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*Integrators of Mitsubishi, TMEIC, Benshaw, Baldor,
Siemens, Rockwell, Eaton.*

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BYT Engineering Corp.

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www.BYTmotion.com

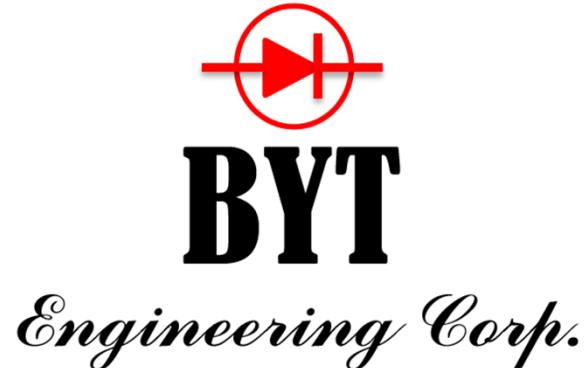
Design and Control for the following Sectors: | Metals: Crain, Fan & Pumps | Mining: Mills, Conveyors, Hoists, Draglines & Shovels, Ventilation | Wood & Paper | Oil & Gas, LNG | Solar Inverters | Utilities: Dams | Cement | Municipal: Water & Waste | Commercial: HVAC, Compressors, Vacuum | Recreation: Amusement Parks, Water | Energy Savings |Automotive |Underground VFD Skids| Low Voltage VFD | Medium Voltage VFD | Soft-Starters | Motors | Commissioning-Testing | Design of CSA & UL Industrial Control Panels | Design for Manufacturing-Ready Panels and Motor Controls.



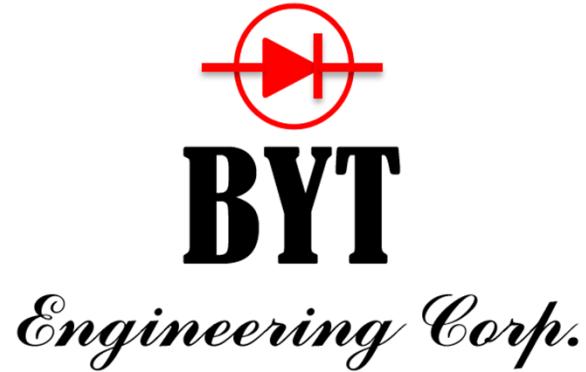
BYT

Engineering Corp.





- ❖ We are Consultants and System Integrators.
- ❖ We Design, Code HMI-PLCs and Commission.
- ❖ We understand Motors / Servos / Braking Regen.
- ❖ We master DOL, Soft Starters, VSDs/VFDs.
- ❖ We provide Energy savings studies.
- ❖ We understand Harmonics reduction methods.
- ❖ We can improve your Power Factor.
- ❖ We know Mitsubishi / Siemens / Rockwell very well.



- ❖ Who is BYT Engineering Corp.?
- ❖ Who are our Partners?
- ❖ How to save with Induction Motors?
- ❖ DOL vs Soft Starters vs VSDs, what to use?
- ❖ Can Equipment be paid by energy savings?
- ❖ How Harmonics are destructive and costly?

Lets have a lunch and learn meeting and we will explain!!



BYT

Engineering Corp.

The following is an overview presentation of product features
and capability of the services family we provide.

This presentation does not constitute or represent a specific
offering for consideration.

Should the following be of interest to your company, please
solicit a quotation from either myself or one of our local
sales representative to obtain current status of products
we service and feature availability.



Safety Moment

BYT Engineering Corp.

Welcomes

You

Safety Moment - Drowsy Driving

DID YOU KNOW:

- 100,000 car crashes per year in the USA
- In 2013; 44,000 injuries and **800 fatalities** were attributed to falling asleep at the wheel
- The highest risk are: young male drivers (17-23y)
- Being awake for more than 18 hours

Safety Moment - Drowsy Driving

WARNING SIGNS:

- Difficulty focusing
- Daydreaming, wandering
- Trouble remembering the last few miles driven.
- Missing exits or traffic signs.
- Yawning repeatedly or rubbing your eyes.
- Drifting from your lane.

Safety Moment - Drowsy Driving



BENSON, NORTH CAROLINA (August 3, 2015) – One person is dead after a bus driver fell asleep at the wheel on Interstate 95, according to WRAL.com



Get a good night's sleep.

FISH LAKE, OREGON (April 29, 2009) State Police Say Woman Fell Asleep at the Wheel Before Serious Injury Crash. Salem-News.com

Safety Moment

- Prevent Carpal Tunnel Syndrome

- There are no proven strategies to prevent carpal tunnel syndrome

- **Precautions:**

- Reduce your force and relax your grip.
- Take frequent breaks.
- Watch your form.
- Improve your posture.
- Keep your hands warm.

Prevent carpal tunnel syndrome with better posture



Safety Moment

Did you know?

- Severe heat has caused more deaths than all types of natural disasters combined.
- Once the body reaches 40.5C (104.9F), it will suffer a heat stroke which can result in death if not treated immediately.
- Injuries from severe heat are preventable!



What can you do?

1. Stay hydrated
2. Proper Clothing
3. Take breaks
4. Utilize shade
5. Limit activity in direct sunlight
6. Avoid caffeine and alcohol



Safety Moment – Are You a ‘Petextrian’ ?



- Pedestrian fatalities are once again on the rise.
- After decades of decline
- “Petextrians” — people who text while walking — may be partly to blame, according to the report.”
(ABC News Report)

Safety Moment

How Does a Teenager Cross the Road?

Older teens now account for half of all pedestrian deaths among children 19 and under. In the last five years, pedestrian injuries among 16-19 year olds increased 25% over the previous five years.

How big a problem is distraction? To find out, Safe Kids observed 34,325 middle and high school students crossing the street in a school zone. Here's what we learned.



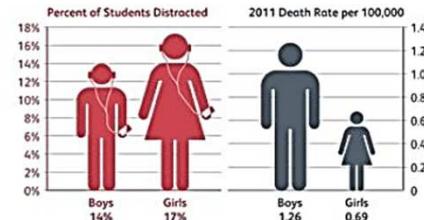
One in five high schoolers and one in eight middle schoolers were observed crossing the street while distracted.



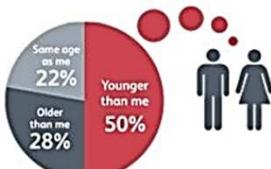
Teens who were distracted were most frequently texting or wearing headphones.



Girls are more likely to walk while distracted, but the pedestrian death rate is 1.8 times higher for boys.



78% of teens perceive the most at-risk age group for pedestrian injuries to be one other than their own.



Join the Moment of Silence Campaign to stop distracted walking.
Learn more at www.safekids.org

Safety Moment

Remember:-

- 1) Keep a wide base of support
- 2) Squat down
- 3) Keep good posture
- 4) Slowly lift
- 5) Hold
- 6) Use your feet
- 7) Lead with your hips
- 8) Set d`

Caution:

- 1) No bending forward.
- 2) Lift below shoulder level.
- 3) Avoid turning or twisting body

Proper Lifting Technique



© Healthwise, Incorporated

Safety Moment

DID YOU KNOW

THE ONLY THING YOU SHOULD
BE DOING WHEN YOU'RE
DRIVING IS ... DRIVING.

Behind the wheel, nothing is more important than focus.

Do not take a call, make a call, text, apply makeup, eat,
let your eyes.

If any of the above things must be done, pull safely off
the road and out of the traffic flow to do them.

Every day people are killed and injured simply because a
driver is distracted. Don't be one of them.



Safety Moment

DID YOU KNOW

YOU SHOULDN'T PROVIDE HELP
THAT YOU'RE NOT QUALIFIED TO
PROVIDE.

But if you're asked to do something you're not qualified to do,
like operate lifting equipment, don't do it.

Only personnel qualified and authorized to operate such
equipment should do so.

Doing otherwise could prove more harmful than helpful.



Lifting and Hoisting



Safety Moment

DID YOU KNOW

PERSONAL PROTECTION EQUIPMENT
CAN'T TAKE CARE OF YOU IF YOU
HAVEN'T TAKEN CARE OF IT.



1) Identify 2) Maintain 3) Inspect

Identify: potential hazards you could encounter.

Maintain : all PPE so it's safe to use at any time.

Inspect: each piece of equipment before you put it on.



Personal Protection Equipment (PPE)

Safety Moment

DID YOU KNOW

NO TEXT MESSAGE IS IMPORTANT ENOUGH TO READ WHILE DRIVING.

Drivers who take their eyes off the road put themselves, passengers, pedestrians, and other drivers in danger.

Never read or compose a text message while driving.



Driving Safety



Safety Moment

DID YOU KNOW

THE BEST TIME TO WEATHER THE STORM IS BEFORE IT ARRIVES.

Hurricane season can :

Bring dangers that threaten life and property as well as...

Shortages of essential supplies.

Don't wait until it's too late.



Safety Moment

THIS IS YOUR SAFETY MOMENT NO.30

WORKSAFE

► Stretches for the Neck and Shoulders

Working at a computer workstation all day can cause pain and discomfort in the neck and shoulders. Here are some stretches that will help relieve pressure and strain in the neck and shoulders.

- **Shoulder Shrug**
The purpose of the shoulder shrug is to relieve early symptoms of tightness or tension in the shoulder and neck area. Raise the top of your shoulders towards your ears until you feel slight tension in your neck and shoulders. Hold this for 3 to 5 seconds. Then relax your shoulders downward to their normal position. Do this 2 or 3 times.
- **Head Glide**
The head glide helps to stretch your chest, neck and shoulder muscles. Sit or stand upright. Without lifting your chin, glide your head straight back. You know you are doing this exercise correctly if it gives you the feeling of having a double chin. Hold for 20 counts and repeat 5 to 10 times.
- **Neck Relaxer**
This exercise helps to relax the neck. Drop your head slowly to the left, trying to touch your left ear to your left shoulder. Repeat on the right side. Slowly drop your chin to your chest, turn your head all the way to the left, and then turn all the way to the right.
- **Shoulder Roll**
This exercise will help relax the shoulder muscles. Slowly roll your shoulders backward five times in a circular motion. Next, roll your shoulders forwards.

WORK
SAFE.
LIVE
SAFE.
BE
SAFE.

From: CCOHS , *Office Ergonomics Safety Guide*

Adapted from: www.ccohs.ca/oshanswers/ergonomics/office/stretching.html



Safety Moment

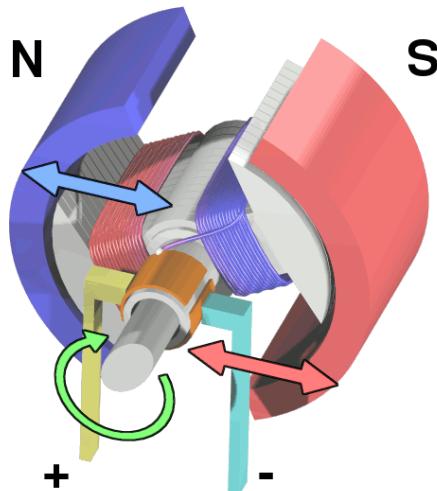
BYT Engineering Corp.

We are conscious of our part regarding safety



BYT Engineering Corp.
is a systems Designer-Integrator
of multiple brands like
Mitsubishi, Siemens, Rockwell,
Eaton, Schneider and others.

WE ARE SPEED CONTROL EXPERTS

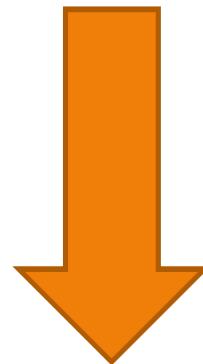


WHAT DO WE DO ?

- CANADIAN EXPERT VFD INTEGRATORS
- SPECIALIST IN MOTOR CONTROL OF ALL TYPES:
VFDS, SOFTSTARTS, DC DRIVES
- AUTOMATION SPECIALISTS
PLC, HMI, SERVO, MOTION CONTROL
- OVER 35 YEARS COMBINED EXPERIENCE IN BUSINESS
- EXTENSIVE APPLICATION EXPERIENCE
- FULL ENGINEERING CAPABILITIES
- AFTER-SALES SERVICE AND SUPPORT
- CSA/UL APPROVED PANELs.
- VFDS UP TO 1000 HP FOR LOW VOLTAGE APPLICATIONS

WHAT ARE OUR STRENGTHS ?

WE HAVE A SELECT GROUP OF HIGH QUALITY VENDORS
THAT WE PARTNER WITH:



- **LV VFDS:** 0.5 to 1000 hp 120,230,460,575V
- **PLCs:** 10 to 5000 I/O compact/rackmount
- **SERVO MOTORS and AMPLIFIERS:** 0.1 TO 110 kW
- **HMs:** 2" TO 16" B/W, COLOR, TOUCHSCREEN



Control & Visualization

Programmable Logic Controllers (PLC)
Programmable Automation Controllers (PAC)
Human Machine Interfaces (HMI)

Drive Systems

Servos and Motion Products
Variable Frequency Drives (VFD)

Mechatronics Products

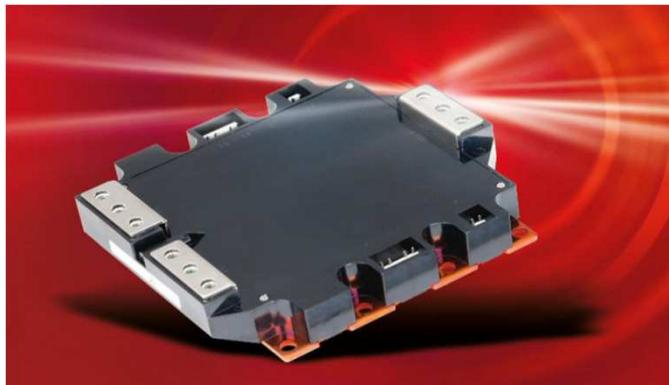
Computerized Numerical Control (CNC)
Industrial Robots

Low Voltage Switchgear

Contactors
Circuit Breakers



What Makes Mitsubishi Different ?



3 yr warranty on PLC & HMI
Products

- 5 yr warranty on Micro VFD products
- 3 yr warranty on Robots

Operating Cost Reduction

Outstanding Product Quality

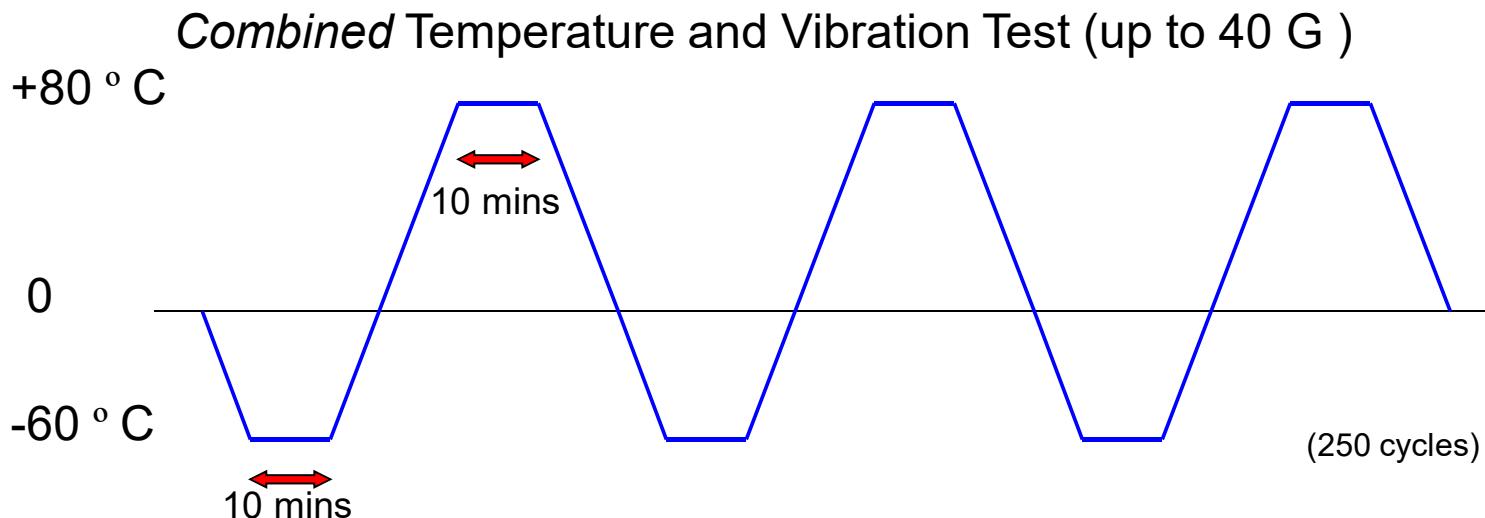
- Extensive use of Mitsubishi components
 - ASICs, IGBT, CPUs, IPM...
- Highly Accelerated Life Test (HALT)
 - Vibration testing 60G rms
 - -100 to +200 degrees C
 - Rapid temp. change - 60 degrees / min
 - Components, Assemblies, Finished Products
- 1st pass yield rate = 99.98%
(best in class)

What Makes Mitsubishi Different ?

Example – Air Handling Units

In April 2007, a group of 18 200V, 400V and 600V E500 drives was systematically tortured in a test to destruction.

	Factory Recommendation	Customer Test Conditions
Vibration Withstand Rating	0.6 G	40 G
Minimum Operating Temperature	-10 ° C	-60 ° C
Maximum Operating Temperature	50 ° C	80 ° C



What Makes Mitsubishi Different ? The Result ?

Highly Accelerated Lifespan Tests

- All but two of the drives actually survived and were still operating at the end
- Customer chose to go with Mitsubishi simply because no other competitor could match the E500 test results. YTD sales of 1500 drives.
- *Advantage : high product quality = high field reliability*
- *Benefits : reduced repair, return and support costs*
- A tough act to follow !

What Makes Mitsubishi Different ?

Predictive Maintenance

■ Long life components

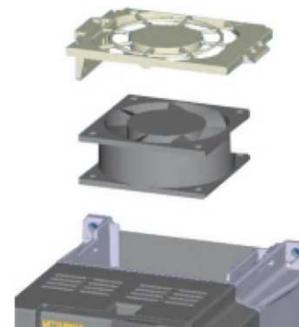
Electrolytic aluminum capacitors and cooling fans are designed for 10 year life-time.

■ Life time diagnosis and breakdown detection.

Life diagnosis function for main capacitor, monitoring rotation speed of cooling fan and monitoring temperature of In-rush current suppression resistor.

■ Easy maintenance

Easy to change the cooling fan, because of being located on the top of drives,



Pre-emptive warning = preventative maintenance tool



What Makes Mitsubishi Different ?

Differentiators:

A800 – Diagnostics & Maintenance

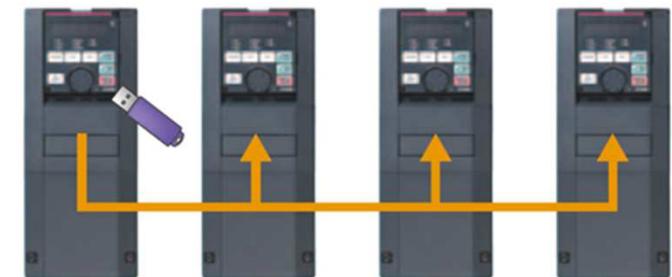
Time Stamping for trip messages

Internal realtime clock allows for more accurate, easier troubleshooting

Trace Function

Store / download information leading up to a trip

Upload /
Download
Parameter
data to
USB stick



USB 2.0 supported (full speed)

A8NETH-2P – **Multi-Protocol** Ethernet card improves Diagnostics & Maintenance



Web-Server interface ‘Dashboard’ – allows all drive operations to be performed via a normal web browser

Supports :

- Modbus/TCP Server
- EtherNET/IP Server (DLR node)
- Allen Bradley CSP Server (also known as ‘PCCC’ and ‘AB Ethernet’)
- BACnet/IP Server
- Mitsubishi MELSEC Server (also known as ‘MC Protocol’)
- PROFINET IO Device (MRP client)

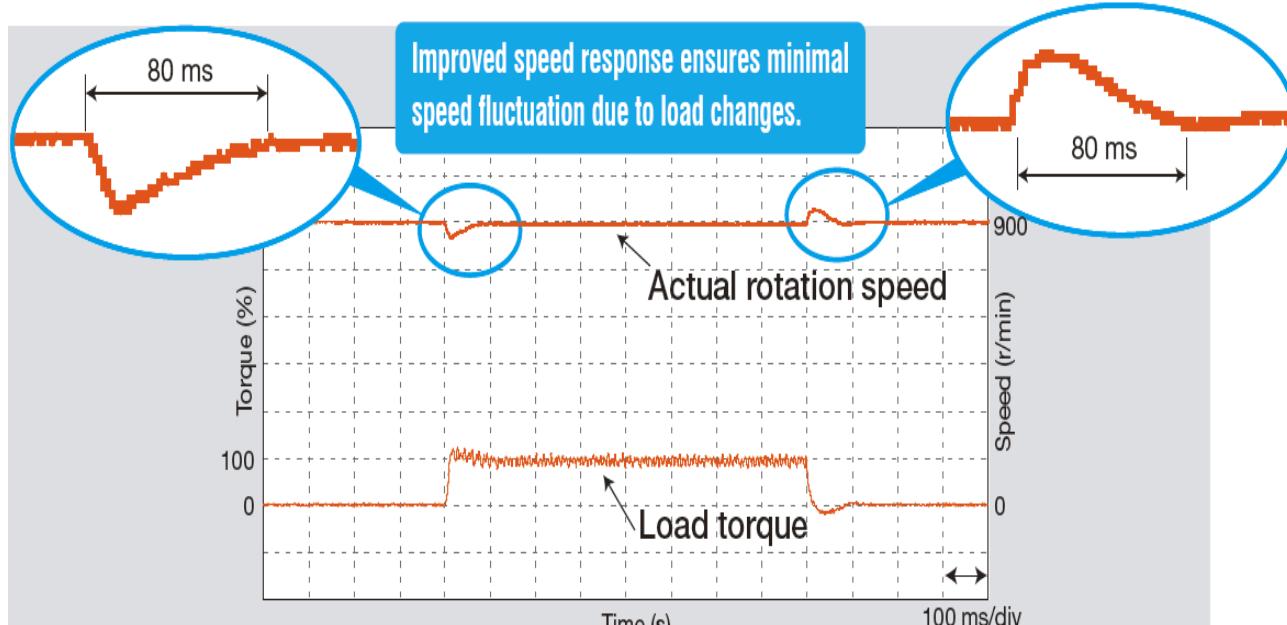
Mitsubishi Configuration Studio – Graphical User Interface for discovery, configuration and firmware update

What Makes Mitsubishi Different ?

- We own the key technology & we keep improving it.
- We have a complete, coherent drive range
- We can use our own components – IGBT, Controllers, etc...
- Others have to rely on their suppliers.



What Makes Mitsubishi Different ?



[Example of changes in actual rotation speed with impact load]
 (With Real sensorless vector control, SF-JR 4P motor (3.7 kW))

Class-leading speed range (200:1, 1500:1 with encoder)

Class-leading speed range (200:1, 1500:1 with encoder)

- Torque at zero speed (with / without encoder)
- Fastest acceleration
- 4 quadrant control (with regen. unit)

Best response to shock loads.

Fastest response to
Fastest response to
signal change

A800 can control

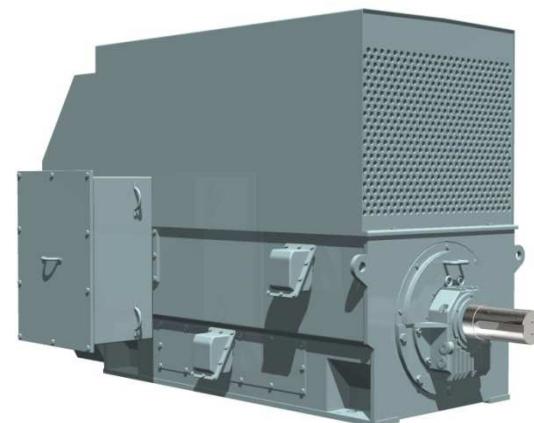
A800 can control

- Speed
- Torque
- Shaft position

TMEIC


BYT
AUTOMATION

- **LV SYSTEM VFDs:** 10 to 1500 HP 460-690 VAC
- **MV VFDs:** 1000 TO 100,000 HP 2.3 to 6.6 Kv
- **LARGE ENGINEERED MOTORS:** 460V to 15 kV
500 to 50,000 hp, 2 to 30 pole, EXPLOSION PROOF



- **MV SYSTEM VARIABLE FREQ DRIVES:**

Dyna-VAR 16 MVAR



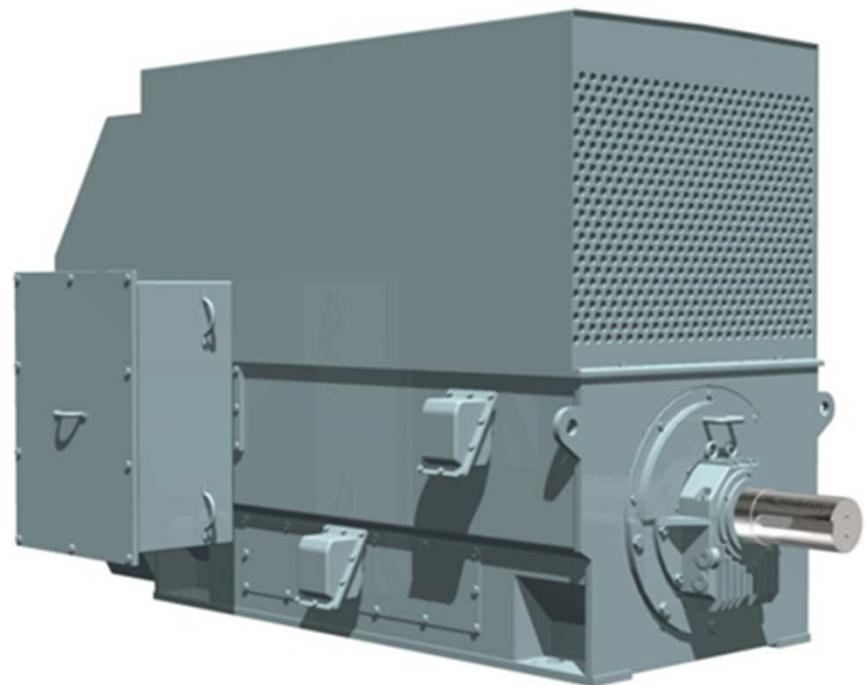
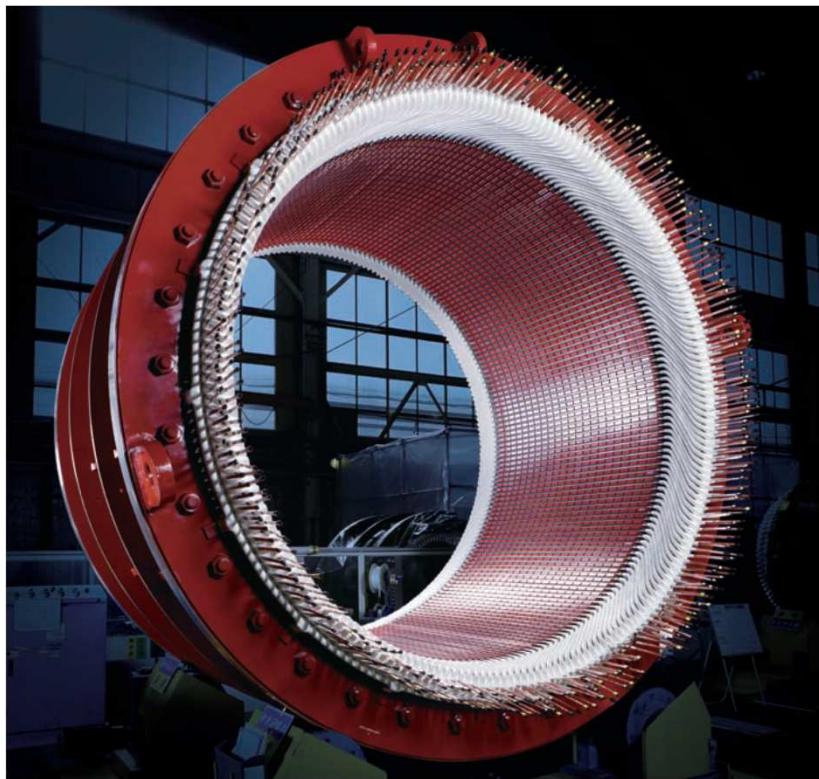
➤ Water cooled stack



- **LARGE ENGINEERED MOTORS:**

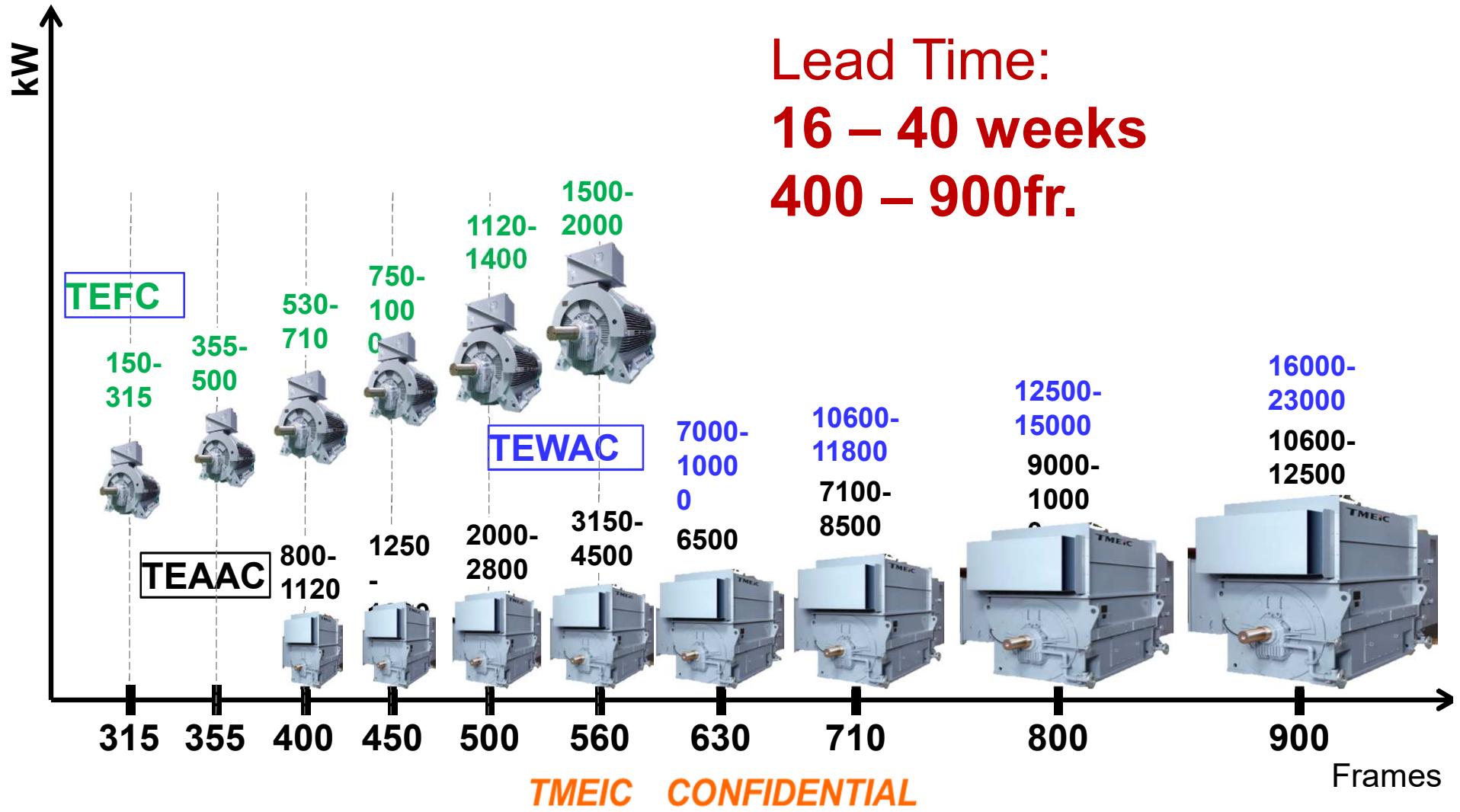


- **LARGE ENGINEERED GENERATORS:**



TM21-G Series Motors – Output kW in Frame

TM21-G series induction motor



BALDOR


BYT
AUTOMATION

- **MOTORS:** AC & DC
- **Sizes:** 0.25 to 25,000 HP
- **Voltages:** 120 to 11 Kv
- **Poles:** 2 to 48 poles
- **RPM AC MOTOR :** PM & Salient Pole Design
- **Enclosures:** TEFC, TEBC, TEAAC, TEWAC, DPFV, DPFG, WP1/2



- **SOFTSTARTS: LV & MV**
- 10 TO 2000 HP 230 to 575VAC
- 100 TO 30,000 HP 2.3 to 6 kV
- FUJI CONTACTOR BYPASS



WHO ARE OUR CUSTOMERS ?

- LARGE END USERS:

- SAWMILLS
- PULP MILLS
- MINING
- OIL & GAS
- PORT OF VANCOUVER

- OEM: ORIGINAL EQUIPMENT
MANUFACTURERS

MINING CUSTOMERS

TUNNEL BORING CONVEYORS & VENTILATION

- B2GOLD – Namibia.
- TECK – Red Dog, AK
- TECK – Elk Valley, BC
- LAKESHORE GOLD – Timmins
- FREEPORT – Indonesia
- WEIR MINERALS- Canada

VFDs for Ventilation and Conveyor for a Tunnel Bore Machine.



400hp VFD's at
tunnel entrance....



.....and Booster drives along
the length of the conveyor
inside the tunnel

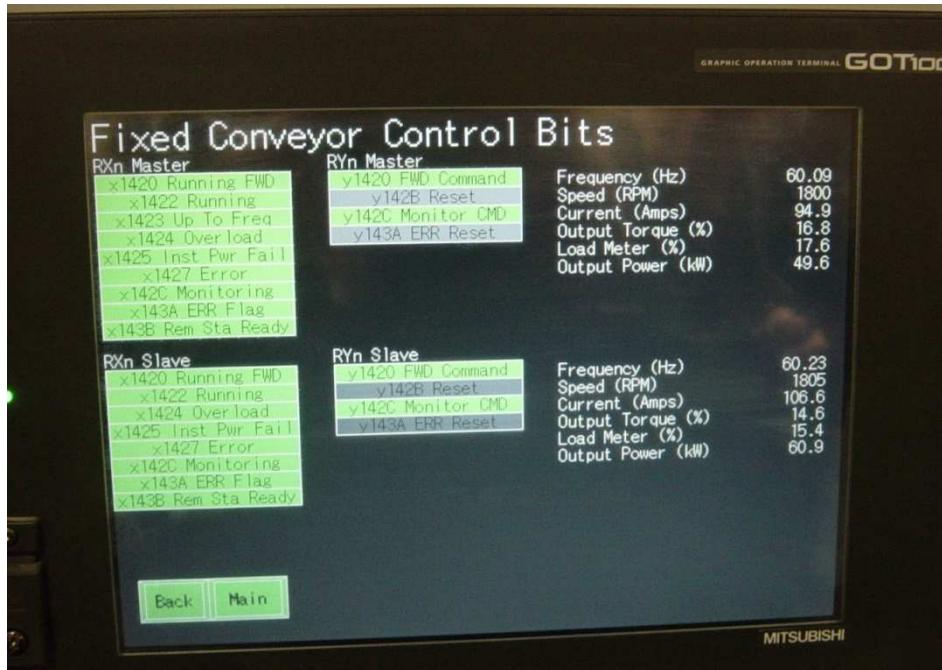
Tunnel Ventilation & Emergency Evacuation Communication



Air Duct



GOT 1000's (HMI) for control, monitoring, and diagnostics at street level and at Tunnel Bore Machine.



MINE HOISTS

SURFACE & UNDERGROUND

- 2 X 1250 HP, 650RPM
- 2 X 1750 HP, 1200 RPM
- 4 X 1600 HP, 985 RPM
- 1 X 700 HP, 1200 RPM
- 1 X 350 HP, 1200 RPM
- FULL REGEN
- MASTER SLAVE



OIL/GAS PROSPECTS

ARTIFICIAL LIFT, PRODUCTION, REFINING & TRANSPORT

- TRANSCANADA PIPELINES
- TRINIDAD DRILLING
- ENCANA
- SYNCRAUDE
- CHEVRON
- CANADIAN ADVANCED



SAW MILL PROSPECTS

- CANFOR – 10 MILLS
- TOLKO – 5 MILLS
- APOLLO FOREST
- JORDAN LUMBER
- NECHAKO LUMBER
- LANGDALE FOREST
- WEYERHAEUSER



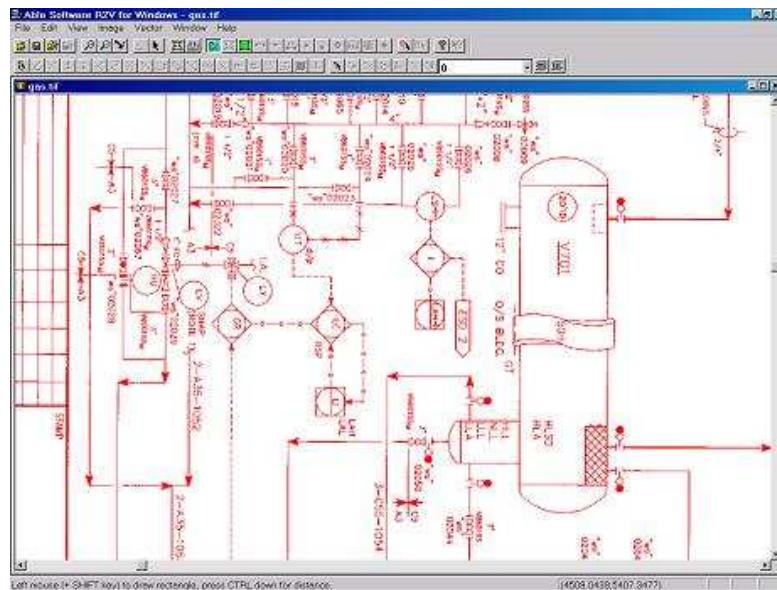
PULP MILL PROSPECTS

- CANFOR MILLS
- WEST FRASER MILLS
- CATALYST PAPER MILLS
- CELGAR
- DOMTAR
- ALBERTA NEWSPRINT
- HARMAC
- NEUCEL
- KRUGER
- TEMBEC



ENGINEERING EXPERTISE

- 3 STAFF DESIGN, APPLICATION & SVC ENGINEERS
- 35+ MAN-YEARS OF COMBINED VFD EXPERIENCE
- PLC / HMI / MOTION PROGRAMMING SOLUTIONS
- ALL DESIGN IN ELECTRICAL AUTOCAD



DESIGN - MANUFACTURING - SERVICE

- CSA AND UL APPROVED.
- DOCUMENTED QC SYSTEM
- VFD PANELS: 0.5 TO 60,000 HP (LV-MV)
- MCC LINEUPS
- PLC CONTROL PANELS
- SOFTSTART PANELS
- CUSTOM PANELS
- E-HOUSES



LOCATIONS

- HEAD OFFICE IN METRO VANCOUVER, CANADA.
- OTHER BRANCH OFFICES:
 - PHILIPINES
- SPANISH SPEAKING ENGINEERS COVERING:
 - LATIN AMERICA.

SOME EXAMPLES OF PANEL WORK



UNDERGROUND CONVEYOR – 2 X 300 HP VFD SKID



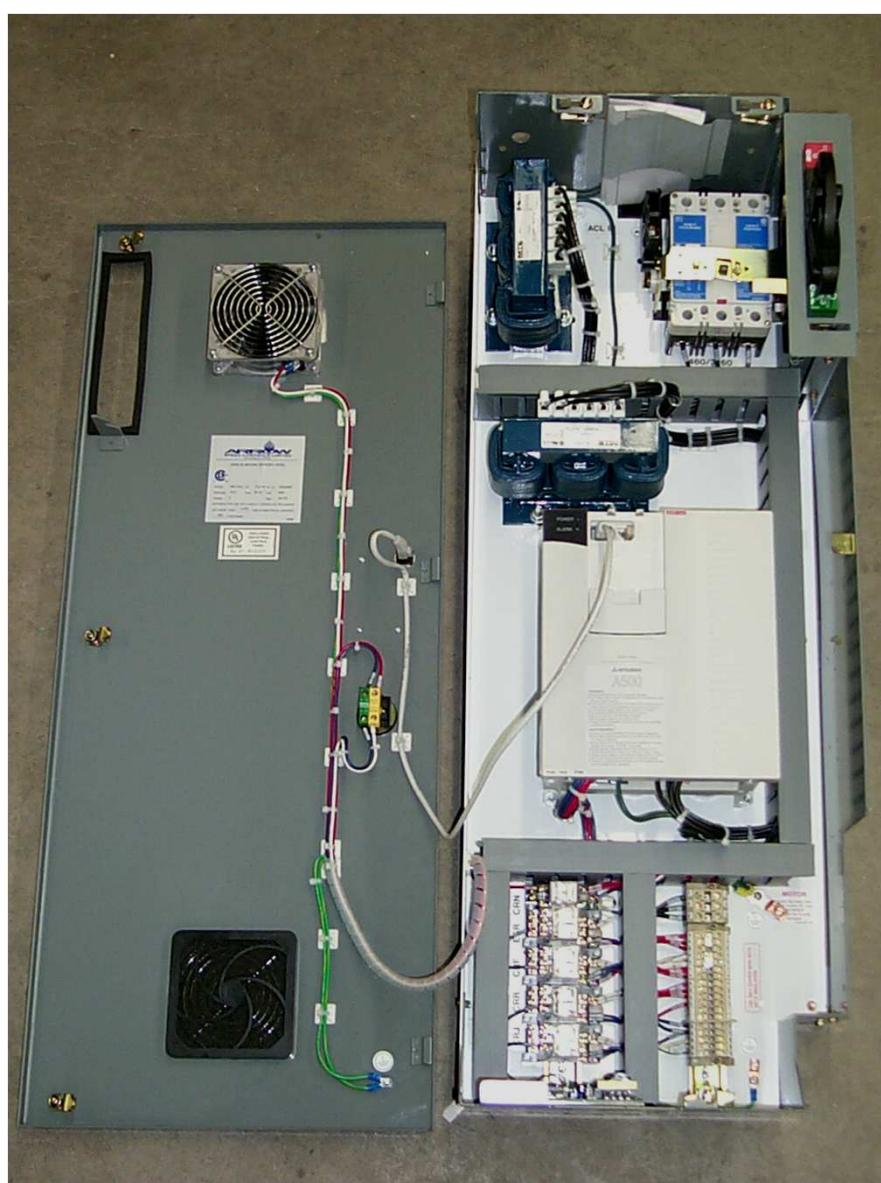
4 DRIVE CABINET – DOUBLE SIDED



50 HP – NARROW CABINET



A/B MCC BUCKET – 10 HP



SAWMILL MCC LINEUP



TRIPLE MCC SECTION



1000 HP – 575V -12 PULSE



INDUSTRIAL PANEL 500 HP – 4160V



INDUSTRIAL VFD PANEL

5000 HP – 6.6 kV



INDUSTRIAL VFD PANEL 800 HP –



PULP & PAPER MCC 1800 HP – 575V



INDUSTRIAL VFD PANEL 800 HP – 575V

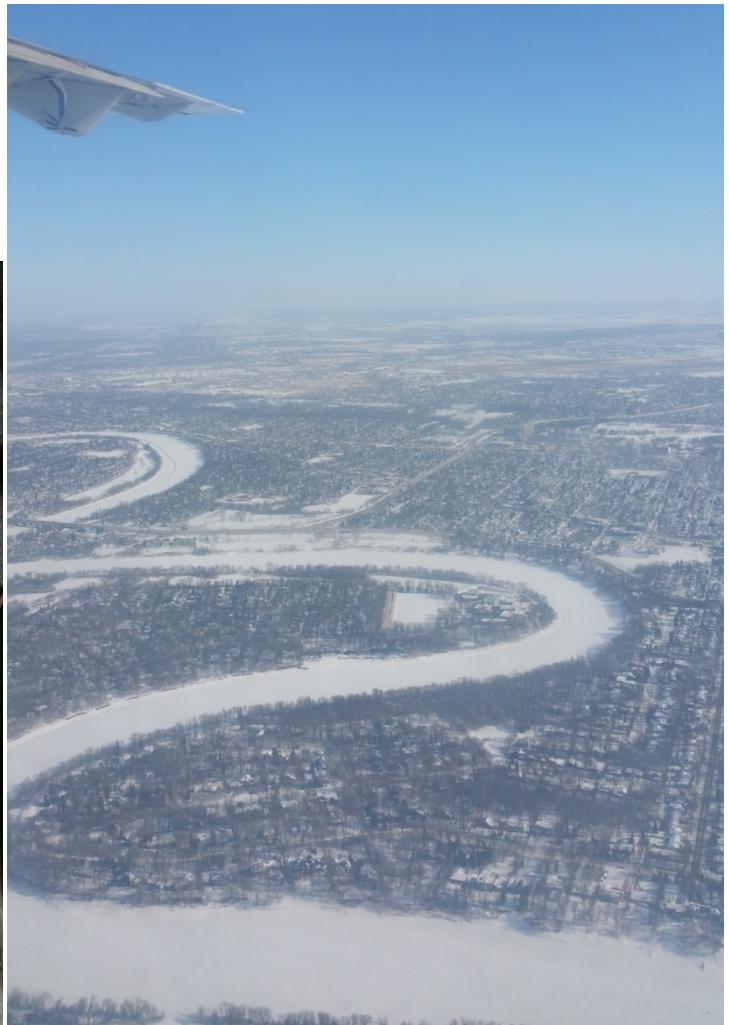


CRANE PLC & VFD CONTROL SYSTEM



MOTOR CONTROL & CSA-UL APPROVED INDUSTRIAL PANELS FOR MINES.

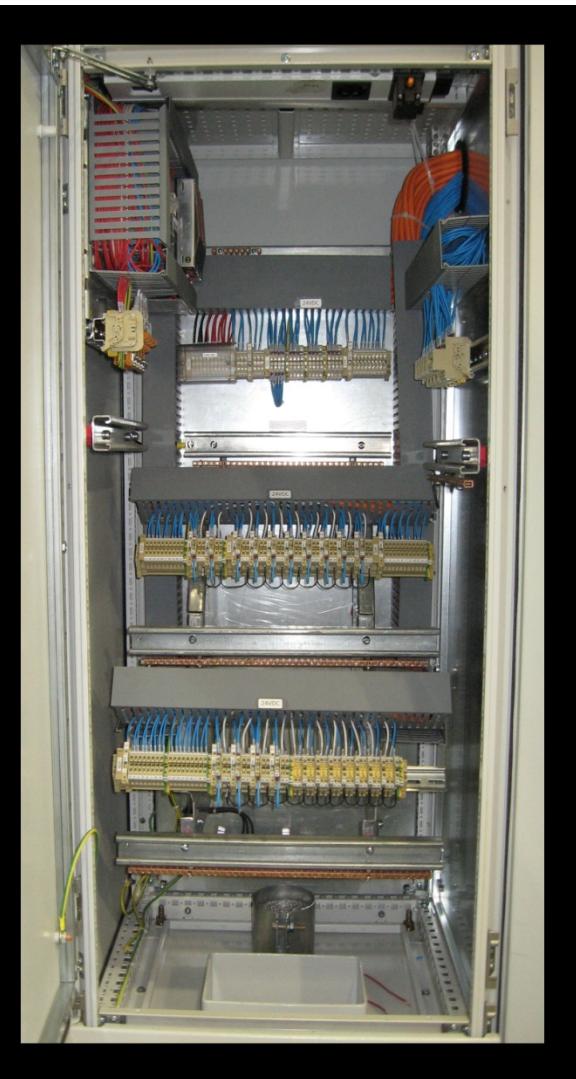
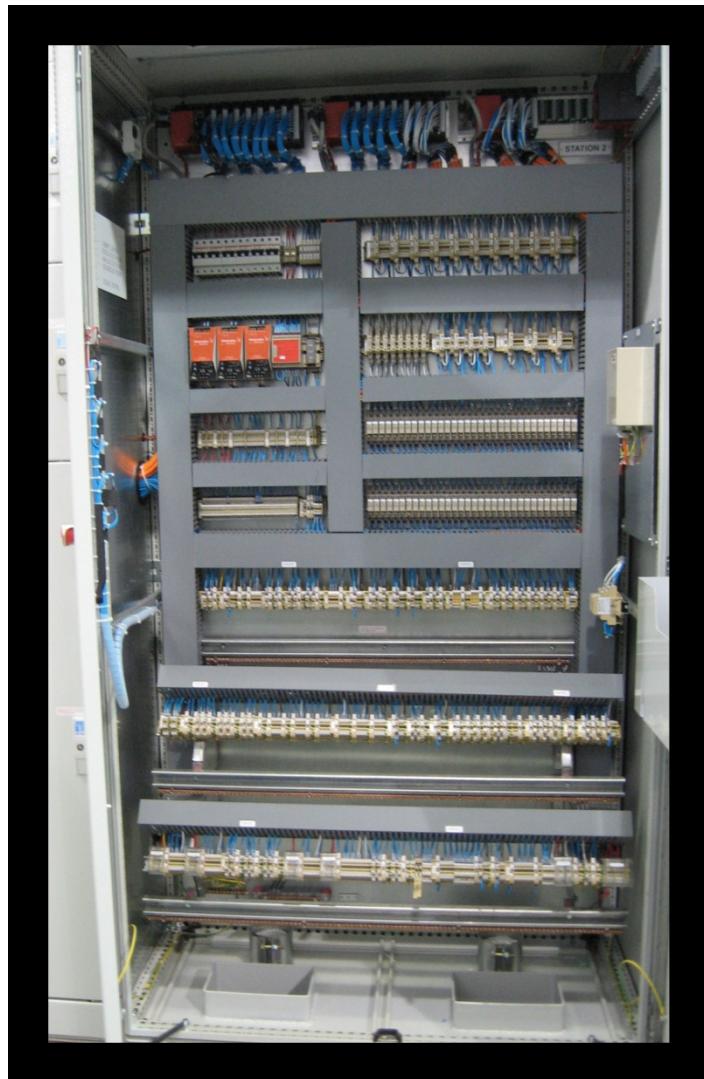
- MINE FAN 50m UNDERGROUND
- EXTREM LOW TEMPERATURES.



INDUSTRIAL VFD PANEL 500 HP – 575V



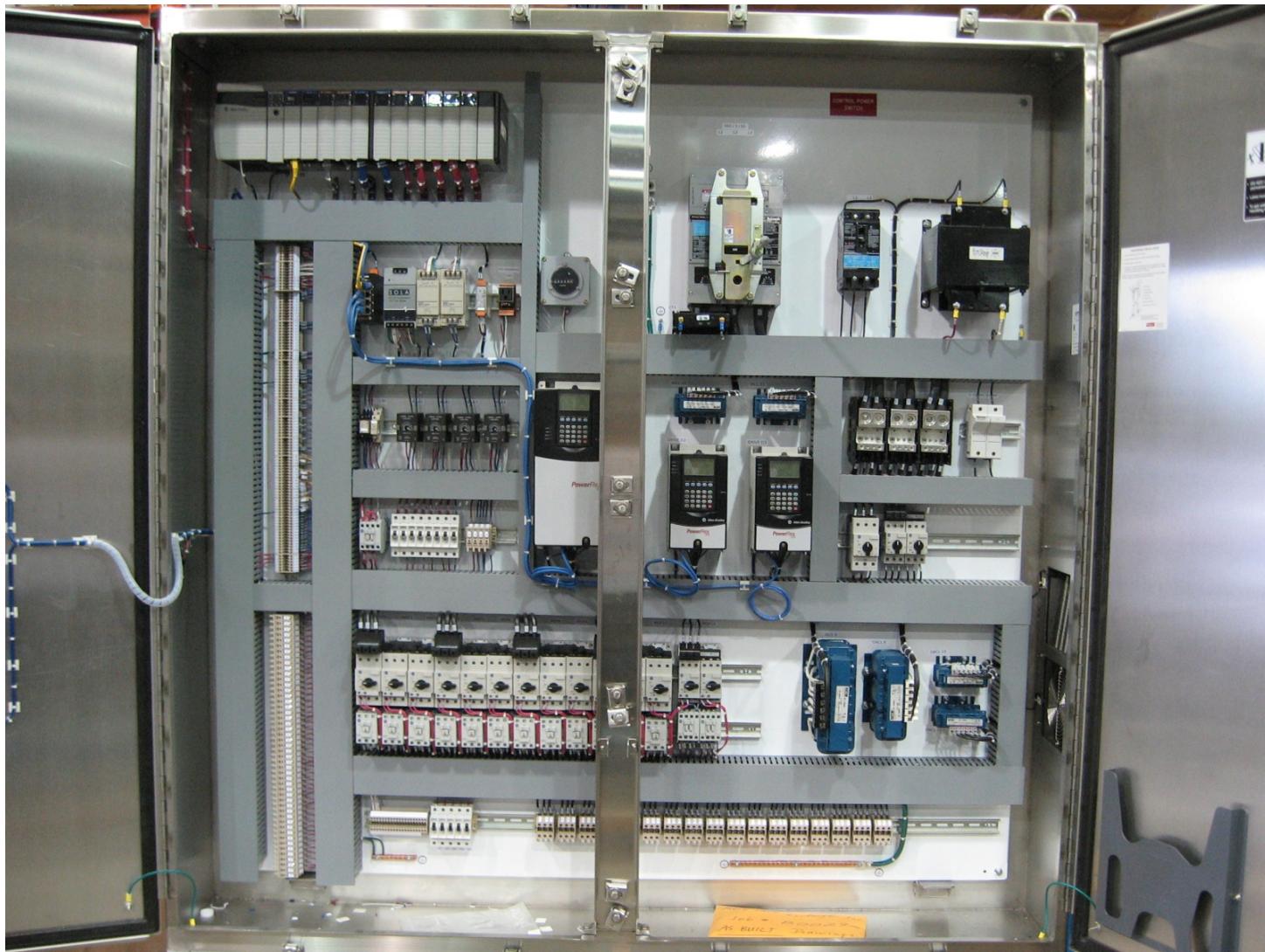
CRUISE SHIP CONTROL PANEL



MOTOR CONTROL MCC 1200HP BACK TO BACK/COMMON DC BUS.



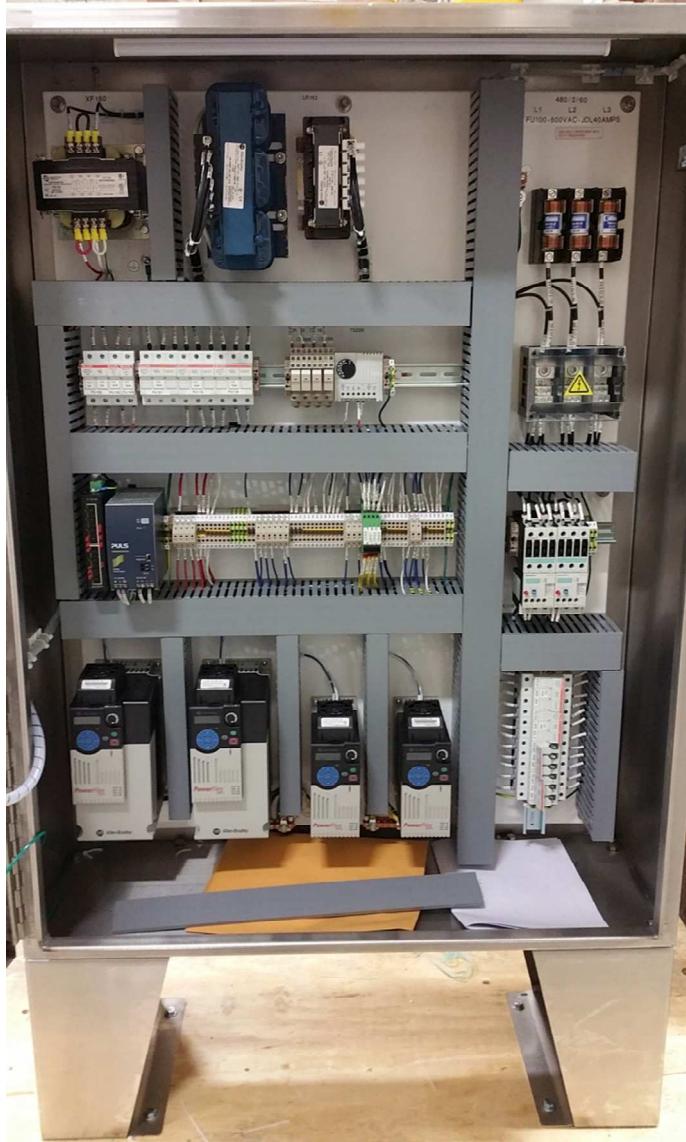
ROCKWELL CONTROL PANEL



CONTROL PANEL- OPERATOR INTERFACE



Shop Work Services - Nema 4X Panel



Shop Work – Custom Made Mine Jobs



MOTOR CONTROL PANEL

- MINE FAN 50m UNDERGROUND.



SUMMARY

- VFD INTEGRATORS LV & MV
- MOTOR CONTROL SPECIALISTS
- OVER 35 YEARS IN BUSINESS
- EXTENSIVE APPLICATION EXPERIENCE
- FULL ENGINEERING CAPABILITIES
- AFTER-SALES SERVICE AND SUPPORT
- (CSA) CANADIAN / (UL) U.S.A. STANDARDS ABIDED.



Next:

**Would you invite us for a
lunch and learn?**

**Any project where we could
give you support?**