

ASSOCIATION OF CONSULTING ENGINEERS OF ZAMBIA

Future Leaders Group NEWSLETTER

A Quarterly publication by the Future Leaders Group of the Association of Consulting Engineers of Zambia

2022 | QUARTER 1 NEWSLETTER (January to March)

MAY 2022

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Special points of interest:

- We have new Future Leaders Committee (FLC) Members.
- We held our first Future Leaders Symposium this year in March!
- There is an upcoming FIDIC Africa Future Leaders Conference at this year's annual FIDIC Africa Infrastructure Conference in Lagos, Nigeria

Message from the Chairperson

Greetings, my fellow future leaders. It is with much excitement that we present to you, our first quarterly newsletter for the year 2022.

After a few years of hitting career progression stumbling blocks resulting from Covid-19, we are now functioning under the 'new normal'. This means having to make adjustments in life, business, careers, the industry, practically everywhere! There is therefore, no better time than the present for us to regroup and strategise on how best we can navigate through the rapidly changing world.

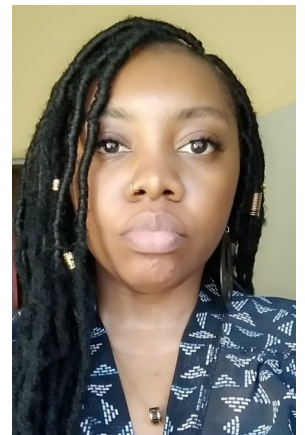
In this day and age of abundant information and easier access to resources by way of technology, this is our chance

to share information on lessons learned, engineering solutions for current problems, and insight on changes in our industry.

A wave of change is slowly sweeping across the FL landscape in which we have FLs taking a keen interest in perfecting their craft and rising up the professional ranks in their workspaces.

It is on that premise that I encourage us all to be vocal agents of change and contributors to the development of society.

This issue includes news about events that will be happening in our regional and global FIDIC community, which we encourage FLs to participate in.



Pauline Phirri, FLC Chairperson

We also invite you to submit newsletter articles to voice out your opinions under the future leaders think pieces section.

We look forward to hearing from you. Enjoy the read

Editorial Contribution

The Future Leaders Group Newsletter is a quarterly publication which shares information and news about various activities that FLs are engaged in.

Any contribution from FLs in the form of articles, letters, comments and innovative

ideas aligned with FL development in Member Associations (MA), showcasing of FL talent, consulting engineering news and FIDIC & FIDIC Africa priorities is welcomed.

If you would like to contribute to our quarterly

newsletter,

Please contact:

Pauline Phiri
Future Leaders Committee
Chairperson
Future Leaders Group of
ACEZ

Email:
phiripauline288@gmail.com

Future Leaders Committee (FLC) 2022/2023

The ACEZ Future Leaders Committee (FLC) is a group of selected professionals under the age of 40, who are members of the Future Leaders Group, appointed to advise the Group on a number of activities and operations. The FLC provides opportunities for FLs to participate actively in ACEZ with their peers and to develop as the next generation of consulting engineering industry leaders. Membership in the FLC is voluntary. Get to know a little more about the FLC for 2022/2023.



Pauline Phiri
Chairperson

Pauline Phiri

Pauline is a Civil Engineer at WCE Zambia Limited, an infrastructure development consultancy firm.

She has a Master of Engineering Degree in Construction Management and a Bachelor of Engineering Degree in Civil and Environmental Engineering from the University of Zambia.

She has expertise in design review, detailed engineering design, feasibility studies, contract administration, construction supervision, cost-benefit analysis and performance monitoring and evaluation of construction projects.

She is an advocate for the active participation of young professionals in engineering research and innovation. She has a passion for research in engineering skills development and capacity building of young engineers



Frank Mwangilwa
Vice Chairperson

Frank Mwangilwa

Frank is a Civil Engineer at Mimshach Engineering Consultants

He has a Master's Degree in Civil and Industrial construction with extensive experience in both roads and structural projects and designing and construction supervision. Working as a Civil engineer for over 10 years in engineering consultancy, he has technical experience in all aspects of project planning, monitoring and implementation. He also has extensive experience in various types of construction works, substations, overhead transmission lines, buildings, road infrastructure, rural structures etc.



Harold Chibwe
Member, Past Chairperson

Harold Chibwe

Harold is a Civil/Structural engineer with Kiran & Musonda Associates.

He has a Bachelor's degree in Civil & Environmental Engineering from the University of Zambia and is currently pursuing a Master's Degree in Construction Management from the same University.

Harold was one the founding pioneers of the Association of Consulting Engineers Young Professionals Forum (ACEZ YPF) now called ACEZ Future Leaders Group in 2014, acting as interim vice chairperson. He served as chairperson of ACEZ FLG from 2014 to 2016. He later went on to serve as Vice Chairperson of FIDIC Africa Future Leaders Committee (FAFLC) from 2017 to 2019 and proceeded to be the Chairperson of FAFLC. He is currently a member of the FIDIC Future Leaders Committee. He further serves as a member of FIDIC Africa Executive Committee. He also serves as committee member of the Construction Sector Anti- Corruption Advisory Forum (CACAF).

He has over 8 years' experience in structural designs, roads and infrastructure projects in Zambia. He has been involved in providing technical expertise and carrying out feasibility studies for various projects, detailed engineering design, preparation of tender documentation, site management, contract administration, construction supervision and technical quality control for infrastructure development in Zambia. Harold is a passionate believer that the current crop of young ones in engineering fields, given the opportunity and properly mentored, can act as a bridge in the Consulting Engineering.



Thembi Ndhlovu
Member

Thembi Ndhlovu

Thembi is a Civil Engineer at Zulu Burrow Development Consultants. He has a Bachelor's Degree in Civil Engineering and a certificate in Hydro-power Operation and Management from Xinyu University in China. He has knowledge and expertise in various areas of road construction, dam construction and tunnel construction in which he has worked as a site engineer, technical and quality control Engineer, as well as design Engineer.

He aspires to explore the Engineering and Construction industry with a vision to not only grow as an individual but to be able to create solutions and add to the development of the Engineering sector. Thembi is committed, with a creative approach to problem-solving and critical thinking skills.



Malita Tembo Sichone
Member

Malita Tembo Sichone

Malita is an Electrical Engineer. She has a Bachelor's degree in Engineering – Power Systems and Machines from the University of Zambia. She has over ten years experience in the consulting industry

She is a certified data centre professional and has experience in the building services industry as well as the energy sector. Her experience spans from design to supervision, testing and commissioning of office blocks, hospitals, data centers, power reticulation networks, solar (PV) plants, universities and mixed use developments

Malita is proficient in feasibility studies, assessment of electrical installations, energy audits and tender documentation preparation. She is also conversant with the use of software such as Digi-Silent, Dialux and AutoCAD.

What does the Future Leaders Committee do?

The FLC provides opportunities for FLs to participate actively in ACEZ with their peers and to develop as the next generation of consulting engineering industry leaders. As a leadership council, the FLC was formed to develop communication and networking opportunities for all FLs involved in the ACEZ FL community. The FLC leads the Future Leaders Group.



*“Be on the look out
for the Call for New
Members of ACEZ
Future Leaders
Committee!”*

FLC Primary Functions

- ◆ Identify opportunities and promote the interests of Future Leaders (FL) by creating platforms for them to contribute, develop and succeed within ACEZ, in the industry and towards external stakeholders.
- ◆ Create targeted activities for FLs to increase their exposure.
- ◆ Advise the ACEZ Council and Secretariat on all aspects of FLs in the Zambian consulting engineering industry.



The ACEZ Future Leaders Committee (FLC) is a group of selected professionals under the age of 40, who are members of the Future Leaders Group, appointed to advise the Forum on a number of activities and operations

Highlights from the 1st ACEZ Future Leaders *Symposium*



ACEZ FUTURE LEADERS GROUP
Future Leaders Symposium

DATE: 24 March, 2022
 Time: 14h00
 VENUE: Virtual - Google Meet

JOIN US

Theme: "Challenges Faced by Young Engineers in the Consulting Engineering industry in Zambia and possible solutions"

The 1st ACEZ Future Leaders (FL) Symposium was held virtually on the 24th March 2022 at 14h00CAT.

The theme of the symposium was '**Challenges faced by Young Engineers in Consulting Engineering Industry in Zambia and possible solutions.**' The purpose of the Symposium was to create a platform for Future Leaders to discuss the challenges that they face throughout the course of their career progression in the consultancy industry. It was organized in order to initiate a dialogue between Future Leaders and Principals to discuss strategies that could contribute to the sustainability and continuity of the Consulting Engineering profession.

Remarks

ACEZ President Remarks

- (1) FLs are necessary for the sustainability of the Consulting Engineering Profession;
- (2) ACEZ has their principles aligned with those of FIDIC, in developing FLs into high quality professionals in consulting engineering; and
- (3) Future Leaders should create more platforms in which to influence the strategies and initiatives of FIDIC in society.

FLC Chairperson Remarks

- (1) FLs need to actively seek to participate and engage in pro- FL conversations;
- (2) It is important for FLs to take up leadership roles in order to advocate for their participation in all stages of infrastructure projects; and
- (3) FLs affiliation to engineering professional bodies (both international and local) is beneficial to their career growth

Proceedings

The discourse of the symposium was set by firstly introducing the topic of conversation through a presentation made by the FLs, in which they highlighted the challenges that they faced in the Consulting Engineering Industry, as well as their suggestion of possible solutions to those challenges. This led to a panel discussion in which seasoned Principal Engineers provided insight on ways in which to address those challenges, based on their vast experience and knowledge of the industry.

The panel had three participants consisting of two seasoned Principal Engineers and a Future Leader:

1. Eng. George Sitali – Principal - Brian Colquhoun, Hugh O'Donnel & Partners
2. Eng. Suzanna Rattray – Principal - Rankin Engineering Consultants
3. Eng. Harold Chibwe – Future Leader - Kiran and Musonda Associates

FL Presentation Highlights

A presentation was made by FL Harold Chibwe on “Challenges Faced by Young Engineers in the Consulting Engineering Industry in Zambia and possible solutions”

Challenges

- Lack of deliberate support for professional career development programmes. Mentorship is given less priority
- Lack of serious consideration when it comes to decision making in the professional space because of ‘age’- you are still young, they say!!
- Lack of effort to teach financial management in consulting engineering
- Finance i.e. remuneration, benefit, gratuities lack of defined minimum wage. Unattractive remuneration packages
- Work overload resulting in reduced efficiency
- Blocking of career progression under the guise of ‘wait for your time’
- Female young Engineers are not easily accepted and taken seriously in the industry compared to their male counterparts

Suggested possible solutions

- ◆ 1. Encouraging them to grow professionally through well-structured career development programmes.
- ◆ 2. Provide attractive remuneration packages with defined minimum salaries and earning potential
- ◆ 3. Making them feel valued especially when it comes to decision making
- ◆ 4. Promoting professional membership qualifications based on experience and technical capabilities and not just age or the number of accumulated years post acquisition of EngRB practicing license.

“Future Leaders are the ‘young talent pipeline’ of the Consulting Engineering industry

Panel Discussion Highlights

The discussion after the presentation was centred around the following:

Career Development/Mentorships

- ◆ FLs need to find firms that clearly mark out demonstrated career progression plans. They should inquire about what the HR Policies are in terms of mentorship and career development at the companies that they would like to join.

Workload

- ◆ Involving FLs in different stages of consultancy practice is key for the planning for work/time inputs and deliverables, so that service efficiency won’t be over or underestimated.

Career Progression Blocking

- ◆ The perception of the FLs is that the period of time required to elapse before they can be registered to practice is too long, yet some professional competencies are actually recognized over a period of time.
- ◆ Character/code of conduct and ethical standards of individuals need to be observed over a period of time
- ◆ Knowledge and experience are acknowledged, yet competence is a dimension that must be demonstrated and it is recognized over a period of time.
- ◆ FLs should ensure that they are building their competences under a mentor and focus more on preserving the practice and integrity of the profession, and their professional growth rather than about how long it takes.

Female Engineers

- ◆ Female Engineers need to be vocal agents of change by speaking out to their Principals on gender biased issues that affect them in the workplace.

The panelists also highlighted some industry challenges that have a trickle-down effect on some of the issues that affect FLs such as:

- * Retaining quality staff becomes difficult in cases where FLs do not join firms with the intention of continuing to work in the consultancy industry. In some instances, the firms invest in the upskilling of FLs who leave as soon as they have been trained well.
- * Private jobs are not regulated and sub-standard work is carried out by individuals with underdeveloped skills, due to the empirical nature of the profession which gives the illusion that it can be easily replicated. This gives the profession a bad reputation.

Audience Interaction Highlights (Q+A Session)

The audience made a few comments and suggestions.

- ♦ For sustainability of the practice and knowledge transfer, there should be a deliberate policy in which each registered firm should select a FL to be part of the FL Group.
- ♦ Deliberate steps should be taken in creating programmes which focus on educating FLs on financial management in line with running a consulting engineering firm as a business.

THE OUTCOME

The Symposium was able to create a platform for Future Leaders to express their views on key issues that affect them. The closing narrative was that the Future Leaders are the 'Young talent pipeline' of the Consulting Engineering Industry, and as such must be treated and handled with all the professional care.

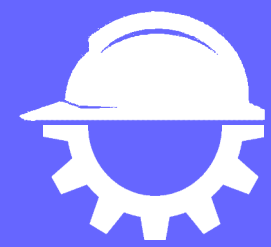
Network.



Engage.



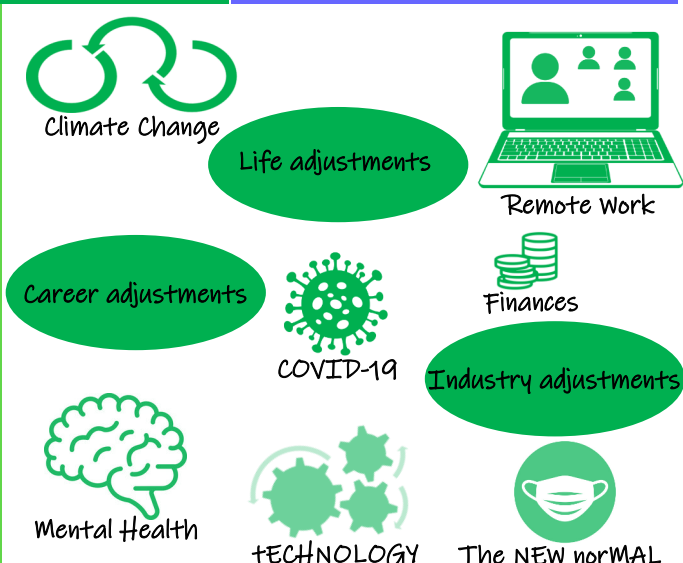
Explore your Industry.



What sort of events do YOU want to take part in?

A LOT IS GOING ON. MAYBE YOU NEED A BREATHER!

Let us know what Future Leader Group Events you would like to have in the future.



News and Events | REGIONAL AND INTERNATIONAL

ACEZ is affiliated to the International Federation of Consulting Engineers (FIDIC) globally and FIDIC Africa, regionally. It is only natural that as Future Leaders, we keep abreast with activities that are happening in the consulting engineering community. Here are Some FIDIC related events to look out for.

FIDIC 2022 Future Leaders Management Course – FLMC

5 April 2022 – 16 August 2022

The registration deadline for 2022 may have past, but it is an annual training course with the following content

- ◆ The consulting firm and profit
- ◆ The consultant contracts
- ◆ Human resources and career planning
- ◆ Business development and project management
- ◆ Quality management and ISO
- ◆ Liability insurance and risk
- ◆ Integrity management
- ◆ Sustainability management
- ◆ Sustainable design

The focus of this FIDIC programme is to strengthen the business expertise of young engineers and other professionals working in the field of consulting engineering.



FIDIC Official Contract Users' Conference Africa and Middle East Regional Conference



Dates: 11 - 12 May 2022

Location: Virtual Conference

Delivered Live (CET) and On-Demand Afterwards

Price: Euro 245

For more info visit: www.fidic.org

28th Annual FIDIC Africa Infrastructure Conference

Theme: Infrastructure Development in Africa

Dates: 15 - 17 May 2022

Location: Eko Hotel, Lagos Nigeria

Prices:

Delegation Registration: Physical Attendance - \$800.00

Delegation Registration: Virtual Attendance - \$640.00

Future Leaders Registration - \$500.00

For more info visit: www.fidicafrica2022.com



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Part of the conference activities includes a Future Leaders Conference that will take place on 15 May 2022. The highlights for this conference should peak your interest and motivate you to attend.



The poster for the Future Leaders Conference highlights the following activities:

- > Keynote Address
- > Panel Discussion
 - > How Future Leaders can bring about a fundamental shift in Africa's economy through Infrastructural development
- > Paper Session
 - > Future Leaders Role in making Africa a more attractive investment destination
- > Award presentation for the winners of Graduate Awareness Program (GAP) & Graduate Integration Program (GIP)
- > Student Design Competition.
- > Prize-winning activity
- > Networking session

The poster also features the FIDIC AFRICA 2022 logo, the theme "Infrastructure Development In Africa.", and the date "15 MAY 2022 | LAGOS, NIGERIA". A "REGISTER HERE" button with the URL "fidicafrika2022.com" is also present.

FIDIC Global Infrastructure Conference 2022

Dates: 12 - 13 September 2022

Location: Geneva, Switzerland

Price: TBC

Theme: "Building a better tomorrow by investing today: Sustainable infrastructure development to improve community wellbeing."

www.fidic.org

ACEZ Secretariat Relocation

The ACEZ Secretariat moved to new premises. The physical address is below.



Association of Consulting Engineers of Zambia
St. Eugene Lake Road Office Park
Office No. 6
37/1P Lake Road
Lusaka

**Contact
Secretariat**

Call: +260 211 256 651/609

Email: info@acez.co.zm

Website: www.acez.co.zm

FUTURE LEADERS THINK PIECES

"Un-tapping Our Business Potential: Why so few Engineers are Entrepreneurs?"

By Harold M. Chibwe ACEZ FL Member, FIDIC AFRICA FL Immediate Past Chair, Zambia

Introduction

The field of engineering is filled with people who are trained to solve problems. Being trained as an Engineer provides one with the greatest opportunities that one can ever have. One such opportunity is being an entrepreneur. Engineers possess particular qualities that make them become good entrepreneurs. Engineering education should therefore, cement such qualities in order for engineers to find their place in society and take the leading role in innovation and technology so as to improve the "quality of life". The world today demands more of engineers to solve the many problems that society has. Problem solving alone however, will not bring about the changes that society requires. This entails that the mindset of Engineers should change from being traditional Engineers to entrepreneurial engineers.

Objective

This paper explains why so few engineers are Entrepreneurs. It further explores the qualities that engineers have, to untap their potential to become great entrepreneurs. The paper also acknowledges the limitations of assessing a broad range of engineers who indeed have managed to untap their entrepreneurial skills.

Research Methodology

Literature review

In conducting literature review, international publications such as construction and dispute resolution books, journals, and any other relevant publications such as newspapers and magazines were some of the sources of literature that were reviewed. The internet was another source of foreign data.

Interviews

Business consultants were interviewed using unstructured questions. The interviews were preliminary,

consultative and provided a good opportunity to obtain important statements, experiences of the stakeholders.

Questionnaire surveys

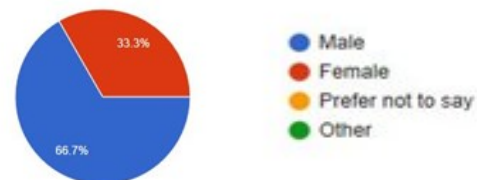
The main method of primary data collection was through questionnaire surveys. The information obtained provided understanding on why so few engineers are entrepreneurs.

In order to achieve the objectives of the research, a random questionnaire survey was undertaken and results presented below.

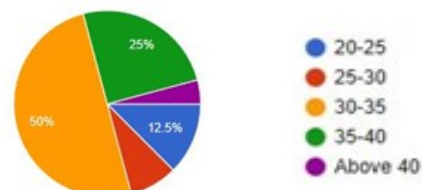
Results

Findings from Respondents

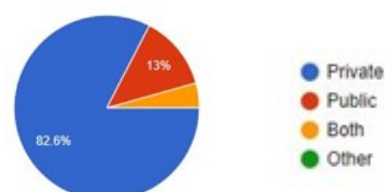
Gender



Age Group

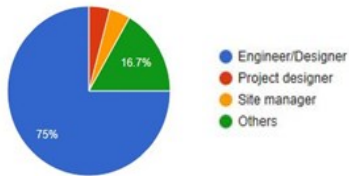


Organization Type

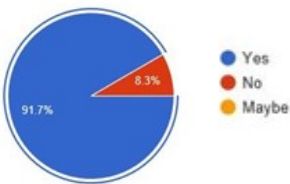


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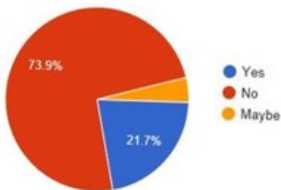
Disciplines



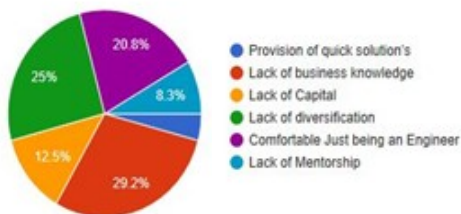
Have you ever thought about becoming an Entrepreneur as an Engineer?



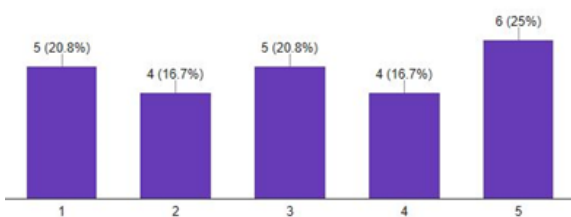
Has College or Varsity education influenced you in any way to being an Entrepreneur?



Why so few Engineers are Entrepreneurs?



How does the quality of Engineering Entrepreneurship compare with other professionals?



Analysis & Discussion

From the results, the following was deduced as some of the reasons why so few engineers are entrepreneurs;

Lack of business knowledge and/or an entrepreneurial mind

Engineering education must teach engineers how to be entrepreneurially minded.

The educational paradigm must include instruction in the technical fundamentals of engineering and business knowledge, which needs to be integrated into curricular.

Lack of Capital

Engineers are trained to interpret exact science and taught to design within restricted parameters. Simply put Engineers are not taught to take risks.

A good Entrepreneur on the other embraces risk as an opportunity. The result is that engineer driven solutions often are too late if they ever get in today's fast-moving markets.

Comfortable in the comfort Zone

Engineers are extremely brilliant and passionate about engineering. This results in engineers being comfortable in that daily norm of their lives. It further blinds them from stepping out of the comfort zone as employees and become entrepreneurs or employers.

Lack of Capital

Access to capital in starting up an enterprise is another reason why so few engineers are entrepreneurs.

Reasons are many but not all have been discussed in this article.

What makes Engineers Great Entrepreneurs?

1. Engineers Solve Problems



New businesses erupt when there is a need to bring something into the market that is missing. Filling a void is perfect for someone who is capable of defining a problem. Engineering courses teach people to persist in the face of difficulty, persevere & always entertain positive thoughts.

Continued from page 10...

Engineers are trained to think logically and to follow a methodology to uncover useful solutions. This is the basis of a successful business.

2. Engineers Are Optimistic

The world can be a very pessimistic place, especially when the economy is biting.



3. Engineers Can Build Trust



An engineer will tell the truth in a blunt manner. This candor establishes trust with consumers. Trust is a quality that is not easy to establish, but an engineer should have little problem.

4. Engineers Yearn for Knowledge



When a person is not afraid to learn and gain more knowledge, growth will occur. Growing is a key factor involved with developing a solid business. Being an entrepreneur means constantly striving to uncover the most amount of knowledge possible.

References

Articles by Joshua Turner & Mark Crawford

How Changing Times Affect the Building Services Industry

By Malita Tembo Sichone , ACEZ FLC Member

From the invention of the flushable toilets to the light bulb and telephone system, the building services industry has generally come a long way from what it used be in the past, as far back as the 1960s to what it is now. Wikipedia defines building services engineering

as a professional engineering discipline that strives to achieve a safe and comfortable indoor environment whilst minimizing the environmental impact of a building.

I would like to assume that before the advent of any new innovation, even in the past, societies worked with innovations available to them. For instance, until Elisha Otis pioneered the safety lift in 1852, construction of buildings was restricted to a certain height. Although the height of constructing a building is still affected by restrictions such as proximity to airports or local regulations, the invention of the lift, has allowed for flexibility of the types of structures which can be constructed, and the maximization of available land through the construction of high-rise buildings.

The impact of innovations in building services on the construction of buildings over time can also be seen with the innovations and technological advancements of Heating Ventilation and Air-Conditioning (HVAC) systems, development of LED lighting, use of alternative energy sources such as solar (PV) plants, use of water efficient

Continued from page 11...

plumbing systems, advancements in building communications systems, addressable fire alarm systems, audio visual systems and many more. The modern societies seem to quickly adapt to new innovations and technologies which was not always the case in the past. According to the Smithsonian Magazine, the flush toilet was invented in 1596 but did not become widespread until 1851.

In comparison to past societies, the ease and rapid adaptation of modern societies to innovations and technologies has allowed for faster improvements on available technologies and new innovations. For a building of equal or similar area coverage, the design brief for building services issued in the 1980s, will vary considerably to one issued in the 2000s or 2022.

While functionality was the core focus of design briefs in the past, factors such as energy efficiency, environmental impact, ease of integration with available technologies are some of the additional important considerations to be taken into account in modern building services engineering designs. With the advent of global warming, and more countries endeavouring to achieve zero carbon emissions within the near future, the future design briefs for building services engineering shall most probably also focus on a more stringent design brief such as ensuring that the full life cycle of proposed materials have minimal to zero carbon foot print from their manufacturing process to installation/operational and finally when disposed of.

What does this then entail for Zambia? This means that while the country joins the rest of the world in trying to achieve net zero greenhouse gas emissions, introduction of alternative energy sources such as solar (PV) plants or other clean energy sources should be coupled with a campaign to ensure efficient and environmentally friendly building services. There is further need to ensure that the proposed new buildings are built with the goal to have minimal carbon foot print and use efficient materials and technologies. There is need to encourage refurbishment of the building

services for old buildings to ensure that services are brought up to date as much as possible.

Going into the future, the building services industry shall continue to grow at a fast pace as designers adopt solutions that can be integrated with technology. It is therefore, imperative that various sectors of the built environment interact at different levels to not only keep abreast on the changes that have taken place in the built environment but to also effectively coordinate on how these changes can be adopted or managed within the Zambian set up. Furthermore, there is need to ensure that an archive of historical data is maintained. This archive can include data on weather, energy consumption, equipment loads, etc. for future design reference or development of materials/products suited for Zambia.

“.....factors such as energy efficiency, environmental impact, ease of integration with available technologies are some of the additional important considerations to be taken into account in modern building services engineering designs.”



Surge Shaft Construction Layout of the Kafue Gorge Lower (KGL) Hydro Power Plant

By Thembi Ndhlovu ACEZ FLC Member



Fig.1. Surge Shaft Concrete Construction Layout

The Kafue gorge Lower hydro power station was constructed on the Kafue River in the southern Chikankata district in Zambia. Its construction was implemented in order to address the growing demand for electricity both locally and regionally.

The design and construction processes of hydro power plants vary and constantly evolve according to growing demand requirements as well as the emerging of advanced technologies, materials and methods. The different features of a hydro power plant each play a vital role in power generation.

A Surge Shaft is one of the essential components in hydro power production. A Surge shaft structure is provided at the end of a headrace tunnel or pipe to account for water hammering effect in the pipe at its downstream. In most of the hydropower projects involving pressure tunnels, when the power house is suddenly shut down by closing the turbine valves, the water in penstock stops suddenly and because of the inertia of incoming water from the back it creates a resonance (a vibration of large amplitude) effect, which soon causes the 'water hammering effect'

It is for this reason that the surge shaft is considered to be an important component of hydropower projects, especially for those involving headrace pressure tunnels. If no arrangement has been made to prevent this water hammer, it may result in the bursting of the penstock pipe and may lead to serious stability issues of the hydropower

project. The best solution is to provide a surge shaft or surge tank depending upon the site constraints. The design of a surge shaft is dependent on different parameters.

In the case of KGL-HPP the following were considered:

- ◆ Design discharge
- ◆ Headrace water level
- ◆ Headrace tunnel diameter
- ◆ Headrace tunnel length
- ◆ Headrace tunnel slope
- ◆ Headrace tunnel material

Design discharge is the amount of water to be carried by the headrace tunnel of specific diameter with a pre-defined longitudinal slope. The greater the slope, the higher the velocity of water through the headrace tunnel and hence the higher the head losses.

The Kafue gorge Lower hydro power surge shaft is a reinforced concrete lined, circular shaped shaft with a diameter of 32m after lining, open to sky, with an impedance slab at the bottom where the 4.78 km long HRT (Head Race Tunnel) terminates and five 4.8m diameter (after lining) power tunnels begin. It also has 5 bulkhead gates and 5 guard gates. The top elevation of the surge shaft concrete structure is EL.615.3m and the bottom is at EL.481.5m with a total height of 133.8m.

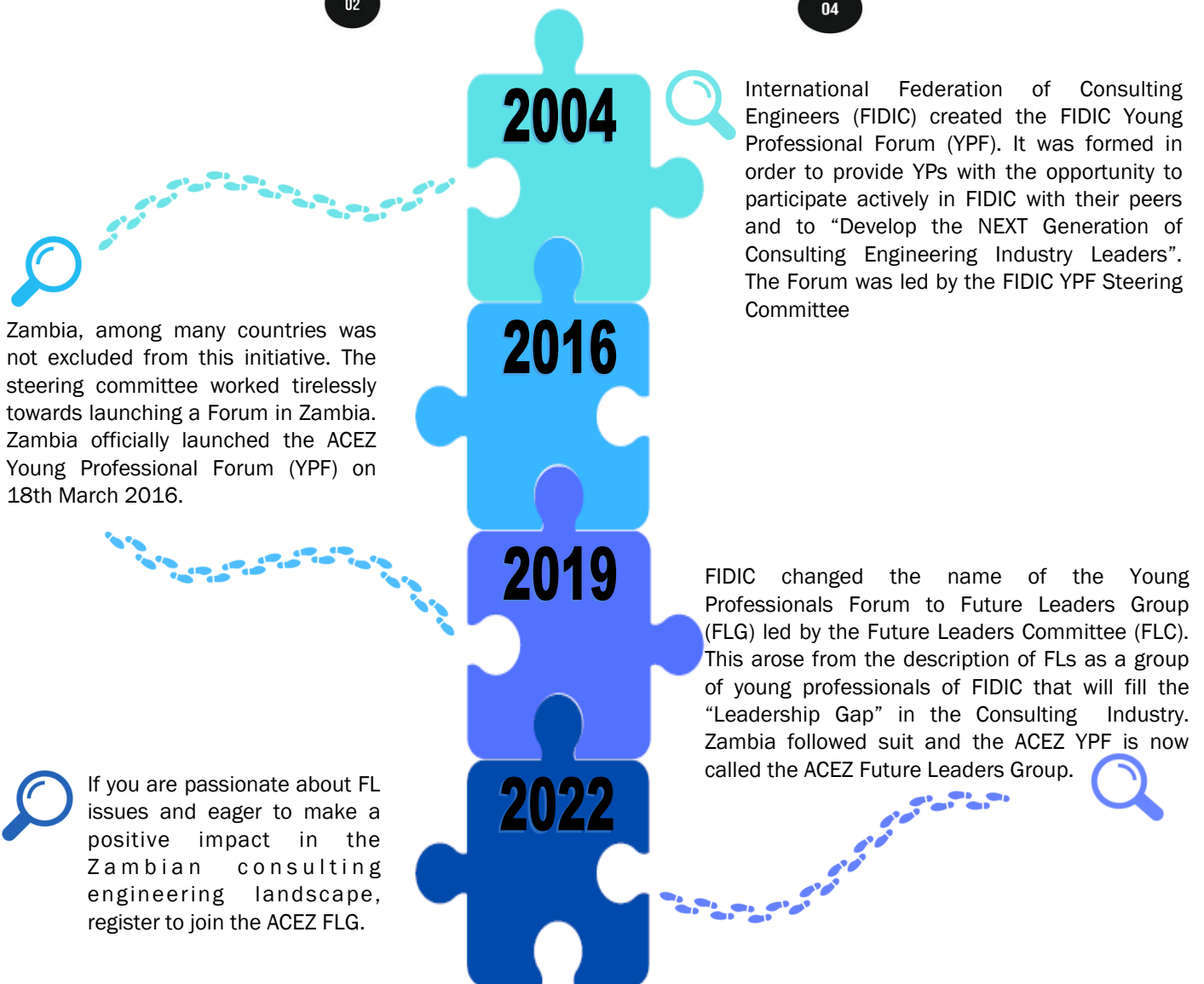


Future Leaders Group (FLG) of the Association of Consulting Engineers of Zambia (ACEZ)

Who are we?

The Future Leaders Group (FLG) of the Association of Consulting Engineers of Zambia (ACEZ) consists of Future Leaders (FLs) who are passionate about the consulting engineering industry and are interested in ensuring the sustainability and promotion of the profession.

Future Leaders Group



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Membership criteria

Must work under an ACEZ Member Firm

Must be a qualified engineering professional (registered with Engineering Institution of Zambia (EIZ))

Must be under the age of 40 Years

Membership is voluntary and restricted to the above criteria.

You may register to join on the ACEZ website on the following link:

<https://www.acez.co.zm/about-us/future-leaders/>



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