



WATER

Herald

Volume 5, Issue 1, January–March 2014

Frontiers for Business Opportunities

Learn from your peers



President Museveni officially opens Lubigi WSTP (pg 5)



Gaba VSDF starts vocational training courses (pg 13)



NWSC wins global award (pg 9)



Corporate Social Responsibility for the needy (pg 14)

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Dr Eng Silver Mugisha
Managing Director–NWSC

First and foremost, it gives me great pleasure to welcome you once again to this Edition of the Water Herald magazine for the period, January–March 2014. I welcome you to the New Year 2014, in which we hope to see continued efforts to improve service delivery to our esteemed customers.

I am glad to report that the **Five–Year Strategic Direction (2013–2018)**, launched in November 2013 has taken shape with a number of key milestones already attained. These include, among others, the launch and achievements of the following tactical strategies and activities:

- Increase in the NWSC service area from **23 towns** to **40 towns** in February 2014.
- **Launch of the 90 Days Step Up Programme in all Areas of operation.** The programme encompasses the ideals and philosophy of Service, Team Work and Team Spirit, Enthusiasm, and Performance Productivity.
- **Launch of Division Action Plans, January–June 2014** in which each Division prepared two levels of activities the first being the 5-year annual deliverables for which the Division has lead responsibility, and the second is the six-months Action Plans entailing key activities and milestones for the period, January–June 2014.

Managing Director's Foreword

- **Commencement of a restructuring exercise** aimed at ensuring that the existing structure is aligned to the NWSC business processes, available skills, expertise, and the envisaged increased mandate of the Corporation following the take over of new towns.
- **Launch of an infrastructure service delivery mains extension programme** aimed at ensuring the objectives of water supply accessibility and reliability are attained.
- **Launch of Package I and III of the Kampala Lake Victoria Watsan Project** which entails the refurbishment of the Gaba Water treatment Plant and the rehabilitation and expansion of particular transmission mains and reservoirs.

All these activities are already beginning to bear fruits, with billings and collections increasing dramatically during the period January–March 2014. In the month of February, billings were **US\$ 16 billion**, while collections were about **US\$ 20 billion** a performance which has never been attained in the history of the Corporation. This has enabled the Corporation appropriate about US\$ 10 billion for the **infrastructure service delivery programme** in which various areas are to benefit from improved water supply.

The theme of this edition **Frontiers for Business Opportunities**, brings to light the attendant down-

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stream collaborative arrangements which are beneficial to various stakeholders resulting from the increased business activities of NWSC. These Business opportunities include the following:

- Opportunities for **supplies** of various inputs in the NWSC business processes. These include: supply of pipes, fittings, electro-mechanical equipment, chemicals and various other accessories. The expansion of NWSC services has increased the market for these inputs which in turns presents itself as a business opportunity for various suppliers.
- Opportunities for **contractors** and **consultants** who design and install various infrastructure. This has increased with the expanding NWSC investment drive. Currently, various projects are underway and this has created immense business opportunities for the consultants and contractors.
- Opportunities for **financiers**. The expanding NWSC needs and exponential growth in demand for services has created opportunities for financiers. The water intakes in Gaba

and Jinja were financed through a concessionary loan from the French Government that was channelled through a local bank. It is envisaged that more funding will be solicited to ensure efficient and effective services are delivered in all the towns.

- Opportunities for **businesses** that are predominantly water intensive. The expanding NWSC services provides opportunity for various industrial and commercial entities that use copious amounts of water for their production processes.

- Opportunities for **benchmarking** and provision of **professional services** resulting from increased productive and allocative efficiency within the Corporation.

As a Corporation, we are certain that the steps we are undertaking will bring about a positive change to the people we serve, which will result into increased synergies, and “tangible” satisfaction for our various stakeholders. I wish you a good reading, and we pledge our continued commitment towards improved service delivery.

Thank you ■



NWSC-INTERNATIONAL RESOURCE CENTRE (NWSC-IREC)

a newly constructed state-of-the-art facility. Plot M11, Old Portbell Road, Bugolobi Kampala



Services Offered at the NWSC-IREC Facility Include:

- * Hosting of Conferences (local and international)
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Dr Martin Kalibbala

Chief Editor-Water Herald

Precious Readers,

The theme of this issue is “Frontiers for Utility Business Opportunities.” No doubt, utilities have to identify and/or create new frontiers to enhance business growth within their operational jurisdictions. Fortunately, when one compares this theme with what really transpired within National Water and Sewerage Corporation (NWSC) – for the period January–March 2014 – one will somehow agree with me that the two scenarios are in relative concomitance.

A number of things happened – in line with the NWSC Strategic Direction (2013–2018) – which are potential frontiers and hot beds for enhancing NWSC business opportunities, for water and sewerage services. How did this happen? Please keep reading the pages of this issue of the Water Herald to find out more!

Firstly, the President of the Republic of Uganda, General Yoweri Kaguta Museveni commissioned the newly constructed NWSC Lubigi Water and Sewerage Treatment Plant (WSTP). The Lubigi WSTP is part of the Lake Victoria Protection Project Phase I, extracted from the Sanitation Strategy and Master Plan (SSMP) for Kampala City.

The implementation strategy of the SSMP is envisaged over an extended period – in a phased approach. The plant with a treatment capacity of 5.4 million liters/day is designed to handle piped sewage and waste from septic tanks and pit latrines in informal settlements. This is a potential frontier which will see our Kampala Area sewerage coverage increase from a paltry 6 % to probably 10 %. According to NWSC technocrats, this projected increase will depend on a cocktail of factors, ranging from marketing, political to social-economic initiatives.

Editor's Note

Secondly, NWSC won a prestigious global water award – after trouncing four other potential competitors – at the Global Water Summit (GWS) in Paris, France. The guest of honor during the awards ceremony was HE Ellen Johnson Sirleaf, President of Liberia, Nobel Laureate and United Nations Goodwill Ambassador for Water, Sanitation and Hygiene in Africa. President Sirleaf is African's first ever female president dubbed, “iron lady.”

The level of publicity that accrued from this prestigious GWS awards ceremony is another hot bed for growing our External Services business frontier. How? It is quite obvious that several utilities might be interested to find out – through benchmarking visits and other initiatives – what recipe NWSC applied to deserve such an award. And what practicable take-homes solutions they could also apply to grow to greater heights.

Thirdly, during the quarter, the NWSC–Vocational Skills Development Facility (VSDF), Gaba Campus started running vocational courses to train our shop floor technical staff. Great “thank you” compliments go to the German International Cooperation (GIZ) for the financial support! The primary aim of NWSC–VSDF courses is to equip staff with relevant theoretical and hands-on sessions. We hope that the re-skilled vocational workforce – ably trained under this VSD initiative – will competently operate and maintain NWSC's water systems.

This is a another potential frontier for enhancing our business operations because, the re-skilled staff who have gone through the NWSC–VSDF will: (i) enhance operational efficiencies, (ii) ensure better asset management, and (iii) enforce practical methods of reducing non-revenue water (NRW).

Fourthly, NWSC officially opened a new state-of-the-art customer-centred call centre, which is able to handle at least 3,000 customer calls per day, with great ease. This initiative is phenomenal, because interfacing with our customers, in order to address their complaints has been set to over-drive. As a result, lesser drop calls are experienced.

Do you want to know more? Keep flipping through the pages of this issue! I really wish you a pleasant reading■



Implemented by:
KfW



The President Commissions Lubigi Water and Sewerage Treatment Plant

On Friday 28th March 2014, His Excellency, the President of the Republic of Uganda, General Yoweri Kaguta Museveni commissioned the newly constructed Lubigi Water and Sewerage Treatment Plant (WSTP). The plant with a treatment capacity of 5.4 million liters per day is designed to handle piped sewage and waste from septic tanks and pit latrines in informal settlements and slums.

The Lubigi WSTP will serve: Kawempe, Bwaise, Katanga, Makerere, Nsooba and including hotspots like Mulago Hospital, Public Service and Wandegaya areas. Lubigi WSTP is the second treatment plant in Kampala. It is part of the Kampala Sewerage Master Plan that will see the government construct four (4) plants located at Nakivubo, Kinawataka, Lubigi and Nalukolongo.

The sewerage system in Kampala was constructed over 70 years ago, and only covers part of the central business district. The system currently serves about 7 % of the total population residing in Kampala metropolitan. As a result, the majority of the city residents rely on poorly managed and un-hygienic on-site sanitation facilities.

The increasing incidences of water borne and sanitation related diseases, and degradation of the environment in and around Kampala city are a manifestation of the poor sanitation situation. Currently, sanitation related diseases are among the top five causes of child mortality and

morbidity in Uganda.

In line with Government's efforts deliberately aimed at eradicating poverty and continuing progress towards achieving the Millennium Development Goals (MDGs) on water and sanitation services, NWSC has developed a long term Sanitation Development Program for Kampala, which is elaborated in the Sanitation Strategy and Master Plan for Kampala City, being implemented over an extended period – in a phased approach. Currently two phases are being implemented, namely: Lake Victoria Protection, Phases I and II.

The Government of Uganda managed to undertake this initiative with joint funding from the European Union (EU) and the Germany Government – through KfW. The Lake Victoria Protection phase I funding contributions are: EU (Euro € 6.9 m), KfW (Euro € 6.0 m) and Government of Uganda/NWSC (Euro € 2.5 m).



The Lubigi WSTP is part of the Lake Victoria Protection Project Phase I. This phase also includes expansion of sewerage services to Katwe and Makindye Army Barracks and minor rehabilitation works at the existing sewerage treatment plant at Bugolobi. Under this project, an appropriate sludge collection mechanism was piloted using UgaVACS to facilitate collection of faecal sludge in informal and unplanned settlements – where accessibility is very limited.

The commissioning of the Lubigi WSTP comes at a time when a clarion call to put as much emphasis on sewerage management as with water supply is required, plus the protection of Lake Victoria from environmental degradation through pollution.

In general, the program will definitely bring general improvements in public health within Kampala city, curtail water and sanitation-related diseases, and contribute to the environmental sustainability of Lake Victoria. The treated sludge from the Lubigi WSTP will be used as organic fertilizer, and this will boost agricultural production.



"Sowing" the Lubigi mustard seed: President YK Museveni plants a tree during the commissioning of Lubigi WSTP.

Pictorial # 1: President Yoweri Kaguta Museveni Commissions the new Lubigi Water and Sewerage Treatment Plant (WSTP)

(Friday, 28th March 2014)



The President cuts the tape as Prof Ephraim Kamuntu (Minister of Water and Environment) looks on.



The President is given a guided tour of the newly constructed Lubigi WSTP plant by Prof Ephraim Kamuntu and Dr Eng Sliver Mugisha (NWSC Managing Director).



Grand arrival: President Museveni is received at the Lubigi WSTP commissioning ceremony by Prof Ephraim Kamuntu (Minister of Water and Environment).



Attention as the national anthem is played!



A cross section of NWSC management and staff who attended the ceremony.

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Pictorial # 1, Cont'd...



The President greets Dr Eng Sliver Mugisha (NWSC-MD) upon his arrival to commission the Lubigi facility.



Eng Johnson Amayo (Chief Manager, Planning and Capital Development Division, NWSC) explains the Lubigi WSTP configuration to HE, the President of Uganda.



Touring the newly commissioned Lubigi plant



Dr Cecilia Oyet (NWSC Board Member) opened the commissioning function with a word of prayer.



Crane performers entertained the guests with traditional dances.

Pictorial # 1, Cont'd...



Golden choice: Mr George E Okol (Chief Manager, Commercial and Customer Care Services Division, NWSC) was the Master of Ceremony at the Lubigi function.



Job well done! President Y K Museveni keenly listens to the presentations by NWSC technocrats during the guided tour of the Lubigi plant.



A cross section of NWSC staff stand for the singing of the national anthem.



Dr Eng Sliver Mugisha (NWSC-MD) gives his speech during the commissioning function.



Excellent supervision! President Museveni greets NWSC Board Members upon his arrival.

NWSC Wins Prestigious 2014 Global Water Leaders' Award

by Editorial Team

Every year, the prestigious global water awards are presented at the Global Water Summit (GWS). The GWS is a major annual business conference for the water industry, worldwide. This year, the GWS was held in Paris, France. The GWS awards acknowledge the important achievements in the international water industry within several categories. One of the unique categories within the GWAs is the Global Water Leaders' Award (GWLA).

The GWLA recognizes entities and/or personalities who are making a significant difference in the battle for safe water and good sanitation. The GWLA nominations are done by the readers of the Water Leader Magazine. For 2014, the winner was selected from four nominated utilities serving the populace in low and middle-income countries (LAMICs), namely; [i] Hyderabad Metropolitan Water Supply and Sewerage Board, India; [ii] National Water and Sewerage Corporation (NWSC), Uganda; [iii] ABSA's Metro Water Education Programme; and [iv] Lusaka Water and Sewerage Corporation, Zambia.

NWSC won and received this year's GWLA – during a GWS gala dinner on Monday, 7th April 2014 – and the award was presented by the Awards Ceremony guest of honor, HE Ellen Johnson Sirleaf, President of Liberia, Nobel Laureate and United Nations Goodwill Ambassador for Water, Sanitation and Hygiene in Africa. The NWSC delegation – led by the Minister of State for Water, Hon Betty Bigombe – was greatly honored to receive the award from President Sirleaf, Africa's first democratically elected female president.

President Sirleaf – internationally known as Africa's "iron lady" – is an iconic promoter of peace, justice and democratic rule. She has led the war-torn Liberia to restored freedom and peace while enacting economic, social, and political reforms. Whether focusing on providing for basic needs of her people, striving to end corruption or advocating for women in all walks of life, President Sirleaf has lived a life of courage and vision. Her message of peace, human rights, economic empowerment and moral leadership leaves audiences inspired.

NWSC scooped the award due to the fact that her internal reformation efforts soared to greater heights in 2013 when new connections increased to 28,000 – and the Ugandan urban service coverage within her jurisdiction almost doubled – with a 30 % profit increase during the period. Additionally, NWSC receive a cash prize which is designed to foster further efforts in sustaining and improving water and sanitation service delivery within her jurisdiction.



L–R: Ms Ruth Asiimwe Kanyaraju (Board Member), Dr Eng Christopher Ebal (Board Chairman), President Ellen J Sirleaf (GWLA guest of honor and Liberian President), Hon Betty Bigombe (State Minister for Water) and Dr Eng Silver Mugisha (Managing Director–NWSC), share a "photo-shoot" moment at the GWS awards ceremony in Paris, France.

As stipulated in the NWSC Strategic Direction (2013–2018), the corporation is committed to 100 % service coverage in the areas within her jurisdiction. As at 31st March 2014, NWSC extended her water and sanitation service coverage to 43 urban centres, compared to the 23 urban centres at the beginning of the FY 2013–2014. By 2018, NWSC is envisaged to cover 80 towns. Under the bi-annual infrastructure development plans (January–June 2014), NWSC hopes to extend 262 km of piped network across the country.



NWSC Builds Research Bridges with Hamburg Wasser, United Nations University and University of San Diego

by Babu Mohammed

Through the Research Department and in the spirit of promoting research via institutional collaboration, NWSC has established important linkages with Hamburg Wasser (HW), United Nations University (UNU) and University of San Diego (USD). The research initiatives are already in progress and a smooth collaboration is anticipated. It is believed that such joint activities will contribute to the overall objectives of NWSC.

Hamburg Wasser

Hamburg Wasser (HW) is a water utility based in Germany and is responsible for provision of water and sewerage services in the city of Hamburg, and the surrounding region. An MOU was signed between NWSC and HW on 1st June 2013. The key issues therein include: reinforcing organizational and operational performance, as well as management aspects. The memorandum also included partnering in business ventures, capacity building and training, asset management, NRW, energy efficiency and wastewater management.

Building on its broad utility practice and international consulting experience, HW and Consulaqua (consulting wing) are well suited to provide to NWSC a hands-on approach suitable for laying a corner - stone for a resilient and cost-effective water supply. They can ably develop systematic and sustainable management of surface and ground water.

In the NWSC Strategic Direction (2013–2018), the financial perspective (under the strategic focus area of cost optimization) emphasizes NWSC to roll-out cost effective water treatment options. In this context, NWSC wishes to explore bank filtration (BF) and ground water (GW) sources. BF specifically is known to be a cost effective water treatment option while ground water sources

BF would provide decentralized water supply that would ease on the demand from the Gaba water treatment

works. Areas of the metropolitan Kampala would greatly benefit from the decentralized systems thus improving service delivery to the population.

As a first initiative, a team of three experts from HW, namely: Dr C Czekalla (water treatment expert), Mr K Radmann (hydro-geologist) and Dr C Hansen (hydro-chemical expert) visited Uganda from 3rd – 8th November 2013; on a fact finding mission. This visit was made successful through co-funding between NWSC and development partners, GIZ. The mission targeted Kampala and Mbarara, and was aimed at evaluating water treatment processes and setting the climate for feasibility studies on BF and GW.

In Mbarara, both the old and new plants were visited. The first impression from both abstraction sites gave an optimistic outlook. Sandy sediments probably with sufficient hydraulic conductivity were found at both sites. Sedimentological and hydraulic test are recommended to proof applicability of bank filtration.

For GW sources, exploitable local aquifer systems could be expected at places with sandy overburden, coarse grained weathered bedrocks and / or fractured bedrocks. Typical sites have been found close to Mbarara. In Kampala, potential sites suitable for BF were located at Kisubi beach on the shores of L. Victoria (Figure 1). The Kisubi beach area holds a potential for abstraction of 1-2 Million m³/ year but depending on thickness of aquifer and hydraulic conductivities, there is a potential for higher abstraction rates. The advantage of BF is that chemical treatment costs can be drastically reduced.

In Kampala, GW sources are very important in supplementing the water production from Gabba. Transporting of water to areas far away from Kampala is expensive in terms of NRW and energy costs. Decentralized systems would reduce costs and improve supply reliability. Potential sites for GW abstraction sites have been identified at the Nsimbe region (Figure 1), about 15 km from





Figure 1. Kisubi beach and sandy overburden in Nsimbe Area which show potential of BF and GW

Kampala on Masaka road. It is estimated that Nsimbe area holds a potential for sustainable abstraction of up to 1.6 million m³/year. These are conservative estimates; the production could be even higher.

The scope of the fact finding mission by HW was to identify potential sites for bank filtration and groundwater abstraction in Mbarara and Kampala. The ability of these sites to contribute to NWSC water production has to be tested by means of a drilling program and subsequent hydraulic tests; this will be part of the next phase of the project.

United Nations University (UNU)

United Nations University – Institute for Water Environment and Health is a unit of the United Nations University found in Hamilton, Canada. NWSC has just signed an agreement with UNU in wastewater research. The research interests are waste to wealth with the aim of exploiting waste for energy and nutrient recovery. Additionally, the two partners are planning to make a joint proposal for sewage management in small urban towns that are not sewered. This is aimed at developing a model based on PPP; hinged on energy recovery mainly targeting small NWSC towns which may not be sewered in the near future. As part of the collaboration, UNU has trained and built capacity of the NWSC laboratory staff

in biomethane assays and potential and had donated equipments for biomethane measurements.

University of San Diego (USD)

University of San Diego (USD) is based in California – USA. In January 2014, a research MOU between NWSC and USD was signed. The major interest of research between the two parties is arsenic and other heavy metals. The key elements of the MOU included but not limited to:

- Developing a risk assessment for human exposure for arsenic, other metals and algal toxins for NWSC water sources
- Capacity building on methods and procedures of analyzing arsenic and algae toxins



Two professors: Keith McDonald and James Belonder from USD visited Uganda in January 2014. While in Uganda, the NWSC areas visited included Gabba water works, Entebbe, Jinja, and Lugazi. Other areas were: Masaka, Mbarara, Bushenyi, Kasese, Fort Portal, Mubende and Mityana. During the visits to the areas, about 25 NWSC laboratory staff were trained on the rapid analysis of arsenic.



Figure 3: NWSC staff being trained in rapid assessment of arsenic and algal toxins.

Although the initial analysis of arsenic show low levels of arsenic in the raw water sources, it was found that most NWSC areas were able to remove arsenic through the current water treatment processes to safe levels of < 10 µg l⁻¹ as recommended by WHO standards. Water samples were taken to USD for further analysis of other metals. The USD team is expected to be back in Uganda in June 2014.

McCoy Myths in Management Practice

by Moses Kisiibo



Just about every American or some of us, in **LAMIC** Countries have heard the term the “**real McCoy**.” The real McCoy is an idiom or metaphor in certain English speaking countries to mean the real thing or the genuine article, in contrast to a fake

one. Some people believe that the expression originated from Elijah McCoy. In 1871 – McCoy, born in Canada – invented a lubricating device for steam engine locomotives.



His successful invention inevitably spawned imitations, which forced numerous railroad purchasing agents to demand for for real McCoy products. There are other stories about where the expression originated from. However, no doubt, it emanated from false imitations versus the real deal.

In the animal kingdom there are two types of snakes that look alike. The venomous coral snake which has bands of red, yellow and black, while the harmless king snake has the same or similar bands of color, but in slightly different permutation. The latter’s color coding mimics the deadly coral snake.

When one looks straight at a set of railroad tracks, the two seem to “converge” into one at some point. Rail road tracks are often used in art classes as an example of single-point perspective because of their apparent visual convergence effects to our eye sight.

Fundamental lessons for leaders:

- Sometimes, a truth track lies closely besides that of errors, and it takes a guided discerning spirit to ably separate the two scenarios.
- Counterfeits are rampant along a rail of operations in management; throughout the

value chain activities, but the real McCoy begins with you.

- Stick to the Master’s direction and timing. In Luke 5:1-4, Peter and his associates had laboured all night, during the best time to catch fish, and had almost nothing to show for their efforts. He did not questions his Master (Jesus).He just said, “Master! We have toiled all the night and have taken nothing, nevertheless, at thy word, I will let down the net.” Following the superior’s instruction, Peter realized that the nets were so filled with fish, that they almost tore.
- Avoid believing in any seemingly good message. You may had an opportunity to attend some conference, rally, lecture or sermon. While presenting on a subject, a speaker could have probably remarked in error and you clearly saw that the talk was 180 degrees far from the truth. Yet after their presentation, praises and applauses were heaped upon the delivered presentation, perhaps with more invitations for the presenter to consider coming again because of this interesting and informative piece of new light,” by the ones praising it.
- Step up information search – Elijah McCoy would not have arrived at the innovation of ages in locomotive industry, if he did not craft a robust non-routine thinking, hitching on some choreographed truth and error scenarios – in rational conformity with the known laws of Physics.
- Do good to others, even in error. By lubricating a rigid system to enhance productivity and efficiency, you would be narrowing down your two-way destiny to one-way. How can this be? Hassan Nduga clearly narrates this in his latest Luganda hit song dubbed, “ebintu bizibu.”

The writer is a Senior Commercial Officer, Mbarara Area.

Vocational Skills Development (VSD) Training of Trainers Course

The selected NWSC participants of the Training of Trainers (TOTs) course were led through the main introductory intricacies of effective vocational skills development (VSD) tutoring by the German expert, Mr Josef Ehrmann. The course took place from 26th February to 4th March 2014. It was officially opened and closed by a high powered delegation from NWSC, German International Cooperation (GIZ) and the Directorate of Industrial Training of the Ministry of Education and Sports (DIT-MoES).



the participants exercise the VSD teaching skills during the TOTs training session.



Eng Alex Gisagara (Chief Manager, Engineering Services Division) represented the NWSC-MD at the official closing ceremony of the TOTs VSD course.



Mr Jasper Masolo, Director for Registration and Accreditation (DIT-MoES) also attended the closing session and gave his remarks.



TOTs participants during practical VSD training sessions.



Group photograph after the official closing session of the TOTs VSD course.



Dr Axel Klaphake (GIZ Country Director) attended the official closing session of the TOTs VSD course and gave his remarks.

NWSC Corporate Social Responsibility @ Mapeera Bakateyamba Home

On 24th March 2014, The Archbishop of Kampala Dr Cyprrian Lwanga Kizito, Board Chairman, Dr Eng Christopher Ebal, the Managing Director, National Water and Sewerage Corporation, Dr Eng Silver Mugisha; together with the staff of National Water and Sewerage Corporation visited the Mapeera Bakateyamba Home for the elderly (Nalukolongo). The team spent time with the elderly and cleaned the Home. The delegation of National Water and Sewerage Corporation was the first of the kind this year to carry out such corporate social responsibility. The delegation handed over some home requirements to the Chair, Mapeera Bakateyamba Home.



ICT: A Strategic Enabler for Smart Water Management Policies

by Edward Ssendikwanawa

Smart water management has become a key policy issue for the 21st century, as a growing number of factors are impacting the delivery of already scarce fresh water to millions of people. Economic growth, seasonal climatic conditions and rising population are all affecting availability of water resources.

Moreover, a number of effects linked to climate change, such as lengthy droughts and extreme weather events, are worsening the situation.

Here I give an overview on how ICT can be a strategic enabler for smart water management policies and survey some upcoming ICT standards that will enable smart water initiatives.

ICT is recognized as a strategic enabler in the process of developing innovative solutions to address the problems of water scarcities as well as facilitating the analysis of environmental data to enable researchers and climatologists to build more accurate models for weather forecasting as reliance on past data is no longer sufficient in the looming era of climate change. One of the major

Technologies such as satellite remote sensing in combination with semantic sensor web and geographical information systems can be used innovatively by water authorities to obtain information in real time about water use including monitoring of the quality of water, track and forecast the level of water sources, monitor water pressure at particular points and in real time thereby curbing some of the non revenue water causes, and to identify new sources of water.

With the impact of climate change, sole reliance on historical hydrologic weather patterns is no longer a viable forecast for water authorities. The availability of information about current conditions in a particular situation on a timely basis is crucial for decision making in water resource management.

The availability of information about current conditions in a particular situation on a timely basis is crucial for decision making in water resource management.

For instance, non revenue water management is a dynamic process, changing daily, weekly or monthly, depending on weather conditions, pressure of the water, efficiency of piping system and any other water losses that may be realized.

ICT provides a unique opportunity for water stakeholders to obtain information in near real time about a number of physical and environmental variables such as temperature, soil moisture levels, rainfall, and others through web enabled sensors and communication networks, and can

thus have accurate information about the situation at hand (without physically being there) for their forecasts and decisions. Smart metering technologies can provide individuals, businesses and water companies with information in near



challenges for sustainable development faced by both the developed and developing countries are to ensure that all people continue to have reliable access to water supply and sanitation services.

real-time about their own water use, thus raising awareness about usage, locating leakages and having better control over water demand.

Radio-based ICT systems such as remote sensors are a major source of observation and information about the efficient monitoring and management of water resources. Remote sensing technologies coupled with satellite radio-communications systems, global positioning systems (GPS) and Geographical Information Systems (GIS) have been instrumental to the identification of new water sources, building models of watershed basin area and analyzing the environment.

Sensors placed throughout the water distribution network and smart meters at consumer place will become commonplace in order to save water. The outcome will be a system that helps manage end-to-end distribution, from reservoirs to pumping stations to smart pipes to intelligent metering at the user site. For water companies, the capability to be able to identify leaks or carry out repairs on the water distribution network in near real time basis will be crucial.

Developments in the area of sensors and nano-technologies could lead to the incorporation of these technologies in the water pipes network. These sensors could be remotely monitored to provide information about the state of the pipe and allow water companies to take proactive action on problems detected on the distribution network and

better control over assets. If resulting actions could be taken remotely (e.g., pressure regulation within a system, bypassing a section of pipe until maintenance carried out), or even self healing triggered within a 'smart pipeline system' by the sensors themselves, no undue loss of service would occur.

Finally, in order to manage assets, water companies need to have information about the water distribution networks on maps. Having the maps in electronic format rather than on paper enables water companies to carry out more sophisticated analysis and respond faster. In addition, the use of geographical information systems permits water companies to have their entire water distribution network at their fingertips with information about the characteristics of the network (for example, pipe length, diameter, date installed, valve size, pump curve, etc.) and individual customers linked to the system as well.

In conclusion, the write-up has shown how ICT can bring enormous benefits to water authorities in mapping and monitoring of water resources, revenue collection and asset management. Developing countries could make use of GIS/ ICT tools for smart decision making in water management policies in order to meet the MDG targets for water.

NWSC Revamps PR&C Department

by Public Relations and Communications Team

National Water and Sewerage Corporation (NWSC) has revamped its Public Relations and Communications department as it gears to communicate better, deepen stakeholder engagement and serve its customers better.

To this end, the corporation has made two new appointments to strengthen the existing team.

Sarah Namuwenge who has worked in the Corporation in various capacities has been appointed the new Public Relations and Communications Manager NWSC.

Samuel Apedel, an experienced journalist has been appointed the Public Relations Manager Kampala Water, Entebbe and Jinja.

The two have joined the existing public relations team of Vivien Newumbe, the Principal Public Relations Officer NWSC, Sheba Bamwine Mukiza the Principal Communications Officer Kampala, Entebbe and Jinja, George Kasule the Call Centre Manager, Victoria Komukyeya the Customer Relations Officer and Irene Birungi the Senior Administrative Officer.

The appointments are in line with the corporation's new 5-year strategic direction 2013 to 2018 in which the corporation seeks to expand water coverage to 100%, ensure consistent and reliable supply, enhance stakeholder engagement and serve its customers better.

The expanded public relations and communications department is a measure of the value the corporation attaches to its image, stakeholder engagement and customer delight.

The public relations and communications team is charged with enhancing the Brand, Image and Reputation of NWSC. It is also responsible for building strategic partnerships with the media, managing stakeholder relations, communicating the corporation's Vision, Mission, programmes and projects among others.

To ensure prompt and efficient customer response, the call centre is being revamped to ensure immediate, efficient, courteous and around the clock responses to customer queries and complaints.

This will go a long way in deepening and sharpening our customer engagement to the delight of our customers. The public relations and communications team will work in collaboration with other departments in achieving all the goals of the corporation. The team is working on a comprehensive communications strategy that is guided by the 5-Year Strategic Direction.



Faecal Sludge | Potential Fuel Source for Large Scale Industrial Kilns

by Dr Babu Mohammed

Makerere University is conducting a collaborative research with NWSC on the possibility of using faecal sludge (FS) in industrial kilns. An MSc student Mr. Patrick Sekigongo under the supervision of Dr. Charles Niwagaba from Makerere University is conducting experiments at the low level, Bugolobi sewerage treatment works for these investigations.

The use of FS as a fuel to provide energy for industry can help solve both sanitation challenge and supplement the already existing fuels which are becoming scarce. On average, the calorific value of FS compares well with other commonly used fuels such as rice husks, forest residues, coffee husks and sawdust.

Preliminary results are very promising and indicating that there is potential for faecal sludge to be used in industrial kilns. When dried and combusted, the sludge can generate temperatures of up to 1000 °C which are suitable for burning clay products.



Figure 1: Clay products after combusting with dried faecal sludge from BSTW

Future Perspective

Field trials at full scale industrial kilns are expected to be conducted soon at Uganda clays, Kajansi and positive results are expected.

These studies demonstrate that companies can use clean renewable energy fuels in a bid to move towards sustainable industrial development and green energy. Apart from improving sanitation and reducing the burden of faecal sludge management at the treatment works, the sludge could be a potential income to NWSC.

It is reported that the FS collected in Kampala is 250 m³day⁻¹ (even though estimates suggest that up to 500 m³day⁻¹ could be collected). However, the collectable amount of FS exceeds 1,000 m³day⁻¹. Given the large volumes generated daily, there is a potential for generating income from sludge while saving our water sources.



Figure 2: Experimental kiln and a sample of the dried faecal sludge used in the experiment

Areas Performance Score Card, Oct 2013 – December 2013

By Christopher Mwandha

Area	Oct 2013 Performance					Nov 2013 Performance					Dec 2013 Performance				
		NRW	WR	COM ('000 UShs)	Incentive Earned ('000' UShs)		NRW	WR	COM ('000' UShs)	Incentive Earned ('000' UShs)		NRW	WR	COM ('000' UShs)	Incentive Earned ('000' UShs)
Kampala	Actual	38.7%	52.3%	4,509,423	153,067		38.6%	53.8%	4,387,470	39,311		38.8%	55.0%	4,234,758	0
	Target	35.0%	53.2%	4,941,326	1,085,924		35.0%	50.2%	5,210,824	1,185,746		35.0%	50.2%	5,210,824	1,185,746
Jinja	Actual	39.0%	53.4%	336,460	6,000		40.9%	51.9%	351,704	1,355		42.7%	55.8%	315,591	0
	Target	28.0%	49.1%	562,572	144,808		28.0%	50.6%	580,415	173,661		28.0%	50.6%	580,415	173,661
Entebbe	Actual	22.6%	46.8%	388,205	9,931		21.2%	48.4%	394,985	9,425		21.4%	56.0%	329,422	0
	Target	16.0%	46.5%	517,269	140,825		16.0%	46.5%	531,633	168,300		16.0%	48.2%	531,633	168,300
Mbale	Actual	9.9%	74.0%	96,889	7,653		9.0%	75.5%	109,745	12,508		9.3%	80.3%	99,371	5,661
	Target	8.5%	68.7%	132,671	94,183		8.5%	71.0%	131,368	108,240		8.5%	71.0%	131,368	108,240
Mbarara	Actual	12.1%	59.6%	219,958	8,303		12.6%	62.0%	194,014	28		13.0%	65.9%	169,426	0
	Target	8.0%	45.8%	394,961	101,649		8.0%	47.6%	405,660	119,312		8.0%	47.6%	405,660	119,312
Masaka	Actual	31.5%	80.0%	78,133	23,452		31.9%	85.0%	63,788	16,499		32.9%	96.5%	27,303	0
	Target	28.0%	81.0%	62,386	61,811		28.0%	83.0%	60,493	72,822		28.0%	83.0%	60,493	72,822
Tororo	Actual	13.1%	117.4%	-19,706	0		13.2%	120.8%	-19,822	0		13.6%	131.4%	-33,399	0
	Target	8.0%	90.9%	20,717	41,989		8.0%	98.9%	9,460	52,137		8.0%	98.9%	9,460	52,137
Soroti	Actual	13.6%	90.6%	12,448	0		14.0%	73.6%	41,069	5,522		14.1%	86.4%	19,239	718
	Target	11.0%	70.2%	59,257	38,705		11.0%	76.1%	52,032	43,386		11.0%	76.1%	52,032	43,386
Arua	Actual	29.5%	102.7%	-1,332	0		28.9%	104.2%	-3,086	0		28.2%	100.7%	-344	0
	Target	16.0%	81.1%	29,231	31,848		16.0%	80.0%	31,862	34,397		16.0%	80.0%	31,862	34,397
Gulu	Actual	23.8%	68.6%	23,202	980		23.7%	68.9%	32,444	453		23.1%	71.7%	25,992	183
	Target	17.0%	52.3%	133,416	47,124		17.0%	56.2%	130,062	57,788		17.0%	56.2%	130,062	57,788



Area	Oct 2013 Performance						Nov 2013 Performance						Dec 2013 Performance			
	NRW	WR	COM (‘000 US\$)	Incentive Earned (‘000 US\$)	NRW	WR	COM (‘000 US\$)	Incentive Earned (‘000 US\$)	NRW	WR	COM (‘000 US\$)	Incentive Earned (‘000 US\$)	NRW	WR	COM (‘000 US\$)	Incentive Earned (‘000 US\$)
Bushenyi	Actual	26.4%	101.7%	2,275	4,146	24.2%	106.3%	6,832	26.0%	120.6%	-5,278	11,888	26.0%	120.6%	-5,278	1,390
	Target	17.0%	95.0%	7,730	28,730	17.0%	98.3%	5,460	17.0%	98.3%	5,460	33,896	17.0%	98.3%	5,460	33,896
Kabale	Actual	11.9%	83.4%	26,217	10,011	12.0%	87.3%	18,483	12.2%	110.9%	-12,234	11,666	12.2%	110.9%	-12,234	0
	Target	10.0%	91.0%	17,870	40,385	10.0%	96.7%	11,201	10.0%	96.7%	11,201	53,200	10.0%	96.7%	11,201	53,200
Lira	Actual	14.3%	74.1%	58,497	3,560	14.6%	74.7%	60,139	14.5%	79.6%	52,084	4,029	14.5%	79.6%	52,084	1,545
	Target	9.0%	67.6%	93,984	53,387	9.0%	69.4%	94,792	9.0%	69.4%	94,792	64,271	9.0%	69.4%	94,792	64,271
Fort Portal	Actual	18.3%	71.7%	42,213	4,769	19.2%	75.4%	38,076	20.8%	81.9%	34,395	5,508	20.8%	81.9%	34,395	2,858
	Target	15.0%	67.5%	61,794	42,652	15.0%	73.1%	55,661	15.0%	73.1%	55,661	54,322	15.0%	73.1%	55,661	54,322
Kasese	Actual	20.1%	56.0%	53,557	3,030	20.2%	58.3%	51,032	21.2%	64.0%	43,407	1,860	21.2%	64.0%	43,407	35
	Target	15.0%	52.7%	67,008	29,386	15.0%	56.1%	66,356	15.0%	56.1%	66,356	36,185	15.0%	56.1%	66,356	36,185
Hoima	Actual	28.4%	110.3%	-12,047	3,017	30.4%	114.6%	-12,778	28.9%	131.5%	-25,772	2,911	28.9%	131.5%	-25,772	0
	Target	22.0%	106.8%	-1,431	35,237	22.0%	109.9%	-4,065	22.0%	109.9%	-4,065	40,643	22.0%	109.9%	-4,065	40,643
Lugazi	Actual	17.7%	127.5%	-14,995	1,201	18.4%	126.1%	-11,651	19.0%	134.7%	-14,801	4,248	19.0%	134.7%	-14,801	1,977
	Target	20.0%	115.2%	-5,719	23,746	20.0%	117.8%	-7,560	20.0%	117.8%	-7,560	27,508	20.0%	117.8%	-7,560	27,508
Masindi	Actual	13.1%	100.1%	-16,909	0	13.3%	104.0%	-20,773	13.2%	110.0%	-22,791	0	13.2%	110.0%	-22,791	0
	Target	10.0%	91.6%	13,509	72,895	10.0%	93.8%	11,917	10.0%	93.8%	11,917	72,347	10.0%	93.8%	11,917	72,347
Mubende	Actual	9.2%	107.9%	-18,246	0	10.2%	112.3%	-16,552	9.9%	115.9%	-17,535	0	9.9%	115.9%	-17,535	0
	Target	8.0%	91.8%	10,568	28,479	8.0%	96.5%	7,195	8.0%	96.5%	7,195	35,005	8.0%	96.5%	7,195	35,005
Iganga	Actual	13.5%	60.0%	32,747	0	15.4%	60.4%	32,927	12.2%	64.8%	29,510	2,473	12.2%	64.8%	29,510	770
	Target	19.0%	46.8%	49,946	23,526	19.0%	56.6%	44,018	19.0%	56.6%	44,018	28,481	19.0%	56.6%	44,018	28,481
Kisoro	Actual	35.5%	111.1%	-24,130	0	35.2%	108.8%	-18,829	35.0%	121.2%	-25,215	3,016	35.0%	121.2%	-25,215	1,572
	Target	28.0%	69.7%	31,371	28,306	28.0%	77.8%	24,296	28.0%	77.8%	24,296	33,785	28.0%	77.8%	24,296	33,785
Mityana	Actual	42.6%	110.6%	-8,762	4,976	44.3%	144.7%	-20,033	43.8%	161.2%	-25,272	3,804	43.8%	161.2%	-25,272	2,011
	Target	25.0%	85.4%	19,557	26,779	25.0%	85.6%	20,532	25.0%	85.6%	34,532	30,541	25.0%	85.6%	34,532	19,448

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Area	Oct 2013 Performance				Nov 2013 Performance				Dec 2013 Performance			
	NRW	WR	COM (‘000 US\$)	Incentive Earned (‘000 US\$)	NRW	WR	COM (‘000 US\$)	Incentive Earned (‘000 US\$)	NRW	WR	COM (‘000 US\$)	Incentive Earned (‘000 US\$)
Nebbi	Actual	33.9%	262.3%	-38,083	310	33.9%	282.1%	687	33.4%	296.5%	-40,075	575
	Target	20.0%	129.2%	-12,611	23,793	20.0%	145.4%	32,557	20.0%	145.4%	-20,789	32,557
Kitgum	Actual	20.2%	201.2%	-27,091	6,328	27.3%	241.5%	5,182	31.8%	436.7%	-64,010	0
	Target	20.0%	120.3%	-12,442	26,636	20.0%	124.9%	32,236	20.0%	124.9%	-16,179	32,236
Pader	Actual	27.9%	485.8%	-14,359	2,394	26.6%	739.3%	1,404	25.1%	761.8%	-26,945	2,361
	Target	15.0%	156.4%	-14,970	13,024	15.0%	164.0%	16,299	15.0%	164.0%	-17,968	16,299
Apac/Aduku	Actual								30.0%	191.9%	-7,161	0
	Target								20.0%	113.1%	-5,650	26,519
Luwero	Actual								16.8%	123.5%	-11,998	0
	Target								13.0%	77.7%	14,430	25,366
Wobulenzi	Actual								14.4%	246.2%	-21,397	0
	Target								10.0%	149.1%	-10,882	18,808
97%												
5,684,563												
253,126												
106.1%												
5,563,070												
143,776												
118.2%												
5,026,269												
21,654												
NRW – Non-revenue water, WR – Working Ratio, COM – Cash Operating Margin, US\$ – Uganda Shillings												
Performance in a particular month represents the cumulative average performance from July 2013 to that particular month.												



October 2013 Performance

Non-revenue Water (NRW):

The October 2013 performance indicates that only Lugazi and Iganga Areas achieved their NRW target. All other areas fell short of their targets.

Working Ratio (WR):

The following Areas achieved their working ratio targets; **Kampala, Masaka and Kabale**. The rest of the Areas were unable to achieve their Working ratio targets.

Cash Operating Margin (COM):

With regard to cash operating margin, all areas were unable to achieve their cash operating margin targets with exception of the following Areas; **Masaka, Kabale and Pader**.

Incentives Earned:

With the exception of **Tororo, Soroti, Arua, Masindi, Mubende, Iganga and Kisoro**, the rest of the Areas earned incentives in the month of October 2013.

November 2013 Performance

Non-revenue Water (NRW):

During the month of November 2013, most of the Areas did not meet their NRW targets except **Lugazi and Iganga**.

Working Ratio (WR):

With the exception of Soroti Area that managed to achieve its working ratio target during the month all other Areas failed to achieve their targets during the month.

Cash Operating Margin (COM):

All Areas failed to achieve their COM target in the month of November 2013 with exception of **Masaka, Bushenyi and Kabale**.

Incentives Earned:

all other areas managed to earn incentives during the month of November 2013 except **Tororo, Arua, Masindi, and Mubende**.

December 2013 Performance

Non-revenue Water (NRW):

The performance for December 2013 indicates that only **Lugazi and Iganga** achieved their NRW target. All other Areas fell short of their targets.

Working Ratio (WR):

All other Areas failed to achieve their targets during the month.

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Cash Operating Margin (COM):

All Areas did not achieve their targets during the month of December as a result of costs relating to salary adjustment.

Incentives Earned:

With the exception of **Mbale, Soroti, Gulu, Bushenyi, Lira, Fortportal, Kasese, Lugazi, Iganga, Kisoro, Mityana, Nebbi and Pader** that managed to earn incentives, the rest of the Areas were unable to earn an incentive in December 2013.

Overall Performance

Non-revenue Water (NRW):

Only **Lugazi and Iganga** Areas managed to achieve NRW target throughout the period. The rest were unable to meet their targets throughout the period.

Working Ratio (WR):

Most of the Areas recorded a decline in their working Ratio over the period due to increased operating costs. Only Kampala, Masaka and **Kabale achieved their targets once during the month of October 2013 and Soroti during the month of November 2013** the rest never achieved their targets during the quarter.

Cash Operating Margin (COM):

The COM declined during the quarter, i.e. from 5.6bn in October 2013 to 5bn in December 2013 reflecting the period when salary adjustments took place. [The Areas of Masaka and Kabale managed to achieve their target for COM consecutively in the months of October and November and during December, none of the Areas achieved their targets, however more effort should be put in reducing Arrears, improving collection efficiency and minimising expenditure.

Incentives Earned:

The total incentives earned by the Areas progressively declined during the quarter. i.e. from 253m in October 2013 to 21m in December 2013. The Areas of Tororo, Arua, Masindi and Mubende did not earn any incentive throughout the quarter due to failure to achieve Minimum Standards for some performance indicators particularly COM. For the period October – December 2013, a total of **US\$ 418.5 Million** was transferred to Areas as incentives.

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Pictorial # 3: NWSC @ AfWA Congress (Abidjan, Ivory Coast)



Ground Breaking Ceremony (Gaba Water Works Refurbishment)



Pictorial # 4: NWSC Opens New Customer Call Centre



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Pictorial #5: NWSC-CSR at Bakateyamba Home



Kampala Water (KW) Launches **WACOCO Clubs and Wetstorm II**

Kampala Water launched the Water Community and Community (WACOCO) Clubs and Wetstorm II initiatives. The primary objective is to increase dialogue between KW and the water communities they serve, especially through zonal political and informal leadership.



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ANGER MANAGEMENT

by Juliet K Namuyimbwa

During a commercial break of some American conference, a chief executive officer (CEO) asked each of his staff to draw a work colleague's photo they detested the most.

As the drawing exercise went on, everyone was glad to release the 'beef' they had held for so long at work on paper. Each person presented their piece of art during the convention, and since there was no name labeling on the work, they expressed themselves liberally.

The agenda of the day ended, then came the time to attend on the art exercise. The CEO wanted all his staff to overcome bitterness against each other, and so in this bid, all the pictures were pinned up on a soft board, and every attendant was given a good number of darts.

The charts were flipped each at a time and everyone had to throw as many darts as they wanted on a picture displayed at a time. The room was filled with so much excitement as the session went on. Pictures of supervisors, co-workers, nagging security personnel were recognized.

Guess who came last, the CEO! Someone had drawn up him as their detested person!

The room went silent as everyone awaited the reaction from the CEO. He neither frowned nor even strained to see who is throwing their darts. He remained regular. He meant it to be a genuine hearty exertion so it had to remain so.

At first, many darts came in and now silence prevailed.

So the M.D now had to remove all the charts and under them was a picture of a man that no individual had drawn. The man wore a crown of thorns on his head, and tears were dripping from His eyes. It was JESUS! He had attained holes all over his face and white cloak. He had bore the pain of every dart that came by. Everyone went speechless, the room grew cold! The picture looked so real and touching. Little sobs were heard sweeping across the room. No words were said after. Everyone left the room vehemently penitent that day.

Every time we hurt someone, regardless of whether we know them or not, we practically wound Jesus!

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Occupational Health and Safety (OHS)

by Julius Oyet

Occupational health and safety (OHS) is about ensuring a safe and healthy working conditions, preventing illness, disease and injury in the workplace. Occupational Health and Safety is a major responsibility for all the workers. The possibility of serious injury and even death as a result of workplace accidents can not be overlooked. Under the Law, providing and maintaining a safe working environment should be a priority. This safety responsibility is very important as any other role or function that management may be required to fulfil.

OHS Legislation

Occupational Health and Safety Act develops a framework that both the employer and employee can use to reach a workable solution.

Key Elements of the Legislation

- Protection of every worker.
- Duties of care not to endanger the health and safety of all staff and others and to resolve OHS issues in a timely manner.
- Consultation with the workers

Safety Policy Statement

It is a written statement by management stating the corporation commitment for the protection of health and safety of employees and the general public.

Reasons for Health and Safety programs or policies

- To clearly demonstrate management's full commitment to their employee's health and safety.
- To clearly state the company's belief, principle, objectives, strategies and process to build through all levels of the company.

- To clearly outline the employer and employee accountability and responsibility for workplace health and safety.
- To comply with the occupational health and safety Act.
- To set out work practices and procedures to be followed to prevent workplace injuries, diseases and illnesses.
- Safety performances and business performances are compatible.

Essential OHS Policy Areas

- Hazardous substances
- Training and OHS information
- Manual handling
- Emergency evacuation
- Accident, injury and disease reporting
- First Aid

Codes of practice

These are practical documents that assist in implementing safe work procedures. They may also be used in courts as evidence of an employer's failure to implement their duty of care.

Internal Responsibility System

The goal of internal responsibility system is to have all employees working together to identify and control situations (hazards) that could cause harm. It's ultimate objective is to ensure everyone integrates health and safety into their work. Due diligence means that everyone with the responsibility for health and safety must"...



take every precaution reasonable in the circumstances to avoid work related injury or illness or accidents.

Duty of Care

- A duty of care principle for all employers to ensure the health, safety and welfare of employees and others in the workplace.
- An obligation for employers to establish that all reasonably practicable measures have been taken to control risks against all possible injuries arising from a workplace activity.
- People in control of workplaces used by non-employees must ensure the health and safety of people who use these premises as a place of work.
- The "Duty of Care" applies to all people in the workplace, including visitors, contractors and students.
- A general obligation on the manufacturers and suppliers of plant and substances to ensure that their products are not a risk to health and safety when properly used, and to provide information on the correct use and potential hazards associated with the use of the products.

General Responsibility for the Employer or Management

- To ensure the health and safety of the workers and other workers present at the workplace.
- Establish OHS policies and program.
- Provide specific direction and delegate authority to those responsible for health and safety.
- Consult and cooperate with individuals carrying out OHS duties.
- Providing workers with information, instruction, training and supervision necessary to protect their health and safety.
- Provide supervisors with the support and training necessary to carry out their health and safety responsibilities.
- Provide and maintain personal protective equipment, devices, that are used rightly and always.
- Make a copy of worker's Compensation Act and OHS regulations readily available for review.

Objectives

- To minimize on occupational accidents, illness and diseases.
- To promote good health of the workers at the workplace.
- To promote good working conditions
- To promote construction of safe and health workplaces.
- To promote awareness of OHS among workers, management and the public through trainings.

Hazards

A hazard is something (situation) that has potential to cause harm.

Risk

A risk is the likelihood of the potential hazard being released and causing damage or injury i.e. liquids, gases, fumes, vapours, dust, solids, fibres, naked electric cables etc.

Hazard Management Plans

As part of management program, it is necessary to develop an implementation plan for conducting regular hazard identification and assessment (inspections).

Looking out for unsafe work practices

- Dealing with hazardous substances
- Storage and maintenance of equipment
- Emergency plans and emergency procedures

Material Safety Data Sheets

Material Safety Data sheets are information sheets written and supplied by manufacturers or suppliers of chemical substances or products. The purpose of MSDS is to provide the user with information on:

- Substance's proper use
- Health effects
- Precautions for use
- Safe handling techniques
- Emergency procedures
- Other relevant information to help in the health and safety of the substances/products.

Emergency Procedures

There are many types of emergencies that occur during the work. Management is responsible for ensuring that when an emergency occurs, procedures are in place



to deal with the situation on the ground. An emergency is an unplanned critical event that could cause illness, death and property damage. A good OHS management system includes contingency plans for emergency situation i.e. fire, bomb, medical casualties, chemical spills/leaks.

Fire Prevention and Control

An organization should have fire prevention and control measures in place for all departments /branches or areas, plus an evacuation procedures. Even with the best control measure in place, fire may occur. So every section/department, branch or area must have;

- Emergency evacuation procedures in place
- Procedures in place for reporting
- Make sure all staff know how to operate the fire extinguishers
- Fire extinguishers recharged after it has been used.

Provide OHS information and Training

Under OHS Legislation, management are required to

provide training, instructions, information and supervision to all employees. All from management perspective, training is essential if OHS program is to be broad and overall costs reduced.

Key Areas of Training

- New employees safety induction program
- Workplace committee training
- First Aid
- Fire fighting
- Safe work procedures

First Aid facilities

- Provision of first aid facilities at the workplaces
- Volunteers to be trained as first aiders

Fire Extinguishers

Every workplace should be provided with well mounted and fully serviced fire extinguishers.

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