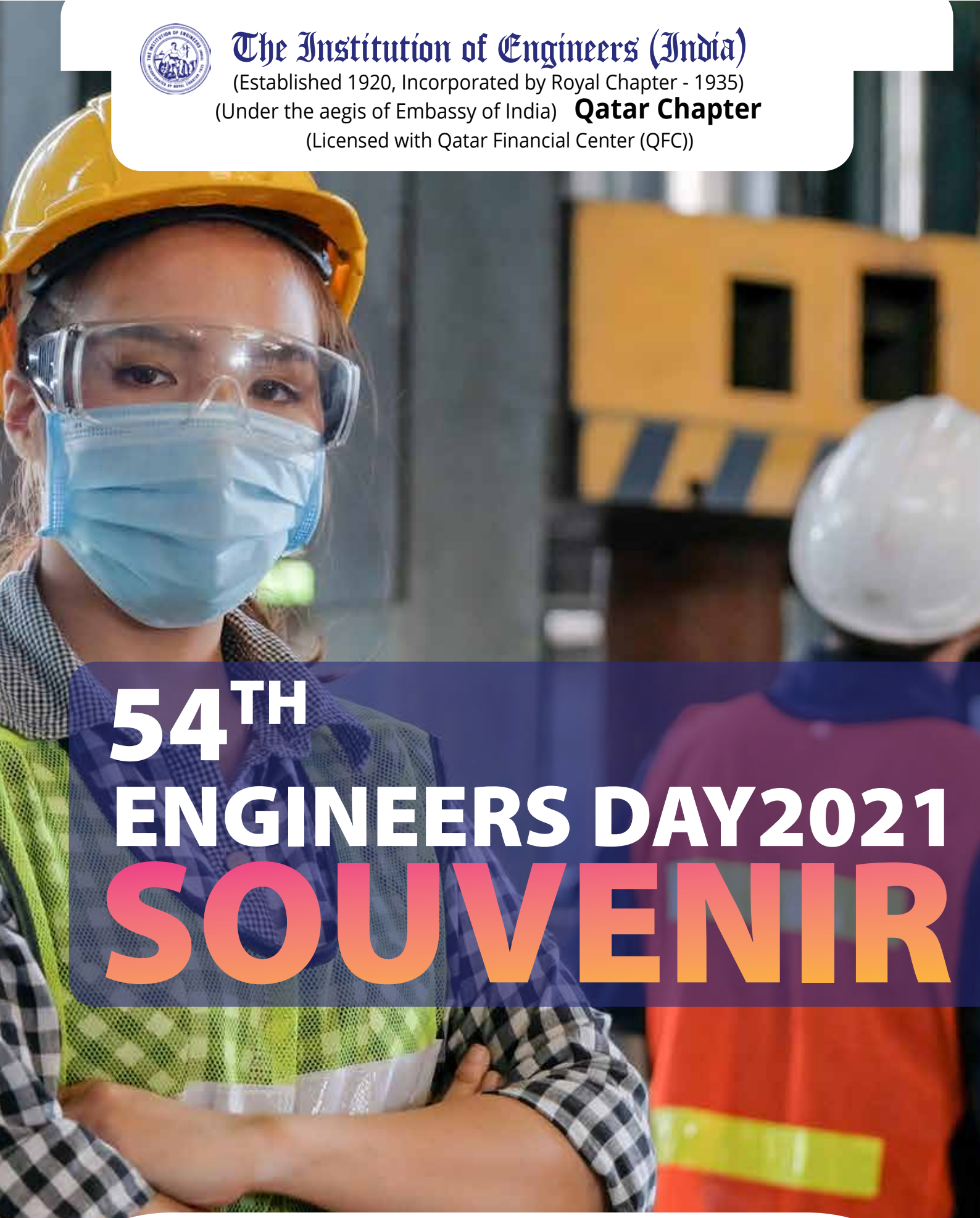
The Institution of Engineers (India)
(Established 1920, Incorporated by Royal Chapter - 1935)
(Under the aegis of Embassy of India) **Qatar Chapter**
(Licensed with Qatar Financial Center (QFC))



54TH ENGINEERS DAY2021 SOUVENIR

Engineers for Skill Development & Employment in combating COVID

H.H. SHEIKH TAMIM BIN HAMAD AL-THANI
(Amir of the State of Qatar)

H.H. SHEIKH HAMAD BIN KHALIFA AL-THANI
(Father Amir)

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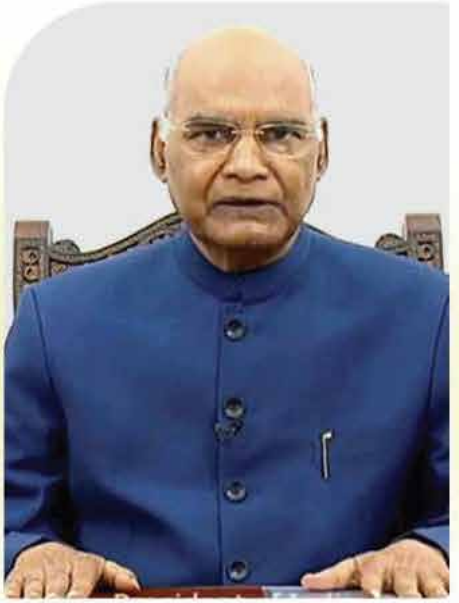

H.E RAM NATH KOVIND
(President of India)

H.E NARENDRA MODI
(Prime Minister of India)

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H.E. Dr. Deepak Mittal,
Ambassador of India

MESSAGE

Ambassador

भारतीय राजदूतावास
السفـــارة الهنـــدية
EMBASSY OF INDIA

P.O. BOX 2788, DOHA-QATAR
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E-mail :amb.doha@mea.gov.in
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Twiter : @IndEmbDoha

MESSAGE

I am happy to learn of the Institution of Engineers (India) Qatar Chapter's celebration of the 54th Engineers Day on 24th September, 2021. I extend my warm greetings and best wishes and commend IEI for selecting the theme - **Engineers for Skill Development & Employment in combating COVID**", a relevant theme in the present context.

It is heartening to note that IEI, QC has been celebrating this special Day since its inception in 1991 to commemorate the birth anniversary of Sir Mokshagundam Visvesvraya, a recipient of Bharat Ratna.

As we celebrate Azadi ka Amrit Mahotsav - 75 glorious years of India's Independence, I pay tribute to Sir Mokshagundam Visvesvraya, a legendary engineer and architect of modern India, who dedicated his life to our country's development. I also take this opportunity to commend the efforts of our engineers who have contributed immensely not just to the overall progress and development of India, but to that of Qatar as well.

I also congratulate IEI, QC for playing an active role in fostering partnerships with engineering forums of our host country Qatar and also third countries. IEI QC is one of the most active forums to foster cooperation in various engineering sectors and has organized events in academic, technical, training and research fields. I am happy to note that even during COVID, IEI QC has continued to engage with counterpart agencies and conducted virtual sessions to benefit the engineering and technical fraternity.

On this occasion, I congratulate the Indian Engineers fraternity in Qatar for their relentless contribution and wish them the very best in their future endeavors.

(Deepak Mittal)

Internatonal Telecome day

Sheikha AlanoudBint Hamad Al-Thani,
Deputy CEO and Chief Business Officer, QFC

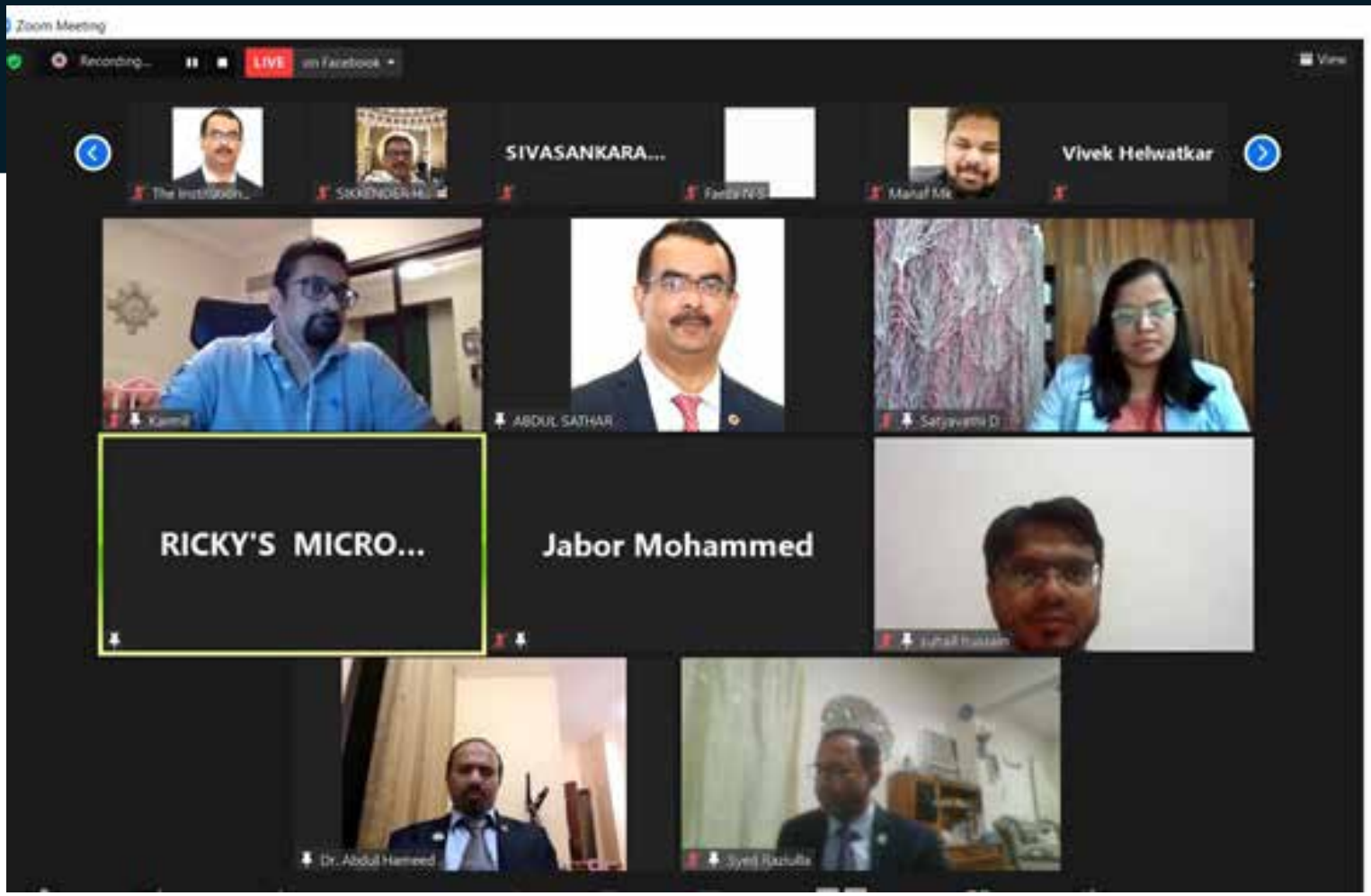
MESSAGE

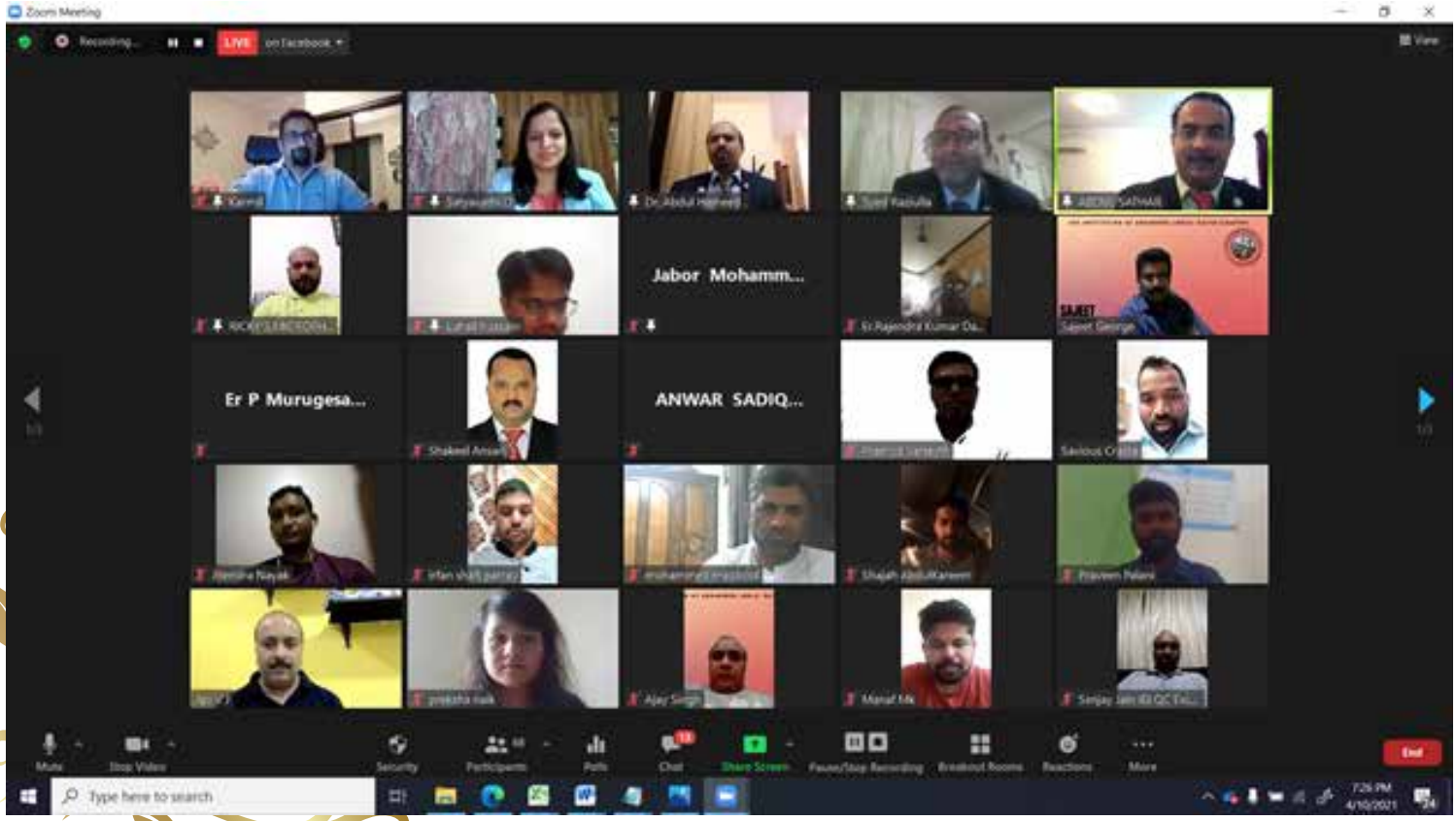
مركز قطر للمال
Qatar Financial Centre

Sheikha AlanoudBint Hamad Al-Thani, Deputy CEO and Chief Business Officer, QFC

"It is a true honour to be part of this year's Engineers Day to join the Institution of Engineers India (IEI) Qatar Chapter in celebrating the achievements and successful journey of Qatar's engineering community. Engineers continue to play pivotal roles in Qatar's developmental journey and have been instrumental in realising the objectives of Qatar National Vision 2030. The Indian community in Qatar, in particular the Indian engineering talent, have seamlessly supported the country's long-term growth and their commitment to Qatar's prosperity reinforces the burgeoning ties between the two countries."

CYBER SECURITY ON CLOUD-WEBINAR





Er. Narendra Singh , FIE
President

MESSAGE

The Institution of Engineers (India)

AN ISO 9001 : 2015 CERTIFIED ORGANISATION
(ESTABLISHED 1920, INCORPORATED BY ROYAL CHARTER 1935)

Er. Narendra Singh, FIE
BE(Civil), P.G.D.
President

Headquarters : 8 Gokhale Road, Kolkata 700020
Contact : 91- 33-22231979 / 40106204
E-mail : president@ieindia.org

A Century of Service to the Nation

MESSAGE

It is my immense pleasure to note that Qatar Chapter of The Institution of Engineers (India) is observing the 54th Engineers' Day on the theme "Engineers for Skill Development & Employment in Combating COVID" on 24th September 2021 to venerate the Birth anniversary of Sir Mokshagundam Visvesvaraya – an illustrious icon in the gamut of engineering fraternity.

Due to COVID-19 pandemic since early 2020, global economy has been reeling under a downturn and as a consequence, many industries have adopted conservative approaches towards employment thereby putting financial stress on the employees and the job seekers. The pandemic has changed business processes and also opened several new business opportunities. Our engineering community needs to think of technical interventions and engineering solutions towards designing and developing a well-crafted strategy to deal with the employment crisis so that our workforce is empowered with the right skills for becoming more agile and resilient. I am sure that the guest speakers will highlight more on this subject for updation of the participants.

I convey my hearty greetings to all associated with this event on this significant day and laud the efforts of Qatar Chapter for conducting this celebration.

Er. Narendra Singh, FIE
President, IEI

Residence : C-101, Alaknanda Apartment, 51-B, Rajpur Road, Dehradun 248 001
Ph: 0135-2712167, **Mobile**: 9412051590, **E-mail:** nsinghfieindia@rediffmail.com

Future Network SMARTGRID Network -WEBINAR

The Institution of Engineers (India)

Qatar Chapter under the aegis of Embassy of India
(Licensed with Qatar Financial Centre)

Technical Webinar on: "Future Power Network (Smart Grid)- Challenges and Trends"

Chief Guest

Dr. Mohammed Abdulla E Al-Hitmi
Head, Dept of Electrical Engineering
Qatar University

Guest of Honour

Er. Ahmed Jassim Al Jolo
Former Chairman ,
Qatari Society of Engineers

Welcome Address

Er. Abdul Sathar, FIE
Hon. Chairman,
The Institution of Engineers (India) QC

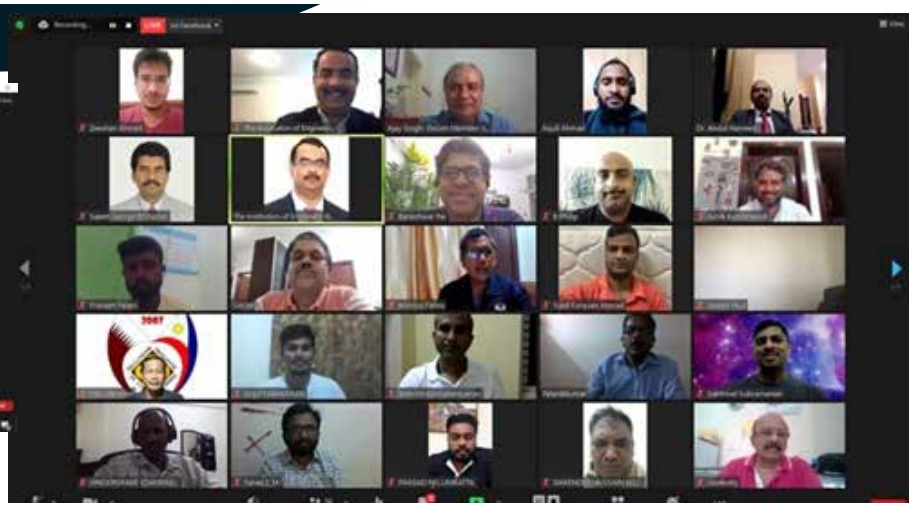
Keynote Speaker:

Prof. Atif Iqbal
(Dsc, Poland, PhD, UK)
Vice-Chair IEEE Qatar Section
Dept of Electrical Engineering
Qatar University

zoom Meeting ID: **820 9860 8880**
Passcode: **IEIQatar**

Date & Time : Saturday, 3rd April '21 @ 6:00-7:30 PM

www.iei.qa



Maj Gen MJS Syali, VSM (Retd.). FIE
Secretary & Director General

MESSAGE

The Institution of Engineers (India)
AN ISO 9001:2015 CERTIFIED ORGANISATION
(ESTABLISHED 1920, INCORPORATED BY ROYAL CHARTER 1935)
8 Gokhale Road, Kolkata-700 020
http://www.ieindia.org

Maj Gen MJS Syali, VSM (Retd.), FIE
Secretary & Director General

Ph. Direct : (91) (33) 2223 8230
E-mail : sdg@ieindia.org

A Century of Service to the Nation

MESSAGE

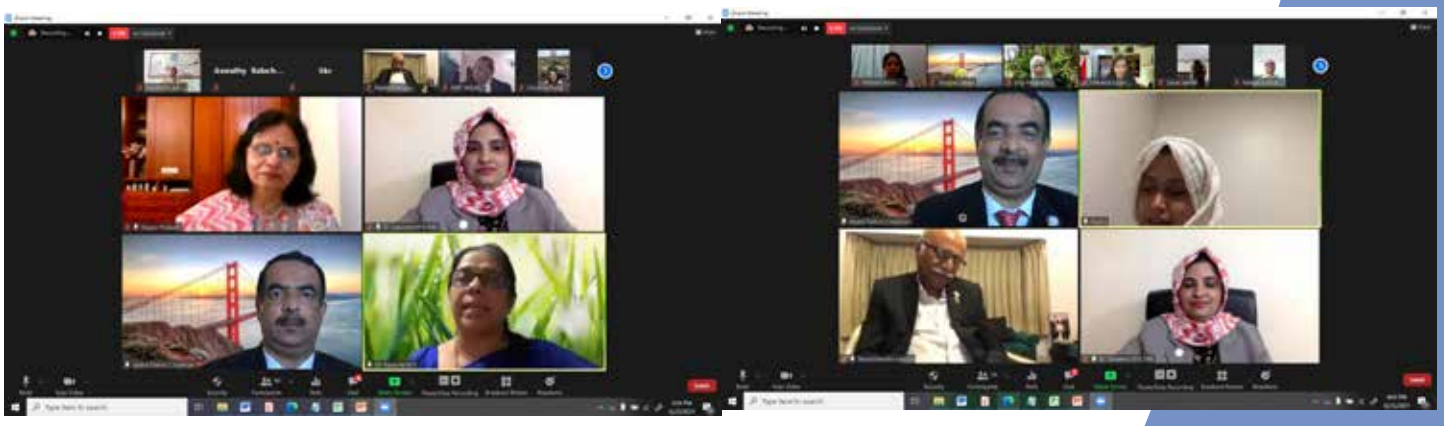
I am happy to note that Qatar Chapter of The Institution of Engineers (India) is celebrating the 54th Engineers' Day on 24 September 2021 to commemorate the birth anniversary of Sir Mokshagundam Visvesvaraya, an eminent engineer Statesman of the country.

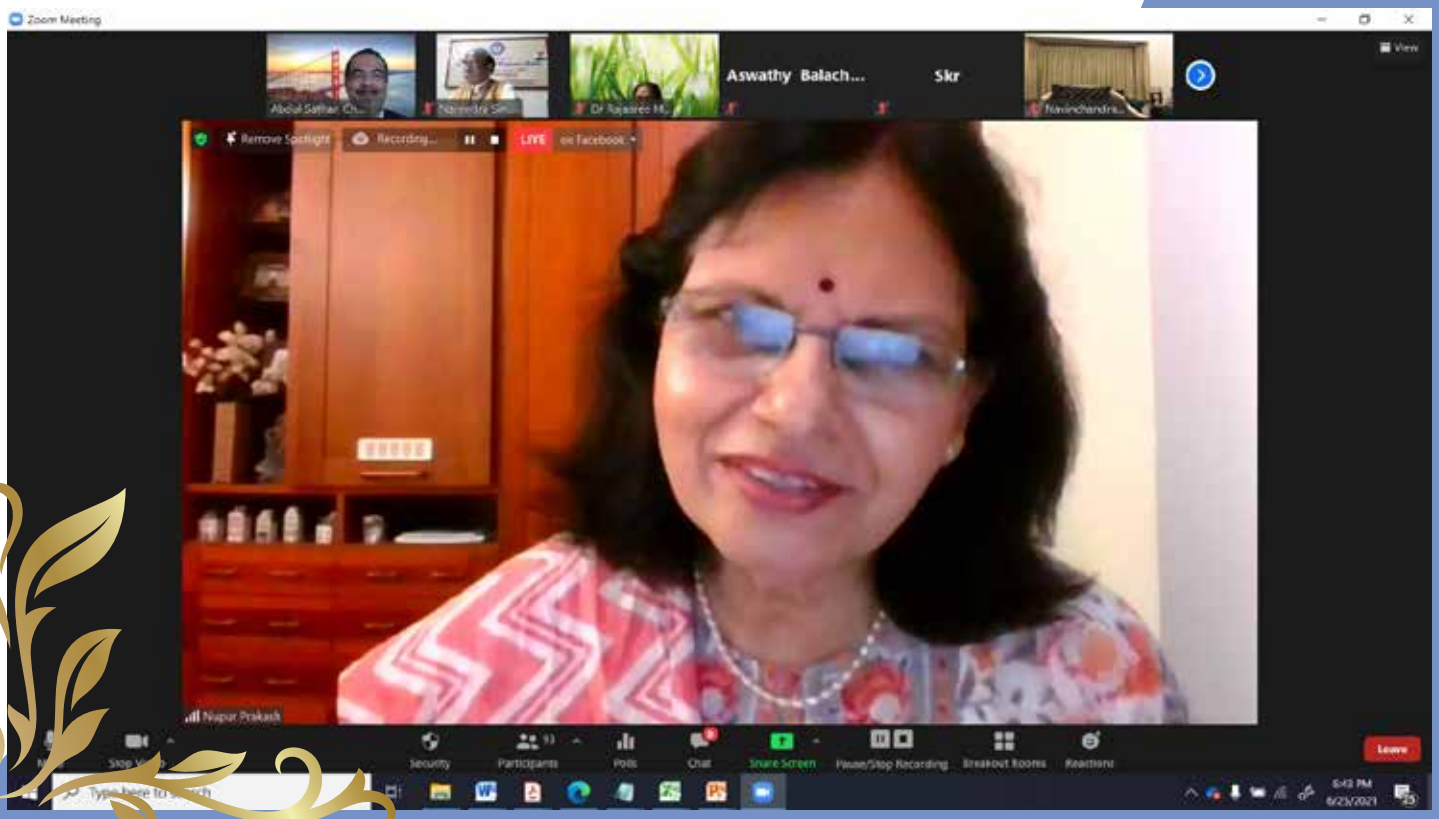
This year, the theme for the 54th Engineers' Day is **"Engineers for Skill Development & Employment in Combating COVID"**, which is an apt topic considering the ongoing pandemic situation across the globe. I am sure that the experts would highlight the ways and means of developing skills of workforce and to combat challenge of employability during this pandemic time and the recommendations that emerge will be useful for all stakeholders.

I convey my hearty greetings to the organizers and members attached to the Qatar Chapter of IEI and wish the event a grand success.

Maj Gen MJS Syali, VSM (Retd)
Secretary & Director General

International Women Day- May 2020





MESSAGE

KIMSHEALTH

14th September 2021

Message for the IEIQC Souvenir

I am delighted to learn about the outstanding activities of The Institution of Engineers (India), Qatar chapter and the 54th Engineers Day theme "Engineers for Skill Development & Employment in combating COVID". Your expertise, skill development and commitment are equally important for the social and industrial development of Qatar and India during this pandemic times. Technology and digitalization have greatly contributed to sustain and recover from the challenges of the pandemic.

IEIQC is an important organization to showcase the outstanding capabilities of Indian Engineers in Qatar. IEIQC has helped not only nation building but also the long lasting professional and business relationship between India and Qatar. I am sure you will be able to continue with the same vigour at a time Qatar is going to host the Asian games and Footfall World Cup Soccer.

On this occasion, I congratulate the entire Engineers fraternity in Qatar for their contributions and wish them continued success.

Dr M I Sahadulla, MD,FRCP(Ire),FRCP(Lon),MBA
Chairman & Managing Director
KIMSHEALTH

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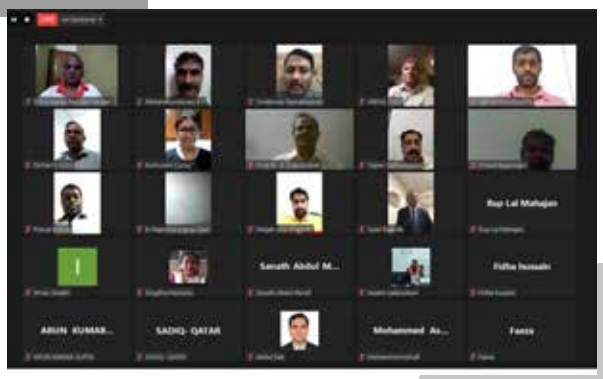
Engineers for skill development & Employement in Compating covid - 19



Dr. Rajasree MS

MESSAGE

Dr. RAJASREE M.S.
VICE CHANCELLOR

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
(A State Government University)
CET Campus, Thiruvananthapuram-695 016
Kerala, INDIA

MESSAGE

I am extremely delighted to share my greetings to Institution of Engineers India, Qatar Chapter on the occasion when the Chapter is celebrating 54th Engineer's Day on 24th September 2021. Acknowledging the nobility of the profession and sharing professional experience is a powerful means to enrich ones career in Engineering. The diversity with which engineers address the challenges faced by the society and empower the lives of people is tremendous.

I wish the deliberations in the meeting and the articles in the Souvenir will benefit the Engineering Community in a massive way...

26-08-2021

Rajasree M.S
Vice Chancellor

CASE STUDY Termination of a Consultancy Contract as a Consequence of Covid -19 Pandemic-OUCLiverpool John Moores University-Qatar

WEBINAR

on Saturday 29th May 2021
at 6:30-7:30 PM
(Qatar Time)

Chief Guest
Mr. Azmy Ameer
President & Executive Director
OUC | Liverpool John Moores University-QATAR

Guest of Honour
Er. Abdulla Mohsin A B Al-Wahedi
Qatar General Electricity and Water Corporation (KAHRAMAA)

Key note Speaker
Er. Giridhary Kutty
Regional Director – Business Development ETAP Power & Automation

Guest of Honour
Er. Seenu Pillai MIE
Hon.Advisor - The Institution of Engineers (India) QC Board of Governor & CTTC Chair- ASHRAE-Qatar

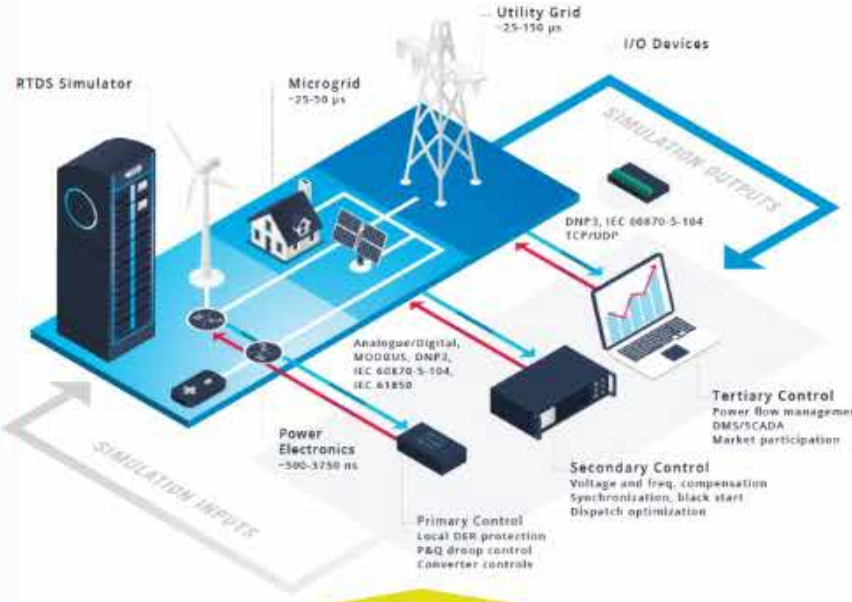
Presidential Address
Er. Abdul Sathar FIE
Hon. Chairman, The Institution of Engineers (India) Qatar Chapter

The Institution of Engineers (India)

(Established 1920, Incorporated by Royal Charter-1935)

Qatar Chapter

(Under the aegis of Embassy of India)
(Licensed with Qatar Financial Center (QFC))



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Meeting ID: 820 9860 8880
Passcode: IEIQatar

Dr. A. Sivathanu Pillai

MESSAGE

Message from Dr. A. Sivathanu Pillai, Distinguished Scientist, Founder & CEO, Brahmos Aerospace, President, Project Management Associates, India

I am glad to know that Institution of Engineers (India) Qatar Chapter is celebrating 54th Engineers' Day on 24th September 2021 and on this occasion, publishing a Technical Souvenir containing many valuable articles.

Institution of Engineers (India) has been functioning very effectively over hundred years, providing valuable service to Engineers, covering not only the professionals in India but also the Indian Professionals working in several parts of the world. IE(I) Qatar Chapter has been rendering excellent service to Indian Engineering Community in Qatar since 1992. Thanks to the dedicated efforts of IE(I) Qatar, our Indian professionals in Qatar are well connected to share their knowledge, success stories as well as innovative solutions to the various challenges.

Projects are for future and Engineers work towards ensuring a better future. They are the backbone for all development work that we are witnessing today. Therefore, it is a timely and laudable gesture to acknowledge the contributions made by all Engineers by celebrating Engineers' Day. I appreciate IE(I) for this initiative.

PMA as a Member of IPMA, International Project Management Associates has partnered with IE(I) to promote Project Management Competence Development to all our Engineers in Qatar. I take this opportunity to convey my best wishes and offer our support for all activities of IE(I) Qatar.

Blockchain and Future

The Institution of Engineers (India)

(Established 1920, Incorporated by Royal Chapter - 1935)

Qatar Chapter

(Under the aegis of Embassy of India)

(Licensed with Qatar Financial Center (QFC))

Chief Guest
Dr. Pratapsinh Desai
President
Indian Society For Technical Education, New Delhi

Guest of Honour
Er. Ahmed Jassim Al Jolo
Former Chairman ,
Qatari Society of Engineers

Presidential Address
Er. Abdul Sathar, FIE
Hon. Chairman,
The Institution of Engineers (India) QC

Keynote Speaker:
Dr. Anish Mohammed
Co-Founder & CTO
Panther Protocol

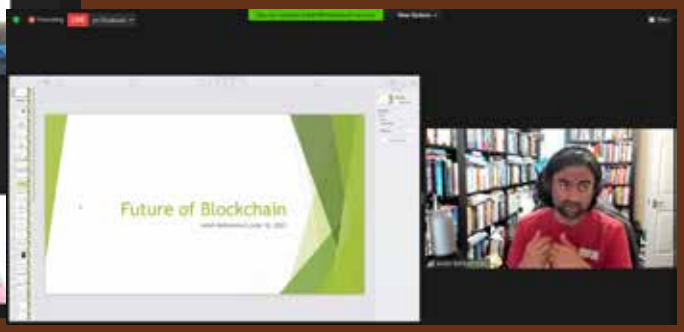
WEBINAR

On Saturday, 12th June 2021
at 6:30-7:30 PM
(Qatar Time)

In Zoom

Meeting ID: 820 9860 8880
Passcode: IEIQatar

BLOCKCHAIN AND FUTURE



SHAPING SKILL & FUTURE LEARNING SYSTEMS TO COMBAT PANDEMIC

Dr S M Ali
Director (Membership)
The Institution of Engineers (India)
director_membership@ieindia.org

Abstract

The world faces unprecedented challenges that will have a profound impact on workers and businesses, economies and societies. This paper focuses on the shaping skill and future learning system which would play a significant role in enabling enterprises, workers and societies to adapt to and shape the megatrends and seize opportunities, and in turn calls for an adjustment of policies and systems. The COVID-19 pandemic has severely disrupted labour market but has also accelerated some of the longer-term megatrends, leading to a combination of structural and crisis-related pressures and creating enormous challenges for employment, decent work and skilling opportunities.

Introduction

The turn of the year 2020 brought the world to a completely unpredicted and unprecedented new year. The economic and social disruption caused by the pandemic is devastating: In today's globalised world, there is hardly any place that has remained unscathed by the severity of the Novel Coronavirus or the Covid-19 pandemic. The COVID-19 pandemic is posing the most challenging crisis the world has ever faced testing the strength and resilience of our society and economies. A world which once buzzed with activities has fallen silent and all the resources have been diverted to meeting the never-experienced-before crisis. Countries were forced to impose lockdowns with widespread economic and financial loss to contain the pandemic restricting the movement of people and gatherings and rendering millions jobless and economically vulnerable.

Global Commitment for Quality Education, Skills Development

Before the outbreak of COVID-19 pandemic, skills development and lifelong learning systems were facing increasing challenges in meeting the fast-changing demand of job markets. Global megatrends, including new technologies, globalization, demographic shifts, climate change, and migration, are causing the loss of some jobs while also creating new opportunities. But the pandemic has further accelerated the challenges and also exposed deep-rooted labour market fragilities and structural inequalities, with low-paid workers, young people, women, ethnic minorities, the self-employed and informal and fixed-term workers among the hardest hit by the crisis. Skill mismatches is one of the foremost factor which has exposed the existing inequalities that has evolved over the years and there is a greater risk of leaving behind a "COVID-19 generation" of current and future workers with lower earnings and lower quality jobs over their lifetime unless we look for some paradigmatic shifts in our existing system .

The Government has a crucial role to play in implementing the lifelong learning systems ensuring the continuation of training and development at workplaces, as well as improving the effectiveness of skills development and so as to enhance the agility and resilience of societies to deal with the challenges posed by the pandemic and crises in the future. So, a close coordination between governments, social partners, the private sector, and education or training providers can enable development of an effective skill development system updating the curriculum and delivery of existing programmes capable of adapting to labour market transformations in the long-run.

Conventionally engineering education has been content-centered, hands-on, design-oriented, and focused on the development of critical thinking or problem-solving skills. However, the COVID 19 pandemic had led to introduction of an online education system mode which has now become a viable component of higher education in engineering subfields such as electrical and computer engineering, computer science and information

technology especially at the master's or post-graduate level. But for vulnerable, disadvantaged and under-represented students facing substantial challenges beyond their academic responsibilities, including family obligations, financial burden and additional employments utmost careful and evidence-based planning and effective online courses are needed to mitigate the impact of pandemic on engineering education. Recently, several studies have tried to identify the major factors and best practices that can contribute to the acceptance, assimilation and success of online education including course design, course content support, instructor's personal characteristics and students' familiarity with and access to technical resources. We should therefore devise methods to implement these factors so that the challenges encountered due to this abrupt transformation can be sorted out and efficacy and sustainability can be maintained providing holistic support to the these group of people.

In the COVID-19 crisis situation, we also required inclusive skills development and lifelong learning opportunities to prevent people from being left behind and maintain their employability and ensure fast recovery for economies and enterprises. The outreach strategies need to adapt to the new reality and deploy digital tools to ensure continuity of activities for diverse target groups. Such support should be provided to persons with disabilities using information and communications that are accessible, including sign language interpretation, video subtitle. A decent employ

ment strategy also needs to be devised for inclusive growth of women particularly in rural, informal and traditional economies where barriers in education and training are evident by actively involving employers and other relevant partners such as private employment agencies in channeling support to women in affected sectors and industries which can prevent skills deterioration and disengagement from job-seeking.

With remote work becoming the new norm, a global reappraisal of the care economy, forced digitalisation and increasing automation, the world of work is transforming. New occupations are

emerging and replacing others, and as they become more digitised and knowledge-based, the skills and competencies required are evolving as well.

As a result, a set of emerging roles will gain significantly, even as another set of job profiles become increasingly redundant. The remote work culture during the pandemic, brought fresh insights into the competencies required in today's employability landscape.

Enterprises and organizations around the world also have demonstrated their ability to improvise and innovate, and the many good practices and innovative solutions undertaken by them to mitigate the impact of the pandemic. The emergence of data analysis and cloud computing as a business purpose has introduced key IT skills as the trending subject. Employers foresee the inevitable shift to a more technology oriented workplace, encouraging their prospect employees to be more tech savvy than previous years. The remote work culture made effective collaboration and business operations possible, owing to the technical adaptability and expertise of a company's workforce. This is due to the increasing stake of technology and software tools impacting the functions across the value chain. Industries have taken up new forms of technology, requiring qualified personnel to meet the demand . Some have focused on inducting employees having multiple engineering skill sets. However, these transformations should happen on all levels, be it national, regional or local, so that we can thrive in a global competitive landscape. The only way to remain competitive in this globalised world is to harness new and emerging technologies and we need to educate and skill our people to absorb these technologies. **Conclusion**

We need to improvise upon effective models for equitable access to lifelong learning, recognition and utilization of skills so that we can bridge the gap of economical inequality and also address the societal needs. We should assess and understand the aspirations and potentials of individuals and the needs of vulnerable groups, promoting career guidance and outreach which are valuable instruments for raising awareness about learning solutions, empowering individuals to use them and better targeting training offers and incentives. We should also mainstream gender equality in skills and lifelong learning systems and implementing programmes to strengthen partnership

among stakeholder involved so that they can play a pivotal role in devising policies to replicate and implement successful interventions and new approaches to establishing new-generation skills and lifelong approaches to establishing new-generation skills and lifelong learning eco-systems.

Reference

Report IV -on International Labour Conference, 109th Session, 2021 -Shaping skills and lifelong learning for the future of work-ISBN 978-92-2-132402-7

5S TO 10S: LEAN IN WORKPLACE ORGANIZATION

To start with one of the basic initiatives of Lean Construction or Lean Manufacturing, as we look into the foundation stone, the most recommended adoption is the workplace organization towards productivity improvement that eliminates or reduces the muda (Waste), Mura (Inconsistency) and Muri (Physical strain). Visual Management and 5S are very basic tools that are practiced widely in workplace organization. The visual management focuses on the placing an item, component, or machine at specific location with proper labeling and colour coding. While 5S continually improves the workplace by sorting & placing setting at proper location, cleaning the targeted area, standardization and sustaining. 7S is the new terminology consists of the seven phases namely Sort, Set in order, Shine, Standardize, Sustain or Self Discipline, Safety and Spirit. Here we discuss about the methodologies involved in

implementation of 7S as a tool of organizing workplace scenario, and its further evolution to the advanced concept of 10S.

What is Workplace organization and why it is necessary?

The workplace organization is one of the simplest means of determining an organizational approach to its business to evaluate its housekeeping and visual management. When things look right, they often are. The workplace organization consists of visual management and 5S or 7S or 10S as per a basic Lean concept in construction or production.

What is Visual Management?

Visual Management at a workplace where all associates understand and manage their own work in a safe, clean, organized environment that fosters open communication, pride, and continuous improvement. The Visual Management provides real-time information on workplace status by a combination of simple, effective visual information aids. These allow employees to understand their influence as well as improve the organizational performance. Visual Management implementation consists of phases like Visual control board, Andon Footprints, Signage etc.

5S Methodology:

5S is a systemized and methodical approach allowing teams to organize their workplace in the safest and most efficient manner. The initial stage involves removing all unnecessary items from the workplace. Leftover is then placed in a permanent location depending on the frequency of use.

5S is a process for implementing and maintaining a clean, safe and organized work area. 5S provides a way for organizations to operate efficiently and effectively.

5S consists of Seiri = Sort , Seiton = Set in order, Seiso = Shine, Seiketsu = Standardize, Shitsuke = Sustain.

Some industries also termed it as 5C which are Clean out, Configure, Clean & Check, Conformity , Custom & Practice.

5S implementation methodology and guidelines to improve performance of the industries. The qualitative form of results obtained in the safety, productivity, efficiency and housekeeping practices on in other way, 5S is the good housekeeping technique for enhancing the productivity, quality and safety at the workplace The results after implementation and before implementations are shown by using photographs in general. The implementation has given very good result in Stores, Office Desk, Document Controllers office, complicated or multi-tooled workstations etc.

Total Quality Management (TQM) can be achieved through lean principles such as 5S.

Fig.: Evolution of 5S to 10

7S Methodology:

Seven S (7S) methodology is a one-step adjusted or required advancement adopted for the workplace organization by eliminating or reducing wastes. The 7S implementation consists of two more additional phases to 5S, they are Safety and Service or Spirit.

Apart from improvement the morale of the employees, 7S implementation shall directly result in reduction in the Manufacturing Lead Time (MLT) or Project Lead Time, by reducing quantifiable

variables like search, move, waiting time, cycle time, lead time, production rate, productivity, quality, profit and client network and the qualitative variables are working environment, easy and distinct communication.

10S Methodology

To precise the methodology, more phases has been recommended further to the above 7S and resulting to the evolution of 10S. Security, Strategy and Superfluous are the three phases namely. They are applicable to both manufacturing and construction industry, has impacted the industry in asset management, effective storage of materials as per manufacturer specifications, store planning and cost savings.

10S Phases at a glance:

(1S) Sort: This means distinguishing or sort out between wanted (Value Added) and unwanted (Non-Value Added) items at place of work and removal of unwanted (NVA) items. Unwanted items shall be Red tagged.

(2S) Set: Arranging and labeling, marking, color coding of items in such a manner that they are easy to find and use.

(3S) Shine: This means removing dirt, strain, filth, soot and dust from the work area. This includes cleaning and care for equipment and facilities and also inspecting them for abnormalities or primary maintenance of equipment.

(4S) Standardize: This means ensuring that whatever cleanliness and orderliness is achieved should be maintained.

The purpose of standardization is to make sure that everyone in the company follows the same procedure, the same names of items, the same size of signalization/floor marking, shapes, colors, etc.

(5S) Sustain: Sustain also means 'Discipline'. It denotes

commitment to maintain orderliness and to practice first 3S

as a way of life.

(6S) Safety: Safety is the condition, that equipments are protected against consequences of failure, damage, error, accident, harm, or any other event that could be considered non-desirable. Human accessibility shall also be considered to be adequately safe during use of the equipments.

(7S) Service / Spirit: The equipment preservation shall be standardized in such a way that its always easy to service them, as and when required / recommended. Team spirit is a willingness to cooperate as part of a team.

(8S) Security: Implementation of any of the above phases should not compromise the security of the items/ tools/ equipment

(9S) Strategy: Strategic storage or preservation of items/ tools/ equipment etc. shall be implemented, maintaining the self-specification or OEM specification, that the intrinsic property is sustained

(10S) Superfluous: Implementation of any of these previous phases, should be reviewed to assess the application of undue or unnecessary facility and resource. The review should be on basis of permanency or duration of preservation, Cost incurred, periodic maintenance requirement etc.

Working in disorder is neither productive, nor safe. 7S is a simple and practical method to build a quality culture at the workplace. It is relatively easy to undertake and requires minimal additional resources. The first and small investment made in time and effort pays off in a much bigger manner when the results are realized and maintained.

Only implementation of the 7S is not sufficient, it requires continuous monitoring and controlling. 10S implementation does not only involve by field personnel, it demands involvement of project management or production planning team. The phases and the activities should continuously be monitored using questionnaire survey, GEMBA walks, internal audits etc.

10S / 7S is the extension of 5S which has proven track in reduction of accidents in the industry. Team spirit encourages and motivates the team members to work in better way. It increases the efficiency of the production operations or process, inclusively.

UDHYASATYA BANERJEE

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Larsen & Toubro Limited, PT&D Qatar
Electrical & Electronics Engineer
Lean Engineer (LSS GB Certified)
Chartered Engineer IE(I)
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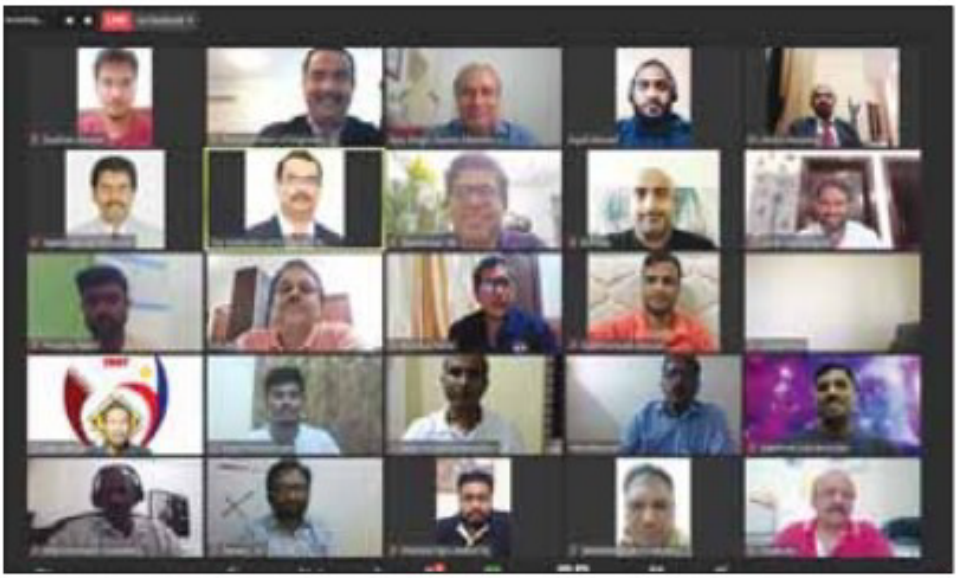
IEI Qatar chapter holds technical webinar on smart grids

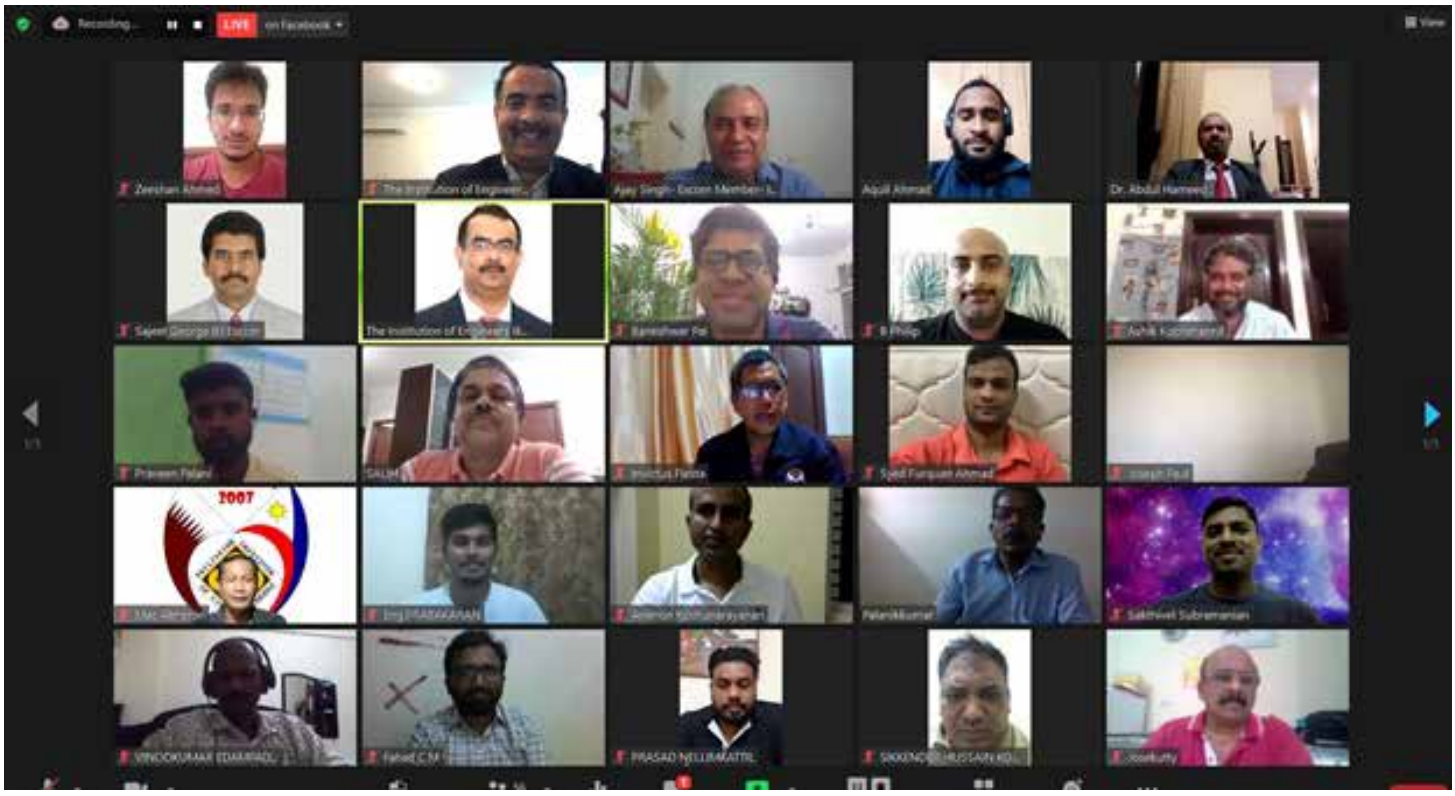
Institution of Engineers India (IEI) Qatar Chapter recently conducted a technical webinar session on 'Future Power Network (Smart Grid) – Challenges and Trends". The session was attended by around 100 engineers via Zoom.

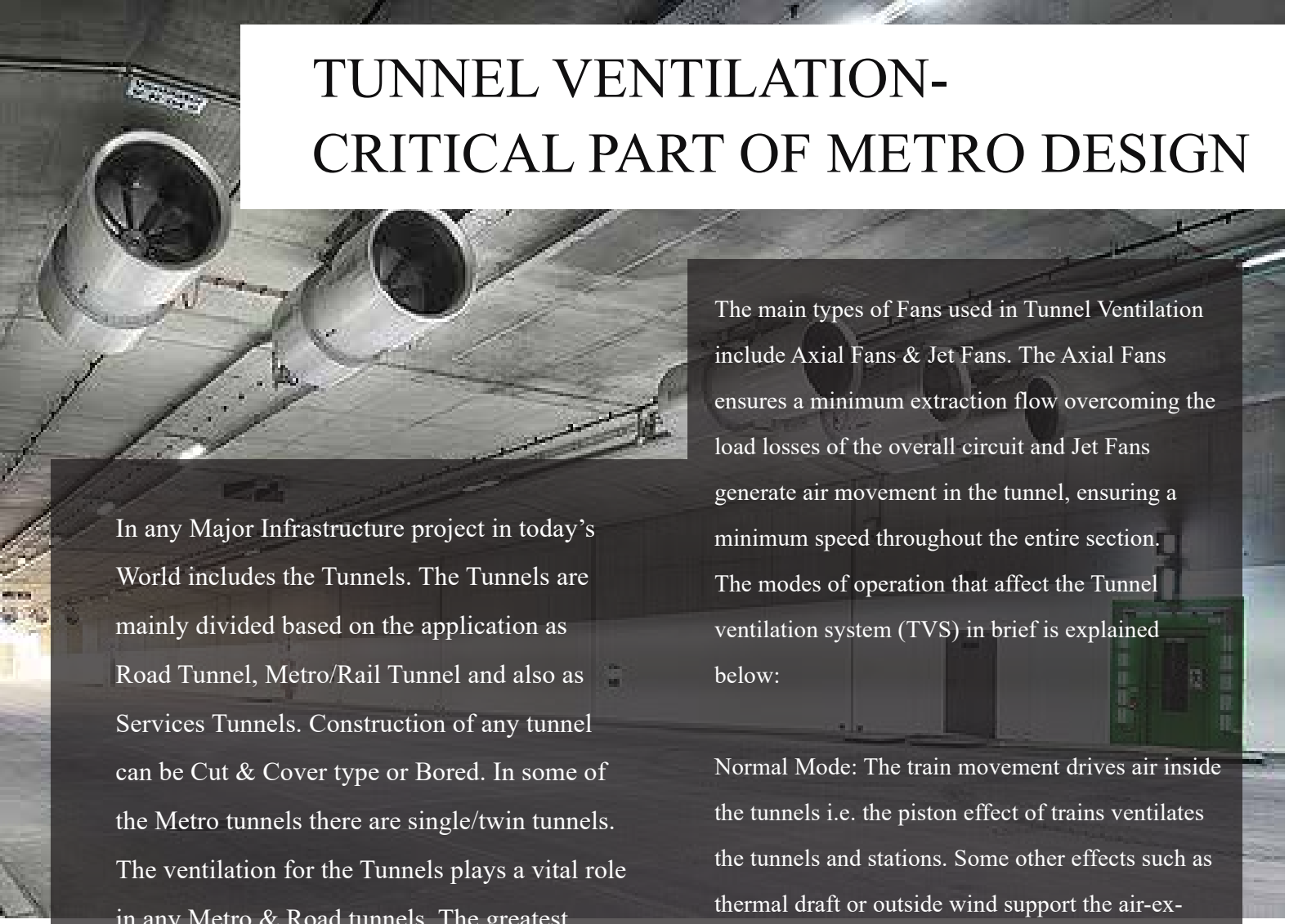
Dr Mohamed Abdulla E al-Hitmi, head of Electrical Engineering Department, Qatar University, was the chief guest. Dr al-Hitmi, associate professor, explained that the traditional electricity grids had almost no storage capabilities. They are demand driven and have a hierarchical structure. A smart grid is an electricity network enabling a two-way flow of electricity and data whereby smart metering is often seen as a first step towards and future possibilities for electric vehicles.

Professor Atif Iqbal, vice-chair IEEE Qatar Section and from the Department of Electrical Engineering, Qatar University, was the keynote speaker. His talk highlighted the challenges and requirements for changing the power grid face from traditional to smart. The concept of smart grid includes renewable energy sources and electric vehicle integration. The increasing penetration of EV in the power grid as upcoming challenge for DSOs was highlighted in the talk. Other enabling technologies such as advanced sensing and control technologies, information and communications technologies (ICT), power electronics controllers, and energy storage were also discussed.

Abdul Sathar, honorary chairman of IEI Qatar chapter, welcomed the gathering, introduced the guest speakers to the gathering and talked about the topic. Dr Abdul Hameed, IEI honorary secretary, compered the event and Ajay Kumar Singh proposed the vote of thanks.







TUNNEL VENTILATION- CRITICAL PART OF METRO DESIGN

In any Major Infrastructure project in today's World includes the Tunnels. The Tunnels are mainly divided based on the application as Road Tunnel, Metro/Rail Tunnel and also as Services Tunnels. Construction of any tunnel can be Cut & Cover type or Bored. In some of the Metro tunnels there are single/twin tunnels. The ventilation for the Tunnels plays a vital role in any Metro & Road tunnels. The greatest challenge by the Client, Contractors, Consultants & the operators faced by Design & Build Metro projects is the Tunnel Ventilation.

The need for a Tunnel Ventilation, the Fire Smoke criteria developed in the Tunnel which is airborne solid and liquid particulates and gases evolved together with the quantity of air, and to eliminate the Smoke by providing theproper Smoke clearance system and safe evacuation of the passengers maintaining a tenable environment within the tunnels for the time necessary to allow evacuation from trains to nearest exit. It also includes cooling the Tunnel. Tunnel ventilation in the Metro system allows handling of three operations normal, congested and emergency modes.

The main types of Fans used in Tunnel Ventilation include Axial Fans & Jet Fans. The Axial Fans ensures a minimum extraction flow overcoming the load losses of the overall circuit and Jet Fans generate air movement in the tunnel, ensuring a minimum speed throughout the entire section.

The modes of operation that affect the Tunnel ventilation system (TVS) in brief is explained below:

Normal Mode: The train movement drives air inside the tunnels i.e. the piston effect of trains ventilates the tunnels and stations. Some other effects such as thermal draft or outside wind support the air-exchange.

Congested Mode: For any reason, trains may come to a halt inside the tunnel. In congested mode of operation, the ventilation system is capable of providing fresh air to a stranded train. All fans operated to maintain temperature is less than 550C.The heat is removed from the train by mechanical ventilation known as push-pull ventilation.

Emergency Mode: This occurs when a train in fire, smoke and low visibility hampers the passengers and the staff of the Metro system. There are two criteria to be considered during the Emergency mode

During Train on fire in Station: The station ventilation is achieved as per NFPA-130. PSD (Platform screen doors) equipped to full height in the Station platform to maintain the overpressure relative to the track. TVS extracts smoke/air from the track.

During Train on Fire in Tunnels: TVS fans are operated and are fully reversible for reaching the operational mode within 180sec. Passengers evacuate in the opposite direction to air movement. Operational control center (OCC) selects the required modes and fan operations.

Tunnel Ventilaton System

The tools used for Tunnel Ventilation system (TVS) sizing are Simulation software's studies and CFD analysis. The TVS coordination with different systems such as PSD, Rolling stock, SCADA, depot equipment, station air-conditioning and System operation team for system integration.

By **ABDUL ZAMEER AHAMED SAB**-Technical Manager ASHGHAL
BEng, MBA,FIE, CEng(UK),IntPE(NZ),CMEng(NZ),APEC Eng, CEng(I),UPDA, IPRA,MASHARE,MASPE

The Institution of Engineers (India)

Qatar Chapter under the aegis of Embassy of India
(Licensed with Qatar Financial Centre)

in partnership with LIVERPOOL JOHN MOORES UNIVERSITY

Webinar on: "Sustainable Design"

Date & Time : Saturday , 27th Feb, 2021 @ 6:00-7:30 PM

Chief Guest:
Er. Dhanapal Antony
Country Head-Qatar,
Larsen & Toubro (L&T) Limited

Keynote Speaker:
Dr Tony Auchterlounie
Dean of academic affairs,
OUC| Liverpool John Moores University

Welcome Address
Er. Abdul Sathar FIE
Hon. Chairman, IEI QC

Guest of Honour:
Er. Debashis Roy FIE
Past Chairman, IEI, QC

please visit **iei.qa**

zoom Meeting ID: **883 2793 7254**
Passcode: **IEIQatar**

oryxuni.com

THE WORLD OF EV AND ITS FUTURE

NIDHEESH UDAYAN, CEng

Introduction:

Humans are in EV Revolution. We celebrated World EV day at 9th September 2021. Countries are promoting EV from last decades; they are changed EV policies and introduced new schemes/Incentives/ Subsidy for customers and Manufacture's. Top vehicle Manufactures are introduced there new models in 2021 and announced new models launches. This will going to help buying tendency of EV.

Range for EV is far better with new technologies and most of the manufacturers are come up with Fast charging facilities. Now average range is 250KM/Full charge and fast charging is useful for easy fuelling up to 70% within 30 Min. This means we can use our vehicle for long drive also. Charging station networks constructions are on-going very fast by Governments/EV manufacturers/other companies.

These all are giving good sign for EV. In past years customers are avoided EV vehicles because of following reasons

1. Vehicle coast is high Compare to Petrol/Diesel vehicle
2. Very Low range
3. Maintenance issues
4. Lack of Charging stations
5. EV's load capacity and speed.

Manufactures overcome all these issues and day-by-day they are working on it.EV is very good for Environment and results zero pollution. Green energy and EV vehicle makes this world more beautiful. Make sure the charging source is from green energies like solar, wind or tidal.

Manufactures offering 5-10 Year battery warranty for their vehicle. Battery parts should reuse for reducing the environmental damages. EV price is reduced 20-35% compare to last year.

From total cost around 50-65% coast is for Battery pack. We are expecting up to 35-50% price reduction in future by introducing new technologies like high range battery, battery swiping etc.

Battery swiping is one of the most reliable ways. Manufactures should follow universal standard for their EV vehicles and ensure below points for easily handling

1. Battery pack should easily detachable from vehicle
2. Battery pack should Easily swipe
3. Full charge battery should connect easily
4. All above points should done in small period of time, this also ensure the companies
5. This battery swiping will suitable for same type vehicles of different manufactures (Ex: SUV VS SUV, SEDAN VS SEDAN, Hatchback VS Hatchback, etc).

I'm going to share one business/investment idea for all, Solar energy is free for us. Solar panel and inverter coast is very cheap and we can setup a charging station/Swiping centres easily in our area and we can welcome this new technology and grow with our world. Now government and some authorized companies will setup our charging stations with small amount as per our investment amount. We can go with multi story parking system and Earn more money with low investment and small space.

The Institution of Engineers (India)

(Established 1920, Incorporated by Royal Charter-1935)

Qatar Chapter

(Under the aegis of Embassy of India)

(Licensed with Qatar Financial Center (QFC))

17th May

"World Telecommunication & Information Society Day"

WEBINAR zoom

on Monday 17th May 2021

6:30 - 7:30 PM (Qatar Time)

9:00 - 10:00 PM (Indian Time)

Meeting ID: 820 9860 8880

Passcode: IEIQatar

Patron & Chief Guest

H.E. Dr. Deepak Mittal

Ambassador of India to the state of Qatar

Chief Guest

(INAUGURATION)

Dr. Sam Pitroda

Father of India's Computer and IT Revolution

Key note Speaker

Dr. Sudhansu Sekhar Singh

Professor in School of Electronics Engineering, KIIT University, Bhubaneswar, India

Guest of Honour

Mr. Yasir Nainar

General Secretary

Indian Business Professionals Council (IBPC)

Guest of Honour

Er. Prasanna Janakasiri

Hon. Chairman,

The Institution of Engineers (Srilanka) Qatar Chapter

Guest of Honour

Mr Mustapha Huneyd

Former CISO, Ooredoo Group

Director of Customer Security at Ericsson Middle East & Africa

Welcome Address

Er. Abdul Sathar FIE

Hon. Chairman,

The Institution of Engineers (India) Qatar Chapter

The Institution of Engineers (India)

Qatar Chapter under the aegis of Embassy of India

(Licensed with Qatar Financial Centre)

Technical Webinar on : CYBER SECURITY ON CLOUD

Chief Guest

Mr. Jabor Mohammed

IT Expert

Presidential Address

Er. Abdul Sathar, FIE

Hon. Chairman, IEI QC

Guest of Honour

Ms. Satyavathi Divadari

Chief Cyber Security Architect

Top 10 Women Tech Leaders INDIA

Moderator

Mr. Karmil Asgarally

President,

ISC2 -Qatar

Panel Speaker

Mr. Arlindo Dsouza

Senior Manager

Cyber Security Expert

Panel Speaker

Dr. SM Suhail

Research Fellow,

National University of Singapore

Panel Speaker

Mr. RICKY RAKESH JHA

CEO PRICORIS VENTURES

& PRIVACY VIRTUOSO

Member of Certification

Advisory Board – IAPP

Fellow of Information Privacy (FIP)

zoom

Meeting ID: 820 9860 8880

Passcode: IEIQatar

Date : Saturday, 10th April 21

Time : 6:00 - 7:30 PM

www.iei.qa

The Institution of Engineers (India)

Qatar Chapter under the aegis of Embassy of India
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Technical Webinar on: "Future Power Network (Smart Grid)- Challenges and Trends"

Chief Guest

Dr. Mohammed Abdulla E Al-Hitmi
Head, Dept of Electrical Engineering
Qatar University

Guest of Honour

Er. Ahmed Jassim Al Jolo
Former Chairman ,
Qatari Society of Engineers

Welcome Address

Er. Abdul Sathar, FIE
Hon. Chairman,
The Institution of Engineers (India) QC

Keynote Speaker:

Prof. Atif Iqbal
(Dsc, Poland, PhD, UK)
Vice-Chair IEEE Qatar Section
Dept of Electrical Engineering
Qatar University

zoom Meeting ID: **820 9860 8880**
Passcode: **IEIQatar**

Date & Time : Saturday, 3rd April '21 @ 6:00-7:30 PM

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Qatar Chapter

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Federation of Engineering Institutions of Asia and the Pacific (FEIAP)

INTERNATIONAL WOMEN ENGINEERS CONCLAVE-2021

Emergence of Women in Engineering

Chief Guest

Dr. RAJASREE M S
Vice Chancellor
APJ Abdul Kalam Technological University Kerala-INDIA

Presidential Address

Er. NARENDRA SINGH FIE
President, IEI

Guests of Honour

Dr. NUPUR PRAKASH
Former Vice Chancellor, Indira Gandhi Delhi Technical University for Women - NewDelhi

Thematic Address

Dr. HRP YADAV FIE
Secretary & Director General IEI

Friday, 25th June 2021 @ 6:00-7:30 PM

www.iei.qa In Zoom

Meeting ID: 820 9860 8880
Passcode: IEIQatar

Welcome address

Er. ABDUL SATHAR, FIE
Hon. Chairman,
The Institution of Engineers (India) QC

Panel Speakers

Er. MK SABEENA MIE
President, IEI QC-Womens Wing.

Dr. NIDHI M.B
India

Er . YAHANA ABBAS
Malaysia

Er. NIRANJANA MOHANDAS
Srilanka

Er. BENJANA SHRESTHA
Nepal

Er. MIKAELA L. ESPIRITU
Phillipines

Er. RAUNAQ JAHAN,
Bangladesh

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e-mail :elevator@darwish.com.qa www.darwish-elev.qa

مصاعد كليمن

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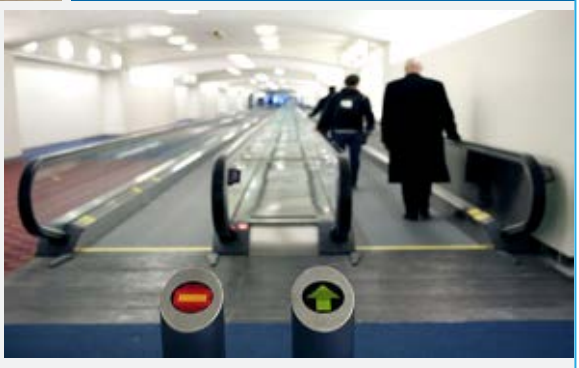
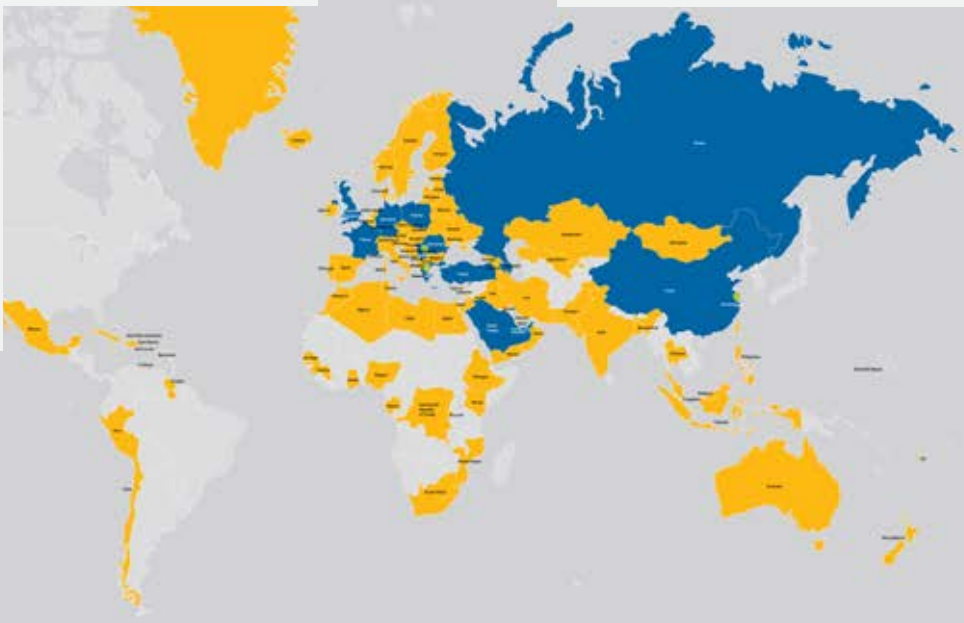
LIFTS





شركة الدرويش للمصاعد ذ.م.م

DARWISH ELEVATORS CO. WLL.

By;
Er. AzeemSalahudeen, B.Tech, MIE
Mechanical Engineer

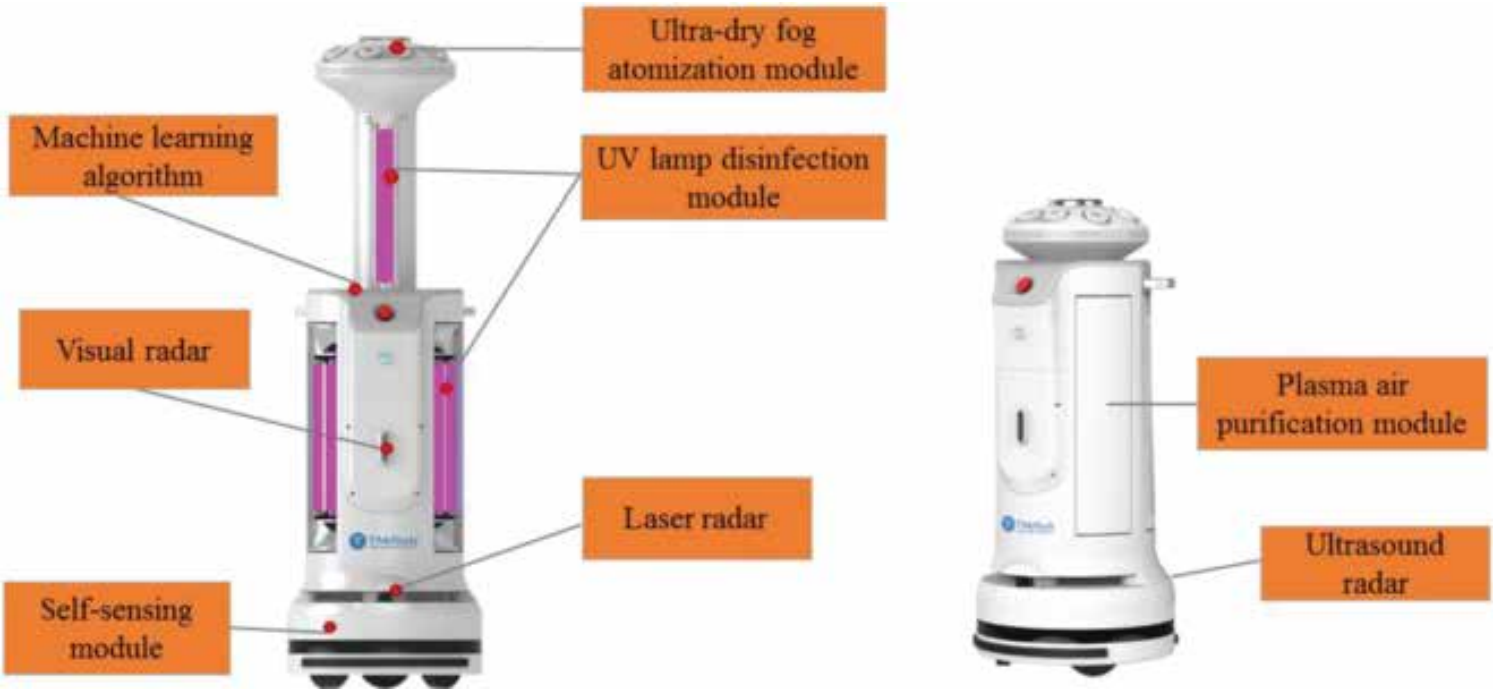
AUTOMATED PROPHYLACTIC ATOMIZING STERILIZER

At present, the whole world is going through a pandemic due to coronavirus disease (COVID-19), which was first spotted in December 2019 in Wuhan, China. This COVID-19 virus began rapidly spreading over the world through China, resulting in COVID-19 sickness in nearly every country. Nearly 18 crores COVID-19 cases were registered in the world by May 2021, with nearly 3 crores of those instances being registered in India. Since this virus is extremely contagious, the World Health Organization (WHO) has issued guidelines for reducing community transmission in various ways which includes maintaining social distance of at least 1m, avoid touching the eye, mouth and nose when outside wear N95 mask. Among them hand washing or rub with soap or hand sanitizer on a regular basis is one of the obligatory suggested measures

The availability of cleaning fluid containers in public spaces is a type of Covid-19 prevention, however it is currently inefficient because there are sections that are frequently touched. This could be a Covid-19 transmission point. In addition, the COVID-19 virus has a high risk of spreading in populated locations. If we come into contact with someone who has COVID-19-related symptoms in his body in this location, it is extremely damaging to us and others with whom we come into contact. In this situation, sterilizing not just our hands but also our entire body is the most effective technique to eradicate viruses from our bodies. However, to begin the sanitization process, a manual interaction is required. Therefore, in order to avoid this manual contact and to automate the system, a sensor based, technology has been implemented. This allows the machine to operate on a “walk through and sanitize” principle.

The Automated Prophylactic Atomizing Sterilizer is a machine that sprays sanitizer all over the body, including clothes, shoes, watches, handbags, and any other accessories they are carrying with them. The usage of misting technology helps in increasing the coverage and also keeps the solution discharge at a very minimal volume, thus helps in reducing the cost to manage and efficiently spraying without having direct contact with skin. This proposed project can be used in a variety of places, including hospitals, schools, malls, public transit etc. This machine is entirely generated by considering cost, availability and effectiveness. The key benefits of simple and low-cost components is that, they are readily available.

Being easily available implies that the system can be swiftly replicated, which is a positive sign, since this corona pandemic time isn't going to end overnight, it's preferable to create or locate parts locally and try to get everything running at the same speed as before, so that the world's economy can come back to a better shape.



1. PARTS

The primary goal of this project is to create an automated full body sanitizer dispenser capable of reducing the transmission of viruses such as COVID-19 and saving people from a pandemic. The dispenser device was created with two main goals in mind: it had to be user-friendly and it had to be cost-effective. The materials to be utilized in the gadget's construction were chosen and the device was triggered with these objectives in mind.

A brief information of all the components that went into making the Automated Prophylactic Atomizing Sterilizer is presented below.

- PIR SENSOR- PIR sensor often referred to as PIR, “Passive Infrared”, “Pyroelectric”, “IR motion” sensor allows to detect whether a human has moved in or out of the sensor range. PIRs are made of pyroelectric sensors, which can detect different levels of infrared radiations.
- PUMP-A DC booster pump boosts the flow and pressure of low-pressure water. It gives you the extra boost you need to get your water pressure to where you want it. A booster pump generates enough pressure to transport liquid from a storage tank to the desired destination.The essential components of all DC booster pump, regardless of manufacturer, are the same. They are motor, impeller, inlet and outlet, pump casing, pump head.
- POWER SUPPLY-To power the operation, we are using an AC to DC switched-mode power supply.A switched-mode power supply (also known as a switched-mode power supply, switched power supply, SMPS, or switcher) is an electronic power supply that includes a switching regulator to efficiently convert electrical power.Input EMI filtering and bridge rectifier, input filter capacitors, primary side heat sink, transformer, secondary side heat sink, output filter coil, and output filter capacitors are the key components of a switched power supply
- MISTING NOZZLE-Nozzle is the device which is used to spray the disinfectant liquid. A nozzle is a tool used to modify the characteristics or direction of flow of a fluid as it enters an enclosed pipe or chamber in order to increase velocity. It's a tube with a specific cross-sectional area that's used to guide or regulate fluid flow. Controlling the speed, mass, direction, pressure, form, and rate of flow of the current that rises from them is a popular use. With the loss of pressure energy, the fluid velocity increases in the nozzle.
- CONNECTING TUBE-Sanitizer is transported from the storage tank to the nozzle end with the help of a connecting tube. Flexible PTFE (polytetrafluoroethylene) tubes, which are routinely used in RO filter connections, are what we're using for the Automated Prophylactic Atomizing Sterilizer. Low friction to flowing fluids, self-cleaning ability, high durability, non-flammable the features that make PTFE the best choice for this project. Its flexibility also enables for very easy bending at corners in a single tube without causing damage.
- TUBE CONNECTORS-Tube fittings connect in-line, offset, multi-port, and mounting tubing lines to other tubing sections, pipe, hose, and other components. In systems, fittings or specially manufactured connectors and joints are frequently used to unite straight pieces. Tee and Elbow are the two types of tube connectors used in Automated Prophylactic Atomizing Sterilizer.
- STORAGE TANK- To avoid vaporization, sanitizers must be stored in certain containers and under specific conditions. The usage of a PVC storage tank gives a more secure storage environment. Corrosion resistance, abrasion resistance, light weight, good mechanical strength, and toughness are the key benefits of PVC. Handling, transportation, and installation costs are reduced. A smaller number of joints speeds up the process and decreases the risk of leaking.
- PVC PIPE- Electrical conduit pipes made of PVC are used to form the frame. Electrical conduit pipes have shown to be long-lasting and maintenance-free. PVC conduit is simple to install and cut, and it doesn't require any special tools. They're also light, heat-resistant, and stable. When compared to other materials that are commonly used for frame work, the availability and cost effectiveness are extremely high.
- SANITIZER- Sodium hypochlorite (bleach/chlorine) at a suggested concentration of 0.1 % or 1,000ppm can be utilised in non-healthcare situations (1 part of 5 % strength household bleach to 49 parts of water). Surface disinfection with 70-90 percent alcohol is also possible, but it is costly. All disinfectant solutions should be kept in opaque containers in a well-ventilated, covered area that is not exposed to direct sunlight, and should preferably be prepared fresh every day.

A revolutionary design of Automated Prophylactic Atomizing Sterilizer was exhibited in this case study. These equipment are employed to disinfect not only our hands but our entire body in this COVID-19 pandemic.

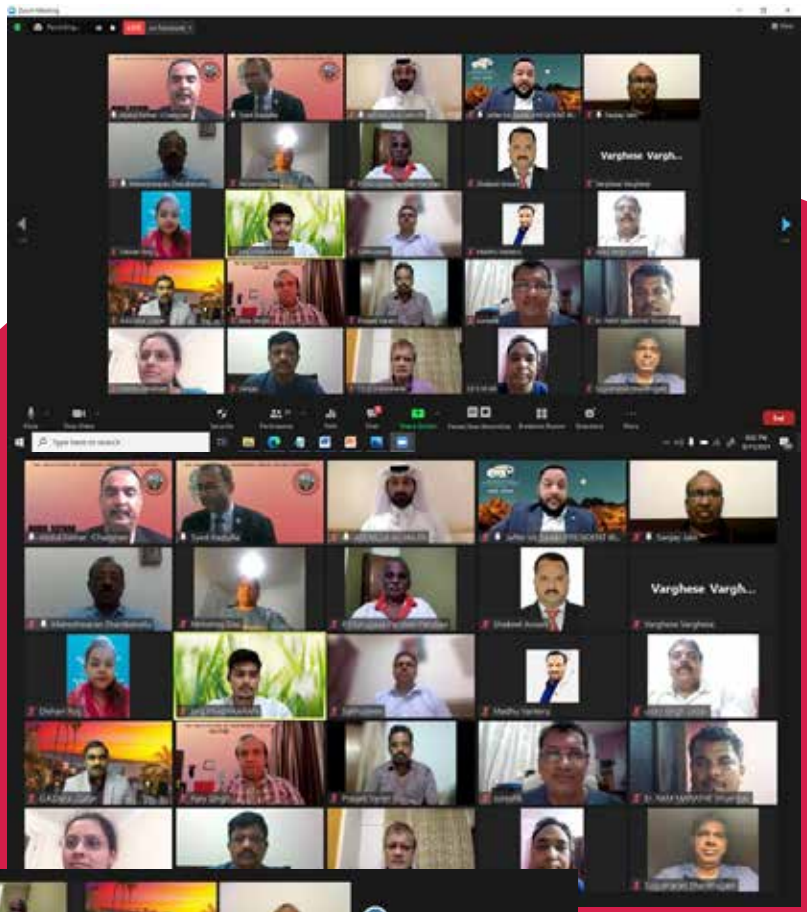
Hand sanitizer machines are used to eliminate viruses only from hands. When we come into contact with another person who has COVID-19 symptoms, we must not clean just the hands but the entire body. As a result, an Automated Prophylactic Atomizing Sterilizer machine for body sanitization has been developed.

All of the components were chosen following a thorough literature review, taking into account a variety of factors which are mainly focused on the specifications and their operation.

To make it even more accessible, the parts were chosen in such a way that cost and availability as a key criterion. Also, depending on the requirements and the deployment environments, this project can be expanded into many more dimensions.

The key benefit of this proposed design is that sanitising a person takes less time and uses a smaller amount of sanitizing liquid.

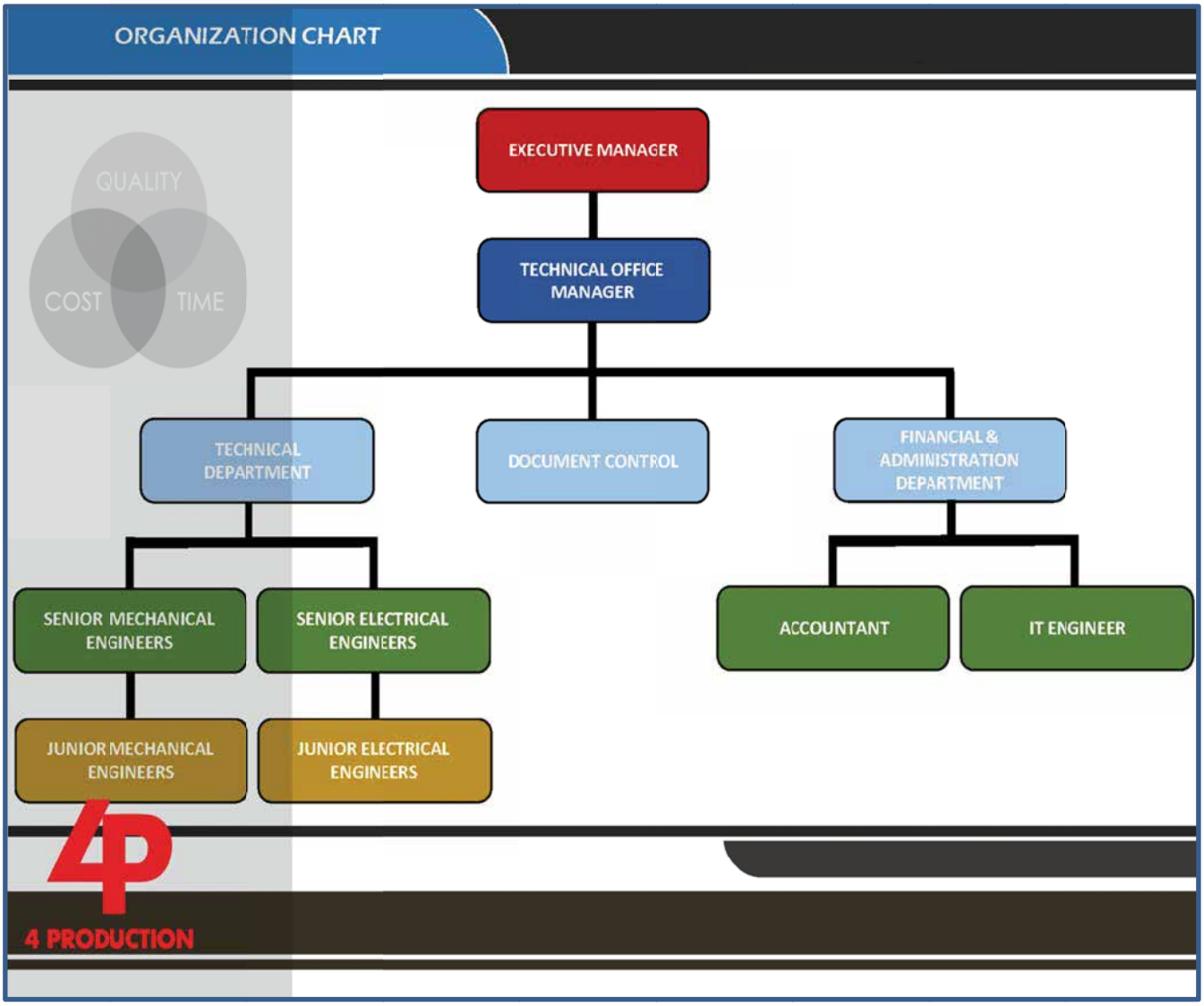
As a result, the study's Automated Prophylactic Atomizing Sterilizer is projected to play a vital role in contactless complete body disinfection in public settings and thereby prevent the spread of infectious disease in society.



4 PRODUCTION

Four Production Trading & Contracting W.L.L

PORTFOLIO



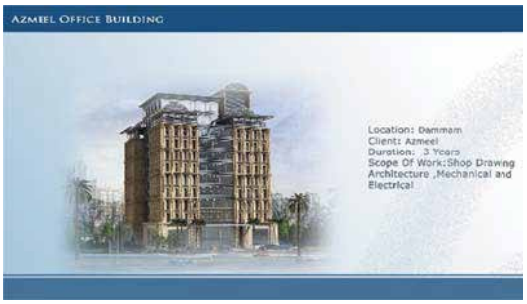
WORK FORCE

We have a strong reputation for the quality of our work force. Skilled and experienced tradesman allows our clients to complete their projects on time & to the required standards.

We have a workforce including Engineers, Draughtsman, & Skilled workers. They are dedicated & committed individuals who have delivered to our commitments.

Projects excuted (Engineering)

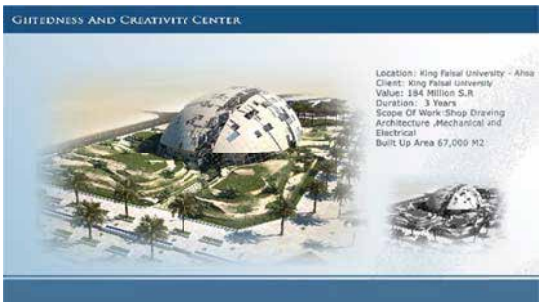
Azmeel Office Building



College of Literature For Girls

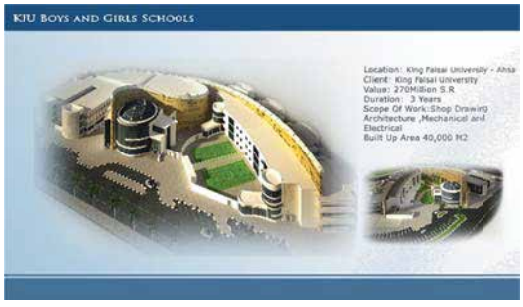
Education College

Giftedness and Creativity Center



Jeddah Gate

KFU Boys ang Girls Schools



P.O. Box 36341, Doha, Qatar Tel: (+974) 31212071,31212042 E-Mail: info@4-production.net

INVITATION

The Institution of Engineers (India)

(Established 1920, Incorporated by Royal Charter-1935)

Qatar Chapter

(Under the aegis of Embassy of India)

Patron: H.E. The Ambassador of India

Licensed with Qatar Financial Centre (QFC)

The Executive Committee

cordially invites you to the

54th Engineers' Day-2021

On Friday, 24th September, 2021

Hybrid Celebration at

OUC | Liverpool John Moores University, Qatar & **Zoom Online**

Zoom Meeting ID: 820 9860 8880 | Passcode : IEIQatar

For Online Registration : https://events.iei.qa

5:45 pm	Login to Zoom
6:00 pm	Lighting of the Lamp
6:10 pm	Presidential Address
6:20 pm	Activity Report
6:30 pm	Release of Souvenir
6:35 pm	Chief Guests Address
6:50 pm	Guests of Honour Address
7:20 pm	Theme Message
7:30 pm	Felicitations
7:55 pm	Vote of Thanks

Er. Sanjay Jain BE, MIE
Hon. Treasurer
Mob: 55593688

Er. Abdul Sathar P.Eng, FIE, MBA
Hon. Chairman
Mob: 55873526

Dr. Abdul Hameed FIE Phd
Hon. Secretary
Mob: 55391148

54th Engineers' Day:
Engineers for Skill Development & Employment in combating COVID

The heralding of a new decade in 2020 was marred with plummeting of the global economy pushing millions into penury as the COVID 19 pandemic took centre stage. Reeling under an economic downturn, many industries have adopted conservative approaches like hiring freezes, pay-cuts and layoffs to remain afloat while others were forced to shut down. The shutting of commercial establishments due to the second wave of Covid-19 has rendered several people jobless leaving them financially vulnerable.

As we move along, the biggest challenge at hand will be getting back on track and accept the new normal. Under the new normal, the jobs, which are heavily dependent on migratory workforce and involve work spaces with higher levels of physical proximity, are likely to see greater transformation and would require skilling and re-employing our workforce. We, as professional engineers, need to think of technical interventions to design and implement sound labour market information systems, including accurate market assessment and need anticipation, and putting in place processes for skills recognition to prevent attrition, poor labour market integration and deterioration of working conditions for all workers.

There is a dire need to scale up Skill Development Ecosystem while strengthening our cloud based infrastructure. Access to skills recognition processes, especially for low- and medium skilled migrant workers, will be crucial and would assist us in formulating policy recommendations for improvement of the relevant legislative and operational mechanisms.

The COVID-19 pandemic has provided us with an opportunity to come up with a well-crafted strategy to deal with this crisis. As uncertainty persists, it is imperative that our workforce is empowered with the right skills through timely and relevant skilling, upskilling and reskilling efforts. This will make our people more agile and resilient, and able to cope with the challenges posed by the current pandemic and what lies beyond.

Best Wishes from IEI QC Executive Members

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Smt. Angeline Premalatha
Counsellor , Embassy of India

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Former President, Arab Engineers Forum
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former Chief Controller, R&D, DRDO
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Director General-R&D, KIIT University &
CEO, KIIT Technology Business Incubator
Bhubaneswar, Odisha

Er. Mahmoud Fahmy
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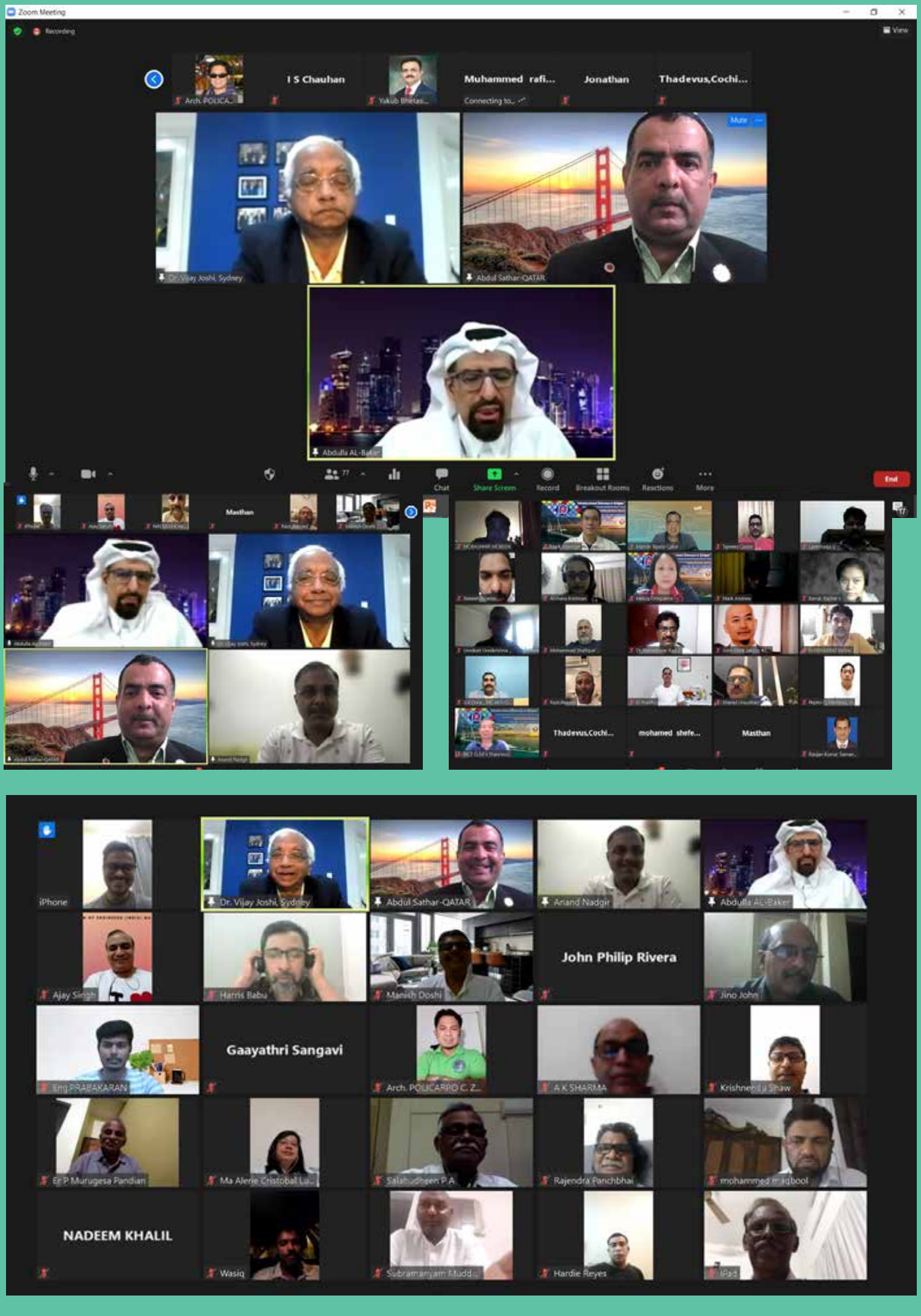
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Centrifugal Pump Fundamentals- net positive suction head (npsh) and cavitation

BIKRANT KPANDA, B.E. (Mech) , P.E

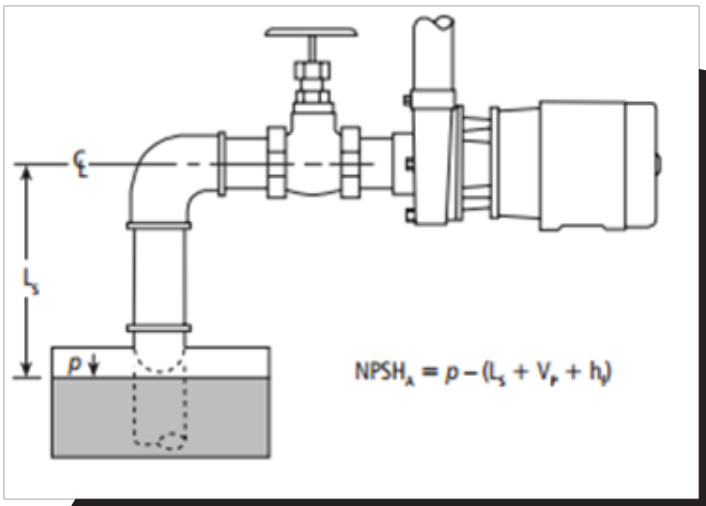
The Hydraulic Institute defines NPSH as the total suctionhead in feet absolute, determined at the suction nozzleand corrected to datum, less the vapor pressure of theliquid in feet absolute. Simply stated, it is an analysis ofenergy conditions on the suction side of a pump todetermine if the liquid will vaporize at the lowestpressure point in the pump.

The pressure which a liquid exerts on its surroundings isdependent upon its temperature. This pressure, calledvapor pressure, is a unique characteristic of every fluidand increases with increasing temperature. When thevapor pressure within the fluid reaches the pressure ofthe surrounding medium, the fluid begins to vaporize orboil. The temperature at which this vaporization occurswill decrease as the pressure of the surrounding mediumdecreases.
A liquid increase greatly in volume when it vaporizes.One cubic foot of water at room temperature becomes1700 cu. ft. of vapor at the same temperature.It is obvious from the above that if we are to pump a fluideffectively, we must keep it in liquid form. NPSH is simplya measure of the amount of suction head present toprevent this vaporization at the lowest pressure point inthe pump.

NPSH Required is a function of the pump design. As theliquid passes from the pump suction to the eye of the impeller, the velocity increases, and the pressure decreases.There are also pressure losses due to shock and turbulence as the liquid strikes the impeller. The centrifugalforce of the impeller vanes further increases the velocity and decreases the pressure of the liquid.

The NPSHRequired is the positive head in feet absolute required atthe pump suction to overcome these pressure drops inthe pump and maintain the liquid above its vapor pressure. The NPSH Required varies with speed and capacitywithin any pump. Pump manufacturer's curvesnormally provide this information.

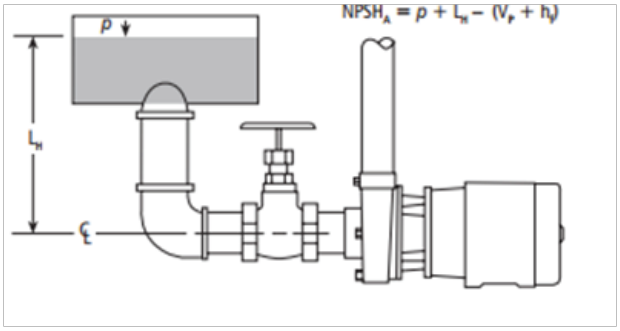
NPSH Available is a function of the system in which thepump operates. It is the excess pressure of the liquid infeet absolute over its vapor pressure as it arrives at thepump suction. Fig. shows four typical suction systemswith the NPSH Available formulas applicable to each. Itis important to correct for the specific gravity of the liquidand to convert all terms to units of "feet absolute" inusing the formulas.



C. CLOSED SUCTION SUPPLY– with Suction Lift

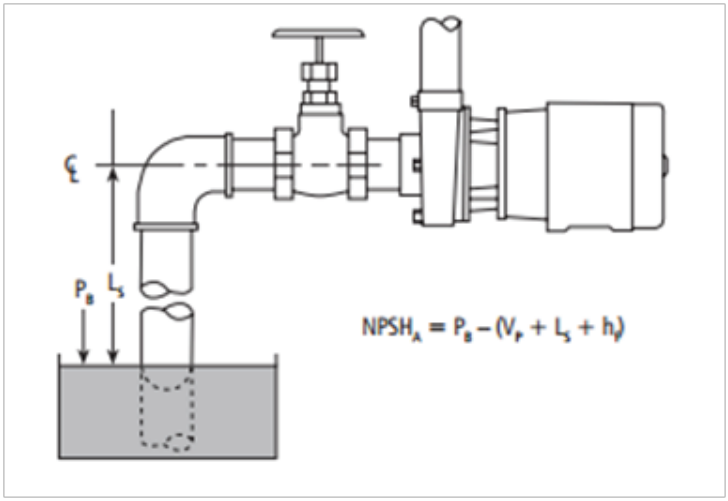
In an existing system, the NPSH Available can bedetermined by a gage reading on the pump suction.
The following formula applies:
NPSHA = PB - VP ± Gr + hV
Where Gr =Gage reading at the pump suction expressedin feet (plus if above atmospheric, minus ifbelow atmospheric) corrected to the pumpcenterline.
hv= Velocity head in the suction pipe at the gageconnection, expressed in feet.

Cavitation is a term used to describe the phenomenonwhich occurs in a pump when there is insufficient NPSHAvailable. The pressure of the liquid is reduced to a valueequal to or below its vapor pressure and small vaporbubbles or pockets begin to form. As these vapor bubblesmove along the impeller vanes to a higher-pressure area,they rapidly collapse.The collapse, or "implosion" is so rapid that it may beheard as a rumbling noise, as if you were pumping gravel.The forces during the collapse are generally high enoughto cause minute pockets of fatigue failure on the impellervane surfaces.
This action may be progressive, and undersevere conditions can cause serious pitting damage to theimpeller.The accompanying noise is the easiest way to recognizecavitation. Besides impeller damage, cavitation normallyresults in reduced capacity due to the vapor present inthe pump. Also, the head may be reduced and unstableand the power consumption may be erratic. Vibration andmechanical damage such as bearing failure can also occuras a result of operating in cavitation.
The only way to prevent the undesirable effects ofcavitation is to ensure that the NPSH Available in thesystem is greater than the NPSH Required by the pump.

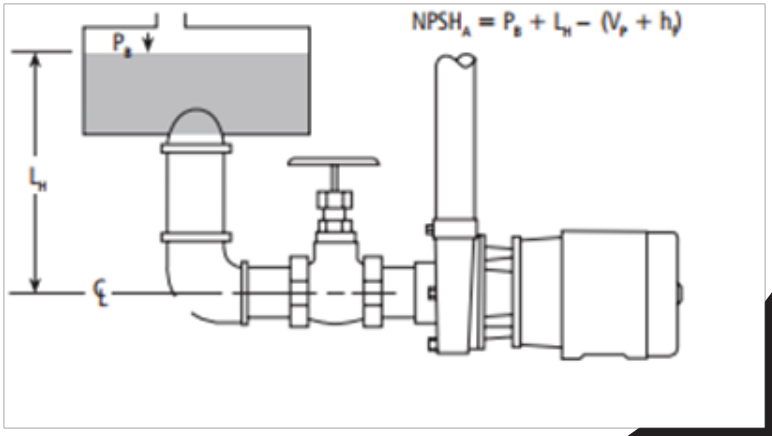


CLOSED SUCTION SUPPLY – with Suction Head

PB = Barometric pressure, in feet absolute.
VP = Vapor pressure of the liquid at maximum pumping temperature, in feet absolute (see next page).
p = Pressure on surface of liquid in closed suction tank, in feet absolute.
LS = Maximum static suction lift in feet.
LH = Minimum static suction head in feet.
hf= Friction loss in feet in suction pipe at required capacity



A. SUCTION SUPPLY OPEN TO ATMOSPHERE– with Suction Lift



SUCTION SUPPLY OPEN TO ATMOSPHERE with Suction Head

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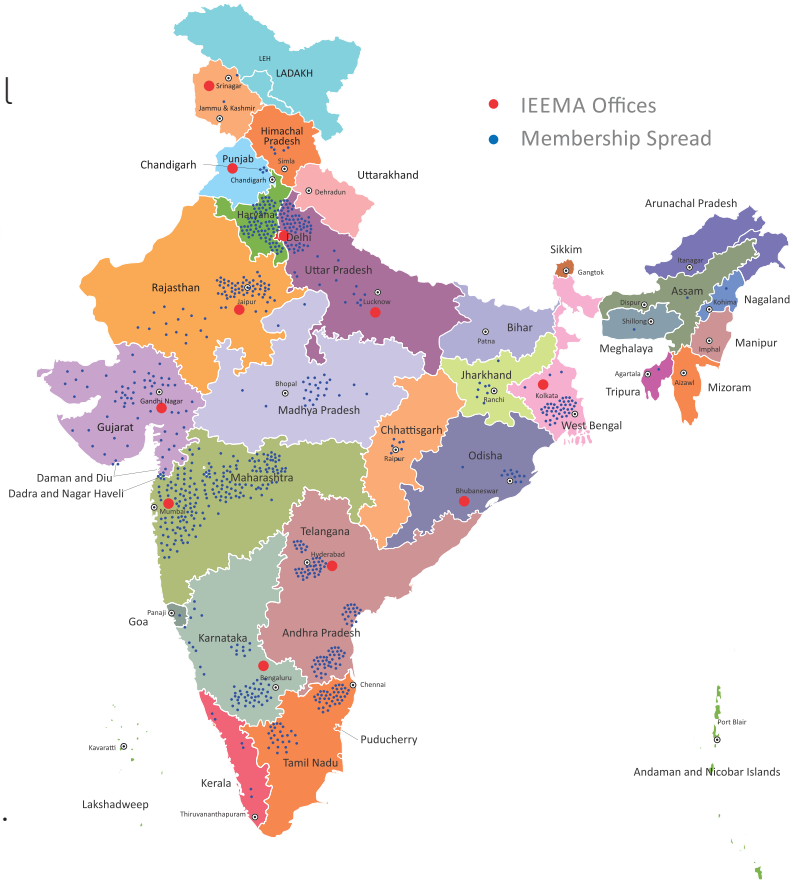

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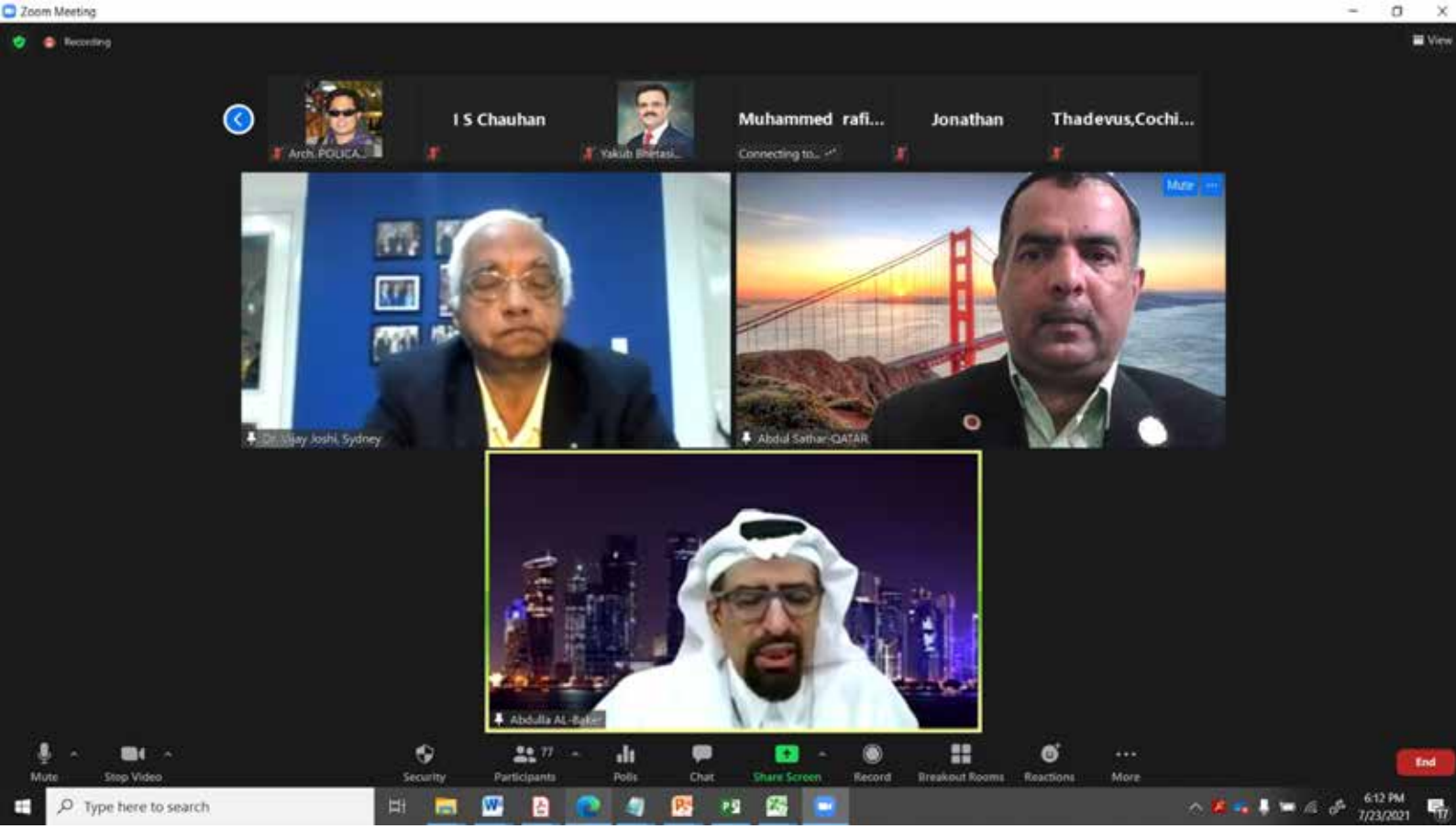

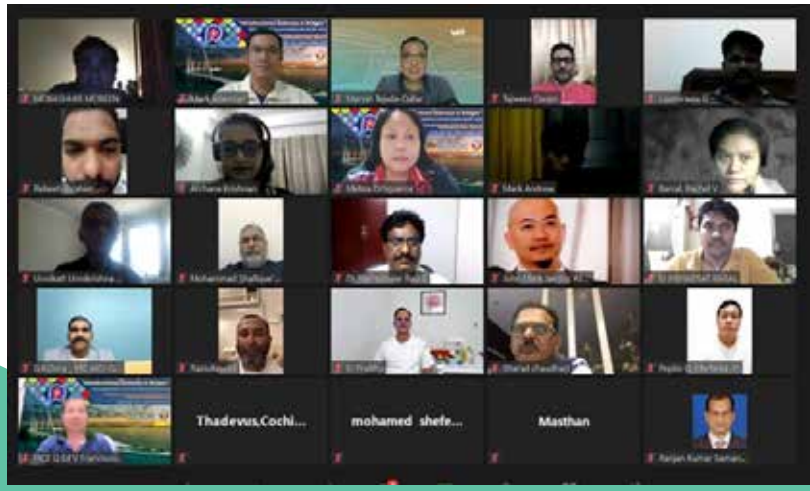

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Do not ignore - Climate Change!

(Dr Mohammed MaqboolAhmed ,
Head of Quality & Certification Qatar University)

Climate change is the shift in the Earth's, but we are already living the As the planet warms, extreme weather events such as heat waves, floods, and droughts become more frequent and intense. It is predicted that global temperatures may rise by at least 1.5 degrees Celsius by 2030. Mainly, greenhouse gas (carbon dioxide, methane, nitrous oxide) emissions caused by burning fossil fuels is the leading cause of this change. And without immediate action, the climate crisis could have devastating impacts of global warming and lead to widespread poverty, hunger, and migration.

Global warming has already begun affecting human health, food, water security, and economic development. As climate change worsens, dangerous weather events are becoming more frequent or severe. More frequent and intense drought, storms, heat waves, rising sea levels, melting glaciers, and warming oceans can directly harm animals, destroy the places they live, and wreak havoc on people's livelihoods and communities. This unacceptable situation harms every facet of life, trapping people in poverty and pushing them into vulnerable living conditions.

Global warming is projected to have several effects on the oceans. Polar ice shields are melting, and the sea is rising. In some regions, extreme weather events and rainfall are becoming more common, while others are experiencing more extreme heat waves and droughts. These impacts are expected to intensify in the coming decades.

Ongoing effects include rising sea levels due to thermal expansion and melting of glaciers and ice sheets, and warming of the ocean surface, leading to increased temperature stratification. Another impact is altered ecosystems and habitats. As climatic patterns rapidly shift, habitats on land and in the sea change, making them inhospitable for some species while letting others move in and take over.

In some cases, entire ecosystems are at risk of collapsing. The polar bear could disappear in the wild unless the pace of global warming slows. Dependent on sea ice, the animal uses it as a

floating platform to catch prey. Experts believe that the Arctic sea ice is melting at a rate of9% per decade, endangering the polar bear's habitat and existence.

Immediate and drastic actions are needed at a global level. This decade is crucial to stop runaway climate chaos. There are more frequent and severe extreme weather events from hurricanes, floods, forest fires to droughts and sea-level rise. Increasingly there will be areas of the world too hot to live in. Disease vectors are spreading with rising temperatures. Ecological and agricultural systems could break down and possibly lead to mass starvation.

Animal agriculture is also one source of climate chaos, generating a considerable amount of greenhouse gas. The Food and Agricultural Organization estimates that animal agriculture contributes 14% of greenhouse gases. According to World-Watch Institute, animal agriculture generates 51% of greenhouse gas emissions.

plants, insects, birds, and mammals become extinct every 24 hours. It is more significant than anything the world has experienced since the vanishing of the dinosaurs almost 65 million years ago. Animal agriculture is also one source of ocean dead zones as fertilizers eventually get into our waterways, further damaging the environment. Controlled animal agriculture and reforest the Earth are needed to bring down the atmospheric carbon content.

The time for looking away from the animal victims and climate chaos is over. The time to act is now. The world leaders shall come together and act fast; take some big decisions, and implement them sincerely. Intense involvement and strong willingness is the demand of the hour. plants, insects, birds, and mammals become extinct every 24 hours.

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The common person can also play a vital role in controlling climate change by applying climate healthy practices such as:

- Speak up! Demand Climate Action at all available plate forms
- Urge the governments to take bold, ambitious climate action now
- Make your voice heard by those in power
- Invest in renewables and divest from fossil fuels; invest your money responsibly.
- Learn more about your carbon emissions. There is much more you can do to reduce your household carbon emissions
- Start a climate conversation
- Mobilize for local climate action
- Use energy wisely and Switch to "green power."
- Power your home with renewable energy.
- Weatherize, and Invest in energy-efficient appliances.
- Buy better appliances and Pull the plug when not in use.
- Small solar lights will have a significant impact on climate.
- Reduce water and food waste. Eat for a climate-stable planet
- Consume less, waste less, and enjoy life more
- Commute by carpooling or using mass transit.
- Drive more efficiently, Plan and combine trips.
- Respect and protect green spaces.
- Plant a Tree or some Flowers to Help Beautify the Area Around Your House

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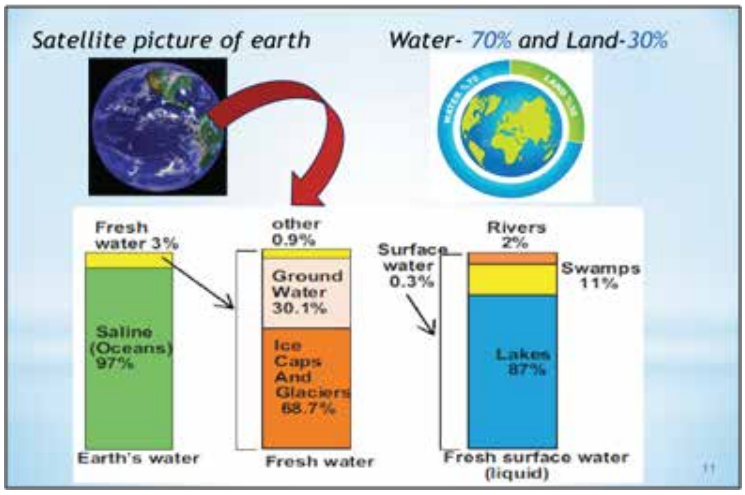
In Indianancient history and civilizations, it was believed that both the universe and our human body are composed of 5 main elements ('Panchtatva'). In today's age of modern science, we cannot imagine life without these 5 elements that represent various forms of energy.

- Earth (Prithvi –पृथ्वी) - Potential Energy
- Water (Jal -जल) - Hydraulic Energy
- Fire (Agni - अग्नी) - Thermal Energy
- Wind (Vayu -वायु) - Wind Energy
- Space (Akash -आकाश) - Cosmic Energy

Facts about water on earth



We have very limited water resources onearth.

- Earth is composed of 70% water and 30% land.
- 97% of the world's water is salty and only 3% is potable or freshwater.
- 68.7% of potable or freshwateris locked in ice caps and glaciers, 30.1% is groundwater, 0.9% is in other forms, and only 0.3% is surface water.
- 2% of surface water is in the form of •rivers, 11% are swamps and the remaining 87% are lakes.

Water plays acrucialrole in our everyday lives and is key to our survival in terms of agricultural, residential, manufacturingand personal needs. On abasic level, a healthy human requires 135 litres of potable water per day for the following activities:

- Drinking and cooking – 10 litres
- Bathing – 55 litres
- Washing clothes – 20 litres
- Washing utensils – 10 litres
- Cleaning house – 10 litres

Disasters due to water scarcity

Dried-up city of Cape Town: Since 2015, Cape Town has faced a severe water crisis, which peaked

during 2017-18. In late 2017, first mentions were made of "Day Zero", with no water supply through the taps in the city. Following this, the government implemented significant water restrictions to curb water usage. These included limitations on filling swimming pools, washingcars, operatingfountains, and using high volumes of water within households. Finally, in 2020, good rains effectively broke the drought and the resulting water shortage, with dam levels reaching 95%.
How do we achieve water demand?

1. Inter-linking rivers to overcome flood and drought problems

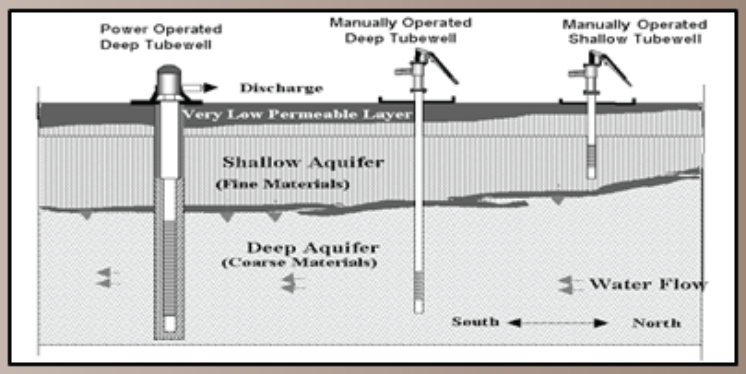
Water is limited in our country. There are many regions that face floods where excess water flows into the seas during monsoons.There are also many regions that face droughts and the rivers are dry both during and after monsoons. With effective interlinking of rivers, this problem can be solved.
Interlinking of rivers was the dream of EngineerMokshagundamVisvesvaraya.Former Prime MinisterShri Atal Bihari Vajpayeemadethis dream a reality by initiating an interlinking project comprising 14 rivers in the peninsular region and 16 rivers of Himalayan origin. InMarch 2021, Honorary Prime MinisterShri Narendra Modi launched'Jal Shakti Abhiyan-Catch The Rain' on the occasion of World Water Day. Currently, historic agreements are ongoing for Ken-Betwa Link Project, Par-Tapi-Narmada Link Project and Damanganga-Pinjal Link Project.Godavari-Cauvery River River Link Project is under progress.

2. Digging open water wells

Construction of conventional open wells is a common and effective technique for meeting water demandand has been used in India since time immemorial.

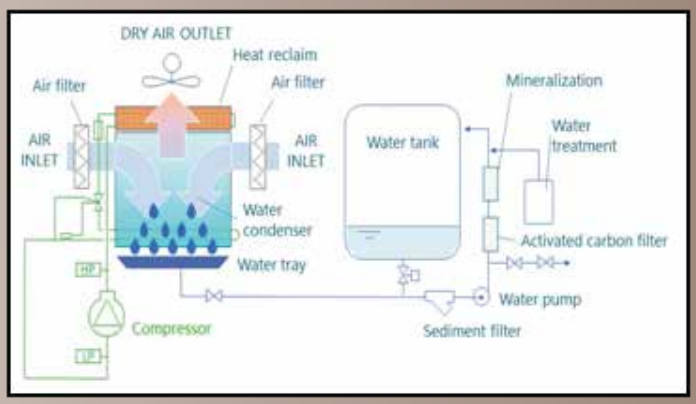
3. Drilling deep tube wells and drawing water by hand pumps or submersible pumps

This is another technique for meeting water demand but studies show that users of deep well water may suffer from cardiovascular diseases,arthritis, cancer, kidney stones, atopic dermatitis (or eczema), etc.



4. Drawing water from atmospheric moisture

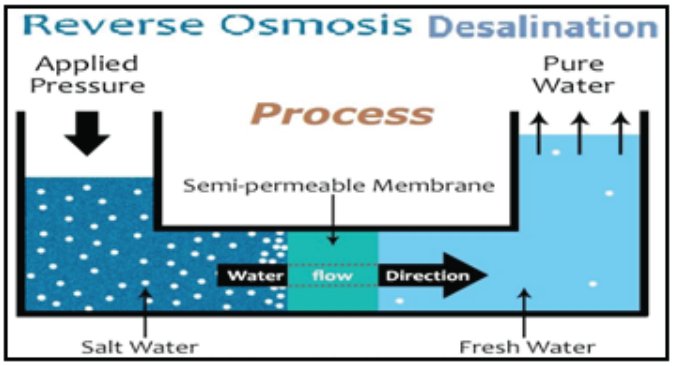
This is a new technique to withdraw atmospheric moisture in coastal areas, by vapour condensing and active cooling of the ambient humid air or fog.



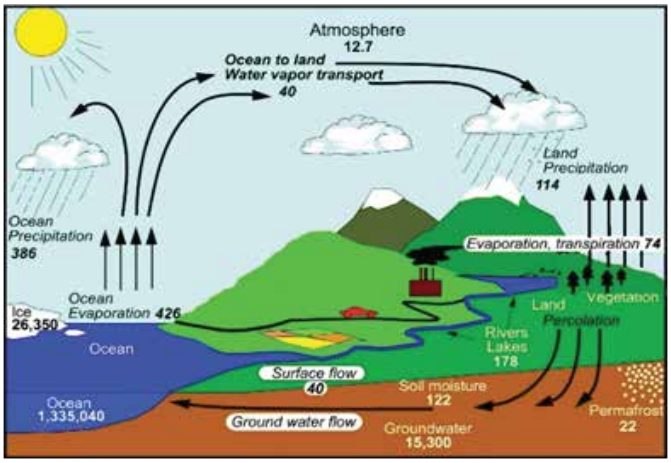
SOURCE Global, Dubai is one of the many companies around the world extracting water from atmospheric air, with the hope of helping water-scarce communities. Through this technique, it is possible to harvest water from the air using just solar power. It is a self-sufficient method requiring no electricity, gridsor infrastructure.

5. Drawing water from sea i.e. water treatment through desalination plants

In most of the Middle East countries (e.g. Qatar, KSA, UAE, Kuwait, Bahrain, Oman, etc.), where no natural water sources (ground or surface) are available, the only solution is the treatment of seawater.Desalination works on the principle of Reverse Osmosis (RO), illustrated below:



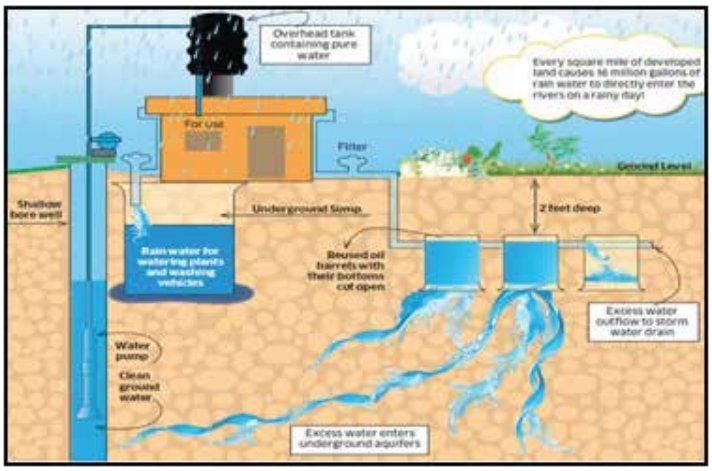
6. Rainwater Harvesting



It is atechnology/process used for collecting and storing rainwater from rooftops, land surfaces or rock catchments using simple techniques such as jars and pots as well as more complex techniques such as underground check dams.It is the accumulation and deposition of rainwater for reuse on-site, rather than allowing it to run off into the open drains, rivers and finally into the sea.

Broadly, there are two ways of harvesting rainwater:

- Surface runoff harvesting: In urban areas, rainwater flows away as surface runoff. This runoff can be caught and used for recharging aquifers by adopting appropriate methods.
- Rooftop rainwater harvesting: It is a system of catching rainwater where it falls. In rooftop harvesting, the roof becomes the catchment, and the rainwater is collected from the roof of the house/building. This method is less expensive and very effective.



Filters are used for water treatment to effectively remove turbidity, colour and micro-organisms. After the first flushing of rainfall, water should pass through filters.

There are different types of filters in practice, but their basic function is to purify the rainwater. Sand gravel filters are commonly used filters, constructed by brick masonry and filleted by pebbles, gravel, and sand. Each layer is separated by wire mesh.

7. Traditional Water Harvesting Systems

Paar System or PataliPaani (kuis):In the Western Rajasthan region (Jaisalmer), still more than 20 kuis are in operation

Talab or Bandhi: They are natural or man-made reservoirs. Notable examples include the ponds(pokhariyan) at Tikamgarh in Bundelkhand or the lakes in Udaipur

Johad or Check Dams:They are small earthen check dams that capture and conserve rainwater.

8. Modern Techniques of Water Harvesting

Ice Stupa:Sonam Wangchuk is an educationist, mechanical engineer and innovator.The SECMOL (Students' Educational and Cultural Movement of Ladakh) Institute was founded by him in 1988.The film, 3 Idiots, was based on his innovations.

He invented the innovative "Ice Stupa" technology, which was a way to bring glacier water to the people of Ladakh.In 2015, with $125,000 raised on a crowdfunding site, Wangchuk built a 64-foot-tall "ice stupa"—an artificial glacier made by piping mountain streams into a Ladakhi village

According to Er.Wangchuk, the ice stupas need very little effort and investment and can be used to provide water for agriculture and other uses in early summer.

The ice stupas are formed using glacial stream water carried down from higher ground through buried pipes, with the final section rising vertically. Due to the height difference, the pressure builds up and the water flows up and out of the pipe into sub-zero air temperatures. The water then freezes as it falls to gradually form an ice cone or stupa. In late spring, the melted water is collected in large tanks and fed onto planted land using a dripirrigation system. Minimizing wastage and saving water

We can minimize wastages and save water by avoiding the following:

- Running tap water while brushing teeth or washing face
- Using the toilet as a trash can.
- Taking baths and long showers.
- Conventional showerheads.
- Leaky pipes.
- Laundry loads that are only half full.
- Running a dishwasher that is not full.
- Washing dishes with running water.
- Conventional toilets.
- Overwatering the lawn.

Vandanaa Sugumaran
Birla Public School, Doha

WHAT IS ARTIFICIAL INTELLIGENCE?

Artificial intelligence refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem- solving.

According to the father of Artificial Intelligence John McCarthy, it is "The science and engineering of making intelligent machines, especially intelligent computer programs".

When most people hear the term artificial intelligence, the first thing they usually think of is robots.But nothing could be further from the truth.Artificial intelligence is based on the principle that human intelligence can be defined in a way that a machine can easily mimic it and execute tasks, from the simplest to those that are even more complex.

The goals of artificial intelligence include mimicking human cognitive activity. Researchers and developers in the field are making surprisingly rapid strides in mimicking activities such as learning, reasoning, and perception, to the extent that these can be concretely defined.

USES OF ARTIFICIAL INTELLIGENCE:

Here are some of the areas where AI plays an important role in helping humans with their everyday requirements:

- Voice Assistants

Digital assistants like Siri, Google Home, and Alexa use AI-backed Voice User Interfaces (VUI) to process and decipher voice commands. AI gives these applications the freedom to not solely rely on voice commands but also leverage vast databases on cloud storage platforms. These applications

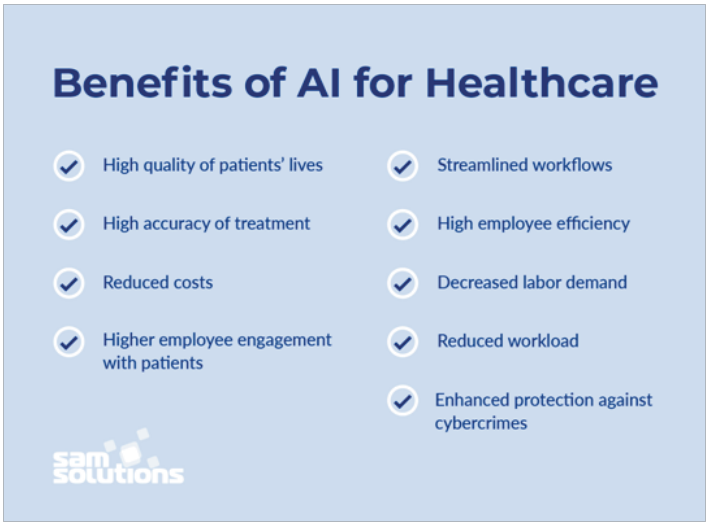
can then parse thousands of lines of data per second to complete tasks and bring back tailored search engine results.

- **Entertainment Streaming Apps**

Streaming giants like Netflix, Spotify, and Hulu are continually feeding data into machine learning algorithms to make the user experience seamless.AI also plays an important role in providing uninterrupted streaming by automating the allocation of servers closest to the user. Bandwidth allocation also changes automatically based on the popularity of a particular piece of media.

- Health

Researchers are studying how to use AI to analyze large quantities of health data and discover patterns that could lead to new discoveries in medicine and ways to improve individual diagnostics.For example, researchers developed an AI program for answering emergency calls that promises to recognize a cardiac arrest during the call faster and more frequently than medical dispatchers. In another example, EU co-funded K-Connect is developing multi-lingual text and search services that help people find the most relevant medical information available.



- **Media**

Journalism is harnessing AI, too, and will continue to benefit from it. Bloomberg uses Cyborg technology to help make quick sense of complex financial reports. The Associated Press employs the natural language abilities of Automated Insights to produce 3,700 earnings reports stories per year — nearly four times more than in the recent past.

- **Education**

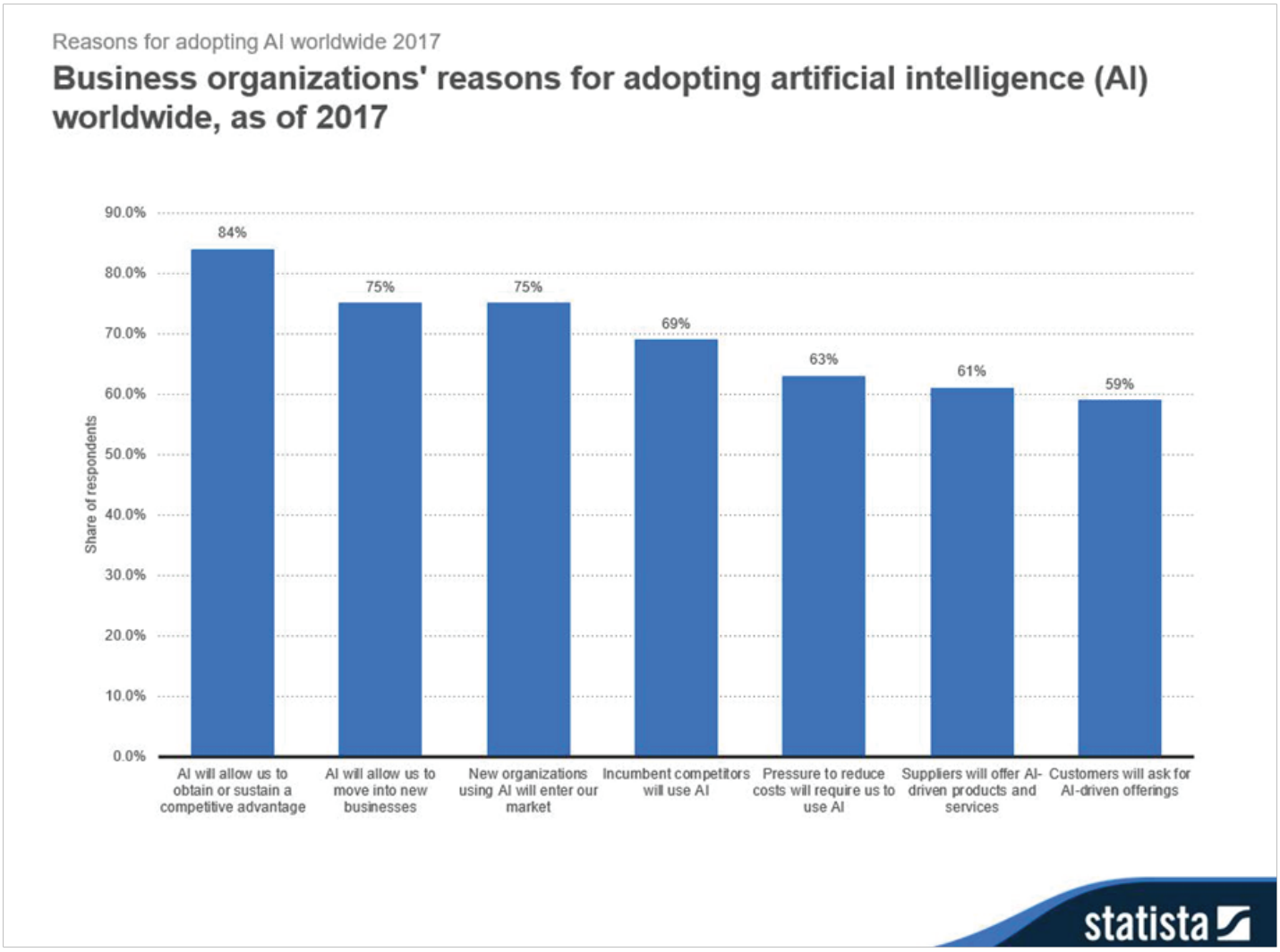
Textbooks are digitized with the help of AI, early-stage virtual tutors assist human instructors and facial analysis gauges the emotions of students to help determine who's struggling or bored and better tailor the experience to their individual needs.

HOW WILL ARTIFICIAL INTELLIGENCE PLAY A ROLE IN CHANGING THE FUTURE:

- **AI to Open Up Millions of New Job Opportunities**

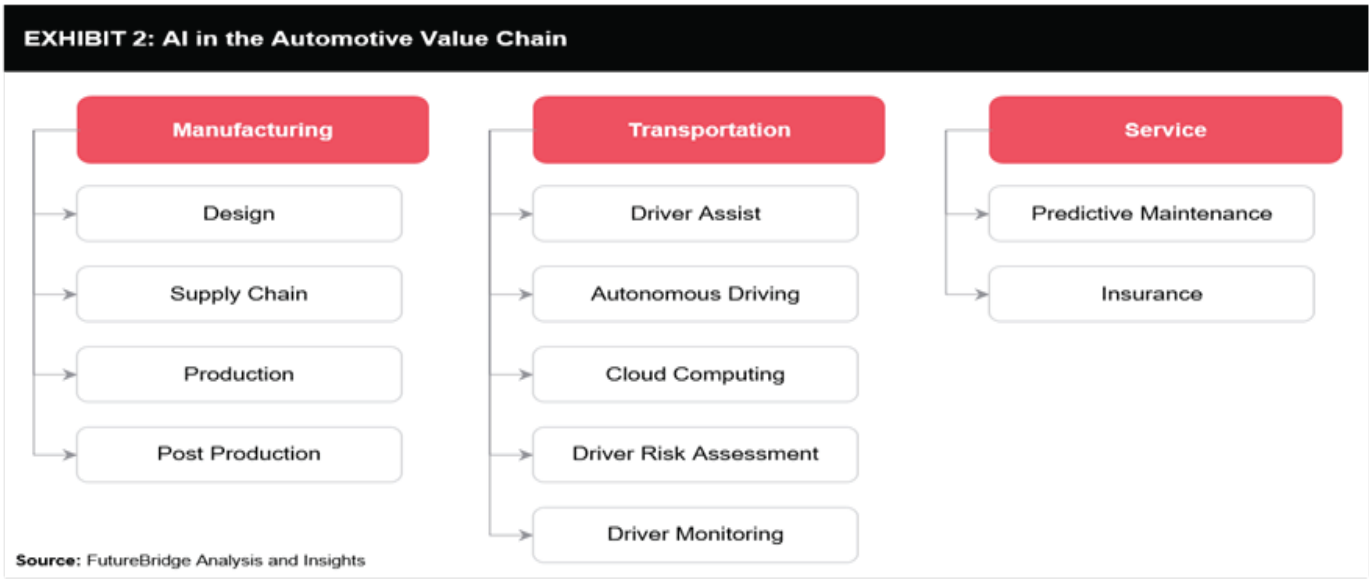
Artificial Intelligence will take our jobs!" is the most common fear surrounding artificial intelligence in the future. With artificial intelligence automating all kinds of work, we can think of a more comfortable future for ourselves that will create new jobs and not displace them. According to a report on the Future of Jobs by World Economic Forum, AI will create 58 million new artificial intelligence jobs by 2022.

In fact, the Indian AI industry has doubled in size in 2019 compared to the previous year. In just one year, 3 times more companies are working on AI-based projects and this momentum is likely to continue. India almost doubled its artificial intelligence engineers in 2019 (from 40K in 2018 to 72K in 2019) but still faces a talent shortage. The growth in the Indian AI industry is powered by professionals transitioning into artificial intelligence engineer job roles by upskilling themselves through various mentored artificial intelligence courses.



- **Artificial intelligence will drive innovations and impact industries.**

Artificial intelligence has had a huge impact on many industries in recent years and will continue to benefit them in the future. The pandemic-induced acceleration of technology adoption has led many sectors, both private and public to leverage AI for their advantage and growth. In the last few years, AI has enabled many innovations and driven the proliferation of technologies like IoT, robotics, analytics, and voice assistants. According to a report, AI topped the patent filings in 2020. This is not new; AI has been securing many patents in the last few years.



- **Artificial Intelligence Future in Banking**

According to IHS Markit's AI in Banking report, the global business value of AI in Banking anticipated reaching $300 billion by the end of 2030. Artificial Intelligence is all set to take center stage in the next decade in verticals like business intelligence and security with reduced cost, increased productivity, and enhanced customer experiences. The banks of the future will not just personalize their services and products but will use AI to personalize customer experiences. A great example of such personalization would be removing the need to produce an ID card when you walk into the bank branch and continue to be greeted with your name and complete knowledge of your entire bank account history.

- **Artificial Intelligence Future in Retail**

-According to a study by Capgemini on the impact of AI in Retail, if retailers deploy AI across their business operations, it can save them over $340 billion by 2022.

-The global market for Artificial Intelligence in Retail is expected to grow over $5 million by 2022.

These statistics are a clear proof of evidence that AI promises a great future for retailers with diverse usage possibilities for better business decision making. In future, you can expect delivery of up to 5-pound packages in less than 30 minutes, all thanks to AI-powered drones. Amazon is already working on it to determine proper safety and reliability of operations for delivering packages but there is no tentative date yet on the commercial use of these drones. However, in the next decade, you can anticipate the autonomous delivery of goods and food immediately with drones.

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Industry disruption from green ammonia

Written by

Dr MP Sukumaran Nair FIE, *Fertilizer industry and policy analyst, and Director,*
Centre for Green Technology and Management, India

Today, most of the world's population is hunger free largely due to the development of the 100+ year-old ammonia industry and its mineral nutrient inputs fertilizing our farms to grow more food. The work of scientist Mr Fritz Haber, who developed the ammonia process, and engineer Carl Bosch, who scaled up the process with a design, catalyst and reactor, created history and both won Nobel prizes. In a matter of three decades the developed world saw an outburst of ammonia production mostly to produce fertilizers, but also for refrigeration and chemical production.

Dr MP Sukumaran Nair FIE

The post 1960 developments through to today saw similar advances in developing countries and emerging economies which brought political stability even in populous nations by reducing deprivation and poverty, as well as fulling aspirations to advance the economic front. In 2020 world ammonia production stood at 180 mn t with China, Russia, India and the US as the major players. Around 80% of synthetic ammonia is used for making mineral fertilizers for enhancing crops yields. Other user industries include plastics, fibres, explosives, nitric acid and intermediates. In the future ammonia is expected to be useful as an energy storage, zero carbon fuel and a hydrogen carrier.

From a humble start of BASF's 30 t per day plant in 1913, single stream capacities today have reached 3500 t per day imbibing a high order of reliability, safety and environment friendliness. The industry is now highly optimized in its operation, efficiencies and most other aspects relating to technology, management, trade and commerce. For a long time the focus was to use the energy of fossil fuel and feedstock to free up hydrogen from steam (water) and separate nitrogen from air to produce the ammonia synthesis gas. However, ammonia technology has attracted criticisms related to its higher specific energy consumption, high-level energy transaction and as a contributor to global warming leading to climatic distortions. The Haber-Bosch process, with its intricacies of design, has a specific energy consumption of around 7.2 giga calories per t of ammonia and a by-product carbon dioxide emission of 2.16 t/t of product. The IFA estimates that approximately 1.2% of the world's energy is used for fertilizer production of which, 93% is marked for ammonia. Despite the enormous strides made by the industry in recent years in reducing emissions, current ammonia production methods still generate significant volumes of CO_2. It is generally agreed in the industry that a further reduction in energy consumption of the order of 6-7% is possible in the most efficient operating plants, although this would come with an increased capex. Greenhouse gas emissions from the ammonia industry accounted for 1% of total global emissions in 2019.

Climate goals

The Paris Agreement COP 21, which was adopted by 196 nations in 2016, intends to limit global warming to below 2.00C, preferably to 1.50C, compared with pre-industrial levels. To achieve this long-term temperature goal, countries aim for greenhouse gas

Recent developments are epoch making and innovation is unprecedented

emissions to peak as soon as possible to achieve a climate neutral world by 2050. The hydrogen/fertilizer industry will bear the brunt of this global decarbonization challenge.

Recent developments in the industry are epoch making and innovation is unprecedented. The green ammonia concept fully eliminates the use of fossil fuel and feedstock and consequently wards off any emissions on that account. The old electrolytic hydrogen manufacturing process is innovated to produce hydrogen from water, air separation through cryogenic liquefaction/membrane process is used to produce nitrogen and a mixture of pure gaseous hydrogen and nitrogen streams in the ratio 3:1 is generated for synthesis of ammonia. The cost effective and matured technology of renewable power generation is set to provide cheap electrical energy from solar/wind power to the green ammonia process.

Major technology developers in the ammonia business are fine tuning the green ammonia process stages and semi-commercial plants are being built on this concept. Besides being a major input to fertilizer production, ammonia is also regarded as an energy carrier and several studies have recently attempted to find the most environmentally benign, energy efficient and economically viable production of synthesis gas. Another important feature is the modularity in the construction of green ammonia plants by which additional capacities may be conveniently augmented to existing operations.

Figure 1. Colours of hydrogen

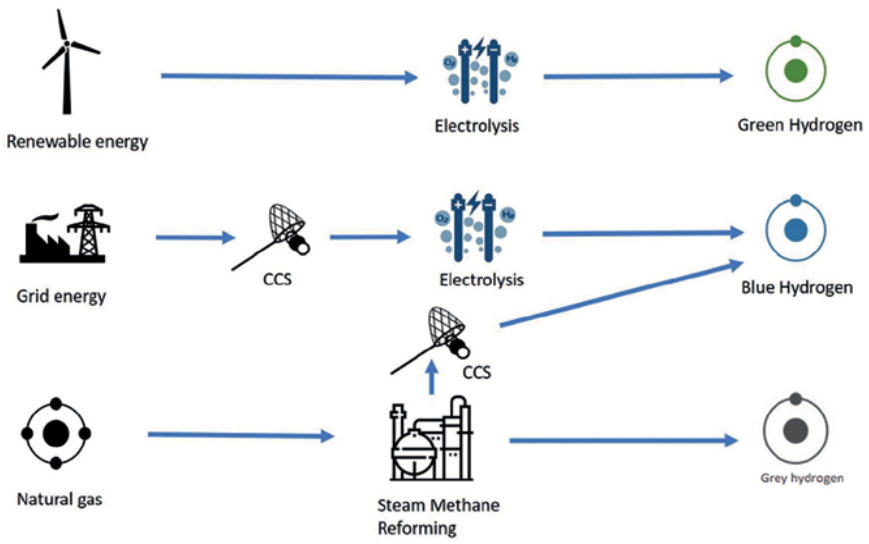


Figure 2. Hydrogen production technologies

JM's technologies

Brown	Grey	Blue	Green
Coal	Natural gas	Natural gas	Renewable electricity
Gasification	Steam methane reforming	Advanced gas reforming	Electrolysis
No CCS	No CCS	CCS	
Highest GHG emissions (19 tCO_2/tH_2)	Highest GHG emissions (11 tCO_2/tH_2)	Low GHG emissions (0.5 tCO_2/tH_2)	Potential for zero GHG emissions
\$1.2 to \$2.1 per kg H_2	\$1 – \$2.1 per kg H_2	\$1.5 – \$2.9 per kg H_2	\$3 – \$7.5 per kg H_2

Potential commercialization of electrochemical synthesis or non-thermal plasma synthesis for ammonia is being researched and critically reviewed. At present these processes have not been scaled up to compete with or replace the Haber-Bosch process and therefore, the ammonia synthesis by the Haber-Bosch process remains the best method.

The disruption in different technologies and process systems and equipment arising out of the development of green ammonia is exciting. If one explores into why the electrolytic hydrogen generation of the 1950s and 1960s did not develop further, the answer could be found in the then prevailing cost of electricity and the easy availability of fossil feedstock as a convenient raw material to produce syngas. The development of technologies such as partial oxidation of liquid and gaseous hydrocarbon feedstock by Texaco/Shell in the 1940s and early 1950s and ICI nickel catalysed steam reforming of hydrocarbons in 1959 gave a renewed growth impetus for hydrocarbon feedstock. The late 1960s saw the advent of the centrifugal compressors which revolutionized plant capacities.

Communicating Cybersecurity with the Board and Executive Management

Where do we get it wrong in context of Cybersecurity?

-Samir Pawaskar, Cybersecurity Expert, Government Organization, Qatar

Introduction

In the digital world that we live in today, cybersecurity has managed to grab the headlines time and again. Hacks, data breaches, ransomwares, denial of service attacks, and what not. Furthermore, cybersecurity has consistently been ranked in the top 5 global risks by World Economic Forum, World Bank, Big 4s, and various cybersecurity organizations. It would be difficult to believe if somebody says that they do not know about cybersecurity. Yet, the irony of today's world is that not many people understand cybersecurity. As a cybersecurity professional, it pains me to no end trying to understand what can be done better to change this situation, how can we communicate effectively with our stakeholders? Today, let us look at how we can effectively communicate cybersecurity with our board and executive management.

"Everybody knows about cybersecurity, but not many people understand cybersecurity"

Problem Statement

In a study conducted by Ponemon Institute1, they concluded that "Communication roadblocks are barriers to reducing the risk of a cyber-attack". It further produced data from the survey that indicated:

1. 31% of cybersecurity team never communicated to the executive management
2. 48% organizations did not provide cybersecurity education to their employees
3. Only 6% educate their executive management about a new or emerging cyber threat

So, we conclude that "Communicating cybersecurity with the management", is a major issue that organizations need to resolve to be able to notch up their cybersecurity program and reduce the risk to their enterprise.

Where do cybersecurity professionals err?

Well, it is not that cybersecurity professionals do not make attempts to evangelize cybersecurity within the organization, including the board and the management. However, statistics unfortunately prove that it is a job not well done!

31% of cybersecurity team never communicated to the executive management

So, one of the challenges is that cybersecurity professionals do not communicate to the executive management. In my opinion, more

[1] http://www.websense.com/assets/reports/report-ponemon-2014-exposing-cybersecurity-cracks-en.pdf
https://docplayer.net/2498346-Exposing-the-cybersecurity-cracks-a-global-perspective.html

than being a personal trait it might have something to do with the organization structure and how cybersecurity reports within an organization. In a lot of organization cybersecurity is nestled somewhere within an IT department, at times further deep within the network and infrastructure team.

Another challenge being that cybersecurity professionals fail to communicate the message when given an opportunity to do so. Some of the traditional communication strategies used by cybersecurity professionals include:

Fear, Uncertainty, Doubt (FUD)

Traditionally, cybersecurity professionals have relied on using fear, uncertainty, and doubt to emphasize while communicating their message or even conceal their inability to grasp the gravity of the message to be communicated or lack of understanding themselves.

The challenge with this strategy is that, management will assess it against statistical data. Also, over a period of time, if these fears do not materialize it goes to form a bias in the minds of decision makers in the sense that they feel, this particular fear is unrealizable!

Fear of Missing Out (FOMO)

Another strategy used by cybersecurity professional involves driving FOMO (fear of missing out), by relying on others (peers) as a support to communicate the message. Usually, this is the case when rooting for technologies, we should move to cloud, because our competitors have moved too, we need to build a SOC, because everybody in the sector is doing that and so on and forth.

The challenge with this strategy is that in most of the times either there is no genuine business requirement or not enough diligence has been done to map the initiative to the business context, that drives this initiative as such it is difficult to articulate ROI over a period time.

REGULATORY COMPLIANCE

Lastly, the most crucial being the crutch of regulatory compliance to drive home the message about the need for cybersecurity. There is no rationale here in the sense, there is no need to justify, things have to be done because it is mandated by some kind of regulations and has to be done.

The challenge with this strategy is that cost becomes a driving factor, management may want to do things at the lowest price with the aim of achieving a tick box compliance, somewhere in between that the essence of cybersecurity gets lost.

To summarize communications between executives and cybersecurity is ineffective because of the following key reasons:

1. Where, security as a function is tucked inside IT, cybersecurity rarely surfaces to executives attention.
2. Siloed communication, cybersecurity pros do not or are not able to communicate with the executives.
3. Security professionals are from “Mars” and management is from “Venus”, they talk in different languages. Security professionals tend to be technical, jargon focused and not relatable to business.

4. Trust deficit builds up non-confidence between cybersecurity pros and executives over a period due to reliance on strategies such as FUD, and FOMO.

And what about the Board and the Executive Management?

Alex Blau (2017) in his article2 in the Harvard Business Review, mentioned that decision makers must use their judgment to estimate how much to invest in cyber security. However, the judgement maybe flawed due to pre-conceived notions of the decision makers, or reliance on statistical data (which often is not relevant in cybersecurity), or relying on wrong models, or worse asking wrong questions.

Only 21% Non IT executives and 18% Board members have good understanding of cybersecurity

Questions like "How much should I spend on cybersecurity?" or "How can I comply with regulations?" don't reflect the organization's level of protection. These misplaced questions drive attention away from improved priorities and better investments.

He further reasons within his article, that broadly there are three reasons why decision makers within organizations often don't take cyber security seriously enough:

1. They believe cybersecurity is a technology problem, in the sense that throwing in a few appliances or solutions will solve all their cybersecurity issues. People and Process are most overlooked.
2. They believe tick box compliance with some security framework like NIST will do the trick.
3. They haven't had a security breach recently, so what doesn't seem broken doesn't need to be fixed.

Conclusion

To conclude, we acknowledge there is a problem in communication that needs to be resolved and cybersecurity pros can effectively tackle these issues by taking the following actions:

1. Ensure that cybersecurity is positioned correctly within the organization. If nestled within IT, it is the responsibility of the CIO to bring cybersecurity to the discussion table with the CEO, executive management, and the board.
2. Cybersecurity professionals must ensure that communication with the board and executive management is simplified (in terms of technicality and jargon) and presented in context of business. Generally speaking, board is focused on shareholder value while executive management is focused on enterprise value, and the message to them should be shaped accordingly.
3. Cybersecurity professionals should ensure that they communicate both laterally and vertically within the organization, to bring about a consensus and understanding of risks across the organization. The cybersecurity professionals should endeavor to foster duplex, bi-directional communication.
4. Lastly, enterprise risk management teams should position, monitor and report communication failure within the organization as a critical risk in all risk assessments.

[2] The Behavioral Economics of Why Executives Underinvest in Cybersecurity (hbr.org)

What is the difference between VFD and VSD?

Er.Salihudeen.KM, FIE

02.09.2021

Electric motors are used almost in every industry as they are high-efficient and convenient in use at the same time. Yet, there are lots of industries requiring a busload of energy. In that cases, owners of such energy-hungry factories require optimizing energy consumption and to provide that, several technological solutions are used. The most popular of them are variable speed drives and variable frequency drives.

Let's discover, what is the difference between a variable speed drive and a variable frequency drive?

Table of Content:

1.What Types of Motors Require a Variable Speed Drive or a Variable Frequency Drive?

For up-to-date industrial goals, there are lots of electric motors types that are the most effective in the manufacturing process, agriculture and even vehicles.

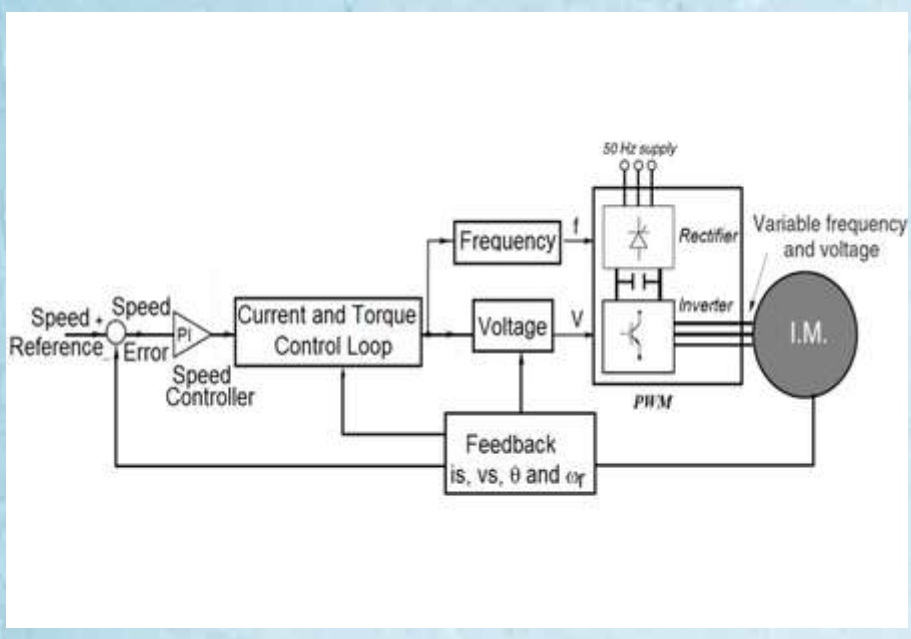
If we'll consider the main footage of their application, it would be the following:

- Among various transporting vehicles they are powertrains, hybrid autos, some subsystem controls i.e. window lifters, windshields etc.
- If we consider the household level of electric motors use, they are installed almost in every type of home appliances and professional kitchen equipment, conditioning systems, elevators or HVACS.
- Industrial use of electric motors is even more widespread as these types are installed in every part of modern electrical or automated equipment.

To decrease the level of energy consumption of these motors, that is, for industrial goals, up to 40% of global energy production, special drives are used. One of them is VSD or Various Speed Drive.

2.What Is VSD?

Various speed drive has its explanation right in its name. It impacts electric motor's energy consumption via changing its speed. This kind of control works with the current's amperage and voltage. It changes them both in AC and DC electric asynchronous motors. If the motor is of an AC type, the variation is provided via a rectifier circuit that helps in turning AC to DC on a special voltage/amperage level. The building of DC various speed driver is much simpler yet it is no less effective.



When choosing a control unit for DC motors, only all types of variable speed drives should be used. Speed controllers are included in the structure of many devices, as they provide accurate electrical control. This allows you to adjust the speed to the desired value.

The DC motor speed controller is used in many industrial and domestic applications.

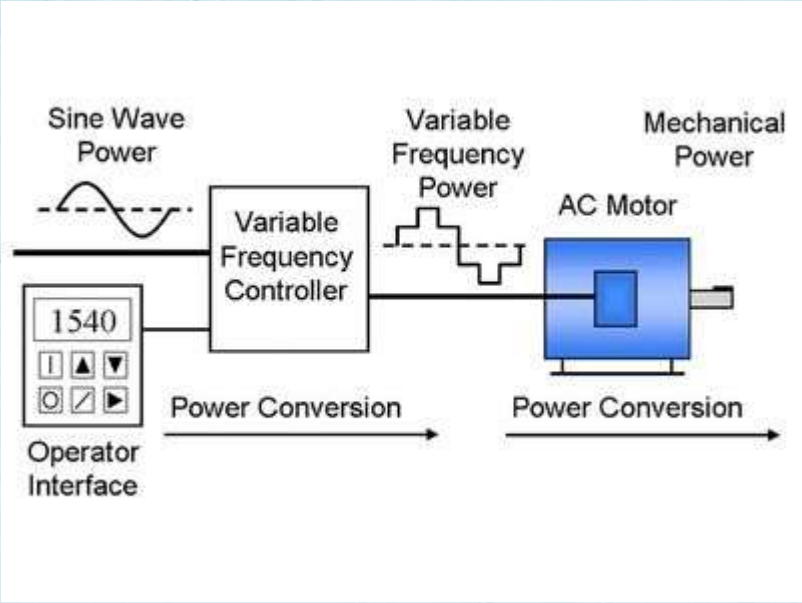
3.Key Benefits of VSD

- Changes the speed, not frequencies.
- Allows controlling both AC and DC electric motors.
- Suitable for household appliances along with industrial motors.
- Is a perfect idea for starting and slowing down the motor.

4.What Is VFD

A variable frequency drive is a static converter device required to control the speed of rotation of induction electric motors. Asynchronous AC motors are significantly different from DC devices. The difference lies in the simplicity of design and ease of use. It is this factor that explains the popularity of induction motors.

It is important to note that speed control can be performed by devices such as a mechanical drive, hydraulic clutch, and others. But all these methods have significant drawbacks, which include the complexity of use, poor quality of work, high cost and



small control range.

The types of variable frequency drives are the following:

- A three-phase VFD is connected to a three-phase 415V network and outputs three phases with a voltage of 415V at the output.
- A single-phase converter is connected to a single-phase 230V network and outputs three phases with a voltage of 230V at the output.

A various frequency drive for an electric motor will help to avoid multiple problems. i.e. during hard braking, the electric motor works like a generator and a braking resistor is needed to absorb the released energy. The resistance value of the braking resistor is indicated in the datasheet of the VFD. In this case, the speed control is performed by changing the supply voltage and the frequency of the electric motor. The efficiency of such a frequency converter reaches 98%, and the risk of occurrence and development of emergency situations is noticeably reduced. Be aware that this type of control drives suits only AC motors.

5.Key Benefits of VFD

- The motor accelerates and decelerates smoothly to prevent shock overloads and extend equipment life when it is controlled by a VFD drive.
- Compared to mechanical speed drives, frequency drives are cheaper and have a wider speed control range.
- Energy savings due to optimal load distribution depending on external factors.

6.What's the Difference?

When comparing VFD and VSD, the main difference is their working principle. While their goal is quite similar and it is reducing energy consumption and rising energy-efficiency of electric motor, various speed drive impacts the motor via changing its speed with the help of changed amperage or voltage. The working principle of various frequency drive, as it is obvious, lies in changing current signal frequencies. 

One more difference between VFD and VSD is their compatibility. When we talk about VSD, it is compatible with both AC and DC motors. VFD is used only for AC electric motors.

And the last difference is their designation. VSD drive is a good idea for motors that work with fast speed-ups and slow-downs required. VFDs are intended for the constant working process of the electrical motor.

7.Conclusion

When it comes to choosing a control drive for an asynchronous electrical motor, the choice is between two main types of control drives. For AC motor, you can choose both VFD or VSD depending on working routines and requirements. For DC motor, only VSD drive is appropriate. Since VFDs are very sensitive to voltage fluctuations, care to be taken for critical applications due to service interruption on any minor voltage dips from Utility. Restarting facility and UPS power shall be implemented as per power system and harmonics study to meet the critical service requirements.