Safety Training Workshop Monday July 10th 2017 Sao Paulo, Brazil

Invited Speakers

Encouraging and organising to be a Host Company Dr. Paul Baekelmans, SOLVAY

Solvay recently hosted 2 STP trainees at their facility in the UK and Belgium. Solvay has a commitment to the ICCA/RC (International Council of Chemical Associations/Responsible Care) Global Charter, to improve EHS (Environmental, Health, and Science) performance. Solvay is represented on the Board of ICCA and is working to improve safety globally. The presentation covered some trips for companies interested in hosting a Safety Training Fellows. Host companies must do some preparation in advance with logistics and planning of the schedule. There is no strict formula; the company can arrange the agenda based on their in-house expertise and safety training system. The training was two-weeks and covered two facilities (Brussels Campus and GBU Peroxides in UK). Following the training, the trainees prepared a report about their experience as well as their commitment for follow-up at home. (This will be posted on the IUPAC website). The feedback was extremely positive, a few minor learning experiences were noted. Preparation of visas was a rate limiting step. Solvay found the experience very worthwhile, but since it does take time and energy from the host company, they are more interested in hosting 5-7 trainees at one time. That will be more efficient for Solvay. It also enhances the experience of the students. The challenge for IUPAC is to find the funding to get the trainee to the training site. We do this via an IUPAC project or CRDF funding, in some cases. IUPAC continues to seek out host companies that are willing to bring 1 or more trainees to their location.

The Latin American Regional Approach to STP Prof. Fabian Benzo, Universidad de la República, Uruguay

Professor Benzo presented the concept of a Latin American workshop in Spanish at the STP Workshop in 2015 in Korea. He recognized that most trainees came from Africa and wanted a program that focused on the culture and reality of Latin America. The concept was realized with the training of 4 students at la Republica in Uruguay. The objectives included the training of professionals with chemical knowledge in EH&S area, improve the management of chemical products in LA to reduce possibility of injury and incidents, and strengthen ties from IUPAC in the region. It was sponsored by IUPAC and UNITAR and University and there were no costs for candidates. There were 8 training modules that covered a range of EHS topics (GHS, Emergencies, Security, culture, chemical products, occupational safety, etc.). There were also activities to engage the participants, including visits to labs for risk assessment and participant in a drill. The training also included a visit to AkzoNobel plant nearby. The training materials came from a variety of sources and were provided in printed and electronic format. They received a 44 applications from 10 countries and selected 5 (one trainee became ill and was not able to attend). The trainees came from Venezuela, Costa Rica, Columbia, and Argentina. Each trainee developed a specific application project to apply the training to. Follow-up that already occurred: purchase of new equipment and fume hoods (Argentina), workshops as part of Responsible Care program (Columbia). Training on chemical safety aspects for the Ministry of Health in Costa Rica. (Improvements in Venezuela will be reported later in the program. The feedback was very positive from the trainees and also the trainers. They felt that the material that was appropriate and the logistics worked well. INTAR also evaluated the program and is very happy with the experience. A few improvement opportunities were identified. For the future, the maximum number of trainees will be 5. A video of the training experience was shown. There continues to be a need for safety training in Latin America. The STP-LA will be offered every two years and they would like to have trainees from more fellows. The funding of the future programs needs to be discussed with IUPAC and others. AkzoNobel is willing to host a day of training in the future.

The Need for Academic Institutional Safety Dr. Robert J. Audette, Canada

Academic laboratory safety is still a problem even if the focus on safety in academia labs has been increased. The perspective from a Canadian university is shared here based on experience at York University. All students have to take a series of 3-hour training courses if they will do any lab work, and extra training as needed for gas cylinders and biological materials. There is also lab-specific training, including radiation safety training. There is a faculty safety officer that provides training for solvents. The faculty member/PI (Principal Investigator) also have to take the same training along with a full

course from OSH (Occupational Health and Safety agency) and accident investigation, reporting incidents, workplace violence and harassment (keep a culture where everyone feels safe). OHS performance a safety audit of all PI labs once a year; some PI have excellent guidelines for safety, and some have none. Many designate a senior lab member to take the lead. The difficulty is buy-in from the staff and especially the students. Things may start fine but become lax over the course of the semester. As people become more experienced, they learn safety is more important, but students take short-cuts. Keeping high awareness and following the letter of the law as well as the spirit of the rules is important. Collection of good data for a thesis requires good safety practices. Many of the graduates go into industry but don't have the right culture yet, so the training has to be done by industry. In some cases, if the students find the safety rules in 1 lab too cumbersome, they go to another lab to do the work, and they don't learn the important lesson. Housekeeping is also an issue since poor housekeeping can result in injury or infection if biological materials are involved. The responsiveness of the faculty can also be an issue. A negative example was shared: a student at a major university reported an unknown white powder in the lab and was ignored by faculty and department. The students escalated the issue, and it was found to be asbestos. Government agencies got involved to resolve the situation and remove the asbestos properly. By contrast, a positive example from the same region: ISO/IEC 17025 has been implemented at a lab at York University, including a detailed lab safety manual. All students must sign off that they have read and understood the manual and will adhere to it. They also focus on maintaining the safety culture and awareness and constant attention to the EH&S requirements. The result is less injury, infection, incidents and better data. These students are better trained for their industrial careers. Students from this lab that have moved to industry return to the department to acknowledge the good safety training they received at the university.

SAVE A LIFE

Ms. Cris Pianelli, Dow Chemical Company, Brazil

This presentation focused on a specific industrial program on sustainability and Save a Life program. Sustainability is about safety, nature, people, and society - and solutions that protect us along life's journey. Dow Chemical created 2025 Sustainability Goals that have 7 elements and multiple programs to redefine the role of business in society. There is a continuous focus on these with metrics and tracking. Elements of the program include technology, innovation, safe use of chemicals, people, nature, expertise, etc. - all to support the Human Element. Dow has a vision of zero: no injuries, no incidents, and no impact on environment on community. We have to be the shield and raise our shield daily. There is a pyramid for safety, and we have to focus on reducing the base. Recognizing and reducing p-life (potential life-changing accidents) will have an impact on making the entire pyramid smaller (including actual injuries and fatalities). Dow is investigating the p-life incidents that occur to identify and address the root causes. We have to think about 'almost' - what a difference it can make to recognize the hazard and address it so that no accident takes place. Almost 4500 workers lose their life every year on the job globally-how many unreported accidents took place? What if we had addressed those - could we have saved some of these lives? It's about looking out for each other, taking care of our friends and family, and the most important things in our life - not just our own success and money. Life's journey is short - and we need to raise our shields to preserve it.

Chemical Safety and Security in Kenya Dr. Austin Aluoch, Kenya Chemical Society, Kenya

Security has been an issue in Kenya, including attacks at a university and other public locations. Therefore, the Kenya Chemical Society is very focused on chemical security and has been extremely active in driving improvements. They partner with OPCW (Organization for the Prohibition of Chemical Weapons), US State Department, Responsible Care @Africa task force. OPCW provides several programs and trainings that have a positive impact and have been held in several locations. The US State Department program on Chemical Security provided grants to improve security and improve knowledge and skills. There have been several workshops on security, chemicals, waste and safety; attended by both academia and industry. Also workshop on the supply chain and security in distribution. A Workshop on chemical inventory management system, based on a program from Sandia National labs, trains participants on how to manage their inventory of chemicals. They also provided training for Somali scientists since they have a common border. Outreach to informal chemical sector is key since people have no training and don't understand any of the hazards (informal businesses may include mixing paints, working with chemicals – but they may mix paint with bare hands, may use the buckets for water containers but not fully cleaned), so training was impactful. A technical security solution was to set up biometrics for access control at his institution along with CCTV, modern fume hood, refrigerator/freezer for chemical storage. Developed an emergency response plan and trained first responders, evaluated legal framework for gaps in legislation, and will

do a project on falsified medicines. Takes efforts to drive change through the government but has made progress. Also set up infrastructure and organizations to sustain gains and drive improvements. Developed program for KCS for chemists and technicians and technologists (T/T not recognized as professionals). BASF and SASOL have led the Responsible Care effort, with KCS supporting the Kenya Association of Manufacturers (KAM, the lead organization). Future plans include creating a database of reputable chemical suppliers in Kenya and outreach at high school level and curriculum development. Best practices include: Government support (policy and legislation), raising awareness, and capacity building and continuous training. While they have made significant improvements, there are still many opportunities to drive improvements in both security and safety.

Fellows Accomplishments and Feedback

Ms. Christine Ashaolu, Chief Regulatory Officer, NAFDAC, Nigeria.

A STP Fellow was trained at National Silicates, Canada. Nigeria has a lot of industry (chemical, oil and gas food and beverage, and building chemicals/materials). They import a lot and need to have permits and control. She works for NAFDAC (National agency for Food and Drug Admin and Control) in charge of food, drug, packaged water, cosmetics, medical devices and chemicals. National Silicates is committed to responsible Care and HSE. She was able to visit 8 other companies and agencies. Noticed immediately that safety has preference in all company meetings and activities. Risk analysis, incident reporting, emergency response plans, and chemical management were clear priorities. Noted safe practice in chemical storage, disposal, and handling. What does she take back to Nigeria? Share training with her leadership and colleagues, and a lot of public outreach. Media and brochures created for public. Working with chemical industry is more challenging but a commitment. Has monthly training for colleagues. Spoke at compulsory development program on Entrepreneurship in chemistry, national center disease control (NCDC) and OPCW workshops. She is able to make the topic relevant to each audience. Each time, she generates contacts that ask questions. Speaking to the NCDC resulted in creation of a chemical events group. Appearances on television creates a lot of awareness and reaches a large audience. She received an award and a promotion for this achievement. For industry, has improved knowledge of SDS, risk analysis, documentation and reporting, and staff welfare. Next steps: encourage more PPE and on-spot detecting devices (funding is an issue), documentation, and outreach to secondary schools.

The big multinational have good programs internally but no funds to help. Their biggest safety issue: disposal of expired chemicals. Many users don't understand safety data sheets, what they contain, or how they are used. She's focusing more on awareness to drive change, especially with her television interviews and radio broadcasts. She does get many calls and questions from users that want to do better. She does talk with Jonathan Babalola (STP Fellow), who focuses more on academia outreach. COCI likes to ask Fellows how many people they impacted with their work; with this television outreach, she estimates 5 million people!

Dr. G.S. Grover, India

Dr. Grover was unable to attend in person, so Dr. Saha made the presentation. Dr. Grover continues to be very active with outreach following his training in 2008. This is his 6th update to IUPAC. He has moved from National Chemical Laboratory in Pune and joined IISER (Indian Institute of Science and Engineering Research). He always reinforces the 'safety first' concept. His outreach includes providing lab safety orientation seminars at universities, researchers in institutions, college teachers, and symposia and conferences. He reaches very large audiences. Dr. Grover also conducts lab safety audits to identify unsafe conditions, provides accident investigations, and writes popular articles. Has also provided training at Nagarjuna Agrichemi Limited Company, including fire safety. He also organized a symposium at BITS Pilani Goa with very positive feedback; He suggested that every symposium should have safety as a topic. He challenges IUPAC to include at least 1 presentation on safety at every IUPAC-sponsored conference. Contacted additional 500 students and researchers in biennium and published articles.

Dr. Daniela María Hernández, Universidad de Zulia (Venezuela)

Dr. Hernández was trained at STP-LA in October 2016. She found the training to be well organized with experienced instructors. Many topics were covered, including chemical hazards, GHS, risk assessment, first aid, and simulations. All participants are now promoting safety culture in their country. Her objectives: develop training chemical safety, improve occupations heal and safety in students, faculty, researchers within laboratory. Increase their response to emergencies and incidents. There are complicated economic and social realities in Venezuela. Need to focus on prevention not

just response to incidents, as well as promote responsible, qualified professionals. She has successfully added basics safety to the chemistry bachelor curricular program, adding new units for health and safety, and the courses hanged from optional to obligatory. Her efforts have expanded older outdated system from Health/Safety to EHS (including environmental), sustainable processes, and integrate management of hazardous substances. She also added compliance topics such as GHS (globally harmonized system) and created education program on prevention of risks in handling of chemical products, offering it to home university, universities in area, and industrial chemists in the area. Her second objective, simulation and accident prevention/response, in partnership with the fire department at the university. Dr. Hernandez led a class-room activity to create a mind-map for EHS and Quality. Her third objective relates to the storage of chemicals and waste management and is in progress. Her participation in the STP-LA 10 months ago resulted in specific improvements at home institution and she's expanding her reach. Having an integrated team with clear leader and focus created the success in spite of several difficulties. She emphasizes that things must be done right, not just done.