

THE VESSEL

JUNE 2020

KEEPING THE ENERGY ALIVE



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Senior Editor: Asha Jonas
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MESSAGE FROM OUR CHAIR

IChemE TTMG is considered to be amongst some of the newest additions of the IChemE Member Groups to our parent body IChemE Worldwide. Though we are still at the cusp of development, since 2015, significant effort has been made by our Steering and Management Committee members who, though changing over the years, have all thoroughly enjoyed serving you. We are grateful for those of you who have been supporting since inception, both at the forefront of our various engagement sessions as well as behind the scenes. Notwithstanding, we do recognize that there are many more of you whom we need to meet at your doorsteps. *The Vessel* aims to do just that— keep you up to date on all we have been doing and plan to do, with regard to engaging with and supporting our membership, stakeholders and supporters alike.

With many challenges presented before us, IChemE TTMG has also had many successes and this first 2020 issue of *The Vessel* highlights some of these wins. Fortunately, over the last year we have revived our social media content to better keep our members ‘in the know’, re-familiarizing you of our intent, recapping our journey, celebrating our victories and forging ahead to the future.

Given all that is happening in our world today, we know that this future we speak of is one filled with a lot more uncertainty than certainties. But we Chemical Engineers adapt by exactly that—assessing uncertainties, covering them in our ‘Basis and Assumptions’ and rallying on, hoping for the best, but doing our engineering due diligence along the way. Here at IChemE TTMG, to ensure our future is one where we can continue to make a positive impact on you and Trinidad and Tobago, we do have our basis and assumptions, we do have a plan and we feel equipped to take you on this journey with us.

Our focus this year remains membership-building, promotion of active participation and chartership drives, all with a vision of IChemE TTMG becoming a self-contained, impactful unit for the benefit of our local engineers, the Trinidad and Tobago society and the wider Caribbean region at large.

“What’s in it for me?” you may ask. Why will your active participation make a difference?

Well, let’s take a step back to the earlier days ... for some of us, more youthful days. Try to recall what guided our decision to embark on a Chemical/ Process Engineering career? Perhaps it was a time when oil and gas was all we knew, or persons in our families worked in this field and we wanted that experience too? Or maybe, for the younger ones, it was, what I like to call, the “Chemistry Trap” ... falling in love with such a beautiful subject, choosing the next thing that sounds as exciting and then Boom! You’re at University, your first semester in year one and you realize...

“Ohhh- there’s not much Chemistry here!!...”.

As the world evolves, our aim is to simultaneously evolve as a profession, opening our eyes to the emerging demands of the local and global communities today. Of course, the role of the Chemical Engineer in earlier times and today, has its place and merits but what about the Chemical Engineer the world needs tomorrow and ten years from now? How can we become better at what we do and what support can we provide to our discipline and to our country?

Wherever you are in your journey— a student, an engineer maneuvering your professional career in a stable or not-so-stable setting, someone in need of mentorship and advice on the path to becoming chartered, progressing in your own space as a consultant or as a budding entrepreneur – IChemE TTMG can support you on your journey. We provide a platform to connect you with the tools you require to excel, connections with like-minded (and differently-minded) individuals and serve as a resource within which you can network with industry professionals, while keeping you in the know on current and upcoming Chemical Engineering or other industry events.

I liken the predicament of IChemE TTMG needing your support to the desire of so many people wanting to visit the ideal tourist destination, wanting first class systems of operation to function in, with world class service.... Sounds great!... But why not make right here at home, our country, a high-in-demand tourist destination. Want to work abroad as a Trinidad and Tobago Chemical Engineer? Let’s make home a place that international Chemical Engineers would want to visit and learn from, that students and professionals would be clambering for, to gain exposure due to our top-of-the-line work ethic, exciting local projects and tremendous passion for continuous improvement in our field. Wouldn’t you want great service when you visit various establishments? Let’s provide above and beyond service to persons in our personal space, our colleagues and our groups.

Whilst we acknowledge that we have been doing a lot of the above for many years, let’s continue to optimize our efforts and operations to improve our IChemE TTMG local chapter.

We hope you enjoy this issue of *The Vessel* and do eagerly await hearing how we can better serve you and your interest in becoming more involved in what we do.

Monifa Graham

IChemE TTMG Management
Committee Chairperson

HISTORY OF ICHEME TTMG



“One main focus for IChemE TTMG is to create a learned society where we serve the local society through development, enhancement and sharing of knowledge.”

Ten things you may or may not know about us:

1. On the 26th September 2014, IChemE Trinidad & Tobago Member Group (TTMG) was founded and its Steering Committee was appointed.
2. The first inaugural IChemE Meeting was held on the 17th October 2014 and was followed by the appointment of the IChemE Senior Ambassador in Trinidad and Tobago, Mr. Maurice Massiah, on 24th March 2015.
3. IChemE TTMG was officially launched on the 29th October 2015. At this event, the University of Trinidad and Tobago offered to host the offices of the TTMG at the Point Lisas Campus.
4. The first IChemE TTMG Annual General Meeting, with election of officers, was held on the 22nd September 2018.
5. IChemE TTMG is made up of three (3) Sub-committees, namely Applied Research (ARC), Technical Training and Mentorship (TTM) and Networking Fundraising and Social Recognition (NFSR).
6. As of 2020, there are currently 173 members of IChemE TTMG.
7. IChemE TTMG is an arm of IChemE global that can support you as you progress through your chartership journey and there is no additional annual cost to join.
8. There are five (5) grades of membership, namely, Student Member, Associate Member, Chartered Member, Fellow and Associate Fellow.
9. The Steering and Management Committee members hail from a variety of corporations within the local industry, inclusive of BP Trinidad & Tobago, Massy Wood, Proman, Shell Trinidad and Tobago Limited, The Ministry of Energy and Energy Industries, The University of Trinidad and Tobago, etc.
10. One main focus for IChemE TTMG is to create a learned society where we serve the local society through development, enhancement and sharing of knowledge.

MEMORY LANE—A LOOK BACK



TTMG Kick-Off Event 2019

The IChemE TTMG Kick-Off Event 2019 was held on the 11th January at Shell Trinidad and Tobago, Corporate Hospitality Suite. The event's format resembled that of a formal review of the past year and gave a sneak peek into what 2019 had to offer. This formal session was followed by a cocktail event with media presence. Apart from a healthy turn out of past and present students of both the University of the West Indies and the University of Trinidad and Tobago, we were graced with the presence of a few

distinguished guests inclusive of Professor Emeritus Mc Gaw, Professor Emeritus Winston Mellowes and Dr. David Janes.

Winners of various crowd engagement activities received prizes from several small and medium business group enterprises such as:

- All in Fitness Boot Camp
- Just Soleil Nail Spa
- CorporateCutz Barber Salon
- Amral's Travels
- Oh Snacks
- Mayfair / Senses



Our Chair, Monifa Graham (left) presenting an award to one of our crowd winners Melissa Mannan (right).

Major corporate donors for 2019 include BP Trinidad & Tobago and Shell Trinidad and Tobago Ltd.

It is the hope of IChemE to encourage further Corporate engagement to allow us to reach the entire Chemical Engineering community and make positive impacts on society.

April 2019 Think Tank - Brain Storming Session

The Think Tank workshop in April 2019 was a working session targeted at bringing the various sub-committees of IChemE TTMG together:

- The Technical Training and Mentorship Committee (TTM)
- The Applied Research Committee (ARC)
- The Networking Fundraising and Social Recognition Committee (NFSR)

The event required teams to work together, with cross—committee

collaboration, to plan the details of upcoming events.



IChemE TTMG members gather for their first Think Tank collaborative workshop at the University of the West Indies.

MEMORY LANE—A LOOK BACK



TTM Event 1: 2019 Technical Talk 1- From Chemistry to Chemical Engineering



Members of IChemE TTMG with Dr. Maria Jiminez-Solomon (fourth from left) at our Technical Talk: From Chemistry to Chemical Engineering.

Date: 14th June 2019

Speaker: Dr. Maria Jiminez-Solomon

With a healthy turn out, our first Technical Seminar featured guest speaker Dr. Maria Jiminez Solomon who shared with us her journey on integrating Chemistry and Chemical Engineering. In her delivery, we learnt about her journey where each seeming misstep was just a detour into the right direction. Her delivery gave insight into her diverse background and her interfaces with cutting edge technology.

Dr. Solomon, a graduate of Imperial College, London, delivered a seminar on her personal academic and career journey, with experiences in Chemistry, Green Chemistry, Materials Science and Chemical Engi-

neering. Dr. Solomon shared on challenges faced in her journey and how these were overcome, elaborating on how Chemical Engineering helped solved her Chemistry dilemmas. She further delved into her expertise in the specialty area of Membrane Science as it applies to packaging and water utilization.

The University of the West Indies Chemical Engineering Department also played an enormous part in affording the IChemE TTMG with the venue and the successful execution of the event.

TTM Event 2: 2019 Technical Talk 2- Hidden Role of Chemical Engineering in the Food Industry



Members of IChemE TTMG with Ms. Jamillah David (fourth from left) at our Technical Talk: Hidden Role of Chemical Engineering in the Food Industry.

Date: 25th October 2019

Speaker: Ms. Jamillah David

Ms. David, a graduate of Imperial College, London and the University of the West Indies, shared on her transition from an Oil and Gas professional to a Quality Assurance professional in the food industry, the transferability of skillsets between the two fields and her new-found passion for food.

In her delivery, a parallel narrative was drawn with the manufacture of local beverages and the issues faced with scaling up from home to industrial sized operations.

IChemE TTMG thanks the event sponsors—Green Age Farms and Climax Sports TT.

MEMORY LANE—A LOOK BACK



ARC Event 1: Think Tank 2- Energy Efficiency

Date: 29th November 2019

The Energy Efficiency Think Tank was a brainstorming session hosted by the Applied Research Committee (ARC), in an attempt to create traction on all sustainable projects which can benefit the Trinidad and Tobago society.

A key partner for the delivery of this workshop was Imperial College Graduate, Dr. Keeran Ward, with one of his main contributions being that of Life Cycle Assessment (LCA) and its role in evaluating the environmental impact on Whole Systems Process

Engineering. This workshop also captured how Life Cycle Sustainability Assessment (LCSA) helps with decision making within organizations. Future work of the ARC committee hopes to capture and assist in the development of local Chemical Engineering projects by university students.

IChemE TTMG thanks the event sponsors— Best Times Mini Mart, Park and Shop and Mrs. Donaldson.



Applied Research Committee members and IChemE Steering/Management Committee members gather at UWI for Think Tank Session on Energy Efficiency.

NFSR Event 1: Fundraiser- Bean to Bar

Date: 30th November 2019

This fundraising session, delivered by the Alliance of Rural Communities, shared on the end-to-end process of chocolate manufacture in Trinidad and Tobago.

During the session, attendees had the opportunity to sample pure, unrefined cocoa beans, as well as end-product chocolate, many of which were manufactured in the region of Brasso Seco, Trinidad.

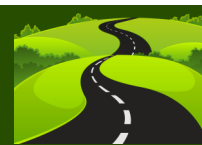
The effects of the political landscape on the cocoa/chocolate industry were also shared as well as the challenges faced by many cocoa farmers in the local economy.



TOP: Gillian Goddard, member of the Alliance of Rural Communities, shares with the IChemE TTMG on the process.

LEFT: Kelly Warren-Fitzjames, member of the Alliance of Rural Communities, holding the cocoa beans.

MEMORY LANE—A LOOK BACK



TTMG Kick-Off Event 2020

Date: 10th January 2020

The IChemE TTMG Kick-Off Event 2020 occurred on January 10th 2020 and was largely sponsored by Shell Trinidad and Tobago Ltd. The company graciously volunteered the Shell Corporate Hospitality Booth at the Queen's Park Oval to host the event.

This annual Kick-Off allows us, the IChemE TTMG, the opportunity to present to members the projects/activities completed in the previous year and those proposed for the current year. There was a lively Q/A session where members discussed their preference on the group's activi-

ties, based on the world's current environmental and economic climate.

Based on the feedback, it is evident that our members look forward to this event as an opportunity to network as it provides a platform to rekindle the interests and commitments of many who wish to volunteer their services to our subcommittees.

We would like to sincerely thank the new and existing volunteers for generously giving their time for the promotion of the continued development of the IChemE TTMG.



Secretary of IChemE TTMG Steering Committee, Vashli Goorahlal, addressing the IChemE TTMG members during our 2020 Kick-Off.

Webinar- Managing Process Safety during and after COVID-19

Date: 14th May 2020

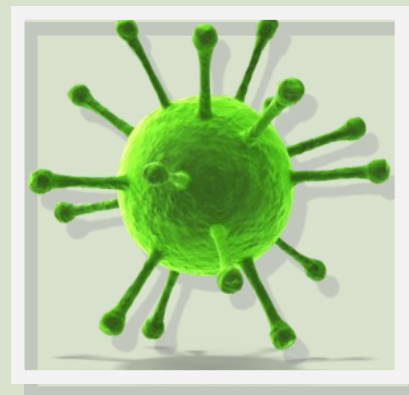
In light of the COVID-19 pandemic and lockdown, IChemE TTMG partnered with Shamrock HSE to host an online session, delivered by Mr. Andre Perseval and Ms. Krishshala Sinanan, on the impacts of the pandemic on Process Safety during and following its presence.

IChemE TTMG would once more like to recognize that the material shared in this session was sponsored by our professional compatriots at the American Institute of Chemical Engineers, AIChE. The material covered 20 elements which could be impacted due to the global pandemic, ranging from

technical aspects such as management of change and compliance with standards, to non-technical aspects such as workforce involvement and stakeholder outreach.

This webinar was the first of many for IChemE TTMG and was driven by the need to expedite the roll-out of the online outreach phase of our operations. We see this as a transformational event, as it compelled us to emerge from our comfort zone of face-to-face sessions.

The event was well attended, to a tune of 25 persons joining in online and it was also endorsed by APETT.



A SPECIAL THANK YOU TO OUR EVENT SPONSORS

2019



We would also like to thank Green Age Farms, Climax Sports TT, Best Times Mini Mart, Park and Shop, The Chemical Engineering Department of The University of the West Indies and Mrs. Donaldson.

2020



Government of the Republic of Trinidad and Tobago
Ministry of Energy and Energy Industries

Interested in becoming a sponsor?
Email us at trinidadtobago.ichememember@gmail.com

Q&A WITH MR. MAURICE MASSIAH—YOUR ICHEME TTMG SENIOR AMBASSADOR

Mr. Massiah, what led you to pursue a career in Chemical Engineering?

In secondary school I developed a deep interest in Chemistry and Biology but discovered that Chemistry won out overall. Immediately prior to entry into University studies, I worked as a Laboratory Technician at the Caribbean Industrial Research Institute (CARIRI) among very distinguished Chemists. It was there that I uncovered that Chemical Engineering held more of my interest than being a Chemist. I realized that Chemical Engineers influenced things on a larger scale and that became more intriguing and interesting for me.

How did your career change after you became Chartered?

For me the biggest change that came with becoming Chartered was the awareness of the huge responsibility that comes with upholding the Ethics of the profession through one's professional conduct. A Chartered Engineer must be cognizant of their actions and the fact that he/she is accountable and responsible to an international institution.

Becoming Chartered certainly changed things in a positive way for me. I immediately felt the recognition of achievement on the job from my colleagues and peers, which gave me a sense of fulfillment and appreciation. I have also experienced such recognition when dealing with companies based in UK/Europe who recognize the designation. Another positive is that I started getting more job offers outside of Trinidad and Tobago, one as far across the globe as Russia. In addition, I have had a few headhunters reach out to me without me even posting my resume anywhere online.

Which person do you emulate professionally either Locally /Internationally?

I have had the privilege of working with a tremendously talented lady, Dolly Nicholas, whom I have tried to emulate but it is still a work in progress for me.

"Dolly Nicholas is the first and only woman to receive a Trinidad and Tobago national award for scientific invention. She has received both the Public Service Medal of Merit and the Chaconia Medal (Silver) for her inventions and contribution to the



field of science and technology." Ref. Icons.Niherst.gov.tt

Ms. Nicholas is a strong believer that we are in control of our own destination and we in Trinidad and Tobago have the capability and intellect to do so without external intervention. She has been a very outspoken individual who is an intellectual giant.

Who has been your lifetime mentor – that person who has motivated you to be as successful as you are today or your best self?

I have had several mentors over the years starting with my parents - my father David Massiah and mother Mabel Massiah. Ms. Clarita Riley, who was my care giver from an early age, also played a major role in my life. These persons, all deceased, were the ones who always instilled in me the sense to do my best at whatever tasks I undertake.

I also grew up in the era of our first Prime Minister and the man considered by most as the father of the nation, Dr. Eric Williams. I have definitely been inspired by him, having listened to numerous parliamentary speeches in my formative years and later reading several of his books. I

would recommend that persons read his autobiography "Inward Hunger - The Education of a Prime Minister". My view is that Dr. Williams brought the vision of scholarship and learning to nationals and the belief that our future would be based on our level of education, which has no limits.

From where does your inspiration and work ethic derive?

My spiritual beliefs drive my work ethic and inspiration. I believe that God exists, that we all have a vocation that we are called to deliver and that we need to see ourselves delivering on that vocation through what we do. Not all of us can be priests, pundits, pastors, imams etc., but we can all show through whatever our calling is that there is a right way to accomplish things. There are many whom I have worked with who have demonstrated that through their actions. Two engineers come to mind through whom I have been inspired by - Mr. Christopher Farquhar and Mr. Anthony Holder. The drive and dedication to excellence of these individuals has been phenomenal and inspirational.

What advice can you provide to young/aspiring Chemical Engineers?

Take time to develop your technical competence. Join and participate in the activities of the IChemE such as the Special Interest Groups and the TTMG activities as well. Review the requirements for Chartership and start planning your career and activities so that you tailor outcomes to match the Chartership requirements.

What advice can you give to Chemical Engineers in industry?

Keep developing your competencies and expanding your knowledge and skills base. The job/industry you are supporting today may change so drastically within the next few years that if you don't develop with the times you could be left behind. Develop your business acumen and understanding of economics and how business is impacted by world events. Keep abreast of industry trends, since while things are rapidly changing within the Oil and Gas industry, energy demand worldwide is projected to continue increasing. In addition, pursue your Chartered Engineer accreditation. It provides international recognition that can give you a professional edge.

What is your most memorable Industry related success?

As a young upcoming Process Engineer I worked on a hydrogen compression facility project at a refinery. As the Process Engineer on this project, I worked on the concept development, prepared the basic engineering package, completed the detailed engineering reviews, was involved in the construction and participated in the commissioning and start-up. I recall being so nervous about the startup and having restless nights worrying whether or not my calculations were correct and if I made any gross errors. It turned out that all went well during the performance evaluation. We had a safe startup and met the performance criteria.

What is your most memorable Chemical engineering Industry lesson learnt/low point?

I recall monitoring the chemical cleaning operation for in-plant piping prior to commissioning a process system. I worked on the night shift with a service provider. I discovered late in the shift that we had exceeded the calculated volume of chemicals estimated to be pumped into the system and stopped the operation at that time. The daylight crew after investigation had discovered that check valves in the system did not stop reverse flow of the chemicals. The liquids migrated all the way to a vessel loaded with catalyst, where they coated the catalyst with the chemicals and rendered it unusable. This was definitely a learning for me - that check valves are not to be relied upon to provide isolation against reverse flow. This occurred long before it became a standard practice and was documented in the industry standards that credit must not be taken for the use of check valves to prevent reverse flow. The catalyst was changed out, the process system was started up and a valuable lesson was learnt by me.

What would you like to see more of, from our engineers in the Trinidad and Tobago society?

Chemical Engineers need to play a key role in the diversification of our economy. We have the tools and training. We need to step up and be more courageous about making recommendations and volunteering to serve on national committees that can influence change. We also need to become more involved at a national level to influence changing behaviours in how we deal with the preservation of our environment. Another area is in Process Safety - although many companies in the energy sector have established process safety plans, not all com-

panies in the country have established clear risk management protocols.

What advice can you share with Chemical Engineering graduates who are currently still looking for a job in their field?

First of all keep the faith. Your situation will not last forever and things will turn around for you. Be patient and keep interested in your career. Participate in the activities of the IChemE and the TTMG. Keep up to date with advancements in your field. IChemE has several interest groups and webinars that will help you enhance your knowledge. Unemployed Graduates who continue to develop themselves in their respective discipline areas always have an edge over those who have decided not to continue their development. Don't let your focus to be mainly on the large corporations. There are many small contractors who are service providers to the larger companies that need the personnel. Don't be too keen on getting the big salary just yet. Companies will pay for your experience and not just because you have a degree. Be prepared to take on a pro bono internship to develop your experience if one becomes available. In fact, approach a few companies and suggest the idea to them. Research opportunities regionally as well as internationally in the developing nations.

What jobs or fields can Chemical Engineers exist in that can be probably overlooked or not even looked at?

Chemical Engineers can fit into so many industries from Petroleum to Pharmaceuticals, Nuclear, Academia, Pulp and Paper, Mining and the extractive industries. Locally, I don't think we have fully explored the opportunities available in Agriculture and food processing. I am thinking beyond how we actually plant and harvest crops but how we are processing the produce to make consumable products that can relieve us from importing so much of our foods and spending our hard earned foreign exchange dollars. TTMG ran a presentation last year from cocoa beans to chocolate bars and the presenters indicated that there are several opportunities available for economic development and employment creation. They were even looking for a graduate engineer to join them.

Can you provide progression advice to those of us

who aspire to managerial positions, similar to those you attained yourself?

First of all, be certain that you want to be in a leadership position. Being a Leader, you need to be selfless and your focus should mainly be on developing your staff to the best of their abilities because you get your work done through them. Many engineers after rising in organizations realize that they prefer to remain technical and dealing with people is the most difficult thing they have ever had to do. Managing people is very different from managing purely technical activities.

So once you are convinced that you have the aptitude and it is really what you want for yourself, then seek to understand the difference between a leader and a manager. The Harvard Business Review has excellent material on the subject and how to get the best performance from teams. Volunteer for different roles in your company, ones that take you away from the usual technical activities you are presently in. For example, put yourself forward for an Executive Assistant role to the CEO of your company. Become au courant with the business side of your company and their business decision making criteria. Do not focus on a particular position as organizations and organograms change and positions disappear. Your focus should be on developing your competencies for a range of managerial and leadership roles in any international company, not just a narrow focus on a specific position. Review what competencies and qualifications are required for the different managerial and leadership positions and equip yourself to prepare for future roles.

What do you do in your spare time?

In my spare time I would occasionally go fishing with friends down the islands. I want to stress that I did not state that "I go catching fish" since we do not usually catch anything. On other occasions, we go to the deep recesses of the Tamana forest to have a great outdoor cook-up on a wood fireside. It's the best tasting food on the planet. I also enjoy movies, music, reading and spending time with family. I am somewhat of a *keep fit enthusiast*, so I invest time trying to improve my fitness levels. I had practiced the Japanese martial art of Shotokan karate for a number of years and a few years ago I started practicing yoga and have experienced tremendous benefits.

GTKY'S (GETTING TO KNOW YOU'S) WITH SOME OF YOUR STEERING & MANAGEMENT COMMITTEE MEMBERS

Name: Monifa Graham

IChemE TTMG Position: Management Committee Chairperson

Hobbies: Travelling and fitness training (weightlifting, aerobics, spinning, etc.)

Fun Fact: On most of my travels, I try to get in some outdoor/nature time- Where there's bush and water, you can find me! I have done solo hiking in Cinque Terre, Italy and nature trails in Noosa, Australia.

Enjoys most about serving IChemE TTMG: Assisting in harnessing the collective skills/traits of my fellow committee members to bring about positive impact to the local Chemical Engineering sector is an exciting challenge. I enjoy connecting with persons of varied backgrounds since each persons' experiences brings an element of surprise and value to the team! I am also excited about the potential of IChemE TTMG to use the technical, organizational and planning skills of its members to provide added structure and strategy to various sectors in our society.



Name: Canute Hudson

IChemE TTMG Position: Treasurer

Hobbies: Working out, planting

Fun Fact: I enjoy watching a good investigative TV series.

Enjoys most about serving IChemE TTMG: Knowing that as a new organization in Trinidad and Tobago, we have immediately engaged the younger generation. As well as working on serving differently with focus on non oil and gas sector. This is the future of a diversified economy.

Name: Vishad Roopnarine

IChemE TTMG Position: Assistant Treasurer

Hobbies: Travelling, hiking and listening to music

Fun Fact: I once lost 50 pounds in 9 months by making lifestyle changes. The mind is very powerful and anything can be accomplished with the right mindset. I like to learn of accomplishments others have made by making lifestyle changes.

Enjoys most about serving IChemE TTMG: It provides a forum through which I can interact with Chemical Engineers of various sectors. It allows me to share experiences and learn from others, thereby broadening my scope.



Name: Vashti Goorahlal

IChemE TTMG Position: Secretary of the Steering Committee

Hobbies: Watching movies, reading, yoga

Fun Fact: I backpacked around South America

Enjoys most about serving IChemE TTMG: Networking - Providing a forum for the Chemical Engineering Community to interact/share knowledge and build relationships.

GTKY'S (GETTING TO KNOW YOU'S) WITH SOME OF YOUR STEERING & MANAGEMENT COMMITTEE MEMBERS

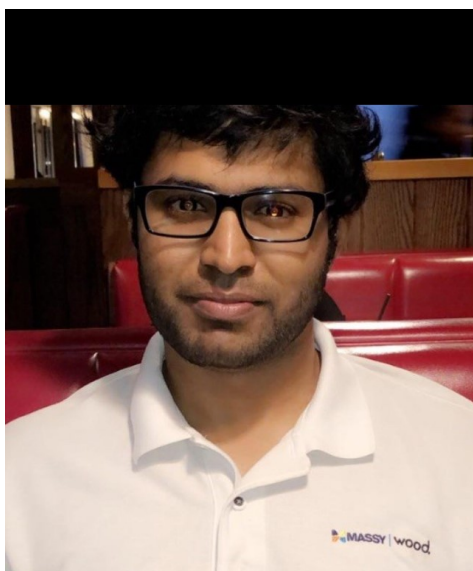
Name: Shakola Mc Lean

IChemE TTMG Position: ARC Lead

Hobbies: Rugby, reading and computer programming

Fun Fact: Although I am no longer a playing member of the Carib's Rugby Football Club, I was a part of the Inaugural Female National Rugby Team, whose first game was against Jamaica.

Enjoys most about serving IChemE TTMG: I like being a part of a group that is attempting to bring about the evolution and improvement of the career space of Chemical Engineers. There is a lot we as a collective can do to improve the livelihood of Trinidad and Tobago and the world at large and I am honoured to play my role in that.



Name: Vicard Gibbings

IChemE TTMG Position: TTM Lead

Hobbies: Football, listening and playing music, exercising

Fun Fact: Adventurous and outgoing. In one sense, I love to experience different places and try different food!

Enjoys most about serving IChemE TTMG: Helping the younger students by creating awareness about Chemical Engineering and its diversification as we can make a difference in most areas (not just Oil & Gas). Examples of such fields include Biochemical Engineering, Consultancy, Education/Universities, Food & Beverage, Health, safety & Environment, Paper & Packaging, Petrochemicals, Pharmaceuticals and Power Generation, just to name a few.

Name: Shannon Pustam

IChemE TTMG Position: Management Committee Secretary

Hobbies: Trying new recipes, hiking, going to the beach

Fun Fact: Instrumentals are my favourite to listen to. Plus you can have your own concert in your car!

Enjoys most about serving IChemE TTMG: The opportunity to build a network with our local Chemical and Process Engineers. I've learnt a lot from our activities which have exposed me to the great work being done in the various sectors. Here we have a space to contribute to the development of our local engineering community.





THE VESSEL GALLERY



Prize winners displaying their tokens at our Kick-Off Event 2019.



Jamillah David being presented with a token of appreciation at our technical talk "Hidden Role of Chemical Engineering in the Food Industry".



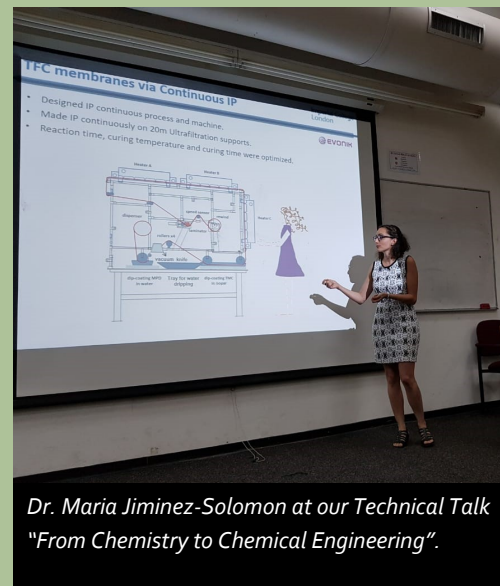
Some of our ICHEME TTMG Members.



Prize winner poses with Assistant Treasurer, Vishad Roopnarine, with his hamper from Mayfair/ Senses.



Qayyim Shah addressing our ICHEME TTMG members at our Kick-Off Event 2019.



Dr. Maria Jimenez-Solomon at our Technical Talk "From Chemistry to Chemical Engineering".



IChemE TTMG Management Committee members with guests at the Kick-Off Event 2020.



THE VESSEL GALLERY



Prize winner collecting his Oh Snacks hamper at the ICHEME TTMG Kick-Off Event 2019.



Prize winners pose with their water bottles at the IChemE TTMG Kick-Off Event 2019.



Participants at our Bean to Bar fundraiser engrossed in the session held in November 2019.



Prize winners at the IChemE TTMG Kick-Off Event 2019.



Members of IChemE TTMG attentively listening to our TTMG Senior Ambassador, Maurice Massiah, at the Kick-Off Event 2020.



Members of the Alliance of Rural Communities, Gillian Goddard & Kelly Warren-Fitzjames, at our Bean to Bar Fundraiser in November 2019.

USE OF LIVE BARRIER HEALTH MODELS TO MANAGE RISK

The goal of every chemical plant should be to ensure its assets are well designed, safely operated and effectively maintained. Process Safety focuses on the prevention and mitigation of major accidents caused by the uncontrolled releases of hazardous materials by ensuring the right barriers are in place to manage inherent risks.

A barrier is defined as a control measure that on its own can prevent a threat from developing into a hazardous scenario or can mitigate subsequent consequences (CCPS). The concept of a Live Barrier Health model is based on the ‘Swiss cheese’ model (Figure 1), which asserts that no barrier is 100% effective as ‘holes’ are always present. These ‘holes’ are due to degradation mechanisms, which are conditions that can impair the effectiveness of a barrier in preventing or mitigating against a hazardous event e.g. ageing equipment, deferred maintenance or bypassed safety systems.

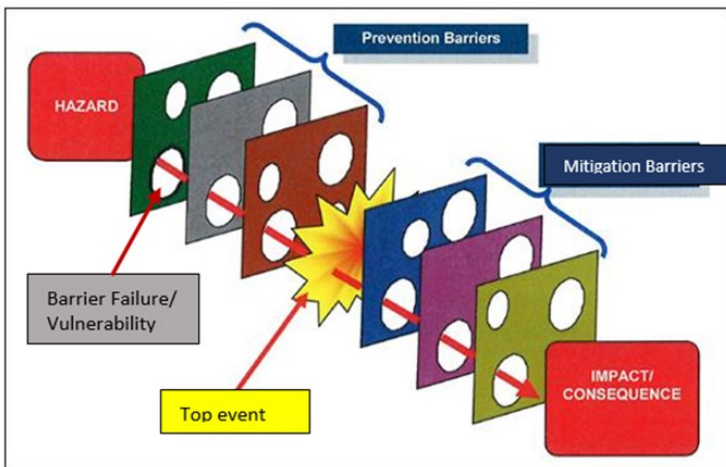


Figure 1: Swiss Cheese Model Illustration

Major accidents like Bhopal (1984) and BP’s Texas City Refinery explosion (2005) occurred due to critical barriers being impaired and unavailable to manage major accident hazards when required.

While individual barrier degradations may not seem significant enough to cause an accident, when holes in certain barriers align, there may be no effective protection in place to prevent escalation. Barrier Management uses a systematic approach for managing hardware barriers to ensure they are functional, effective and available when required to prevent or mitigate against hazardous scenarios. The live barrier model places focus on ineffective barriers and seeks to minimize the resulting emergent risk by implementing mitigating measures or restoring the barriers to a healthy condition.

To create a live ‘Barrier Health Model’:

1. Identify major accident scenarios (potential for one or more fatalities) from hazard identification studies.
2. Identify safety critical equipment (SCE) i.e. hardware barriers that address major accidents and categorize using the eight barrier groups in the IOGP Report 415 Supplement (2016).
3. Assign SCE categories to equipment in a computerized maintenance management system.
4. Develop SCE Performance Standards that outline the performance requirements of the SCE to manage relevant hazards.
5. Assess barrier health using Performance standards criteria and equipment records e.g. maintenance work orders.
6. Use pre-determined rule sets to classify the health of individual SCE as effective, partially effective or impaired and illustrate using risk visualization tools (Figure 2).
7. Develop remedial plans for ineffective barriers to mitigate the associated risk.
8. Monitor barrier health using performance metrics and take corrective actions as required.

Some key benefits of using a live barrier model to manage risk include:

- Visual representation of preventative and mitigative barrier health in real-time
- Ability to quickly identify sources of operational risks
- Implementation of effective mitigation for impaired barriers
- Work prioritization based on greatest levels of risk and exposure

As illustrated, the tool highlights key areas of vulnerability to various levels in the organization, e.g. frontline personnel and leadership, which helps ensure key issues are addressed. This enables key decision makers to make timely, strategic, risk-based decisions to provide assurance that assets are operating safely on a facility and risk is adequately managed.



Figure 2: An example of a facility's Barrier Health Model Overview

- Effective (Green): A functional SCE barrier with no known defects that impact SCE functionality.
- Partially effective (Yellow): A functional SCE barrier with known defects that may impact its functionality in the near future (i.e. operating with defects).
- Impaired (Red): Non-functional SCE barrier i.e. not functioning as per design and does not meet performance standard requirements.

Authors:

Rae-Ann Joseph (Process Safety Engineer) & Michelle Aquing (Process Safety Engineer)

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INDUSTRIAL HYGIENE - IN THEORY AND IN PRACTICE

Author: Abiola Alphonso

Certified Industrial Hygienist; BSC Environment MSC Occupational Hygiene

In every industry, persons are exposed to a number of risks that may be hazardous to their health. In Trinidad and Tobago, being one of the industrialization centers of the Caribbean, the potential exposure to such risks are high within our multiple industries.

These potential exposures vary by industry and may include:

1. Chemical exposures in manufacturing, oil and gas, and agricultural industries;
2. Physical exposures such as noise in the construction industry and oil and gas industry; as well as
3. Ergonomics exposure spanning across manufacturing and most other industries, just to name a few.

We can even go a bit further, to those industries with exposures that I like to call latent (the more accurate term might be overlooked). These include our woodworking industries, with potentially significant particulate exposures; our beauty industry (hairdressing, barbering, spa services) in which ergonomics can be a significant concern; the automotive industry in which there is a potential risk of chemical exposure; and even our health care industry, where biological exposure risks have become evident with the current COVID-19 pandemic.

Most, if not all organizations in the various industries aim to mitigate these risk exposures. This is most effectively accomplished with the assistance of an Industrial Hygienist (IH).

Industrial Hygiene (so called in the United States) has been described as the science and art dedicated to identifying and controlling exposures that can impact human health. By definition, Industrial Hygiene is the anticipation, recognition, evaluation and control of exposures to protect the health and well-being of workers. In countries such as Australia, Canada and the United Kingdom, Industrial Hygiene is also called Occupational Hygiene. In these countries, specific bodies/societies have been developed, which are dedicated to the certification of professionals who meet specific criteria. Globally, IH's have become more cognizant, not only of the health impacts that early industrialization would have had on workers, e.g. asbestosis (construction industry) and black lung disease (coal industry), but also the potential health impacts of the chemicals and environments in which we work.

What does the IH do?

The IH is focused on ensuring that the short-term (acute) and long-term (chronic) health of the worker is not impacted by the potential exposures specific to the industry within which they operate. The IH must therefore understand the potential for exposure and the scientific principles that need to be applied to manage that exposure. This involves the application of both qualitative and quantitative techniques which, when combined with professional judgment, allows the IH to make informed decisions/recommendations to mitigate those exposures.

The practice of Industrial Hygiene is both people-centric and organization focused. An IH has to lean in to the pool of knowledge held by other professionals when performing their duties (e.g. the Process Engineer to gain insight into a process, the Chemist to better understand a chemical, a Project/Civil Engineer to understand

a design, and the Operations and Maintenance personnel to understand the day to day interactions of the system). For the mitigation recommendations to be effective, the IH has to convince both employees and employers of the benefits of implementing the recommendations designed to manage an exposure.

Having a good Industrial Hygiene program embedded in your organization protects the health and well-being of the employees and mitigates the reputational and financial risk exposures of the employer. An organization that recognizes this, is an organization that can maintain the short and long term health of its employees, and by extension communities, while protecting its reputation and avoiding long-term potential financial implications.

In Trinidad and Tobago, there are few IH's, with the majority of them operating within the oil and gas industry.

“Having a good Industrial Hygiene program embedded in your organization protects the health and well-being of the employees and mitigates the reputational and financial risk exposures of the employer.”

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“Climate Change and Path to Sustainability”

Ms. Asia Williams

Climate Change Consultant

APMP, PGDip Project Management,

MSc. Urban Planning and Sustainability

July 2020 – Webinar

“A Chemical Engineer’s Journey, from Pipe Flow to Heart Flow”

Dr. Shelly Singh-Gryzbon

University of the West Indies Lecturer in Chemical Engineering

August 2020 – Webinar

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Ms. Ariana Emanuel — CEng, Project Engineer

Mr. Wayne Mohan- CEng, Professional Safety Engineer

August 2020 – Webinar

“Diversification of the Economy”

IChemE TTMG Panel Discussion with Industry Leads

September 2020 – Webinar

“A Chemist’s Perspective on the Discovery of CO₂”

Dr. Sonja Francis,

Princeton University Lecturer in Chemistry

Reduction Catalysts

October 2020 – IChemE TTMG Bi-Annual General Meeting (TBC)



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Chemical Engineering Word Terms

M X P F C I I R S V L B R P G L X P T J V T V K
 F I N V A V L I D K W Y W K X M K O P L K C N I
 B V O I M R G U J O X G C M E H E T M A S H O C
 C V P J A Q U I F A G H J J J E K E V C O E J G
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 X E T W V T X K A X U Q X L A L C L G C H L W J
 O T X Z S C D O J K O T L E D P I E M U P E Q J
 P R H J B H C Q J Y L E F Y L Q R N W M T N O R
 I I W A H E L W U R L E A D M Y T E U I D G Q J
 F C R W U M Z Y V W G T V K H N E R W Z H I K E
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 E I A H B C E L K Y S P F W A V U Y D O E E J U
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 G E C F B L K C X B L H J Z E Q O N S J P R B X
 U T Q W Z E R E E N I G N E S B V H H B I I M C
 H T B D N N Z N D E A Z P R P J N B E M I N Y R
 H E R C L E A C I M O T A H A M G L S M X G H H
 R Z W X D R I E D C X M O R M S P D U N V H L J
 F N H Y G G Z R I U W S M X Y V M F B B H S C H
 I Y T L A Y F J H F M X T E S T T U B E W V F K
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