ENERGY INTERNATIONAL REPORT

SPRING-SUMMER 2012

In This Issue

EIC report is published twice a year by and for the employees of Energy international Corporation and their friends and associates in the business. All inquiries should be sent to: jpeter@energyintl.com.

Letter from the Top • Rami Fawaz

Rami Fawaz
Executive Vice President

Welcome to the latest issue of the Energy International Report. You'll notice we have a new title for our publication. Using the name Report doesn't tie us down to any specific time-line, allowing us to bring you news and information on Energy International Corporation in a more timely fashion. For the time being we'll concentrate on delivering a comprehensive newsletter twice a year, expanding the frequency of the newsletter as the company continues to grow.

Speaking of growth, Energy International continues to see a lot of positive opportunities in the MENA market. We recently secured a couple of multi-million dollar projects in Saudi Arabia with several more in the works. You can read about one of them, the Haram Expansion in Makkah, in our Project Features section.

EIC has been making a lot of headlines in the recent months. Our Parking & Transportation Division received a prestigious award from the RTA for their work on the Automatic Fare Collection project in Dubai. Syed Tariq Hussain of Energy industrial authored an article that was featured in Climate Control Middle East and EIC's Jordan office has been chosen as an exclusive distributor for JCI. Enjoy the latest issue and we'll be back soon with more news and information on Energy International.

Be A Part of the Energy International Quarterly

The EIC Report is designed to keep everyone at Energy International informed about the happenings at EIC, from the acquisition of multi-million dollar contracts to the latest additions to the EIC family. We need your participation to help make it a success. If it's of interest to you, it's of interest to us. We'd also like to know what you think about the newsletter content and format and how we can make it better. Send all your news, information, thoughts and ideas to me at jpeter@energyintl.com. I look forward to hearing from you.

EIC NEWS

The Latest News

Energy International's Parking and Transportation Group Awarded Certificate of Excellence for Successful Completion of Automatic Fare Collection Project in Dubai, UAE

The Dubai Roads and Transportation Authority recognized EIC at the annual vendor meeting in April, 2012

Energy International Corporation's Parking and Transportation Division has been awarded the Certificate of Excellence for the successful completion of The Automatic Fare Collection Project in Dubai, UAE.

The project, launched in Dubai, UAE in August of 2009, included the supply, installation and maintenance of all user-interface devices necessary to operate the fare collection system for the bus and marine departments of the Roads and Transportation Authority (RTA). The project went from the initial phase through all warranty phases and into the maintenance phase successfully, without incident.

The numerous components of the system include Ticket Vending Machines (TVM) for selling and adding value to cards, Electronic Validation Machines (EVD) for deduction of products and usage of buses, Fare Collection Gates (FCG) for deduction of products and passenger traffic control, Multipurpose Mobile Devices (MPD) for inspection and issuing of fines along with the back-end servers and software solutions encompassing remote control, software distribution, report generation and transaction monitoring on all connected devices for operational control.

"We congratulate EIC's Parking and Transportation Division, lead by Mr. Hussein Farran, Transportation Manager and under the Guidance of Mr. Aspi Kapadia, Division Vice President, on receiving this prestigious award and applaud them for their outstanding dedication to the completion of this very important project," said Dr. Ned Fawaz, Founder and Chief Executive Officer, Energy International Corporation. "I would also like to recognize Chadi Farran, the Project Manager for this project and thank him for his hard work and dedication to the completion of the project."

Chadi Farran, who joined the EIC group in 2008, after almost 10 years of manufacturing experience in the Greater Detroit, Michigan, USA region, holds a Bachelor of Applied Science of Mechanical/ Automotive Engineering from the University of Windsor and a Master of Science of Engineering Management from University of Michigan. He has received certificates from ABB robotics for programming, Siemens Controls for maintenance, St.Clair College for ISO9000 certification and from Dale Carnegie for program management.

Chadi Farran, EIC Project Manager - Parking and Transportation Division receives the Certificate of Excellence from the Roads and Transportation Authority at their April meeting.

Farran was awarded the certificate during the annual vendor meeting which was held on April 3rd, 2012 at RTA in Dubai, EIC was specifically mentioned by name and provided a certificate of excellence for EIC's outstanding work and support during the many phases of the project.

"All of this success would not have been possible without the continuous support from EIC's engineering and technical

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The project included the supply, installation and maintenance of all user-interface devices necessary to operate the fare collection system for the bus and marine departments of the Roads and Transportation Authority (RTA).

EIC NEWS

The Latest News

support staff in addressing all of our customer's requirements and the superior management support to address and eliminate roadblocks," said Farran.

To date, there have been over 1,900 buses equipped with EVD's, over 80 TVM's installed in the streets of Dubai, 30 ticket office machines used by RTA staff at bus and marine stations and over 20 MPD's that inspectors used for inspection of commuters. All these devices are operational 24 hours-a-day, seven days-a-week with EIC's transportation staff supporting above and beyond the contracted KPI's. The number of transactions generated by the system exceeds 16 million per month, all being monitored and maintained by EIC's transportation group.

The transportation team can be contacted via phone at +971-4-2618919, via fax at +971-4-3360509 or via e-mail at either Hussein.farran@energypark.ae or Chadi.farran@energypark.ae.

EIC's parking and Transportation Division received the Award for Excellence for their work on the Dubai Automatic fare Collection Project.

EIC Jordan Chosen as Engineered Systems Distributor for Johnson Controls

Energy International Corporation is proud to announce that they are now the Engineered Systems Distributor for Johnson Controls products and services in Jordan.

Effective April 30, 2012, EIC's Jordan office will handle all requests for Johnson Controls Chillers, Air Handling Units, Fan Coil Units, Close Control units and all related spare parts and services.

In a letter dated April 24, 2012, Johnson Controls announced that they were closing their regional office in Amman, Jordan, handling product sales and distribution through a network of suppliers in Jordan.

"The change has been made predominantly to support our sales model focused on helping our customers achieve and has been used in many countries across the MENA region where it has proved very successful in fulfilling customer needs and growing the market," writes Frank Doyle, Regional Director – MENA. "Johnson Controls stays committed to supporting Jordan through its distributors, ensuring adherence to all obligations and commitments."

JCI's distributors will now be supported by regional offices in Cairo, Egypt and the company's regional Headquarters in Dubai, UAE.

"We are pleased that JCI has chosen EIC to represent them in Jordan," said Saleh Assaf, Regional Sales Manager for EIC's Jordan office, who was instrumental in obtaining the cooperation with JCI and York. "Energy International Corporation enjoys a long and successful relationship with Johnson Controls in the Middle East, and we look forward to continuing to provide our customers with quality JCI products and services in the Jordan market."

All inquiries for Johnson Controls Engineered Systems Components should be directed to Assaf. He can be contacted via mobile at 00962-79-770-7230, via e-mail at saleh.assaf@energyintl.com or customers can call EIC's Jordan office at 00962-6-567-1915.

EIC NEWS

The Latest News

EIC Chosen to Represent Tower Tech Inc. in the Middle East

Oklahoma City, Oklahoma, U.S.-based manufacturer builds the world's most efficient cooling towers

Energy International Corporation (EIC), has signed an agreement with Tower Tech Inc. naming EIC as the exclusive representative for Tower Tech products in the Middle East.

Tower Tech Inc., headquartered in Oklahoma City, Oklahoma, USA, is an innovator in the cooling tower industry, manufacturing patented high-efficiency cooling towers since 1985.

"We are pleased to announce the addition of Tower Tech to the EIC family of quality manufacturers," said Dr. Ned Fawaz, Chairman and CEO of Energy International Corporation. "EIC is committed to bringing our customers the latest technologies in the HVAC and electromechanical industries. We are certain that Tower Tech cooling towers will revolutionize the HVAC industry and become a must-have solution for a region that is searching for state-of-the-art products that are proven to conserve water and energy."

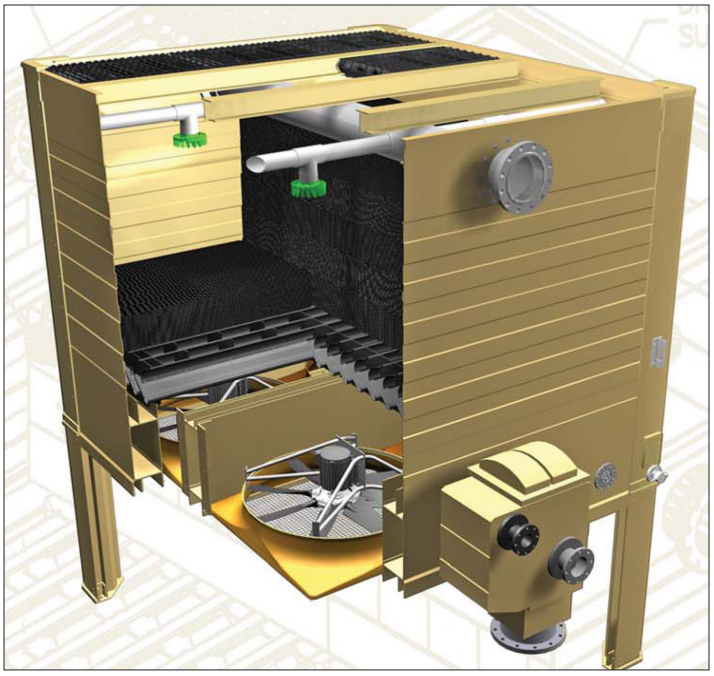
"We look forward to a very successful partnership with Energy International," said Dan Coday, Sales Manager for Offshore FRP Towers, Tower Tech Inc. "EIC is a respected name in the industry and we feel they are the right company to help us introduce this new, cutting-edge technology to the MENA region."

Tower Tech's patented, modular design is the most efficient on the planet. Even though the Tower Tech design can be initial price competitive with stainless steel and other pultruded fiberglass structures when bid according to Tower Tech's "or equal" specification, the life cycle operating cost can be up to 60 percent less over the life of the unit compared to conventional cooling towers. Along with a reduction in energy usage, Tower Tech's innovative technology also conserves water, an expensive natural resource in the Middle East.

A recent life-cycle study on a Tower Tech installation at a university in Kuwait showed a savings of 58 million gallons of water per year. These are huge savings in a climate where water is expensive and the intense heat increases evaporation.

The Tower Tech modular tower has several patented design features developed specifically to address the major shortcomings of conventional cooling towers.

Tower Tech's Flow-Thru Basin is an enclosed, elevated basin design that removes the noisy and inefficient free-fall rain zone, reducing pump energy requirements by as much as 50 percent. The tower incorporates a patented perimeter box beam that serves as both the cold water reservoir and provides the base structural component of the tower. High water velocities in the basin beams continually scrub the walls and floor of the basin to eliminate the build-up of sediment and greatly reduce the potential for Legionella formation. Since the water basin is not exposed to sunlight, the need for algaecide and other treatment chemicals can be reduced by up to 45 percent. Since the water basin is totally enclosed, the majority of the sand in a sand storm is blown under the tower instead of into the tower, as is the case with conventional cooling tower open air inlets. This also completely eliminates water lost due to "windage".



Tower Tech's innovative cooling towers are the most efficient on the planet, reducing operating costs by up to 60 percent.

The patented Water Collection System serves as an efficient collection chamber and conduit for channeling water flow into the Flow Thru Basin. The exclusive shape aerodynamically moves inlet air into the fill media while effectively providing a leak-free barrier protecting mechanical components.

Tower Tech's innovative Rotary Spray Nozzle delivers an even

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fill coverage across a broad range of system flows. The nozzle requires less pressure to operate compared to a conventional nozzle, is virtually maintenance free and dramatically improves tower performance.

"The use of a lateral spray pattern lets us position the nozzle juts one inch off the fill material," said Coday, saving several feet of pump head and nearly eliminating drift loss. A turbine driven rotor spins on a water bearing for clog-free operation."

The nozzle orifice is shaped to provide an even square spray pattern wetting the entire tower's fill, improving tower performance and reducing the likelihood of scaling due to dry regions in the fill. The spring-actuated orifice allows the nozzle to automatically adjust the spray pattern to changes in the flow rate. This innovative design features offers energy savings never before realized with cooling tower operation during part load conditions.

Tower Tech's modular design utilizes a number of bottom-mounted small fans to add even more flexibility and significantly greater reliability. Smaller fans use smaller motors that when coupled with the tower's variable flow capabilities can delivery energy savings of up to 78 percent, based on the size of the tower and system configuration. Direct drive fans eliminate the need for gear reducers, drive shafts, couplings and pulleys. Fans are installed vertically (shaft down) for easy maintenance.

"Our fan placement makes fan inspection a breeze," said Coday. "Most units only require fan inspection once a month. Fans are easily accessible on the bottom of the tower and just need to be checked for unnecessary wear and tear."

Tower Tech cooling towers are constructed of industrial-grade, corrosion-resistant fiberglass for a longer operating life compared to conventional steel and wood cooling towers. All metal parts located inside the water stream are made of 304stainless steel. The modular design comes complete and can typically be delivered unescorted on a conventional semi trailer. Units can typically be installed in one hour each.

Tower Tech's modular towers are easily linked together to create virtually any size cooling tower and quickly accommodates expansion of cooling tower capacity.

For more information on Tower Tech cooling towers, contact your local Energy International Representative visit www.towertechinc.com.

EIC Teams Up to Tackle PROJECT QATAR 2012

The Energy International team poses in their custom-made soccer jerseys for the PROJECT QATAR 2012 Show. The Theme of this year's trade show reflected Qatar's pending hosting of the World Cup in 2022. (Back row, left to right) Farid Abdulhadi, Semaan Obeid, Ammar Assi, Ziad Khalid, Rami Fawaz, Mike Shararah, Farah Alam Eldeen, Allie Bazzy (Front row, left to right) Ahmad Awaly, Mohamad Kammoun, Ribal Yazbeck.

O&M Manuals - ASAP

PennBarry's new QR Code fan labels provide instant access to product Operation and Maintenance Manuals from your smartphone or tablet

Imagine having instant access to Operation and Maintenance manuals for Pennbarry fans in the field where you need them most.

PennBarry has done just that. Beginning in March 2012, all PennBarry fans will be shipped from the factory with QR Code tags affixed to the fans.

Scanning the QR Code tag with a mobile phone or tablet device equipped with a QR Reader will allow online access to anyone who needs information about the installation, operation or maintenance of Pennbarry fans.

The QR Code fan label allows anyone who needs information about the installation, operation, or maintenance to access the latest Operation and Maintenance Manual online from any mobile device that is equipped with a QR code reader.

"Operation and Maintenance Manuals often disappear shortly after the fan is unpacked," says Jenny Abney Sivie, Vice President of PennBarry. "With the QR label, anyone with a smartphone or tablet can scan the tag to open the Operation and Maintenance Manuals for that fan right there when it's needed, even on the roof. Building facility personnel can pull up the fan Operation and Maintenance Manual years after installation, just by scanning the QR tag on their fan."

Initially, only Domex, Fumex and Zephyr fans will have QR Code tags with direct links to O&M manuals. All other fans will carry tags with links to PennBarry's main O&M web page with the eventual goal to link all fans to their respective O&M Manuals.

DOMEX FUMEX ZEPHYR

Scan the tags above with a smart phone or tablet equipped with a QR reader and the apporopriate O&M manuals will open on the screen.

"We know that reading the O&M manual on your iPhone screen isn't ideal, but it is handy and a great quick reference when you are standing in front of that fan that needs maintenance," said Sivie. "Besides, we think that everyone will have tablets in the future and reading the O&M manual on a tablet, at the fan, right when you need it, is pretty cool."

The tags are printed on standard outdoor labels and placed in the best manner possible to protect them from the elements while still making them accessible.

QR code, an abbreviation for Quick Response Code, is the trademarked name for a type of two-dimensional matrix barcode, originally designed for use in the automotive industry. The technology was developed by Denso Wave, a subsidiary of Toyota, in 1994 and used to track parts during the vehicle manufacturing process.

QR Codes are made up of a number of small square modules arranged in a square pattern against a white background. Data is encoded in four standardized types, numeric, alphanumeric, binary and Kanji (The logographic characters that make up the modern Japanese writing system).

Users with a camera phone or tablet device equipped with the appropriate decoding application can scan the code to display text, contact information, link to a wireless network or open a webpage in the phone's browser. For example, a QR Code could connect the user to a company web page without the need for typing in a URL address. Scanning the QR Code on a business card will automatically download contact info into the user's phone. QR codes can also contain e-mail messages and geographical location information.

There are a number of QR Code reader apps available (for free or for a small fee) such as NeoReader and Optiscan for the Apple iPhone, Barcode Scanner and QR Pal for the Android operating system, ScanLife for Blackberry and Quickmark for the Windows Phone 7 operating system. Several manufacturers are now offering devices with QR Readers already installed.

Powering Up In Egypt

Energy International supplies ventilation and fire dampers to the construction of giant electric power plant

As more Egyptians are plugging in, the demand for electricity is increasing. According to the International Energy Agency (IEA), Egypt has one of the highest electrification rates in Africa at 99.4 percent. The country also offers 100 percent access to electricity for those in urban areas and 99.1 percent for those in rural areas.

The IEA data estimates that electricity consumption in Egypt is increasing much faster than capacity expansions. The high demand is putting a strain on Egypt's generating capacity. A current peak demand estimated at 21.3 (GW) combined with an aging infrastructure has led to intermittent blackouts. These problems were further highlighted in the summer of 2010 as Egyptians experienced rolling nationwide blackouts.

In an effort to keep up with the increasing demand for power, the Egyptian government is planning to invest more than $100 billion over the next decade. The 10-year plan includes the construction of new power plants and researching alternative power generating sources including renewable energy (wind and solar) and nuclear.

One part of the proposed plan is the construction of a 2x650 MWe, dual fuel, supercritical steam thermal power plant that will be connected to the National Unified Power System (NUPS) through a new 500/220 KV GIS switchyard facility. This is the first use of supercritical boiler technology in Egypt, making the El Sokhna plant one of the most efficient plants in the country once it is operational.

The Al Sokhna power plant, currently under construction is part of Egypt's USD 100 billion, 10-year plan to keep pace with the country's growing demand for electricity.

The plant, estimated to cost USD 2 billion, will built on part of a 275,000 sq. m site located in El Ain Al Sokhna, situated along the Suez Gulf about 52km south of the city of Suez. The site has been allocated to the Egyptian Electricity Transmission Company (EETC) to be developed for energy production.

The power block will be made up of two Rankine cycle turbine generator kits, each with a nominal rated capacity of 650 MW, with a total capacity of 1,300 MW. The turbines are dual fuel, using natural gas as a primary fuel with capabilities of using mazout (heavy fuel oil) or a combination of both. The dual-fuel capability will provide a secure supply of electricity in the event of a shortage of natural gas.

The plant will utilize a direct (once through) cooling system drawing water from the Suez Gulf.

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PROJECT NEWS

Al Sokhna Power Plant - Suez, Egypt

Hassan Allam Construction has been awarded the contract for constructing the main portion of the plant including a steam turbine generator building enclosed with a steel skeletal structure, two stack chimneys with foundations, main transformers, auxiliary transformers and station service transformers.

The site will also consist of an open boiler building, a common control room and all associated structures and facilities. The project is scheduled to be completed in 2014.

Energy International Corporation has been chosen by contractor Intermechanical to supply PennBarry industrial fans and Air Balance fire and smoke dampers to the project.

The PennBarry fans will be installed in a number of buildings including the Control Room, Battery Room and the Hydrogen Generation Building.

Round Centrex fans (models REX 33B, 14B and 12B will be installed in the Battery Room (model REX 33B) and the Control Room kitchen and toilet areas (models REX 14B and 12B).

The belt-driven, inline, ducted exhaust fans feature a heavy galvanized steel housing and will be hung horizontally from the ceiling to tie into the building's HVAC system. The REX 33B in the Battery Room will come with an explosion-proof motor.

PennBarry's Breezeway P 12 RA was chosen for the Elevator Room in the Electrical Control Building. The wall-mounted, direct-drive axial fan is designed for exhaust or supply in light duty applications, ideally suited for ventilation of the Elevator Room. The P 12 RA features a stamped aluminum propeller with a steel hub and a zinc-coated wire guard/power assembly mounted to a steel venture panel with integrated vibration isolators.

This map shows the location on the Al Sokhna Power plant situated along the Suez Gulf about 52km south of the city of Suez.

Air to the Water Circulation Building and Electrical Equipment Rooms is supplied by Breezeway BCH 36 fans. The most rugged wall propeller fans in the Penn Barry line-up feature a high-efficiency cast aluminum air foil propeller, fabricated steel power assembly and a heavy gauge venture panel and fitted with a weather shield and weather shield guard and integrated filter to protect the fan from the elements.

Penn's Muffan 3010 belt drive centrifugal hooded fan will supply fresh air to the plant's Electrical Control Building. Muffan replaces foul or contaminated air that is removed by the building's exhaust system. Such makeup air is so essential that it is part of the building safety code requirements for rooms such as El Sokhna's Electrical Control Room.

Four PennBarry HI-EX HX30 belt-drive high-velocity roof ventilators will provide high-output exhaust ventilation for the Hydrogen-Oxygen area of the Hydrogen Generation Building. HI-EX ventilators are ideally suited for ventilation of specific problem areas where rapid air

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PROJECT NEWS

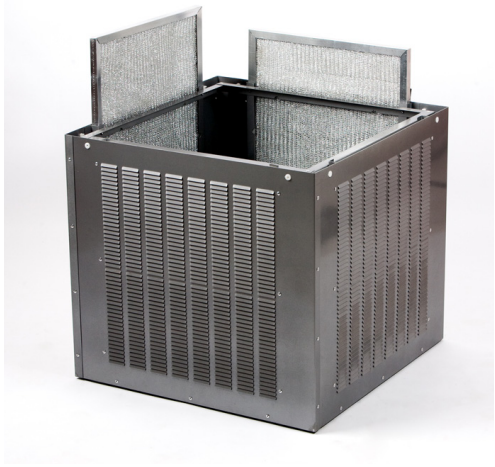
Al Sokhna Power Plant - Suez, Egypt

removal is required. The units are easy to install and don't take up valuable interior space. The ventilators feature a cast aluminum airfoil and will be mounted in explosion-proof enclosures to meet stringent code requirements.

Energy International was also chosen to provide Air Balance Fire Dampers and Combination Smoke Dampers to the project. The damper units will be installed throughout the main control area including the Control Room, Engineering units, Common Engineer Room and Battery, Switch Gear and Electrical Equipment Rooms.

Air Balance 319 Fire Dampers are constructed of 22 gauge steel. The frames are one piece roll-formed with curtain-type blades. The FS1V250 combination fire and smoke dampers are made of galvanized steel and UL rated for 1.5 hours. The units come equipped with 24-volt, motorized actuators that will be encased in explosion-proof housings and mounted out of the airstream.

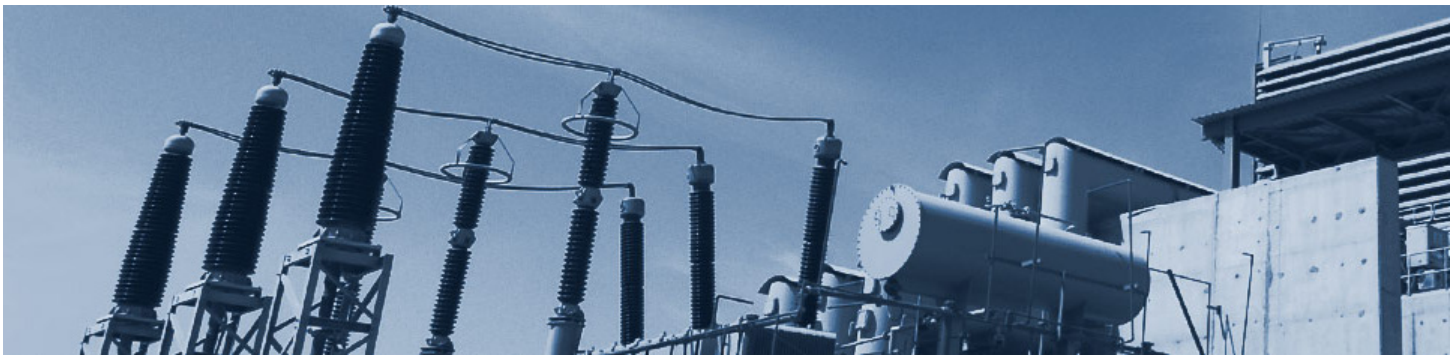
The dampers will be installed in the HVAC system where ductwork penetrates a normal fire barrier, such as a wall. In the event of a fire, the rising temperatures will melt a fusible link in the 319 units, closing the damper and prohibiting the fire from spreading through the HVAC system. The Fire and Smoke units also utilize a smoke detector that automatically closes the shutters, blocking smoke from spreading through the HVAC system.



PennBarry REX fans (above left) will be installed in the battery room and the control room kitchen and toilet areas. Penn's belt-drive Muffan will provide ventilation to the complex's electrical control building.

The PennBarry products will be manufactured at the company's El Paso, Texas factory. The damper units will be built at Air Balance's Florence, Kentucky facility. The Energy International shipping department will handle all logistics of getting the equipment to Alexandria, Egypt where it will be trucked to the construction site.

The PennBarry fans will be installed in a number of buildings including the Control Room, Battery Room and the Hydrogen Generation Building.



PROJECT NEWS

Haram Expansion – Makkah, Saudi Arabia

6,750 New Rooms With a View

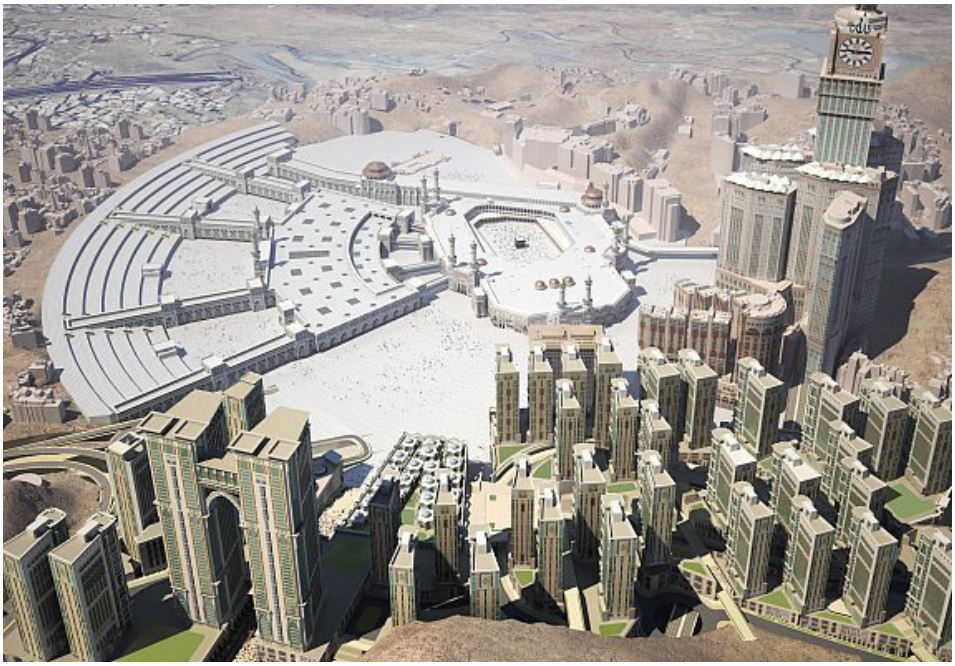
Haram expansion project to include Hyatt, Marriott and the Kingdom's first Conrad Hilton hotel.

The Jabal Omar Development Company (JODC) has recently secured the necessary financing to restart a mixed-use project in Makkah, Kingdom of Saudi Arabia.

The project, part of Makkah Development Authority's plan to develop Makkah's central region by 2020 to improve infrastructure and provide a wide range of accommodations for the rising numbers of pilgrims coming to the Holy City each year, has been stalled due to struggles, by the former contractors, in raising the necessary capital during the recent global economic downturn.

The initial project called for the construction of 38 towers, including three- and five-star hotels and residential units, boasting 1,950,000 sq. m. of floor space. The project will also include 58,000 sq. m. of prayer space, a massive retail concourse with 520 restaurants and 4,360 commercial and retail units along with a 2,000-seat conference hall.

Hotel giants Hilton Worldwide, Hyatt International and Marriott International have all announced plans to operate in 12 of the 38 proposed towers. Hilton will open six hotels, including the Kingdom's first Conrad Hilton, tripling the company's portfolio in Saudi Arabia. Hyatt and Marriott are on line to open three each. The 12 hotels will provide 6,750 rooms for visiting pilgrims.



The rendering above illustrates the expansion project set into the hillside to the west of the Grand Mosque. The finished project calls for 38 towers consisting of three- and five-star hotels and residential units along with a retail and commerce center.

The current project has been divided into five phases. The JODC has signed on new contractor, Nesma & Partners Contracting Company to construct the first phase of the SR3.4 billion project scheduled for completion in the first quarter of 2014.

The initial phase is comprised of three luxury hotels, one each from Hilton, Hyatt and Marriott, and hundreds of shops and air-conditioned prayer facilities for 100,000 worshipers, along with residential towers, near the Grand Mosque and overlooking Ibrahim Khalil Avenue.

In March of this year, the JODC awarded contracts worth SAR1.49 billion to Saudi Arabian Baytur Construction Company and Azmeel Contracting & Construction Corp. for the construction of four hotels as part of phase two.

Nesma & Partners has chosen Energy International Corporation to supply Fire and Smoke Curtains to the construction

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PROJECT NEWS

Haram Expansion - Makkah, Saudi Arabia

of phase one of the project. Phase one includes the multi-level podium that will house commercial and retail outlets as well as providing access to the Grand Mosque from the many hotels that will line the crest of the mountain at the back of the development.

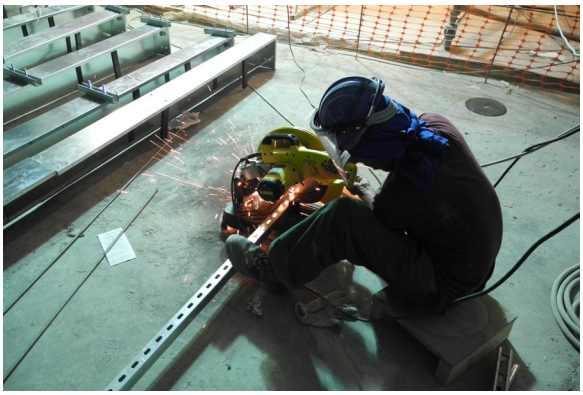
Energy International is the exclusive distributor for BLE Group products in the Middle East. BLE's SD60 Automatic Smoke and Fire Curtains were supplied to the project.

Smoke is the greatest threat to life safety in the event of a fire. BLE SD60 Fire & Smoke curtains are designed to reduce the threat of smoke during a fire. BLE Smoke & Fire Curtains perform two main functions, containing the smoke and channeling it so it can be ventilated it out of the building. These systems are ideally suited for complex structures such as airports and shopping malls like the one being constructed at Jabal Omar.

BLE SD60 Curtain systems are manufactured from glass cloth with a micronized aluminum polymer coating on each side of the fabric. The fabric is manufactured and tested to withstand 1,000^{O} C for one hour. All BLE Curtain fabrics are made from a unique "Panama" weave which offers a more even surface and allows for a tighter interlacing of the fabric edges. Top and side seams are sewn with stainless steel thread.

The SD60 is a gravity failsafe Automatic Curtain system utilizing the latest in electronic technology. Under normal conditions the curtain is retracted into the headbox and held in place by an extra low voltage supply from the 24-volt motor and motor control circuit.

AHMED CHUGHTAI PHOTOS



Workers (above) install the metal boxes that will house the smoke curtains. The curtains were specially designed and hemmed so that, when deployed, they wouldn't scratch or mar the intricate wood lattice work that decorates the interior of the podium, seen in the lower right of the photo above behind the worker's legs. (Right) a skilled tradesman cuts metal support beams used in constructing the metal boxes.

BLE's motor and electronics systems were redesigned in 2001 with new circuitry enabling each motor to lift 20 Kg (44 lbs). The motor circuit is housed in a remote enclosure allowing for routine maintenance checks without removing the motor from the curtain assembly.

In the event of a fire, the Fire and Smoke Curtain group control panel receives a signal from the building's fire alarm system. The group control panel isolates the voltage supply to the motor and the curtain descends under the power of gravity using the weight of the bottom bar. Electronic speed monitoring and control circuits are used to control the rate of deployment. The curtains automatically retract when the signal is removed.

The SD60 curtains manufactured for the Jamal Omar project were specifically designed to deploy and retract without damaging the decorative maple-veneered, perforated wooded latticework that adorns the interior of the podium.

The curtains will be manufactured by BLE in the United Kingdom and shipped to the job site in Makkah.

Indoor Comfort - Thumb Rules for Engineers

Syed Taqi Hussain, while giving tips to improve the quality of controlled air, says that Variable Air Volume box is a smarter way to control indoor space temperature.

The major function of an air distribution system is to provide comfort to building occupants. This article seeks to help specifying and design engineers create better zone comfort.

People are thermally comfortable when their body heat loss equals their heat production, without them sensing any changes in the temperature.

ASHRAE defines comfort as:

- Maintaining a temperature of 22.70C (730F) – 250C (770F)
- Relative Humidity of 25% to 60%
- Maximum velocity in the occupied zone is 50 FPM

How Does An Engineer Determine CFM?

The cooling or heating load (BTU/Hr) in any space determines the quality of air (CFM) that the space requires to satisfy the heat gain or loss. Δ (Delta T) is the difference between the supply of air temperature and the room temperature, and is called the temperature differential. As the load changes and goes either up or down, CFM demand too changes. Thus, the need to change the CFM to match the load changes in the given space.

$$CFM = \frac{\text{Btu/Hr [Load]}}{1.08 \times \Delta T}$$

The devices most commonly used to control the load or air volume to a zone are called Air Terminals – Variable Air Volume (VAV).

VAV boxes and their controllers are the most essential components of an HVAC system to achieve indoor comfort. Their proper selection and operation is, therefore, essential for optimum temperature control.

At present, bypass VAV, pressure independent VAV and CAV are the most commonly used types in the market.

Apart from the standard types, other types include, parallel fan-powered induction, dual-duct air terminal units.

ByPass Terminal Units:

These units are designed to achieve variable air volume delivery of conditioned air to a room through a single duct.

These are constant volume air distribution systems. Variable air volume control is achieved by directing the airflow either to a room or to a bypass port in direct response to signals from the room thermostat, and is the modulating type.

Pressure Independent VAV:

Here, the temperature in the room is controlled by varying the amount of supply of air introduced into the space.

Pressure Independent CAV:

Here, the temperature in the room is controlled by varying the temperature of the supply air introduced into the space, keeping the amount of air supplied as constant.

In a pressure independent system, the most important factor for the best performance of VAV is the selection of an accurate flow sensor. In multi-point averaging flow sensor with flow sampling of both velocity pressure and flow, the differential pressure provides precise air flow calculations.

As conditioned air enters the terminal unit, the sensor calculates velocity pressure in W.C (Pv) and converts its value to CFM. A signal is sent to the actuator, which then adjusts the damper shaft to open or close to reach the desired CFM (Min/Max/Constant).

This article is reprinted from the July 2011 issue of Climate Control Middle East. It was written by Syed Taqi Hussain, Product Manager, VAV & Controls - Energy Industrial Company.

While selecting air terminal units, the information provided on a schedule is critical. Without complete information, you will be forced to make assumptions which will probably lead to product performance problems at the job site.

An improper pressure drop assumption could lead you to believe that you are not able to meet the consultant specification. Apparent NC levels, therefore, may seem to be unattainable.

The most important information which an engineer needs while selecting a VAV unit include:

- Maximum CFM
- Minimum CFM
- Fan CFM (Fan-powered terminals)
- Primary supply pressure
- Sound performance criteria
- Heating requirements

Understanding Pressures

Primary supply pressure is the system pressure provided by the central air handling equipment to the terminal unit inlet damper.

Minimum pressure is the minimum primary supply pressure required to deliver a given CFM at a given pressure.

Downstream static pressure is the pressure that is measured or specified downstream of the terminal unit, as it is demonstrated in figure 2.

Figure 1

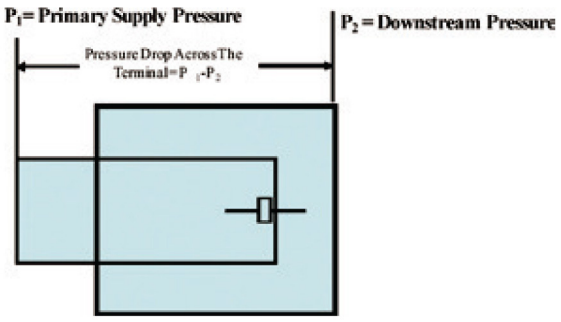


Figure 2

Noise Criteria [NC] and Values

The NC value of a terminal unit at a specific flow is absolutely dependent upon the primary supply pressure. If you do not know the primary supply pressure, you cannot estimate the NC. Given below is a list that could be helpful:

- General offices: NC 30 to NC 35
- Open-plan-office areas: NC 40
- Conference Rooms: NC 30
- Auditoriums: NC 30
- Lobbies and Corridors: NC 40
- Executive Offices: NC 25 to NC 30
- Computer/Equipment Rooms: NC 40 to NC 45
- Classrooms: NC 25 to NC 30

Heating Calculations

In order to obtain the desired temperature in any occupied space and to provide the needed heating capacity, duct heaters are used in line with the VAV boxes. The heater capacity is selected as per the details provided below:

$$kW = \frac{CFM \times (T02 - T01) \times 1.08}{3413}$$

kW = Power in kW
CFM: Air volume in cubic feet per minute
T02: Temperature of air leaving heater
T01: Temperature of air entering heater

Duct heaters can be selected for the best performance as per the criteria given above.

Controls and Calibration

The majority of controls installed in HVAC systems today are Direct Digital Controls (DDC). The controls can be DDC or application-specific controllers (VAV controllers). It is recommended to have controls supplied by the VAV manufacturer with complete calibration and testing

VAV Boxes and their controllers are the most essential components of an HVAC to achieve indoor comfort

ELEMENTS TYPES	ADVANTAGES	DISADVANTAGES
Open Coil	• Excellent heat dissipation • Minimal pressure drops • Fast response time • More kilowatts per square feet • Quick delivery	• Elements in direct contact with air • Cannot be installed in humid environments • Cannot be installed in dusty environments
Standard Tubular	• Less sensitive to humidity and dust • Suited for demanding environments • Excellent mechanical resistance • Heating element not in direct contact with air	• Increase in pressure drop • Slower response time • Less heat dissipation • Less kilowatt per square feet • Longer delivery
Finned Tubular	• Good heat dissipation • Less sensitive to humidity • Suited for demanding environments • Excellent mechanical resistance • Heating element not in direct contact with air	• Increase in pressure drop • Slower response time • Less kilowatt square feet • Longer delivery

from the factory. This procedure benefits the MEP contractors during testing and commissioning. The boxes are calibrated for min/max/constant flow as per the required schedule. And if used for a BMS project, the MAC address/device number is factory-set with a proper tag for each VAV unit.

Armed with the above information, an engineer or the contracting company in-charge of providing quality indoor space conditions, can serve the clients and end-users better. After all, in the final analysis, the aim of MEP contractors and consultants is to strive to provide perfect indoor space conditions through their products, services and expertise.

At a Glance

- VAV boxes are used to achieve a system that is both quiet in operation and energy efficient, and which provides better indoor temperature control. Therefore, understanding VAVs and their requirements is important.
- Properly selected and calibrated boxes result in achieving better temperature control.
- VAV box suppliers need to make sure that proper selection of boxes is made to provide end-user with precise control and a quiet living environment. Very hot or very cold indoor air can make the living environment unhealthy.
- Specifying/Design Engineers need to make sure that controls are supplied with the box at the commissioning stage and during normal operation. The responsibility has to remain at one source.

Without complete information you will be forced to make assumptions which will probably lead to product performance problems at the job site

PEOPLE NEWS

Please join us in welcoming new members to the EIC family

Energy International Corporation is proud to announce that Thajid Mohammed has joined the company's Ryadh, Saudi Arabia office as an Administrative Assistant working Mazen Sheet, Regional Sales manager for the Riyadh area.

Thajid holds a business Administration degree from India and joined the office on March 24, 2012.

EIC's U.S. office welcomes two new faces to the line-up

Tina Troppi joins EIC's Canton Michigan Headquarters as Administrative Assistant to Executive Vice President, Rami Fawaz. Tina is also in charge of managing the company's new Customer Relations Management (CRM) system for entering and tracking inquiries, quotes and orders.

Tina comes to us from Neighborhood Funding Sources in Ann Arbor, Mich., where she worked as an Executive Assistant.

Scott Vanderploeg joins us as an Estimating Engineer in the U.S office where he will be specializing in fans and ventilators. Scott hails from Kalamazoo, Mich., and holds an Associates Degree in HVAC/R .

Anas Mustafa joins our Jordan office as a Senior Marketing and Sales Engineer. Anas comes to us from Johnson Controls International where he worked as a Sales Engineer promoting and marketing JCI HVAC equipment to the Jordan market.

Please join us in congratulating Muhammed Mustafa who was promoted to the position of Operations Manager in the company's Sharjah, UAE office.

In his new position, Muhammed will be acting as a sales coordinator, handling order processing, delivery, logistics and will be in charge of the company store.

"Based on the long years of hard work and dedication to the company, the management has decided to promote Muhammed," said Fadi Salibi, General Manager of EIC's Sharjah office. "Let us congratulate Muhammed on his new position and wish him the best."

EIC U.S. Enjoys Thier Annual Baseball Outing

The EIC U.S. crew enjoyed their annual outing, taking in a Detroit Tiger baseball game with a stop by Nikki's for some delicious pizza. Ned Fawaz and Allie Bazzy (top) enjoy Nikki's pizza (evidenced by the empty tray). Estimating Engineers Mohamed Syenna and Scott Vanderploeg (above left) pose for the camera at Nikki's. Alex Fawaz, Rachel Muller and Bethann Kukla cheer on the Tigers at Detroit's Comerica Park.