Country Updates & Activities summary
INDIA situation

Presentation by
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CSIR-National Chemical Laboratory, Pune, INDIA
at
STP Seminar & Workshop
48th General Assembly of IUPAC,
Busan, Korea
10th August 2015

Established in 1950 in Pune, INDIA

CSIR - NCL

The purpose of this laboratory is to advance knowledge and to apply chemical science for the good of the people

N.C.L.,Pune

- The purpose of this laboratory is to advance knowledge and to apply chemical science for the good of the people
- Excellent infrastructure for R & D in chemical and bio- sciences.
- ~170 staff (almost all PhD's), ~500 PhD students & ~ 550 PA's, ~ 100 trainees.
- Publish ~ 400 papers & file the largest number of patents, both in India and USA (~75)
- Produce the largest number of Ph.Ds (~100) in Chemical & Life sciences in India

Novozymes A/s

- 2 weeks STP at Novozymes A/s, Denmark in June 2008
- An enzyme production facility along with related R & D activities,
- The main focus of OH&S systems and protocols is prevention of enzyme exposure (dermal or inhalation) that may lead to allergy

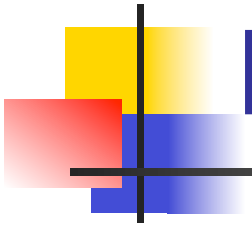
NdES (Nadia El-Salanti); TDA (Ture Damhus); AMNi (Anne Mette Nissen Lykke)

Learning's at NZ: Highlights

- Exposure included a wide variety of topics
- Risk assessment is the fundamental pillar of any safe operation in a production facility or research environment and is very effectively implemented at Novozymes
- Accident reporting and investigations
- Preparation & use of MSDS
- Crisis & disaster management
- Environmental services

STP Mandate

- To undertake safety awareness programmes and to improve safety, health and environment in India.



Progress update

- 2008: STP at Novozymes, Denmark
- 2009 : GA in Glasgow
- 2011: Puerto Rico (x)
- 2013: GA in Istanbul
- 2015: GA in Busan, Korea

Focus

- Lab safety awareness with an aim to let students and others who use or handle chemicals understand basics of chemicals in use
  - Chemistry lab
  - Domestic
- their hazards & risks involved
- and link it to handling these safety.
- SOPs
- Examples of lab incidents, videos clips
- How they can be useful to the society.

Applications of STP -at NCL, Pune

- Safety orientation course for new entrants to NCL (New staff, JRFs, SRFs, PAs and Trainees)
- Methodology
- Up gradation of infrastructure and facilities

Methodology

- On a personal level, convince them that safety in a lab is important
- Motivate them to understand the chemistry behind every experiment and procedure adopted.
- Risk assessment
- Devise systems, techniques and procedure (basically SOP)

Topics taken up during course work

- MSDS and related
- Risk assessment
- Systems, procedures and techniques
- Handling, storage & disposal of chemicals
- Emergency Procedures:
- Electrical & machine safety
- Ergonomics
- Case studies
- Video clips
- Disaster Prevention (for strategic institutes)

Other measures

- Introduced solvent storage cans & cabinets facilities
- Up gradation in infrastructure and facilities
- Appropriate solvent storage facilities in labs at a cost of USD ~250K
- Create and standardize toxic and hazardous waste disposal systems.
- Fire safety audit & Emergency evacuation plans & response teams
- Mock drills .
- Risk assessment

Applications of STP -outside of the institute

- initiative to move out to non urban & rural areas in the state of Maharashtra (western India).
- conduct safety awareness camps for undergraduate and postgraduate students.
- have visited 6 rural areas
- More than 800 students and teachers have been a part of the camps.

Eye opening experience

- to see their excitement in learning about chemicals, understanding the hazards and
- by the application of simple methods of safety compliance,
- the subject of chemistry itself appears to be simple and fun.
- Many a misconceptions and wrong prejudices have been expelled during these interactions.

Other institutes..

- Chem. Dept Pune Univ.
- Modern College
- SP College
- Pharma R & D centres
  - Advinus, Lupin, TCG, Emcure
- UG colleges in interior Maharashtra
  - Barshi, Omerga, Naldurg

Numbers (last 2 years)

- One orientation course per month in NCL
- 8 invited seminars in university, colleges, rural areas and pharma co.
- More than 1000 touched
- Total 32 modules in > 60 hours

Outcomes:

Response and awareness created

- Better infrastructure and facilities created
- Quality improvement in compliance to safety norms
- Within NCL, the frequency of incidents has reduced drastically,
- The response is quick and practical thereby the damage is minimal
- Personal injuries are minimal
- Outside NCL… by number of invitations received !!!
- National institutes
  - National Safety Council (nationwide agency and participation)
  - Strategic institutes CME, INS,
  - NDRF.. to train their battalion
  - Colleges

Outcomes

- Have succeeded in implementing few systems and practices in home institute.
- The rapport within NCL other institutes has broadened the horizon and visibility & also provided some respectability (!)

- The reference of "Mandate from IUPAC" matters (!).

Concerns & major challenges

- Safety awareness in schools / colleges
  - Injuries & discomfort taken for granted (spillage, gas smell)
- poor infrastructure,
- Proper application of chemical safety guidelines / regulations.
  - Inadequate reference to MSDS and SOP's
  - Inadequate use of PPE
- Overcrowding of labs
- one of the reasons financial crunch to implement

Non compliance

- Despite our best and well-meaning efforts to ensure compliance with basic safety norms, it does not seem to work- the way it should.
- Reasons
  - Do not seem to think safety is important (not all but many)
  - They think it is a western obsession and does not apply to India, which is shocking !!
  - We have so far followed an approach of persuasion and an informal understanding (at our level) not to impose fines or take any punitive measures against offenders.
  - Need to shift gears some day
- Unless this changes, it will be hard to go far.

Way out

- Investment in Safety
- Need low cost solutions
- Commitment from top (yesterday there was a mention that all corporate meetings begin data on Ax etc and caution that this need not happen again)
- Continued hammering on safety compliance and its benefits
- Satisfied - even if the success rate is < 15%

Path forward>>>Things to do

- Strengthen local systems & solutions.
- Regulate procedures & documentation.
- Introduce controls and approvals.
- Standardize toxic and hazardous wastes disposal.
- Emergency response team
- Evacuation procedures and drills

- Out of the box approach

Path forward

- Despite limitations, safety awareness drives must continue
- Explore setting up regional training in project mode.

Acknowledgement

- Dr. Mark Cesa, Dr. Bernard West,
- Other memebers of COCI
- IUPAC –UNESCO-UNIDO; CRDF, ...
  - Financial support
  - Opportunity to associate name with IUPAC
- Novozymes A/s
  - Gracious hospitality & training
  - (Nadia El-Salanti, Anne Mette Nissen Lykke & Ture Damhus)
  - Dr. S. Sivaram & Dr. Sourav Pal
- Students in NCL and elsewhere who have given respect and visibility

Thanks for your kind attention.

Regional training centre for INDIA

Early thoughts for discussions

@

STP workshop, Busan

Dr G S Grover

Safety awareness

- Low levels of awareness in schools / colleges
- poor infrastructure,
- Application of chemical safety guidelines / regulations.
  - Inadequate reference to MSDS and SOP's
  - Inadequate use of PPE
- Overcrowding of labs
- one of the reasons financial crunch to implement
- But then, where are the trainers?

Safety awareness

- Several options to continue
  - Identify new trainers and train them
  - Continue safety orientation programmes in colleges and universities on invitation
    - Not sustainable
  - Add value to methodology
  - IUPAC backed project
  - Reach out

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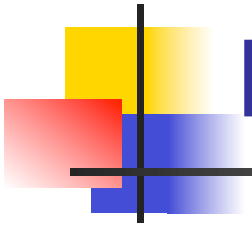
Reach out

- Safety awareness is low in society
- But can be brought about
- Cost for infrastructure improvements are high
- Need low cost solutions in India
- Use of technology can help

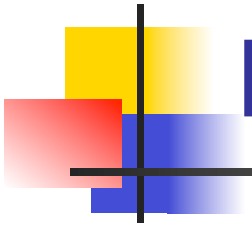
Prelim project activity

- Carry on a survey about the gaps and needs
- Send out a questionnaire
- Based on responses, create web based training materials or coursework
- To deliver benefits for the consumer at the lowest part of the ladder
- Scout for additional external funding in India and abroad



Modules

- Safety awareness and training:
  - To focus on teaching institutions
  - Mostly at undergraduate level
  - Provide low cost solutions
    - i_e_s
    - App__ach



Modules

- Safety awareness and training:
  - To focus on teaching institutions
  - Mostly at undergraduate level
  - Provide low cost solutions
    - ideas
    - Approach

Mission

- To deliver chemistry education with safety to undergraduate level and lowest cost
- To connect and interact to deliver safe environment
- We may then expand and look overseas for a true regional centre
  - Bhutan, Nepal, Sri Lanka, Myanmar,……,…

Requirements for a project activity

- Need an identity, name and address
- IUPAC may support initial project costs
- Seed funding _ a kind of start up grant
- NCL / Venture centre to give space, address at a cost / share
- Explore others
- Total Costs ?

Thanks for your attention

당신의 attention 주셔서 감사합니다