

**APPLICATION DEVELOPMENT**

## Unveiling Cutting-Edge Solutions for Underground Sub INCLINED MINING WINCH HOIST

by Sriramswarup Mishra



YASKAWA has successfully supplied **315kW A1000 VFD** to one of the biggest Copper Ore Mines in the western Region of India . The VFD operates a **250kW motor** coupled to an Inclined Winch Hoist .

The A1000 VFD operates a robust 250kW motor, specifically coupled to an Inclined winch hoist system. This winch hoist plays a vital role in lifting copper ore from a remarkable depth of 275 meters below the location where the VFD is installed. With a **belt length spanning 1000 meters**, the inclined angle of **32 degrees** enables efficient regeneration during operation, maximizing energy utilization. To ensure smooth operations, the VFD is installed with suitable Dynamic Braking Resistors (DBR) along with our reliable 4220D Braking Units.

This comprehensive setup allows for seamless and controlled performance, even in challenging regenerative mining conditions.

Our team has also developed a dedicated **DWEZ program** for this application, that incorporates the use of customer PLC feedback received via Profibus communication. This innovative program effectively limits the speed of the winch hoist, preventing the machine operator from exceeding the permissible limits at different height levels within the mine. This intelligent speed control system **enhances safety** and prevents any potential risks during operation.

The winch hoist achieves impressive **speeds of up to 3.5 meters per second**, ensuring a smooth and jerk-free output. This remarkable performance further enhances the overall efficiency and productivity of the mining operations. The extreme conditions of the underground mine put our YASKAWA VFDs to the test, and we are proud to say that they have proven their ruggedness and durability.

### COPPER ORE MINE

- VFD installed 200m below ground
- 500m inclined distance
- Dedicated DWEZ program
- Inclined angle of 32 degrees
- Speeds upto 3.5m per second

**EXHIBITION**

## YASKAWA at ACREX 2023 : Revolutionizing HVAC

At the ACREX exhibition, YASKAWA India Pvt. Ltd. displayed its range of cutting-edge products and solutions designed to address the evolving needs of the industry.

The highlight of YASKAWA's stall was the **Harmonics Simulation Kit**, which provided a practical approach towards the harmonics generated by different types of VFD. The demonstration was a key attraction for visitors to the stall who were keen to understand the impact of harmonics on their system operations. The YASKAWA team was on hand to answer questions and demonstrate how their products and solutions could help mitigate the effects of harmonics.



In addition, YASKAWA also showcased the **HV600 Network Multiplexing Kit**, which demonstrated the application advancement with Yaskawa VFD for Pumping systems. The kit showcased the company's commitment to research and development and its ability to deliver cutting-edge solutions that meet the specific needs of its customers. One of the most impressive products on display was the **HV600 Narrow bypass system** with IP55 configuration. The system welcomed everyone to the stall with its neat and compact design, designed to satisfy the needs of the Industry.

### CUSTOMER FEEDBACK

" Overall support of M/S YASKAWA is very good & service engineer is very helpful, highly skilled & job is completed within estimated time frame"

- **Ambuja Cement Ltd**

"Excellent job done by service engineer and by team YASKAWA "

- **BPCL , Loni**

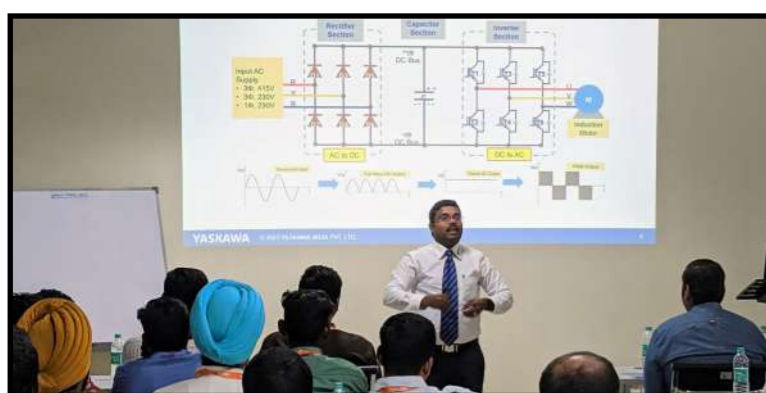
"Excellent job done with proper coordination & safety"

- **Ultratech Cement Ltd**

**TRAINING**

## ANNUAL SERVICE Training – 2023 to Partners

by Service Team



YASKAWA India Pvt. Ltd. conducted a comprehensive Service Training program in April, catering to a group of 48 participants. The training covered a wide range of topics, commencing with the fundamentals of VFD and extending to the analysis of Various Faults. This training session served as a valuable opportunity for all attendees to enhance their understanding of various YASKAWA Products and troubleshooting techniques.

The training program incorporated unique test subjects, allowing participants to gain hands-on experience in areas such

as Gate Driver board operation and test verification for correct PWM output, Cooling Fan Power supply board operation and verification, complete disassembly and reassembly of 315kW GA700 VFD, as well as IGBT operation and verification.

To conclude the two-day training session, an engaging and interactive Quiz Session was conducted. This session provided all participants with the chance to refresh their knowledge and apply the concepts they had learned throughout the training.



Q1 : 2023-24

Highest Field Support Survey  
 Excellent Score : 98%

**CONGRATULATIONS !**



**SRIRAMSWARUP MISHRA**

APPLICATION DEVELOPMENT

## Enhancing Steel Plant Operations with HHP based Ladle Crane

by Sriramswarup Mishra



YASKAWA successfully commissioned a state-of-the-art crane system with dedicated Brake Sequence Logic Program integrated into a **525kW A1000HHP VFD** using DWEZ technology. This customizable software is available with Yaskawa VFDs, eliminating the need for additional Programmable Logic Controllers (PLCs).

The existing slip-ring motor system is upgraded to a Short Rotor motor with A1000 HHP. The ladle crane has a **75-ton** capacity and can operate at speeds of up to **5 Meters per Minute (MPM)**. It has been installed at a prestigious steel plant in India, showcasing YASKAWA's reputation for

delivering high-quality, reliable automation solutions.

An outstanding feature of this Hot Metal Ladle Crane is its capability to operate in extreme ambient temperatures of **up to 60°C**, making it ideal for harsh industrial environments. This achievement demonstrates YASKAWA's dedication to innovation and providing cutting-edge solutions that cater to the evolving needs of customers.



COMMISSIONING

## CFG Grate Coolers for Kiln

by Brijesh Patel

CFG (Controller Air flow Grate) cooler is a type of cooling system used in cement kilns to cool and solidify hot clinker.

The grate cooler is equipped with air distribution plates that distribute the cooling air evenly across the clinker bed. These plates are designed to ensure uniform cooling and prevent localized hot spots.

The CFG cooler utilizes the GA700 VFD, which controls the reciprocating movement of the grates through a crankshaft mechanism. The **GA700 VFD's Advanced Open Loop Vector Control** optimizes regenerative energy usage and prevents the system from tripping due to overvoltage faults. Remarkably, it operates **without the need for braking resistors or units**.

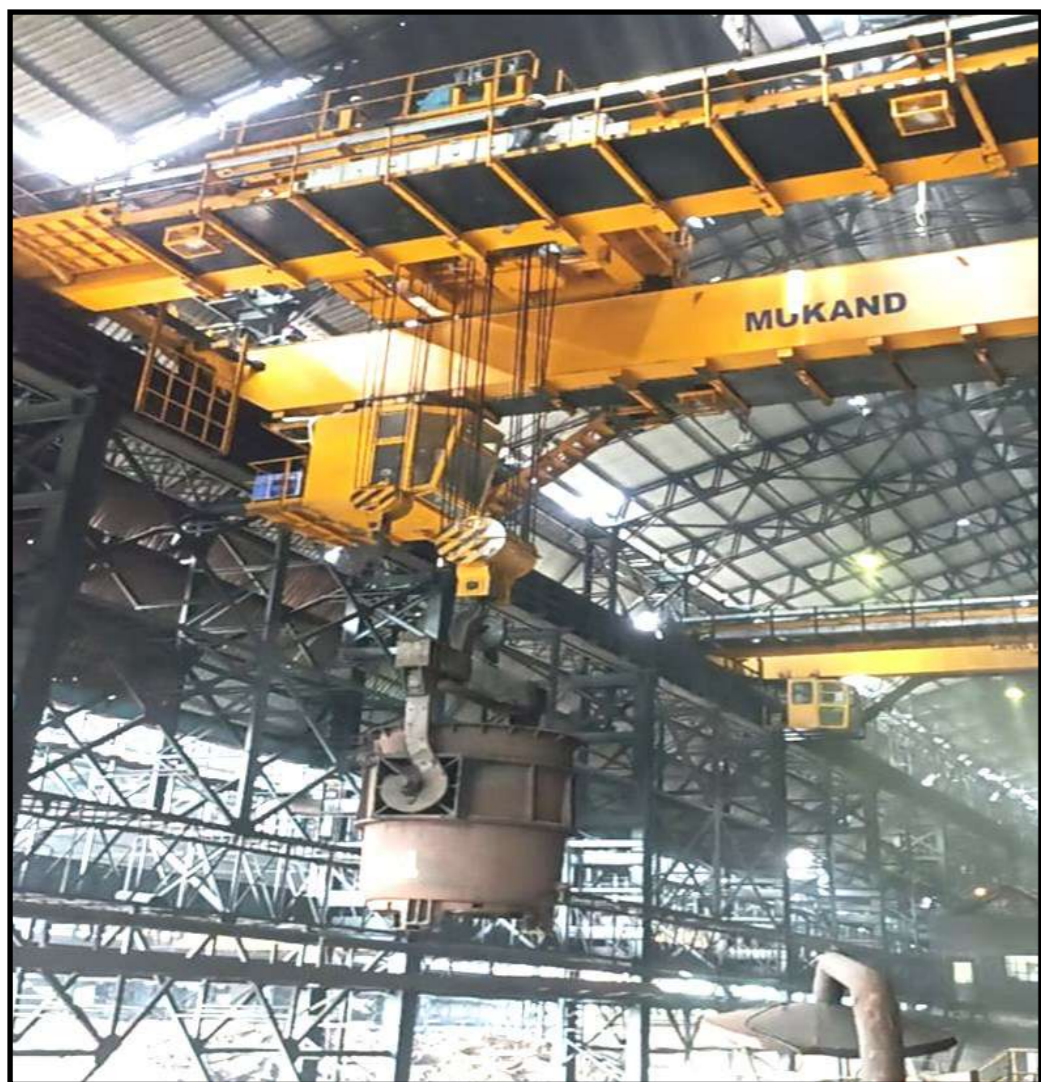
The installed system, commissioned with a powerful **75kW GA700 VFD**, demonstrates exceptional performance and efficiency at one of the largest cement plants in the Central Region of India, setting new standards in cooling technology efficiency.



COMMISSIONING

## Anti-Skew Control with YASKAWA Droop Control for EOT Crane Operations

by Anil Sanap



YASKAWA Has successfully executed a solution to one of the biggest Crane OEMS in India for Ladle Crane application. The crane has a maximum lifting capacity of 50Tons with main hoist and auxiliary hoist capacity of 10Tons

All the components of the Crane comprising of Long Travel (LT) , Cross Travel (CT), Main Hoist (MH) & Auxiliary Hoist (AH) are operated with YASKAWA **GA700 VFDs** ranging from **7.5kW to 75kW**.

With YASKAWA Droop Control the ANTI-SKEW requirement of Customer is easily fulfilled and satisfactory load trials are also executed at site. The Droop control feature in the VFD automatically reduce the speed if the torque reference rises & increase the speed if the torque reference falls again, thereby shifting the load from one motor to the other. This ensures that there is no skew in the LT motion in the crane ensuring parallel operation with equal load sharing. This feature does not require any communication between the two LT VFDs in operation. YASKAWA Advanced Open Loop Vector control can perform this function without the requirement of any encoders. Additionally for better accuracy , Closed Loop vector control can also be utilised with encoders.

MEET

### Partners Application Meet 2023

by Pradeepkumar A

Partners Application Meet 2023, held in Bangalore in the month of April, provided a valuable platform for all YASKAWA business partners to showcase new ideas and engage in application development activities for the VFD.



The event started with opening address from Mr.Shailendra Salvi -CEO & Vice President with encouraging words of the various application opportunities and developments in the current industrial market.

Partners from various regions presented on various development applications such as Straight Line Wire Drawing Machine , Windmill Yaw Movement, Radar Antenna Control, Laminator Winder Machine, Anti-Skew Control, Tandem Hoist, Cold Rolling Mill, Coil Winding SPM , etc. at the event. This gave everyone an opportunity to learn about a wide range of applications gaining valuable insights and engaging in fruitful discussions.

To ensure fair assessment, the presentations were scored by a panel of judges who evaluated various aspects such as presentation skills, effective use of aids, application topic, clarity on technical challenges, etc. YIND Management appreciated all the presentations of the partners & selected the best three partners for their exceptional presentation and development activities in the PAM 2023.

- **MOST INNOVATIVE SOLUTION** : M/s Elee Control
- **BUSINESS EXCELLENCE IN NICHE APPLICATIONS** : M/s Sree Hari Hi-Tech Automations
- **BEST BREAKTHROUGH APPLICATION** : M/s Prithvi Power Engineers



COMMISSIONING

## Tandem operation for Load Synchronization at Paper Plant with CR700

by Boopathi S

YASKAWA CR700 is installed at one of the largest dedicated paper mills in the southern region of India for material handling of Paper Reels. This paper plant has a production capacity of 4,00,000 Tons per Annum . The VFDs installed in the crane can lift a maximum capacity of **50 tons** and are operated in **tandem with two hoists**. The **load synchronization** between the hoists is a testament to the performance of CR700, with its easy auto-tuning features and **advanced brake sequence operation** that prevents load slippages. The system is integrated with two **37 kW** VFDs, responsible for maintaining an **equal load balance**. The Dedicated **CR700 VFD Software** can **dynamically correct any load imbalances** caused by mechanical factors. The availability of a **built-in braking transistor** allows for easy installation without the need for external braking units. The customer is satisfied and appreciated the VFD's performance of its brake sequence operation response time - 300ms, which is among the best available in the market.



The CR700 utilizes various functions, such as Droop Control, Load synchronization, Wire length detection, Speed synchronization, position synchronization, etc., to achieve seamless operation of the cranes. One more notable advantage of the CR700 is its ability to achieve **load synchronization** without the need for any encoders. This feature is particularly beneficial in situations where encoder failure may occur or during emergency operations.



TRAININGS

### Major Customer Visits at YASKAWA, Bengaluru



# KNOWLEDGE SHARE : EZ Vector Control

by Pradeep Kumar A

### GENERAL VECTOR CONTROL

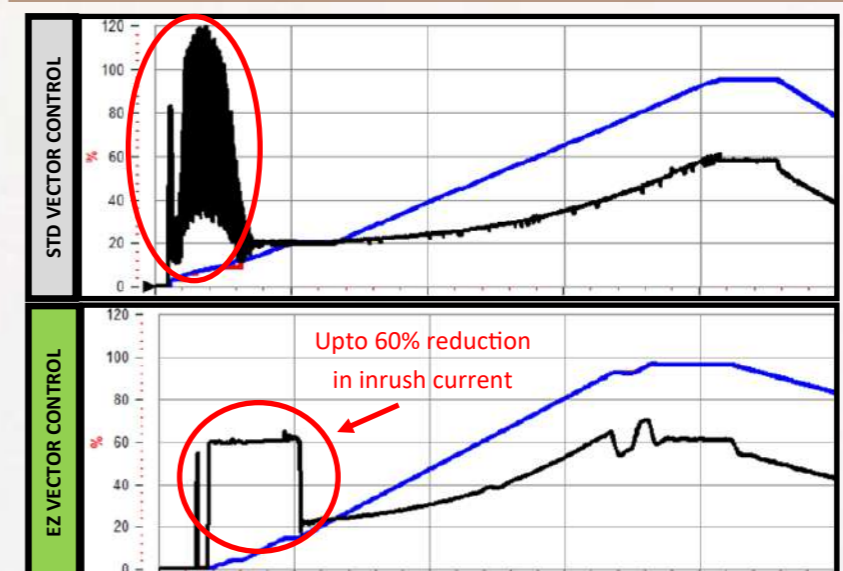
- In general vector control, stable operation can be achieved by separating and handling the flux axis (d-axis) and torque axis (q-axis) based on the rotor flux.
- However, since the rotor structure of a motor varies depending on its type, it is necessary to select a control mode that is appropriate for the type of motor and its characteristics.
- Tuning is required for precise control for operation.

### YASKAWA EZ VECTOR CONTROL

- EZ Vector Control focuses on the fact that the basic **stator structure is almost the same for all motor types** and performs specialized control for diminishing torque applications based on the stator magnetic flux.
- It is possible to control a wide variety of motors with a common operation philosophy and single control method.
- Tuning-less operation control method.

### BENEFITS OF USING EZ VECTOR CONTROL :

- One control method for all motors ( IM , IPM , SPM, Syn RM )
- Tuning less operation of motor as Rotor characteristics are not required for operation.
- Easy Bi-Directional Speed search operation
- MTPA (Maximum Torque per Ampere) with EZ Vector control operation.
- Lower inrush current while starting high inertia applications.



**COMMISSIONING**

## The Synergy of HHP VFD & GEHO Pumps

by Sriramswarup Mishra

GEHO pumps, also known as GEHO TZPM pumps, are a type of piston diaphragm pump commonly used in the mining industry for transporting slurry and other abrasive or corrosive fluids.

These pumps are specifically designed to handle high-pressure and high-volume applications, making them suitable for various mining and mineral processing operations.

The commissioned system boasts a **Robust 690V Class, 675kW, 2 AXIS A1000 HHP VFD**, which enables seamless commissioning and ensures successful operation. The exceptional performance of these VFDs goes above and beyond expectations.

This collaborative integration empowers mining operations to efficiently pump both slurry and solid materials. With a **pumping capacity of 312 m<sup>3</sup>/hr**, continuous fluid transport is achieved without compromising reliability or productivity.

When integrated with GEHO pumps, the combination of YASKAWA HHP VFDs and GEHO pumps brings a host of remarkable benefits of mining operations to the customer.



**APPLICATION DEVELOPMENT**

## Flying Shear : Cut to Length Machine

by Prem Chand

The Flying Shear (also known as a Flying Knife) is a common industrial application for cutting a continuous product to a set length at line speed. One of the critical aspects of a Flying Shear system is the integration of high-performance components, such as the **YASKAWA GA700 Variable Frequency Drives (VFDs), Sigma V Servopacks and an MP Controller** specifically designed for the Cut to Length machine. These components work in harmony to ensure precise and efficient cutting operations.

Operating at a remarkable speed of **15 meters per minute**, the Flying Shear demonstrates its ability to keep up with fast-paced production lines without compromising cutting accuracy. With a cutting accuracy of **+/- 2 mm**.



**TRAINING**

## Advanced MP Controller Operation Training by YEC, Japan

Four members, Mr. Govindaraj, Mr. Moorthy, Mr. Prem Chand, and Mr. Manohar, from YASKAWA India Pvt. Ltd., Servo Team, had the opportunity of acquiring in-depth knowledge on the operation and fine tuning of Servo Drives, including the advanced MP Controller by YEC team at Iruma Factory in Japan. This training proved to be highly enlightening as it provided them with valuable insights into achieving precise output using Servopacks.



**TRAININGS**

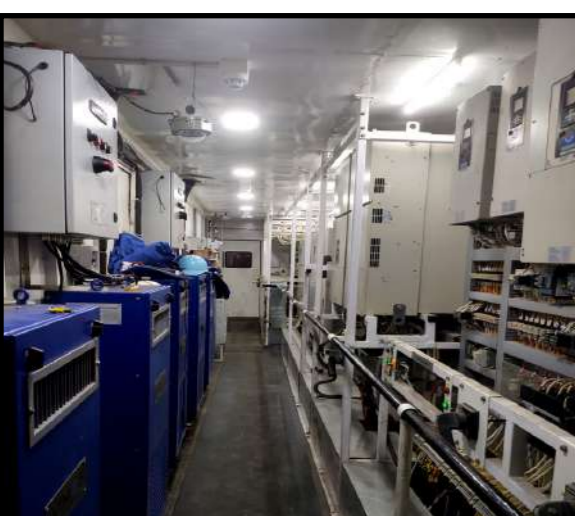
## Trainings & Seminars in Q1 2023



**COMMISSIONING**

## Cutting-Edge CR700 Solution for Material Handling Cranes in the Steel Segment with D1000

by Anil Sanap & Mihir B



YASKAWA CR700 ranging from **55 to 315kW**, combined with Active Front End **D1000 (630amps)**, was provided as a comprehensive solution to one of the largest steel plants in the western part of India. This integrated solution involved collaboration with the Crane OEM and the ABP from the West region. The entire system is housed within a e-Room, configured in an IP00 panel configuration. This setup is crucial as the cranes operate in harsh conditions, and the e-Room acts as a protective environment, preventing any contamination in the surroundings. The operation of the crane with a **110Ton capacity**, utilizes the innovative **Cargo Swing Suppression** feature in CR700. This feature effectively eliminates any swinging of the lifted material/cargo during the travel operation, ensuring smooth and efficient crane operation.

