



GE INDUSTRIAL MOTORS
a **WOLONG** company

MMP

Low & Medium Voltage
Motor Management Program



Small Machines Make A Big Impact

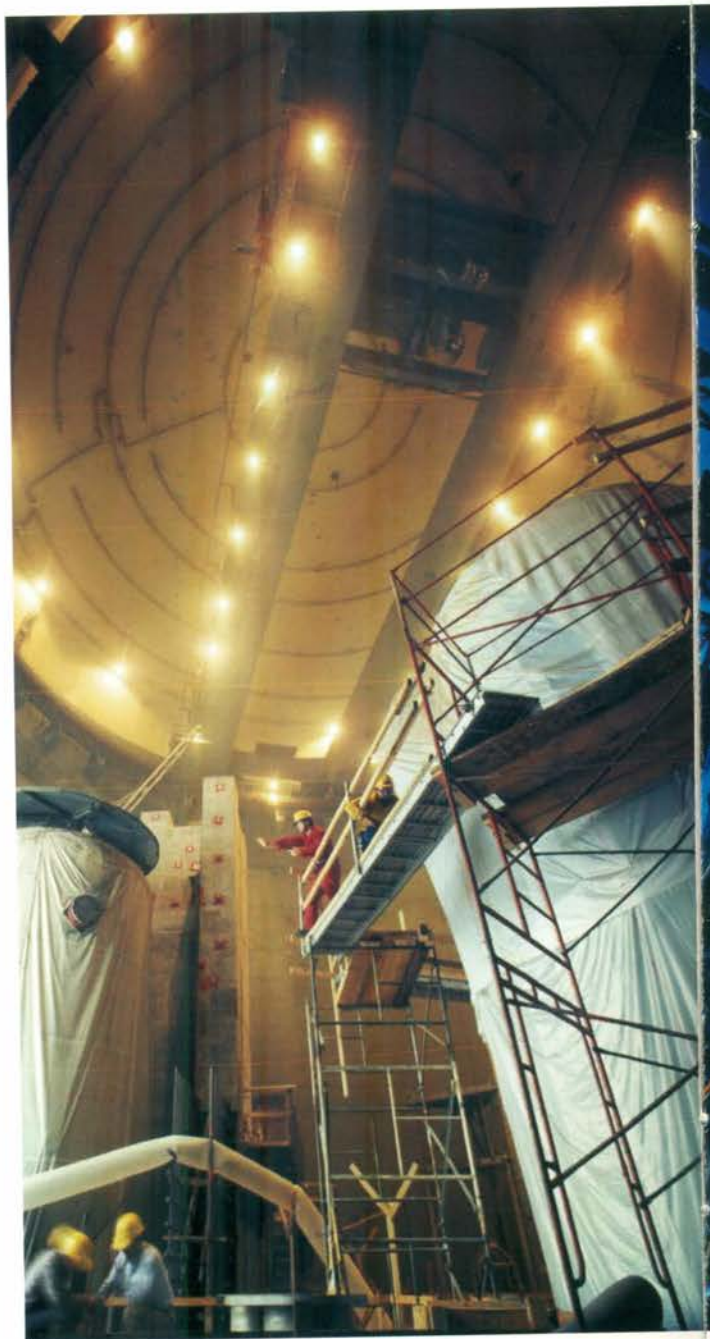
Electric motors make
an average of

70%

total power cost*

\$87^{hr}k

Average cost
of unplanned downtime
for a typical industrial
processing plant**



* <http://energy.gov/eere/amo/downloads/optimizing-your-motor-driven-system>
** <https://iac.university/technicalDocs/prodman.pdf> (Page 67)

Higher Efficiency and Less Downtime



\$930k^{/yr}

Energy savings
uncovered during
a plant motor audit^{***}

Challenges

- Multiple suppliers, designs and specifications tying up resources.
- Frequent unplanned maintenance disrupting operations requiring replacement motors onsite.
- Older low efficient motors eating profits.

Our Solutions

- Frame agreements increase supply and specification efficiency freeing up resources.
- Less unplanned maintenance and downtime with more robust motor designs.
- +1% energy efficiency gains translate to less than a two year payback.

^{***} Large pulp and paper producer motor audit results 2014

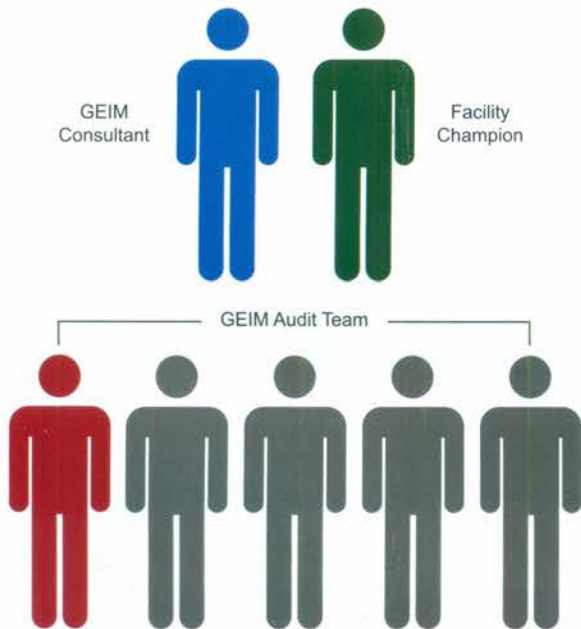
The tools and support to quickly optimize your operations

About MMP

Bringing together over 100 years of motor application experience and 21st century tools, GE has developed a motor management program that is both sophisticated and simple to implement with a turnkey set of solutions.

To get started, there are generally five major steps to follow as you ramp up your management program.

Step #1 Create your Audit Plan



- A GE Industrial Motor consultant will meet with a facility representative to agree on the audit scope and identify any possible roadblocks.
- An audit plan proposal is submitted including timing, resources and deliverables.
- A customized data capture application is generated and reviewed.
- An experienced and specially-trained audit team will be scheduled to visit the site.

Step #2 Gather Information



- The data gathering crew, escorted by designated plant employees, will collect images, nameplate data, conditions, application, notes, etc. from your installed motor fleet. All of the information will be captured by smart phones and tablets.
- Data will then be uploaded to a cloud server each day for exclusive access by plant users.
- Our audit team of up to 5 people can collect data on 250-500 machines / day based on normal plant operations.

Step #3 Report Summary

Motor Audit Summary for End Customer City, State			
Total Plant Operations			
Total Pre-Energy Consumption, kWh	288,618,824	Total Post-Energy Consumption, kWh	187,648,840
Total Pre-Energy Consumption, \$	\$ 9,954,701	Total Post-Energy Consumption, \$	\$ 6,314,732
Total Motors Evaluated	1,000	Total Energy Delta, %	5.64%
		Total Energy Saved, kWh	11,207,194
Total Management Overview			
Installed Base Data			
Number Motors to Replace v. Repair		565	
Cost of Motors		\$1,830,719	
Total Operational Savings/yr		\$569,063	
Estimated spending on repairs		\$995,429	
Total Audit Payback		1.47	

- A GE Industrial Motor Consultant will generate a report from the data showing energy consumption and possible savings through replacements and upgrades.
- The report is reviewed by plant manager(s) and any applicable distributors.
- A strategy and time line is discussed together with all involved parties.

Data to enable your team to operate more predictively

Step #4 Tag Your Motor Fleet



- The report will highlight opportunities such as older machines, low efficiencies, critical applications and special cases.
- Custom motor tags with replacement details are generated by us to attach to those machines applicable to your management strategy.
- QR codes can link smart devices to standard replacement motor data-packs.

Step #5 Manage Your Assets

At this point, you have several options to start operating more predictively which will bring even more reduced downtime and maintenance costs to your organization.

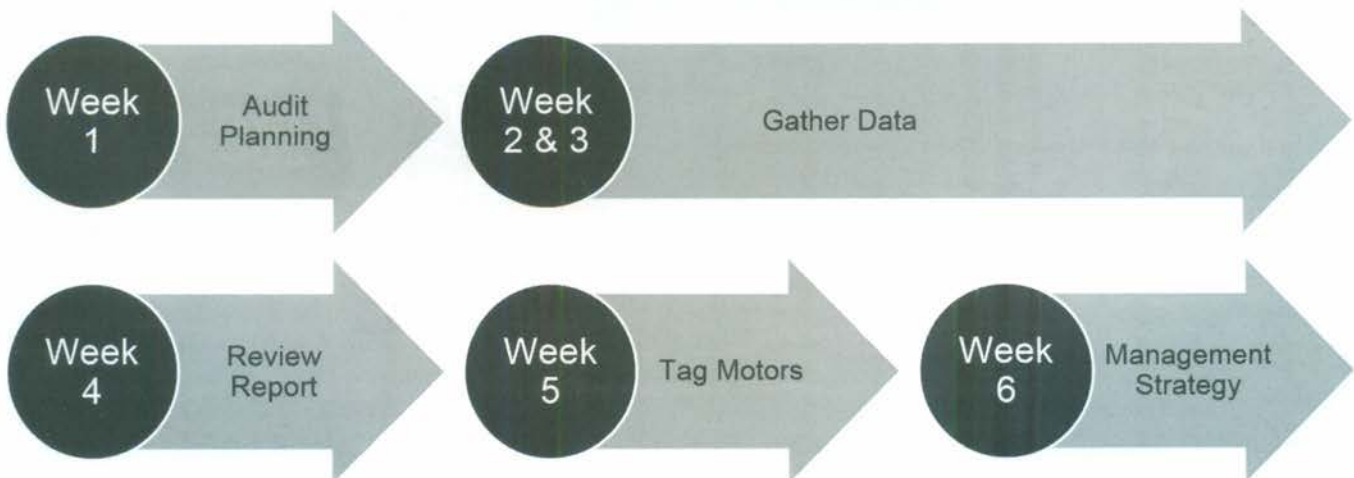
- Motor Frame Agreement
- Direct Manufacturer Engineering Support
- Software Integration Solutions

Build on Your Success

- Measure your maintenance downtime and energy costs. Report the results to your organization.
- Implement a Smart Motor Management System to control your motor fleet going forward.
- Use this project to kick start the development a more proactive operating culture.

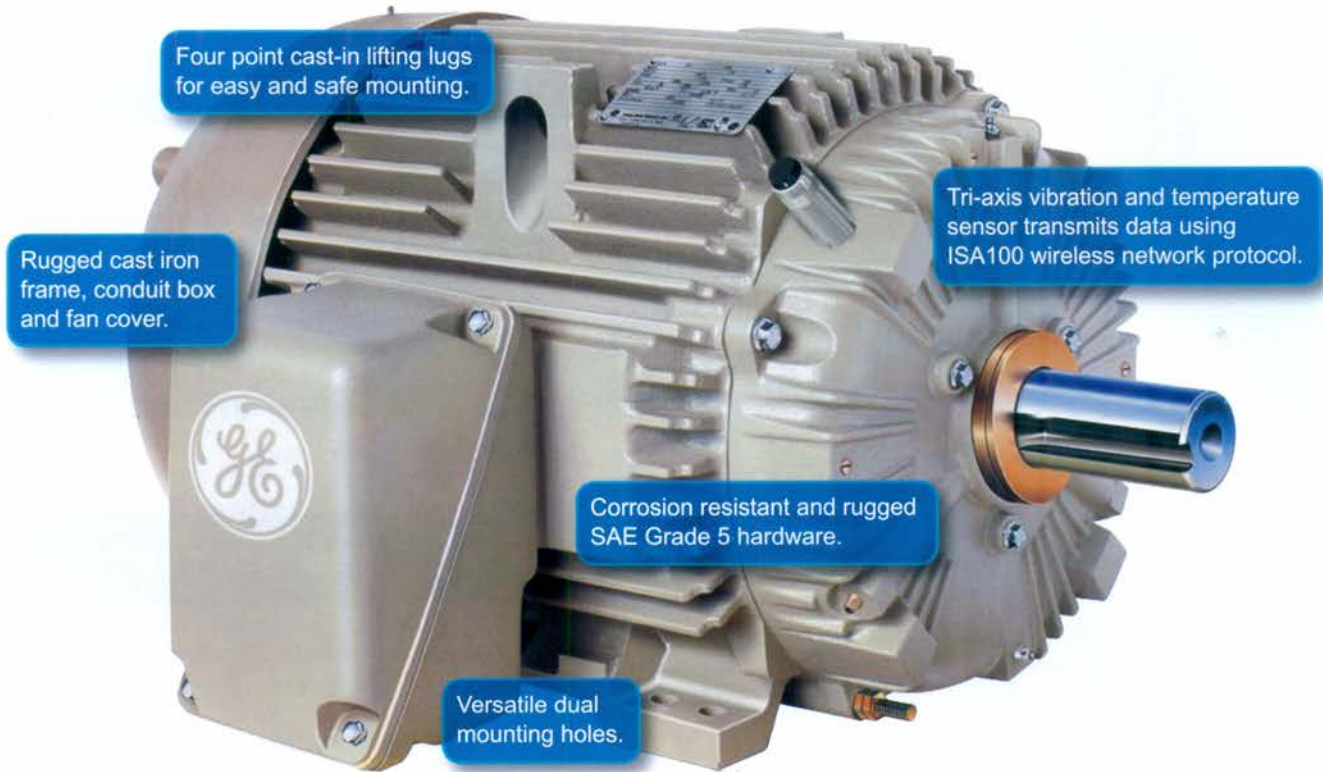
Realize benefits to your organization within a month!

Timing results may vary based on project scope, maintenance schedules, and other factors.



Introducing the GE Smart Motor

Our industry-leading motor can now talk!



Reliability is built in.

Purchasing dependable electric motors is an investment in the reliability of your operations. And system reliability means serious money to your bottom line.

Key Features

All of the great features of the X\$D Ultra 841 motor are included plus:

- Pre-mounted external sensor near drive-end bearing
- Tri-axis vibration and temperature detection
- Wireless condition monitoring solution
- Extended warranty and increased efficiencies
- Up to 5 year easily replaceable battery life
- Connect to plant-wide digital management ecosystem

GEGARD™ Insulation offers added protection.

Our Class H GEGARD insulation system is designed to excel in variable frequency drive applications where lesser designs often short circuit and cause overcurrent trips.



The Smart Motor Management System

Industrial grade equipment with maximum flexibility

Sensor Technical Features

- ATEX/IECEX Zone 0 [ia I/II C T4] Class 1 Div 1
- Truly wireless: sensors embedded in package
- Velocity (5-1kHz), Acceleration (5-10kHz)
- Auto forming, self healing ISA100 Wireless Network Protocol
- Replaceable lithium-thionyl chloride battery
- IP67 hermitically sealed electronics
- Temperature -40C to 85C
- Trended values: velocity, accel., temp.
- Range: 200 meters line-of-sight, 75-100 meters in typical indust. environment
- Security: 128-bit AES encryption
- Modbus output to DCS or Plant Historian
- Battery life: Up to 5 years (depending upon data frequency / type configuration)



DCS/Plant Historian

ISA100 Protocol
GCI Communications
Honeywell or Yokogawa Network



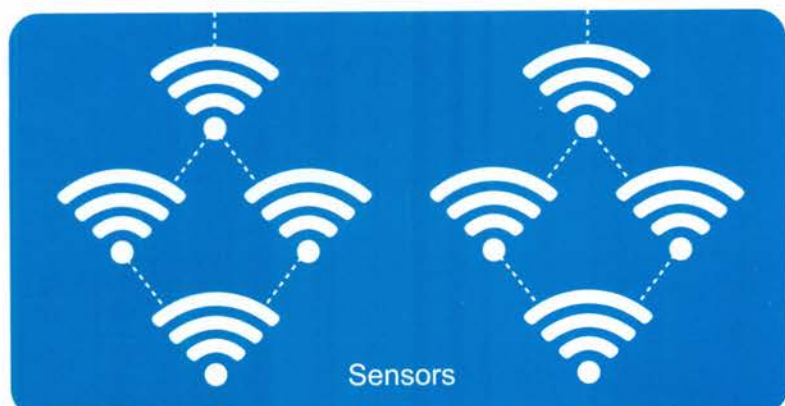
Device Manager

Each can manage maximum 4 access points or 160 machines.



Field Access Point

Each can channel data for maximum of 40 machines.



Sensors Repeaters

Each can transmit 100 meters and repeat up to 3 jumps to the gateway.