

CEEAMA *Live Wire*

E-NEWSLETTER

Published by Consulting Electrical Engineers Association of Maharashtra

Topic for January 2025
GENERATOR (DG/TG)



CEEAMATECH

2024

SESSION 2
MV SWITCHGEAR - MV PANELS & PROTECTION SYSTEMS

21st December 2024 @ The Fern, Lonavala

CEEAMATECH 2024.
2nd Session conducted on 21st December 2024

Electrical Consultants Newsletter
Volume No. 4 Issue #46
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Hon. President



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Mr. Subhash L. Bahulekar
Chief Editor - CEEAMA LIVEWIRE

From the Editors Desk,

Wish you all a very Happy Year!!!

As we usher into the new year, we are excited to proudly commend our President Mr. Veejhay Limaaye for painstakingly arranging CEEAMATECH 2024 at The Fern, Lonavala on 21st December 2024, Session 2 of the Workshop series on LV & MV Switchgear. Sincere thanks also to CEEAMA GC members and CEEAMATECH committee members for making this event a grand success and memorable one! Sponsors, Exhibitors and delegates appreciated the contents of the workshop!

Our president has even compiled and published a 135 pages book on Protection Systems authored by Prof. Y.K. Pandharipande. It was distributed free to all attending participants!

We are also proud to mention our Safety expert, Mr. Ulhas Vajre for conducting regular training sessions on Electrical safety. One such training was conducted by him in a chemical plant last month on CEA Safety Regulations 2023, NEC 2023 and NBC 2016 for the middle and top management.

Glad also to share that our Secretary Mr. C.V. Joshi was one of the special delegates (speaker) for a seminar on "Transforming Healing Places into Safe & Secure Spaces" on 7th December 2024 at Dr. Nitu Mandke Convention Centre in Mumbai.

As, we at CEEAMA take every possible responsibility to educate the masses on electrical safety, its individual's prerogative to observe safety and spread the good word!

Stay safe in 2025!

Subhash L. Bahulekar

Chief Editor – CEEAMA



From the President's desk:

Dear friends,

Reflecting on the impactful events of the last quarter of 2024 during my Presidential term, we successfully organized two sessions in CEEAMATECH 2024-25. The event on LV Switchgears and LV Panels delved into the crucial aspects of selecting and applying proper switchgears, following the guidelines of IEC 61439 and exploring various mechanisms aligned with this standard. A notable highlight was the detailed case study on large rating Bus bar arrangements.

Moving on to the second event focusing on MV Switchgears and Protection Systems, we discussed the significance of IEC 62771-100 & 200, the evolution of MV Switchgear technology, upcoming trends, Instrumentation Transformers such as CTs & PTs in MV protection systems, and the integration of IEC 61850 Sub Station Automation Protocol. The technical session on relay settings and related issues provided valuable insights into protection systems.

A special mention goes to Shri Nitin Suryavanshi, the Electrical Inspector from Pune, for his enlightening session on the mandatory requirements and guidelines of IEC/NBC/CEA, which garnered high praise from all participants.

During these events, we also unveiled the book on Protection Systems authored by Shri Y K Pandharipande for which I had the honour to compile, a gesture made possible by the support of our participants and sponsors. Additionally, we honored our esteemed senior and founder members, Shri Mohan Kelkar ji and Shri Sharadchandra Gogate ji, whose presence and inspiration were invaluable.

I extend my gratitude to the Event Chairman, Shri Narendra Duvedi ji, office bearers, and the entire Governing body for their unwavering support and dedication.

Looking ahead, mark your calendars for ELECRAMA 2025 at Noida from 22nd to 26th February.

Wishing you all a "HAPPY & PROSPEROUS NEW YEAR 2025"!

Warm regards

Mr. Veejhay Limaaye

Hon. President

CEEAMA

The advertisement features a blue header with the text "Single Phase AC Energy Monitor" and a sub-header "Smart metering device on which you can rely". To the right is the RISHABH logo. Below the text are six icons with descriptions: a sleek device icon for "Sleek, Smart & Powerful Design"; a plug icon for "Direct Connection upto 45A/100A"; a bidirectional arrow icon for "Self Powered Bidirectional (Import / Export) Energy Meter"; a digital display icon for "1 Digital Input for Back-up sources energy measurement"; a pulse icon for "1/2 Pulse Output"; and a laptop icon for "RS485 MODBUS RTU for Remote communication". The bottom half of the ad shows a 3D illustration of the energy monitor device, a solar panel, and a house with a power meter, all on a green field.

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From the Secretary's desk:

Dear Friends,

Happy New Year to you!! May all your wishes get fulfilled this year!!

I would like to express my deep gratitude for all those who made the year 2024 so successful for CEEAMA. With two CEEAMATECH events on “LV Switchgear” and “MV Switchgear – MV Panels and Protection Systems”, the future looks good for us.

There are various technical challenges that we may face in 2025 as well as beyond. Top of the list is troubleshooting AI-powered news, clips, infotainment and technical sessions. We simply do not know what is in store for us with the AI challenges. I fear the day when switchgear panels start “talking” to each other, spreading rumours about outdated transformers in the network.

We cannot forget the ongoing feud between solar panels and pigeons, where engineers must design systems both efficient and bird-proof. Cleaning of SPVs has been a great challenge for the mankind. Imagine a world where built-in nanotech cells that repels dirt, dust, and bird droppings and the change we will experience! My wish list for the future includes ultra-light PV cells that can be installed on tents, clothes, and everything else without weighing them down. I also hope that one day SPV cells that can somehow absorb energy from the moonlight or thermal radiation at night, so they never take a break. As a starter we could have SPVs that are available in different colours to blend in with the roof or surroundings, ensuring your house looks stylish while saving the planet.

My wish list for 2025 and beyond for the electrical engineering fraternity includes design of Circuit Breakers that refuse to reset unless you agree to a maintenance schedule—and sign a digital contract promising to keep them “happy and healthy.” This will not only maintain safety of the equipment, but also provide higher longevity. Imagine switchgear panels that take thermal selfies of themselves and post them to the grid network for “performance validation. “What will Auditors do if this starts happening” would be a new challenge that may come up. Imagine if a circuit breaker starts having a personality and refuses to trip because it is “on strike.”

Thinking out of the box is very important for all of us as it turns problems into opportunities. It helps you see challenges as puzzles to be solved creatively, not roadblocks to stop you. Imagine if cable insulation would be transparent – you could take inspections at a whole new level. I would urge the electrical fraternity to dream more about electrical sparks. Imagine if you can design a Wi-Fi so fast that it downloads your future before it happens. Year 2025 and beyond can have all of this and more. My wish list is unending. What about yours?

Wishing all of you a very Happy Makar Sankrant.

Tilgul Ghya, God God Bola !

Mr. Chidambar Joshi

Hon. Secretary

CEEAMA

CEEAMATECH 2024 - Session 2

The Consulting Electrical Engineers Association of Maharashtra (CEEAMA) established in 2004, plays an active role in facilitating industry interactions, skill development, and regulatory assistance for its electrical consultant members, manufacturers, and end users.

CEEAMA organised CEEAMATECH 2024, a one-day conference focused on “MV Switchgears, Panels and Protection Systems” on 21st December 2024. This event served as a comprehensive knowledge-sharing platform for electrical designers, consultants, industry experts, and students.

The event was inaugurated by CEEAMA’s senior Ex-Director, Shardchandra Gogate, accompanied by the lighting of the ceremonial lamp by dignitaries. It began with the national anthem and included the launch of the book “Electrical Protection System”, authored by Prof. Y. K. Pandkaripande and edited by CEEAMA President Veejhay B Limaaye.



The conference featured insightful presentations, including:

1. IEC 62271-100 & 200, delivered by Pralay More of Siemens Industry.
2. Switchgear Selection According to Applications by R S Selvam of Stelmec Limited.
3. Protection relays, different types and their principle of functions selection by Bhushan Joshi of ASHIDA Electronics
4. IEC 61850 Protocol for substation automation & SCADA by Manoj Kumar Sain of ASHIDA Electronics
5. Market-leading electrical design and simulation softwares by Tushar Borole.
6. Discussion on typical case studies by Suhas Patil and Narendra Duvedi



Er. Nitin Suryawanshi, Electrical Inspector, Pune, delivered an insightful and engaging session on mandatory compliance requirements outlined in the National Building Code 2016, the National Electrical Code of India 2023, and Central Electrical Authority (CEA) regulations, critical for the installation of electrical infrastructure.

The event also included product presentations by companies like ASHIDA Electronics, Quality Power, and Stelmec Limited, along with showcases by prominent names such as Rishabh Instruments Limited, Telawne Power Equipments Private Limited, Janitza electronics GmbH, Graycell, Fluke Corporation, Mahindra Powerol, Shyam Global Technoventures Pvt. Ltd., POM Power,

Lauritz Knudsen Electrical & Automation, and Connectwell Industries.

It was a day packed with valuable knowledge-sharing, networking, and thought-provoking discussions on critical aspects of electrical system design and regulatory compliance.

Meeting industry stalwarts and fellow professionals like Bhushan Mankame Sachin Shelar ULHAS VAJRE Uday Sathe Abhijeet Limaaye kailas deshमुख while making new connections added immense value to the experience. Sessions like these significantly enhance the understanding of design aspects and regulatory compliance, contributing to improved reliability and safety in electrical infrastructure.



Mains Connected Power Generation System – Protection Device

Mains protection devices play a vital role in the power generation industry, ensuring the safety, reliability, and stability of electrical systems. As power generation becomes more complex with the integration of renewable energy sources, such as wind and solar, these devices are increasingly important for maintaining consistent and efficient operations across both traditional and modern grids.



Mains protection refers to the range of devices and systems that safeguard electrical circuits and equipment from faults, abnormal conditions, or overloads. The primary function of these devices is to monitor electrical parameters such as voltage, current, and frequency, and to quickly detect any deviations from normal operating conditions. By doing so, mains protection devices can isolate problematic sections of the grid or generation system, preventing damage to equipment and minimizing the risk of power outages or accidents.

Protective relays constantly monitor electrical signals in power generation systems, and when they detect abnormal conditions such as short circuits, voltage dips, or frequency variations, they send signals to circuit breakers to interrupt the flow of electricity. This interruption isolates the fault from the rest of the system, limiting the spread of the problem and protecting both the equipment and personnel. Modern protective relays are highly sophisticated, with digital capabilities that allow for precise monitoring and faster response times than traditional electromechanical relays.

The rise of renewable energy sources has added new challenges and complexities to mains protection. Solar panels and wind turbines, for example, are distributed energy resources that often generate power at variable rates depending on weather conditions. This variability can lead to fluctuations in voltage or frequency within the grid. Mains protection devices are essential for managing these fluctuations and ensuring that power generation remains balanced. Advanced protection systems are now being designed to handle the unpredictable nature of renewables, with features such as adaptive protection settings and real-time communication between devices.

Furthermore, the shift towards smart grids has enhanced the functionality of mains protection devices. Smart grids use digital technology to monitor and manage the flow of electricity more effectively. In these systems, mains protection devices are equipped with communication capabilities that allow them to send real-time data to control centers. This data provides operators with insights into the health of the grid and enables them to make informed decisions about maintenance, repairs, or adjustments to power generation levels. The ability to diagnose and address issues remotely can significantly reduce downtime and improve overall grid reliability.



Modern day protection products are widely used in the power generation industry to ensure the safe and efficient operation of electrical systems. These products provide advanced monitoring and control solutions that protect power generation equipment from faults, overloads, and other potential disruptions. They are known for their versatility, being compatible with a wide range of power sources, including traditional generators, renewable energy systems, and hybrid power plants. By integrating real-time diagnostics, remote monitoring, and automatic fault detection, these protection systems allow operators to manage complex energy networks with increased reliability. They are designed to optimize power generation performance while safeguarding equipment, ensuring minimal downtime, and enhancing overall grid stability.

Contributed by:



Sandeep Chopra

Managing director

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Proud to have our Secretary Mr. CV Joshi as one of the chief invitee

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INVITING DELEGATES

| | | | |
|--|--|---|---|
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| SPEAKER Mr. C.V. Joshi Founder, Nishant Technologies | MODERATOR Mr. Abasaheb P. Kale Managing Director, jsh&S4 Consulting | MODERATOR Mr. Sanjeev Subherwal Founding Director, ParEdge | PANELIST Colonel Jaymeert Singh Director, Projects and Engineering 3D Hospital and Medical Research Centre |
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For Registration, call: Mr. Greshni Shiras | +91 97077330 | mumbaichapter@firein
Mr. Nitin Pare | +91 9600000000 | mumbai@firein.org | Mr. Nitin Pare | +91 9600000000 | mumbai@firein.org

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Running DG set in sync. with Roof-top Solar PV in Industrial areas which experience longer utility power shutdowns

A CASE STUDY

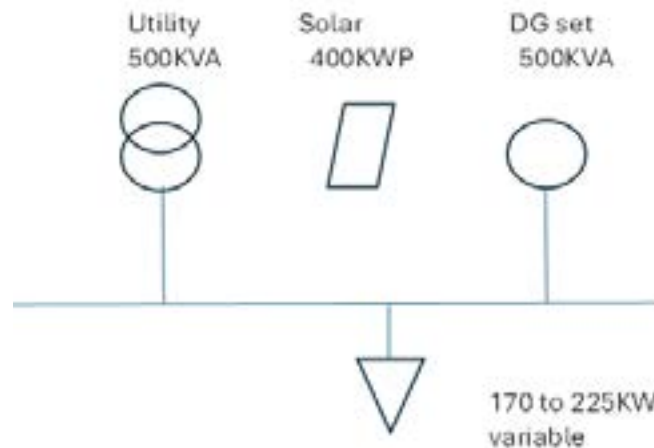
Preamble:

In view of optimizing energy cost, electricity consumers have started using roof top PV solar systems synchronized with DG sets.

| Generator Size | Approximate Diesel Fuel Consumption | | | |
|----------------|-------------------------------------|--------------------|--------------------|-----------------------|
| | ¼ Load (litres/hr) | ½ Load (litres/hr) | ¾ Load (litres/hr) | Full Load (litres/hr) |
| 400kW / 500kVA | 27 | 53 | 80 | 106 |

As shown above, DG sets consume substantially less diesel, if run at 25% load. So this can be used in principle as a synchronizing reference, when utility power fails for longer duration and balance load can be supplied by solar. Recently we come across a situation, wherein this arrangement was in place and working. However, many a times, a DG set while working in this mode experience “huge vibrations and sudden trip”. We analyzed this situation and provided a “RCA” and possible solution. What follows is a brief report on analysis of the above.

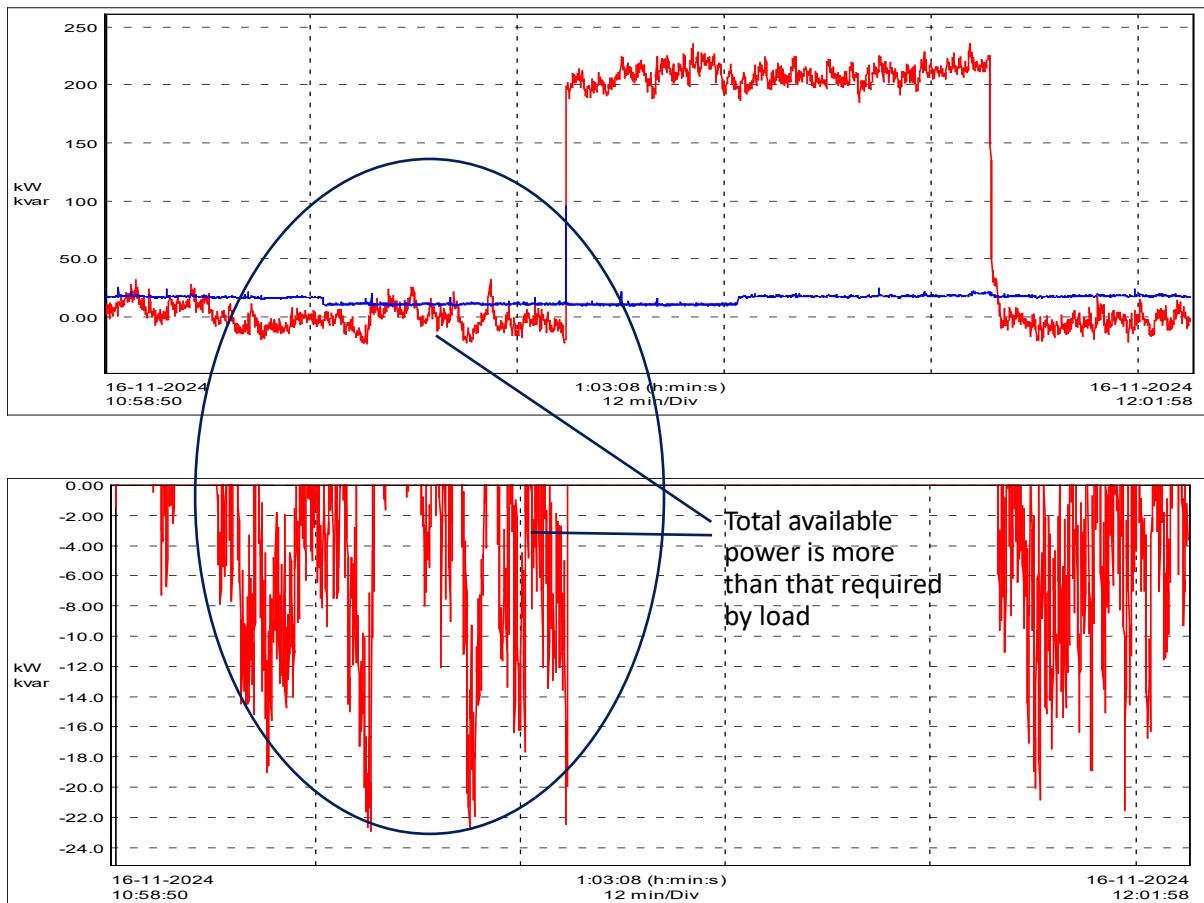
Case:



In normal case, during day time, – 500KVA transformer secondary and 400KWP solar is connected to plant bus and the load receives “Net available Power on the bus”, which will be either grid or solar. Excess generation by solar if any will be exported to grid - banked in the name of plant and will be adjusted against monthly total import.

When utility power fails, to start with, the solar generation stops as there is no “Sync. Reference available”. DG set takes over through ATS and through programming for day time – its generation gets restricted to 30% of its capacity. It serves as a reference to solar and solar inverter will start generating depending on intensity of solar power available.

In this DG+ Solar mode, if total available power becomes more than that required by load, solar inverter tries to backfeed the DG alternator and it starts working as synchronous motor and in turn tries to drive diesel engine. The alternator and engine protection systems do not allow this and the DG set trips with lot of vibrations.



Above recording shows that some times, during the operation, total available power is more than that required by load.

Why consumers opt for this?

Typical Industries in rural area getting electricity from rural feeders experience longer power shutdowns. On the other hand Solar PV roof top systems are now more popular due to very attractive costing and paybacks. The grid tied solar inverters usually work in “Net metring mode” and consumer effectively pays only for “Net Import” of electrical energy from utility company.

Many medium and large electricity consumers are installing roof top PV solar systems to optimize energy cost. In this “sync connected mode” grid can absorb excess solar generation. Typically all these grid tied inverters need “Utility sine wave reference” for generating AC sine wave which remains synchronized with grid and facilitates smooth import or export depending upon realtime plant load and solar generation. (Solar generation exhibits “Bell curve” which peaks only during mid day period on a bright sunny day). Another reason regulations insist on this “utility reference” is to ensure safety of upstream persons. If solar PV keeps on generating when utility has failed (but all breakers are ON), there is a possibility of backfeed which is dangerous for the technicians working upstream on transmission or distribution lines.

With proper interlocking arrangements in special cases, now utility companies have started giving permissions for using Solar PV synchronized with DG sets. However, if DG and solar system sizing is done without considering fluctuating real time ratings of load and solar generation, problems as above can crop up.

Root Cause of Generator Trip:

During utility power failure in daytime, (especially on a bright sunny day and between 9.30AM to 2.30AM), total available power becomes more than PLANT load requirement and this excess power tries to drive alternator as synchronous motor and in turn this motor tries to drive the IC engine in DG set. This causes circulating currents and reverse power flow as far as DG set is concerned – any or both conditions initiate DG set tripping and finally it trips.

Possible remedy:

- a. Plant load may be monitored for 24 hours to know fluctuations and min. and max. values.
- b. DG set generation under these conditions may be reduced further – or modulated based on detection of reverse power flow, when full solar generation is ON.
- c. Solar generation under these conditions may be reduced further – or modulated based on detection of reverse power flow.
- d. Microgrid controller if installed, the vendor should provide a solution which will monitor generation and loading in real time and control the generation in such a way that this situation will be avoided.

CHAT GPT response to the investigative prompt.

Chat GPT has become very popular these days – so just to check its capabilities, after analysis, we asked an analysis from GPT and here is the response we got. We are giving it here just as an example of use of CHAT GPT and readers may take help of this resource selectively to analyze tricky technical situations. Of course one has to use such responses after validating through proper technical knowledge and experience.

CHAT GPT response

If the alternator output and the external energy source are perfectly synchronized in terms of frequency, phase, and voltage, the alternator of the running Diesel Generator (DG) set will start operating as a synchronous motor. Here's what happens technically:

1. Transition to Motoring Mode

- When electrical power is fed into a synchronized alternator, the alternator no longer generates power. Instead, it starts consuming power from the external source.
- The alternator will act as a synchronous motor, driving the prime mover (the diesel engine) mechanically.

2. Impact on the Diesel Engine

- Load Reduction: The diesel engine is designed to drive the alternator to generate power. When the alternator becomes a motor, it exerts torque on the engine shaft, effectively reducing the engine's load.
- Fuel Supply Impact: If the DG governor is set for constant speed, the governor will sense a reduced load and reduce fuel supply.
- In extreme cases, the engine may receive no fuel, potentially leading to stalling.
- Back-Driving the Engine: If the torque from the alternator exceeds the engine's mechanical resistance, the alternator can "back-drive" the engine, forcing it to rotate. This can lead to mechanical wear or damage if sustained.

3. Reverse Power Flow

- In this scenario, power flows from the external source to the alternator and then mechanically to the engine.
- Reverse Power Relay: Most modern DG sets are equipped with a reverse power relay.

-
- This relay will trip the DG set to protect it from operating in motoring mode, as motoring is an abnormal condition for a generator.

4. Stability of Synchronization

- **Dynamic Interaction:** Even with perfect synchronization initially, small variations in frequency or load-sharing between the alternator and the external source can cause oscillations or instability.
- **Load Sharing Issues:** If load-sharing systems are not designed for this configuration, it can lead to imbalance and potential instability.

5. Electrical and Mechanical Stress

- **Increased Alternator Current:** The alternator, acting as a motor, will draw current from the external source. If the external source supplies excessive power, it can overheat the alternator windings.
- **Engine Damage:** The engine is not designed to be driven mechanically by the alternator. Prolonged operation in this mode can cause abnormal wear on bearings, pistons, and other components.

6. Energy Efficiency and Practical Implications

- Operating a DG set in this condition is inefficient. The diesel engine and alternator are not optimized for motoring mode.
- It is typically avoided unless the system design explicitly allows for dual-mode operation (generator and motor).

Summary

When synchronized with an external source, the alternator transitions into motoring mode, driving the diesel engine. This can reduce the engine's load, trigger reverse power protection, and risk mechanical damage. Protection systems (like reverse power relays) and proper load-sharing mechanisms are critical to avoid damage. Such a scenario is highly abnormal and generally not desired in standard DG set operations.

Contributed by:



Narendra Duvedi



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HRSG - Heat Recovery System Generator

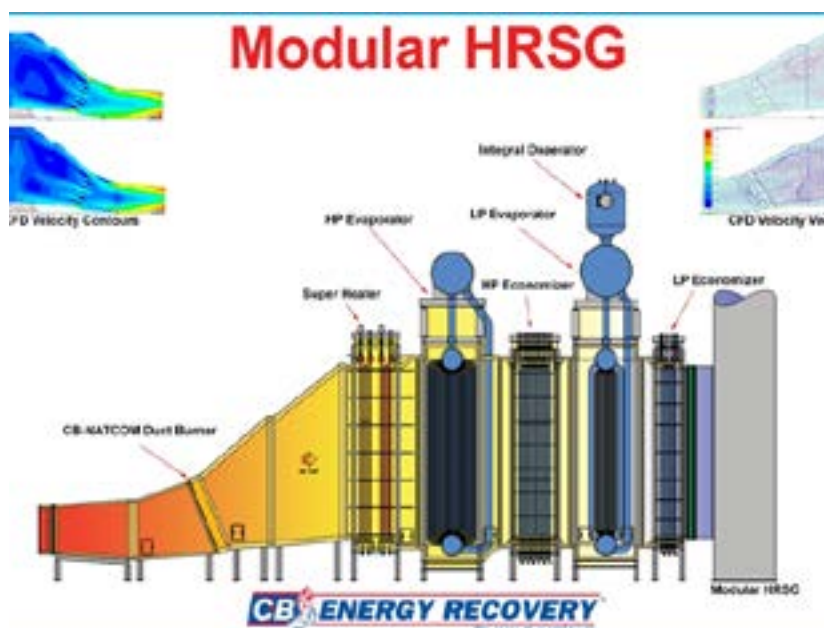
A **heat recovery steam generator (HRSG)** is an energy recovery heat exchanger that recovers heat from a hot gas stream, such as a combustion turbine or other waste gas stream. It produces steam that can be used in a process (cogeneration) or used to drive a steam turbine (combined cycle).



By Sphudson at English Wikipedia, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=35270184>

HRSGs

HRSGs consist of four major components: the **economizer, evaporator, superheater and water preheater**. The different components are put together to meet the operating requirements of the unit. See the illustration below of a Modular HRSG General Arrangement.



Modular HRSG GA

Modular HRSGs can be categorized by a number of ways such as direction of exhaust gases flow or number of pressure levels. Based on the flow of exhaust gases, HRSGs are categorized into vertical and horizontal types. In horizontal type HRSGs, exhaust gas flows horizontally over vertical tubes whereas in vertical type HRSGs, exhaust gas flow vertically over horizontal tubes. Based on pressure levels, HRSGs can be categorized into single pressure and multi pressure. Single pressure HRSGs have only one steam drum and steam is generated at single pressure level whereas multi pressure HRSGs employ two (double pressure) or three (triple pressure) steam drums. As such triple pressure HRSGs consist of three sections: an LP (low pressure) section, a reheat/IP (intermediate pressure) section, and an HP (high pressure) section. Each section has a steam drum and an evaporator section where water is converted to steam. This steam then passes through superheaters to raise the temperature beyond the saturation point.

The steam and water pressure parts of an HRSG are subjected to a wide range of degradation mechanisms, for example creep, thermal fatigue, creep-fatigue, mechanical fatigue, Flow Accelerated Corrosion (FAC), corrosion and corrosion fatigue, amongst others.

Packaged HRSGs

Packaged HRSGs are designed to be shipped as a fully assembled unit from the factory. They can be used in waste heat or turbine (usually under 20 MW) applications. The packaged HRSG can have a water-cooled furnace, which allows for higher supplemental firing and better overall efficiency.

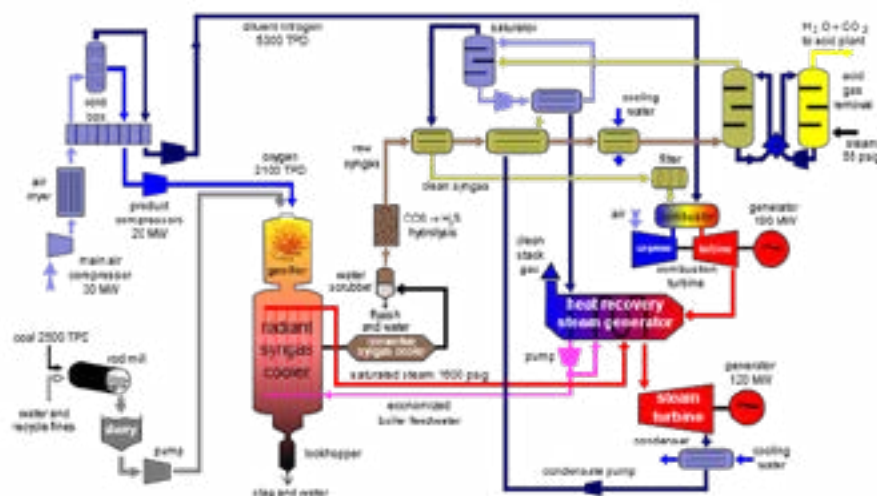


Variations

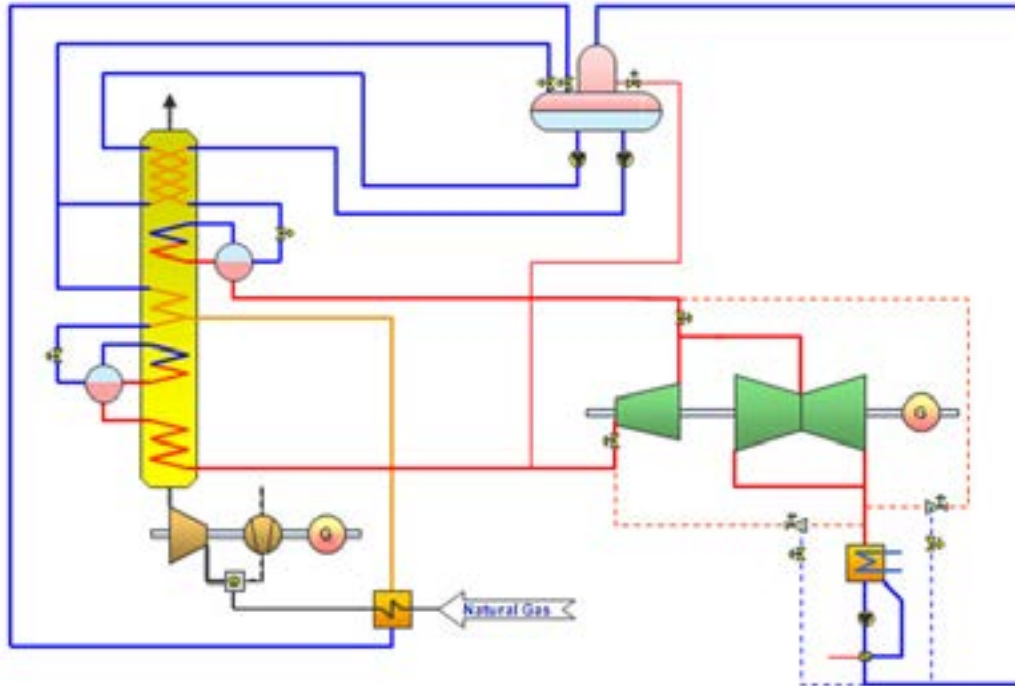
Some HRSGs include supplemental, or duct firing. These additional burners provide additional energy to the HRSG, which produces more steam and hence increases the output of the steam turbine. Generally, duct firing provides electrical output at lower capital cost. It is therefore often utilized for peaking operations.

HRSGs can also have diverter valves to regulate the inlet flow into the HRSG. This allows the gas turbine to continue to operate when there is no steam demand or if the HRSG needs to be taken offline.

Emissions controls may also be located in the HRSG. Some may contain a selective catalytic reduction system to reduce nitrogen oxides (a large contributor to the formation of smog and acid rain) or a catalyst to remove carbon monoxide. The inclusion of an SCR dramatically affects the layout of the HRSG. NOx catalyst performs best in temperatures between 650 and 750 °F (343–399 °C). This usually means that the evaporator section of the HRSG will have to be split and the SCR placed in between the two sections. Some low-temperature NOx catalysts have recently come to market that allow for the SCR to be placed between the evaporator and economizer sections (350–500 °F [177–260 °C]).



Block diagram of IGCC power plant, which utilizes the HRSG



Block diagram of HRSG in Combined Cycle

Once-through steam generator (OTSG)

A specialized type of HRSG without boiler drums is the once-through steam generator. In this design, the inlet feedwater follows a continuous path without segmented sections for economizers, evaporators, and superheaters. This provides a high degree of flexibility as the sections are allowed to grow or contract based on the heat load being received from the gas turbine. The absence of drums allows for quick changes in steam production and fewer variables to control and is ideal for cycling and base load operation. With proper material selection, an OTSG can be run dry, meaning the hot exhaust gases can pass over the tubes with no water flowing inside the tubes. This eliminates the need for a bypass stack and exhaust gas diverter system which is required to operate a combustion turbine with a drum-type HRSG out of service.

Applications

- Heat recovery can be used extensively in energy projects.
- In the energy-rich Persian Gulf region, the steam from the HRSG is used for desalination plants.
- Universities are ideal candidates for HRSG applications. They can use a gas turbine to produce high reliability electricity for campus use. The HRSG can recover the heat from the gas turbine to produce steam/hot water for district heating or cooling.
- Large ocean vessels (e.g. Emma Maersk) make use of heat recovery so that their oil-fired boilers can be shut down while underway.

Contributed by



Subhash Bahulekar

References: [Heat recovery steam generator - Wikipedia](#)

About transition of M V switching technology.

1. Air Blast Circuit Breaker: Uses compressed air to extinguish the arc.
2. Bulk Oil Circuit Breaker: Uses a large quantity of oil to cool and extinguish the arc.
3. Minimum Oil Circuit Breaker: Uses a smaller amount of oil, reducing the risk of oil spills and environmental impact.
4. SF6 Circuit Breaker: Uses sulfur hexafluoride (SF6) gas to extinguish the arc, known for its high dielectric strength and arc-quenching properties.
5. Vacuum Circuit Breaker: Uses a vacuum to extinguish the arc, offering high performance and reliability.
6. GIS (Gas-Insulated Switchgear) with SF6: Uses SF6 gas to insulate and extinguish the arc in a compact, metal-enclosed system.
7. GIS without SF6: Uses alternative gases or solid insulation, reducing environmental impact and maintenance needs.
8. Solid Insulated Circuit Breaker: Uses solid materials (e.g., epoxy, polyurethane) to insulate and support the breaker, eliminating the need for SF6 or oil.

This progression reflects the industry's shift towards more environmentally friendly, efficient, and reliable circuit breakers, with a focus on reducing maintenance needs and minimizing environmental impact.

Contributed By



Veejhay Limaaye



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SUHAS L PATIL

Congratulations

QUIZ JANUARY 2025

1. O – 0.3s – CO – 3min. – CO represents:
 - A. DC Motor acceleration duty
 - B. CB Operating sequence
 - C. Carbon monoxide emission rate in Cable insulation
 - D. None of the above

2. The insulating capacity of an insulation in air ____ with increasing altitude as a result of changes in the air density:
 - A. Decreases
 - B. Increases
 - C. Remains unchanged

3. Cable manufacturers generally provide conductor resistance in:
 - A. Ohm/m
 - B. Rho ρ /km
 - C. Ohm/km
 - D. Amp/km

4. Category of Medium Voltage Switchgear System:
 - A. 220V to 110kV
 - B. 66kV to 132kV
 - C. 110kV to 220kV
 - D. 3 to 36kV

5. Prefabricated transportable substations are also called as:
 - A. E-House
 - B. PDC
 - C. Unitised substation
 - D. All of the above

6. Generally, at operational level, “Electrical Power Quality” is considered to be associated with the presence of:
 - A. Harmonics
 - B. Voltage fluctuations
 - C. Non-linear loads
 - D. All of the above.

7. Electrical Safety Officer designated by electricity company ensures:
 - A. CAPEX of organization is in line with the safety requirements
 - B. Observance of Safety measures
 - C. Observance of safety authorities by the management
 - D. All of the above.

8. Visvesvaraya was appointed a Companion of the Order of the Indian Empire (CIE) in 1911 by:
 - A. King Edward VII
 - B. Lord Mountbatten
 - C. Pandit Jawaharlal Nehru
 - D. Duke of Windsor

9. Power Transformers:
 - A. Commonly found on utility poles stepping down HV from Transmission lines
 - B. Utilised in substations to handle HV transmission over long distance
 - C. Restrict fault level for small loads such as lighting
 - D. Connected to Switchyard busbar to step down HV for control voltage

10. Gas-Insulated Metal-Enclosed Switchgear for Rated Voltages of 72,5 kV & Above follows:
- A. IEC 517
 - B. IEC-62271-203
 - C. IEC-62439-5
 - D. All of the above

Rules for the QUIZ:

- The Quiz will be open for 10 days from the date of EMAIL.
- Each correct answer received on DAY 1 will get 100 points
- Next days the points will reduce as 90 – 80 – 70 and on 10th day points will be ZERO even if the answer is correct.
- All participants will receive E certificate signed by CEEAMA President with the points earned mentioned on the same.

Please use following google form link to participate in the QUIZ.

<https://forms.gle/CWnLUkccsHwD8mzq7>

“Thank you all for the overwhelming response to the E-NEWS in general and E-Quiz in particular. MCQ based quiz is always tricky and surprisingly can take us aback when we realise our conceptions (misconceptions) about the subject / system / product.

The aim of the feature was to create inquisitiveness in your mind and help you check your technical quotient quickly. The response will also help us to present articles and webinars on subjects which are important, but which lack enough awareness / knowledge in general.

It can open a pandora box for our discussions and arguments and probable solutions. Engineering evolves with conception. It gets fuelled with community discussions and capitalist actions. All stakeholders start realising the need to take a closer look and help improve standards as we have seen in the past century. Surely it makes the world a better place.

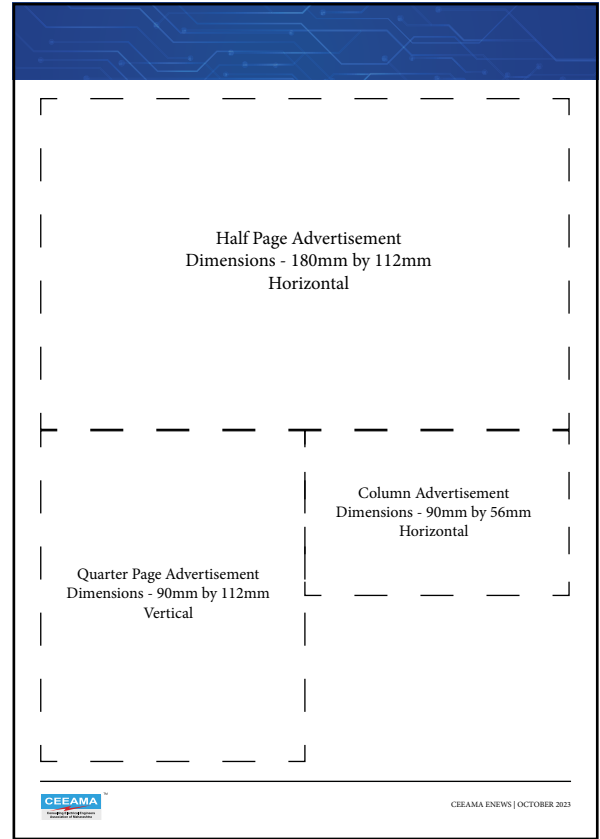
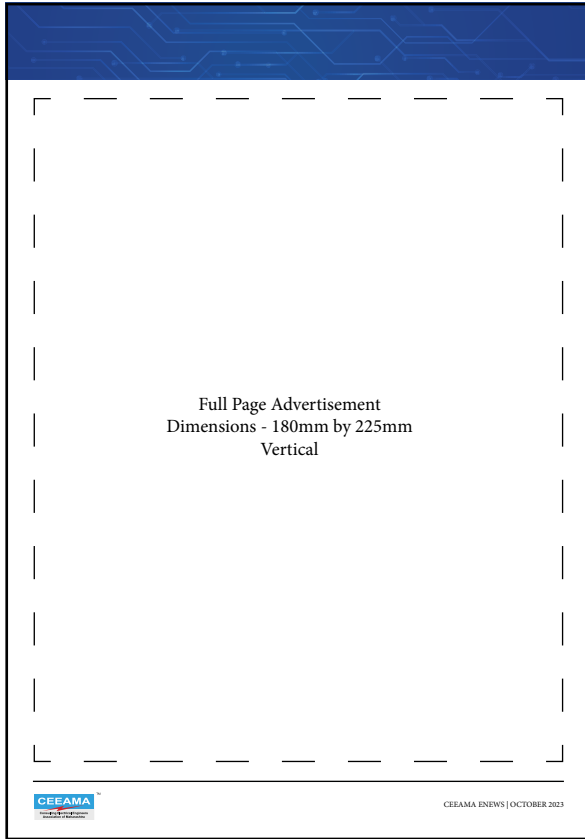
Wish you all a better luck this time.

Do spread the word.

December 2024 Quiz Answers

1. C. Asynchronous slip ring Induction motor
2. B. 1996
3. D. All of the above
4. D. All of the above
5. A. IEC 62351
6. A. Auto Cluster, Chinchwad, Pune
7. D. All of the above
8. B. Insulation deterioration
9. C. IEC: 60947-4-1
10. B. Porcelain Insulator

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A-103. Sanpada Railway Station Building, 1st floor Sanpada East, Navi Mumbai – 400705
Email: admin@ceeama.org
