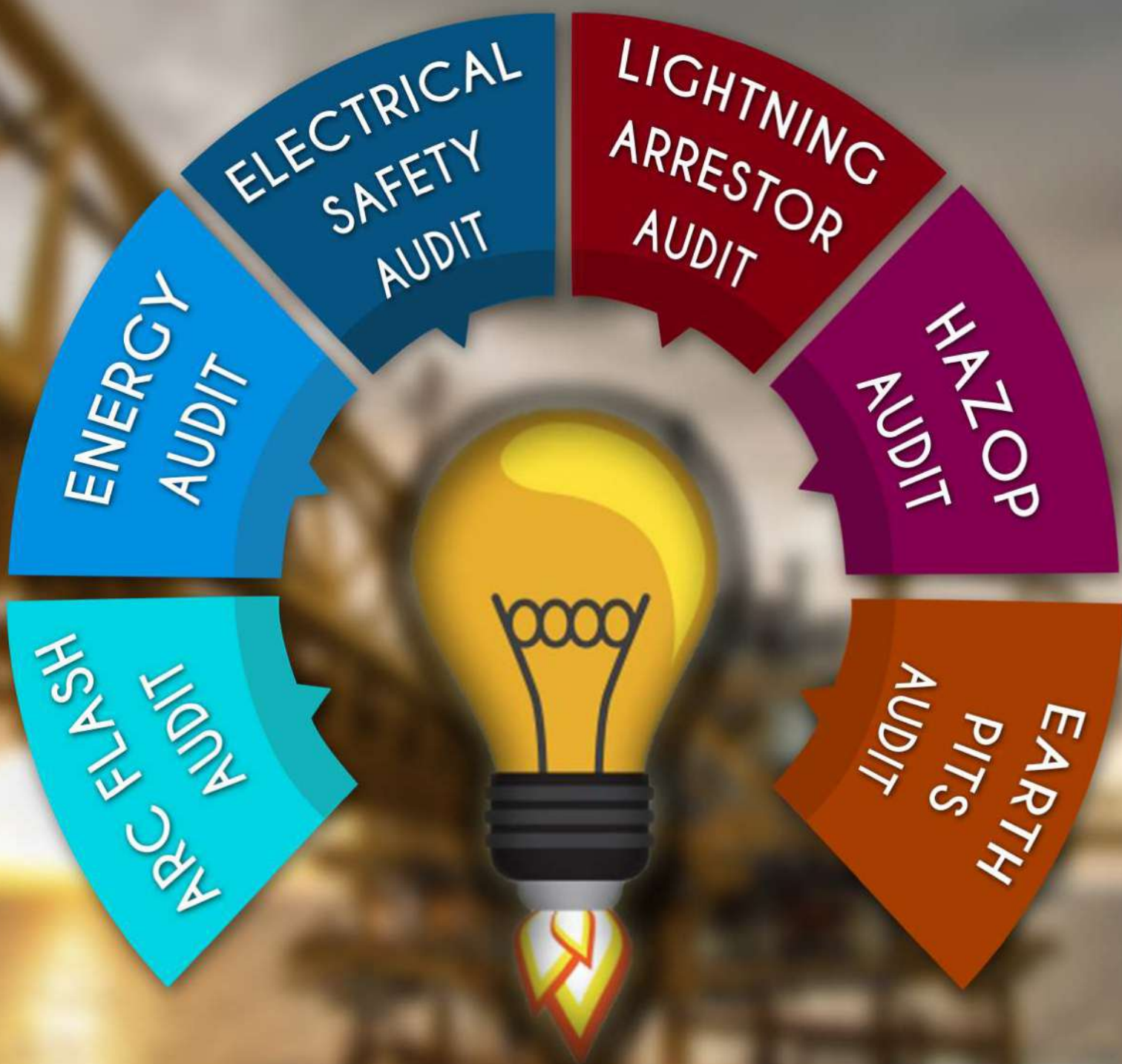
If your answer is "yes" then its time for an electrical safety audit. Electrical hazard in your facility may lead to loss of business, personnel and equipment. Electrical hazards are very dangerous and can be fatal too. Electrical Safety Audit is an effective way of managing the loss by identifying and correcting the inappropriate work procedures followed in the facility. It also involves reviewing the earthing and lightning protection systems as per international standards.

Methodology :

- Physical examination to distinguish electrical risks and to recommend electrical safety arrangements.
- Confirmation of statutory consistence as for Central Electricity Authority and Indian electrical safety rules.
- Survey of electrical mischances and close misses in the plant to distinguish the underlying drivers.
- Audit of electrical systems and techniques (work permits, interlocks, lockout labels).
- Evaluating the importance given to basic electrical safety in the organization.

Highlights :

We at VB Engineering provides a complete range of Electrical Audit Services with best reference and guidelines adopted across the globe. We perform safety audit based on the electrical safety standards.



Lightning Arrestor Audit

Objective :

- Is your facility located in lightning prone area?
- Have you protected your equipment against lightning hazards?
- Not confident about existing lightning protection at your facility?
- Is your lightning protection in compliance with IS 2309:1989 and IS/IEC 62305 stds.?

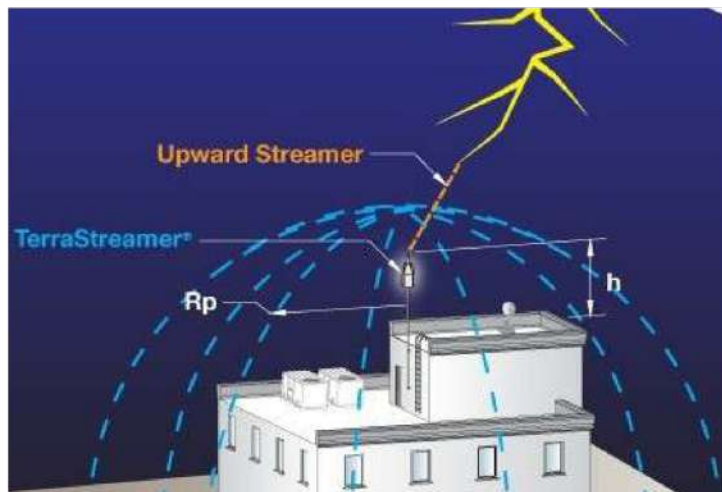
Don't take a chance. We all know that lightning can't be controlled, the only thing we can do is taking adequate protection against it. This study helps you assess the adequacy of lightning protection at your facility. Lightning is a fatal force that can destroy your equipment, buildings etc., It is estimated that millions of rupees of property damage annually.

Methodology :

- Review of the existing protection system in the plant.
- Physical inspection of the plant premises to study the layout of lightning protection system.
- Suggesting suitable lightning protection system where applicable as per international standards IS:2309:1989 / IEC 62305-3:2010.
- Suggesting maintenance aspects pertaining to lightning protection system.
- Review of Lightning earthing system.

Highlights :

With the increase in Sensitive electrical equipment's in the work space, the need for protection against the dangers of Lightning has been increasing. We at VB Engineering provide you a comprehensive report on the adequacy of lightning protection system at your facility, which includes drawings of the area protected under existing Air terminals and earth pit maintenance schemes.



Energy Audit



Objective :

- Is your power bill worrying?
- Are you paying fines for maintaining poor power factor?
- Is your plant running with optimum power utilisation?
- Do you think compressed air leakages have less impact?
- Are you planning to increase your load?

Time Reduce the operating cost and maximise your profits by effective use of electric power. Energy Audit is an approach to identify wastage and inefficient usage of power and recommending the latest alternatives, suggesting energy conservation techniques to achieve balance in power utilisation.

Methodology :

- Physical inspection of the facility.
- Studying the Energy utilization pattern.
- Review of loading on Transformers and line losses.
- Identifying Energy consuming devices and suggesting alternatives.
- Review on historic power bills.

Highlights :

The energy audit process goes both conventionally and unconventionally targeting reduction in energy consumption. An improvement in energy efficiency within your Facility can bring significant benefits by avoiding energy waste. With this in mind, Certified Energy, Certified Auditors of VB Engineering are providing energy audit services to help you find improvement opportunities. We Perform an economic analysis on the available alternatives to determine which best suits your needs and adoptable.

Hazop Study

Objective

- Is your industrial installation in a safe and reliable functioning condition?
- Have you followed effective approach to analyse hazards at work place?
- Are you planning to start a new process?
- Hazard and operability (HAZOP) study is one of the effective ways to tackle the safety needs at the primary stage. It is a systematic approach to identify the possible hazards in workspace. The HAZOP is used to identify the problems even during the early stages of project development, as well as identifying the potential hazards in existing system. It is used to minimise the type of potential hazards presented in vicinity of electrical installations.

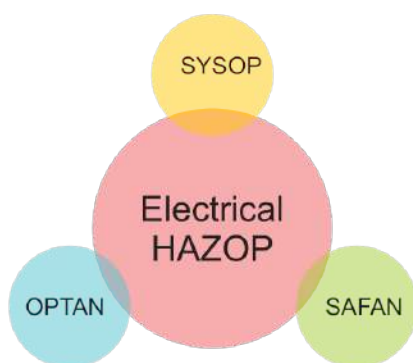
Methodology:

- Collect the data.
- Understanding the procedures and process.
- Define the problems for the interest of analysis.
- Sub divide the system and develop deviations.
- Conduct HAZOP reviews.
- Use the results for giving recommendations.

Highlights:

- HAZOP analysis is used as the first step in process to assess risk.
- The result of HAZOP analysis is the identification of different types of faults.
- HAZOP for phases of plants life.
- HAZOP by logical and symmetrical approach to determining the problems.
- Methods for reducing the damage of plant
- Improving the production quantity or quality

HAZOP study is a guided team work. Vast experienced VB Engineering team Shall Identify each element and its parameters, Considering the Effects of Variation and Failure Points to suggest control and safe methods.



| | |
|-------|-------------------------------------|
| SYSOP | System Security & Openability Study |
| SAFAN | Safety Analysis |
| OPTAN | Operator Task Analysis |

Earth Pits Audit



Objective:

Earthing plays an important role in electrical system for safe and proper operation of any electrical installation. Every electrical equipment, appliance system must be earthed or grounded to obtain a low resistance path for dissipation of current in to earth.

- Have you performed any earth pit continuity test?
- Are your earth pits regularly maintained?
- Not sure whether your earth pits resistance in permissible levels?
- Have your earth pits installed according to IEEE 80-1986 standards?

We at VB Engineering are offering superior quality earth pit testing services to our esteemed clients.

Methodology:

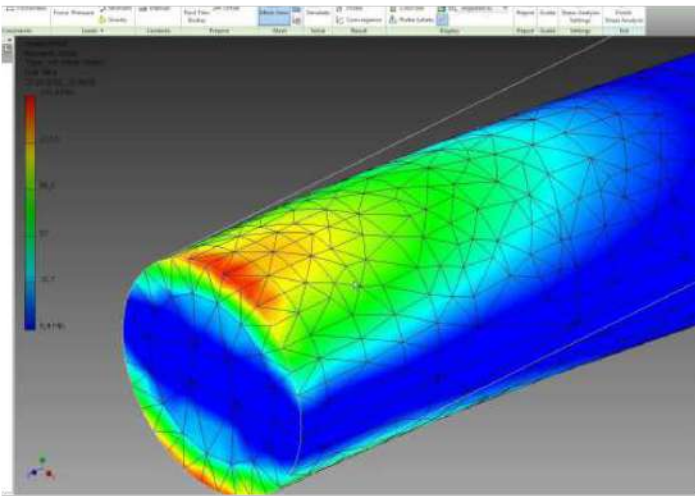
- Remove all plugs and adapters from sockets
- Remove wires from earth leakage unit to test that it's working like it should
- Remove all the neutral wire one at a time and test after each wire is removed

Highlights:

- To save human life from danger of electric shock.
- To protect buildings, machinery and appliances under fault conditions.
- Equipment failure malfunctioning specially in computers, electronic equipment's motors
- To ensure that all exposed conductive parts do not reach dangerous potential.
- To prevent over voltage or excessive voltage on the appliances or equipment.
- To provide stable platform for operation of sensitive electronic equipment.



Stress Analysis



Objective :

- Your machine components loading capacity is as per standards?
- Ever verified where the load acting on components?
- What is the life span of components you are using?
- Are you sure about the correctness of the materials properties?

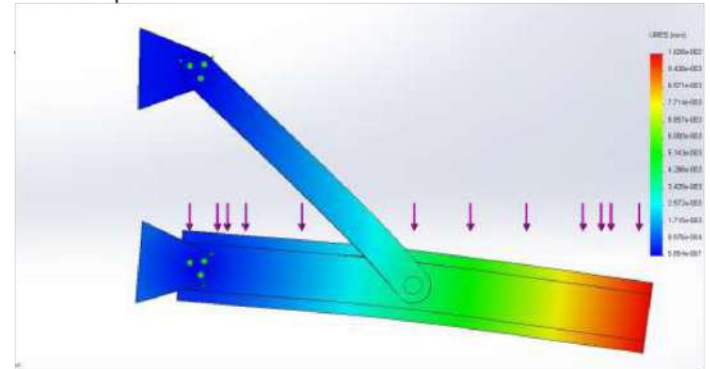
The VB team can help you solving all your above problems by providing comprehensive stress analysis. Our problem solving method will start by identifying the root cause. We extend our services to various industries related to piping, Oil & gas, energy & power, Medical appliances, Thermal plants etc.

Displacement Analysis

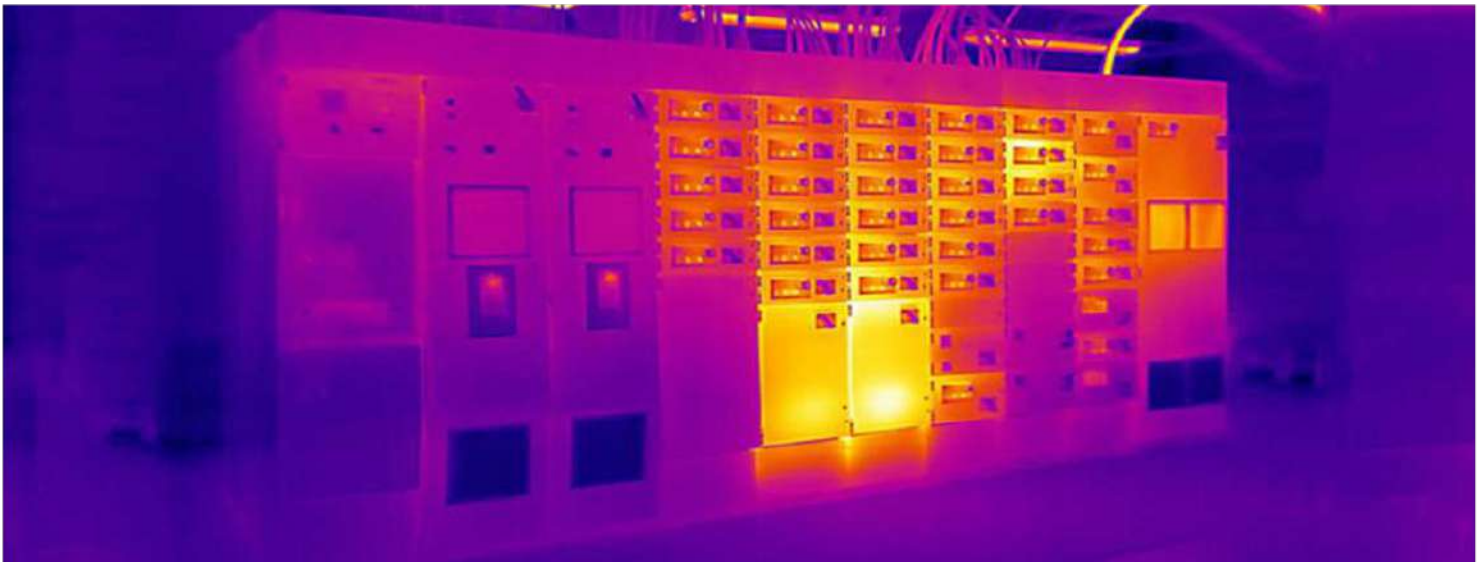
Objective :

- Ever observed your mechanical machines have correct motions after actual manufacturing process?
- Did you check your components are in permissible limits of displacement?
- Your mechanical parts having allowable limit even when we add maximum loads?
- Are your mechanical components fail on fixed ends?

When a load or force acts on a component it will have some residual stresses and strains, which causes some deviation in mechanical properties like tensile and compressive forces. These are main cause to elongation, compression and deformation in a material, these comes under displacement properties of an object.



Thermography Audit



Objective :

- Do you have right tool to track thermal performance of your equipment's ?
- Have you performed Thermal condition assessment at your facility?
- Thermal loss, moisture intrusion, air leakages causing problems?
- Don't get the reason for melt down of cable terminals?

VB team helps you to identify and rectify equipment issues before they become problems.

Routine inspections and preventive maintenance can reduce failures but they cannot reliably identify trouble spots.

Thermography Audit can help keep small issues from becoming disasters.



www.vbengg.com



VB Engineering is committed to the skill development of the employees and enthusiastic persons. We give extensive training to both client level and academic level to cope with industry requirement. Our mission is to provide profession related training as per industry standards.

Our Learning partner www.vbtrainings.com

Training

- ❖ Electrical Safety Training
- ❖ CAD Training
- ❖ GIS Training

Certifications

Solidworks:

- ❖ CSWA
- ❖ CSWP
- ❖ CSWE

Flexsim:

Training with certification

ArcFlash:

Training with certification

PRODUCTS



NEPLAN Electricity is a software tool to analyse, plan, optimize and simulate networks. The user-friendly graphical interface allows the user to perform study cases very efficiently. The customizable software has a modular concept and covers all electrical aspects in transmission, distribution, generation / industrial networks. It suits best for

- ❖ Renewable energy system and
- ❖ Smart Grid application



FlexSim simulation software makes it easy to analyze and optimize any system in any industry. FlexSim is simulation software that models, simulates, predicts, and visualizes systems in manufacturing, material handling, healthcare, warehousing, mining, logistics, etc. It is both powerful and user-friendly. FlexSim helps to optimize current and planned processes, identify and decrease waste, reduce cost, and increase revenue. At FlexSim Software Products our goal has been, and always will be, to create the best simulation software.



Edgecam is market leading CAD CAM software for CNC programming. With unparalleled ease of use and intelligent toolpath generation, it's the only CAD CAM system needed for 3D Milling, Mill-Turn Machining and Multi Axis Machining.



SolidWorks is a solid modeling computer-aided design (CAD) and computer-aided engineering (CAE) computer program that runs on Microsoft Windows. SolidWorks is published by Dassault Systèmes. Solidworks Mechanical design automation software is a feature –based, parametric solid modeling design tool which takes advantage of easy to learn windows graphical user interface. SolidWorks having various features of 2D designing, 3D Modeling, Assembly and analysis of components in various fields.



Bluesol is a software for the design of photovoltaic systems in every country in the world. It allows you to perform the entire process of designing a PV system, from the preliminary assessment of producibility to the realization of the project documentation. BlueSol is a product made with a standard Microsoft interface, very easy to use but at the same time manages every detail of the PV system.



WinRAR is a powerful archive manager. It can back up your data and reduce the size of email attachments, decompress RAR, ZIP and other files downloaded from Internet and create new archives in RAR and ZIP file format.



ECA 3g digital grounding system is known for providing protection to advanced networked electronic IT based systems since 1999. Eca3g provides total lightning protection solution pursuing 100% perfect protection, and has implemented remarkable successful performances with 99.88% protection rate for 16 years. Various models available.

OUR GLOBAL PRESENCE



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