IUPAC-UNESCO-UNIDO Safety Training Program
Workshop and Poster Session
IUPAC General Assembly and Congress
Ottawa, Ontario, Canada
13 August 2003

13:00 – 16:00 **Workshop**
Brunswick Room, Westin Hotel

13:00 Introductory Remarks
Dr. A. Nelson Wright, Chairman, IUPAC Committee on Chemistry and Industry
Dr. Alexandre Pokrovsky, UNESCO

13:15 Overview of the IUPAC-UNESCO-UNIDO Safety Training Program
Dr. Mark C. Cesa, Coordinator, Safety Training Program

Reports from Safety Training Program Fellows

13:45 Ms. Esma Toprak
Bogazici University, Istanbul, Turkey

14:15 Mr. Kelvin Khisa
UNIDO National Cleaner Production Centre, Nairobi, Kenya

14:45 Mr. Tersoo Charles Gwaza
Shell Petrochemical Development Company, Port Harcourt, Nigeria

15:15 Discussion
Status and Possible Improvements of the Program

16:00 Adjourn

16:30–18:00 **Poster session**
Ottawa Congress Centre, Congress Halls C-D-G-H

Financial Support from UNESCO and the IUPAC Committee on Chemistry and Industry is gratefully acknowledged.

Purpose of the Safety Training Program

Reinforce concept of corporate responsibility and accountability in the industrially developing world.

Narrow gaps between developed and developing countries in safety education, research and implementation of technical measures.

Promote interactions to disseminate state-of-the-art knowledge on safety and environmental protection in chemical production.

Allow experts from developing countries to learn about safety and environmental protective measures by visiting and working in plants of IUPAC Company Associates in the industrialized world.

Topics Covered in Training Program

Process Safety Management (PSM)
Environmental Protection
HAZOP/HAZAN Analysis
Legislative Measures and Interactions Between Industry, Universities, Government, and the Public
Emergency Planning and Model Studies
Responsible Care and its Relevance to Developing Countries
Integrated Approach for Safety, Health, and Environment (SHE) At Unit and Company Levels
Training of University Teaching Staff in SHE
ISO 9000 and 14000 Series
Material Safety Data Sheets (MSDS)

Criteria for Selection of Trainees

Professional scientists and engineers who are currently:

Involved at a supervisory or managerial level in chemical companies, governmental or scientific institutions, or universities;

Engaged in aspects of safety and environmental protection in chemical, pharmaceutical, or biotechnological production or in the teaching of these fields;

Influential in the safety practices in their places of employment and elsewhere within their home country.

Responsibilities of Trainees

Utilize learnings within their place of employment

Disseminate knowledge gained in the program throughout home country

Establish new programs to improve safety practices within home country.

File report with IUPAC, UNESCO, and UNIDO

Evaluation of training - host company, content of program, usefulness

Activities to be undertaken to apply training after return home

Benefits to Host Companies

Information exchange between trainee and employees

Interactions beyond safety training - select trainee with similar
research interests or potential for future collaboration

Publicity - demonstrate leadership in health, safety and environment
Shareholders
Public relations
Internal - increasing employee awareness and commitment to safety
Publications in news media, Internet, company publications

Host Companies: BP Chemicals (USA), Bristol-Myers Squibb (USA),
Sasol (South Africa), Sankyo (Japan)

Trainees to Date

Ms. Esma Toprak - Director of Chemical Engineering Laboratories,
Bogazici University, Istanbul, Turkey
Trained at BP Amoco Chemicals Research Laboratory and
Petrochemical Plant, Chicago, IL and Green Lake, TX

Mr. Tersoo Charles Gwaza - Shell Petrochemical Development
Company, Port Harcourt, Nigeria
Trained at Sasol, South Africa

Mr. Kelvin Khisa - UNIDO National Cleaner Production Centre,
Nairobi, Kenya
Trained at Sankyo, Japan

Trainees in 2000

Prof. Ali A. El-Emam - Dean of Faculty of Pharmacy,
University of Mansoura, Egypt

Trained at Bristol-Myers Squibb Corp. Laboratories and Production Facilities in New Jersey, USA

Focus of Training - Safe handling of laboratory chemicals, medical surveillance of employees, crisis management

Applications of Training - Establishment of nationwide safety programs via Egyptian Ministry of Environmental Affairs (with UNESCO funding)

Trainees in 2002

Mr. Zhang GuoHong,
Sinopec, China

Trained at BP Chemicals, USA
Focus: Occupational Health and Safety
Applications: Numerous magazine articles on industrial safety; HAZOP audits and analysis; incident investigations and root cause analysis

演习现场设置的临时指挥部、指挥人员配戴明显指挥标志

石化企业的综合

石化行业具有高温高压、易燃易爆、有毒有害及生产连续化等特点，一旦发生火灾，如果得不到及时扑灭或有效控制，后果不堪设想。扑灭或有效控制储罐、装置的大火，必须搞好平时的消防综合演习。通过演习，达到检查灭火方案是否科学，消防队员素质是否合格、消防设备设施是否完善、指挥系统是否畅通、各部门能否各尽其职等的目的。

视演习为实战。目前我国石化行业还没有条件建立起像BP、PREMCOR等大型石油企业那样的具有模拟石化行业特点的消防演习基地，即向演习基地里的塔、容器、管道里注上油、气等介质，制造出真实的火灾场景，让消防人员或义务消防人员在扑救中提高灭火的实战能力和锻炼临战心理。一般企业在进行消防演习时，先假设某个罐，设备着火，然后根据火场上可能出现的各种复杂情况制定灭火预案，进行演习。由于临战氛围不强，参演人员紧张程度不够，动作随意，甚至嘻嘻哈哈，达不到演习目的。因此必须要求参演人员高度重视消防演习，视演习为实战，严格按照实战要求完成所有程序。

一旦油罐着火，根本扑灭不了吗？扑灭油罐大火，确实有相当大的难度，液化气罐着火后，由于压力、物料未卸完，不仅不能立即灭火，还要等它烧完，否则会引起严重爆炸事故；原油罐一旦着火，极易产生"突沸"现象，给灭火人员带来极大的生命危险。但是，这并不意味只要油罐着火，就只能消极等待。1993年金陵石化公司1万立方米汽油罐首顶着火，大火虽烧了十多小时，但仍被扑灭，最后只损失了几十吨油。2001年泰国菜石油公司两台3万立方米汽油罐着火，最后也被扑灭；1991年科威特油井大火最后都被一一扑灭。由此可见，一般油罐着火，只要有足够的灭火设备、充足的水源和泡沫，措施得当，都可以扑灭。

合理制定演习计划。火灾的发生通常分四个阶段，即初起阶段、发展阶段、猛烈阶段和熄灭阶段，制定演习计划应围绕这四个阶段的特点有针对性地进行。

报警

在火灾的初起阶段，由于着火区域周围的空气温度较低，火焰底部的可燃气与补充的新鲜空气混合处容易猜识，此时的火易于被扑灭，根据经验，在起火后的十几分钟内，如能将火及时扑灭，是防止火势蔓延的最关键时期。

因此，在生产区域内，只要有着火现象，不论范围大小，发现人员都必须立即向消防部门报告，以免贻误时机，然后再向生产调度及其它部门报告，报警内容包括：报警人单位姓名，着火部位，火的性质（油、液化气、电器等），有无人员伤亡，火势大小状况等。

工艺处理

生产调度部门接警后，（根据实际情况决定）迅速通知岗位操作工切断着火的油罐、装置里的进料，并将易燃物料转移到距着火点较远的罐、设备内（相邻罐、设备也处于危险境地，应尽量避免输送易燃物料，必要时也要将相邻罐、设备内的物料外移），并打开相邻罐、设备的冷却水喷淋，现场消防设施等进行初步扑救；同时覆盖或隔离着火区域的地沟、油井等，防止火情向外延伸。

操作人员应及时启动消防泵，确保消防水压稳定在7－12MPa。相关单位要准备好着火区域内相关物料的安全信息、工艺管线、设备图等，以便查阅。

发生火灾单位要及时清点本单位及在其区域内工作的所有人员，积极寻找失踪人员和救助伤员。

气防救护

石化行业一旦发生火灾，常伴随有毒有害气体泄漏，因此气防站最好设置在消防队里，做到消防车到，气防人员也到，这

国际频道

ILO-CIS 年会将召开

第41届CIS年会将于2003年5月19－23日在英国召开。会议主题是创建电子职业安全卫生信息、知识服务以及中心。

会议期间，英国皇家事故预防学会（ROSPA）将举办职业安全卫生研讨会和展览会。国际劳工组织职业安全卫生信息中心（ILO-CIS）将组织成员单位参观英国职业安全卫生局、英国职业安全卫生信息中心以及英国图书馆等机构。会上，将就全球电子信息服务等有关问题进行介绍和讨论。同时，将演示全球电子职业安全卫生信息网络。

IUPAC/UNESCO/UNIDO 安全培训项目

国际理论和化学联合会（IUPAC）、联合国科教文组织（UNESCO）、联合国工业发展组织（UNIDO）为了提高发展中国家安全、环保的管理水平，共同组织成立了IUPAC/UNESCO/UNIDO安全培训项目，为发展中国家在化工、医学及生物研究和生产方面培训安全、环保方面的专家，并通过这些专家在回国的工作中不断应用，逐步提高发展中国家的安全、环保管理水平。

IUPAC/UNESCO/UNIDOP安全培训项目主要由IUPAC内化学工业协会（COCI）负责，主要责任是负责学员的选拔，主办培训的发达国家企业的确定及相关培训的财务支持。学员必须来自发展中国家的政府或企业在化工、医学及生物等领域从事安全、环保监督和管理的专家或专业工程师，并能用熟练的英语进行交流。培训的形式主要通过"手把手"的形式进行，即通过与主办企业的各级领导、职能部门管理人员、生产装置的管理人员等共同工作，让其在工作中介绍其如何开展工作，并在工作中如何贯彻和执行安全、环境与健康的规章制度及以人为本的理念。学员培训结束后须写出其培训报告交COCI审核，培训报告要包括其培训的感受及回国后如何较好地使用学到的知识，并要及时汇报其实际应用的情况。

英国职业安全卫生协会（IOSH）

IOSH是一个独立的、非营利社团组织，它关注职业安全卫生重要事务，向政府提供咨询，并反馈其会员对政府OSH法规、标准、规范、指南草案的意见。

IOSH的工作是为了促进职业安全卫生水平的提高并通过认可会员资格和采取各种手段保持和提高会员专业知识和技能等形式向会员提供全方位的帮助。

IOSH是在以理事会主席为首的理事会的领导下开展工作。理事会每年召开两次会议，重点讨论事关协会和安全卫生的战略问题。IOSH会员的建议和意见可通过有效渠道向理事会反映，并通过IOSH的下列委员会之一给予反馈：

准入委员会：评审申请者的资格，管理安全执业人员的注册，处理争议。

审计委员会：负责评审协会的运行情况，确保符合理事会会议纪要和协会章程。

发展战略委员会：负责向理事会提供协会未来发展战略，确保协会滚动计划的可持续性，监督计划的实施。

专业事务委员会：负责教育培训、发布资格要求等。

专家组管理委员会：监督协会专家组的工作，包括建筑、咨询、教育、环境、火灾风险管理、保健、国际、海上、公共服务、铁路、安全科学及通讯。

技术委员会：确保提供技术咨询及支持的权威性、专业性、及时性、准确性。

IOSH的理念是使一切工作都成为安全、健康和环境友善。

办公室人体功效学指引

新加坡政府人力资源部属下的职业健康处推出办公室人体功效学守则。该守则旨在为办公室建立良好之职业安全指引，提供较全面及具体之资料。该守则一方面列出在办公室内可能引起常见的职业安全健康问题之个人、环境及心理与社会因素。另一方面亦详细介绍各类预防方法，包括工作间设计、设备的摆放、工作间之环境。例如室内空气、噪声及照明等问题，工作姿势与正确提举物件方法及工作模式设计等。由于现代人工作时间长，因此办公室环境设计与个人职业健康息息相关。

Safety: Closing the world gap

BP AMOCO is part of a programme aimed at closing the trial safety gap between developed and developing nations. Led by IUPAC (International Union of Pure and Applied Chemistry), it promotes interaction, disseminates state-of-the-art techniques and encourages accountability.

Esma Toprak on her recent US visit

In its role as a IUPAC company associate, BP Amoco recently sponsored the visit to the US of an IUPAC intern, **Esma Toprak**, chief chemical engineer at Bogazici University in Istanbul, Turkey. She visited BP Amoco sites in Naperville, Illinois, and Green Lake, Texas, shadowing nitriles, HSE and engineering groups during her two-week stay. The Naperville and Green Lake sites were chosen to show her as aspects of HSE both at the corporate, commercial and plant levels.

Toprak was amazed by what she saw. "We are really behind in safety and health in Turkey. We don't have strict safety laws as you have here." She was especially impressed with the safety manuals outside each laboratory door. Site safety councils and emergency response teams were also new to her.

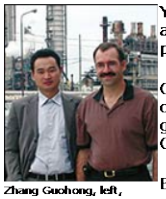
The fact that Turkey suffered a devastating earthquake in August 1999 was never far from her mind. "It was a horrible experience. It makes safety training that much more important."

Upon her return home, Toprak will reorganize the student laboratories to comply with international regulations on safety, and will help her department review and supplement necessary safety measures and required equipment. Toprak is also planning to teach courses on safety to students in her department, as well as other departments and institutions in Turkey.

Reproduced from HORIZON - July 2000

Keeping an eye on the road

Safety at work is not a luxury everyone has, but a BP-backed scheme is trying to change that.



Zhang Guohong, left, with a safe BP driver

You never can be sure who's watching you, or how routine behaviour could affect a co-worker a few feet away or a stranger on the other side of the planet.

Consider the motorists arriving for work recently at BP's Naperville, Illinois, complex or the BP Chemical complex in Lima, Ohio, who couldn't have guessed their driving habits were being observed and might save a life in China.

But Zhang GuoHong was watching. "Every driver would stop at every stop sign and look around in all directions even if no other car was approaching," Zhang says in obvious awe. "Every driver! Each one! All of them!"

Beijing-based Zhang, is one of China's leading industrial safety experts and visited the facilities as a guest of BP, International Union of Pure and Applied Chemistry, United Nations Educational, Scientific and Cultural Organization, and United Nations Industrial Development Organization.

They are all part of a safety training programme that encourages businesses in industrialized countries to share knowledge about health, safety and the environment (HSE) with developing nations.
Zhang, a senior engineer in the Safety Technical Department of China Petrochemical Company (SINOPEC) lost his father in a construction accident and bears his own scars from work incidents. His visit to BP's facilities was his first trip outside of China and during that time he learned how BP deals with HSE issues on a daily basis.

One aspect that impressed Zhang is "the way that your goal of 'getting HSE right' is part of everything." He also notes the speed with which issues are resolved. "You have extraordinarily productive meetings and everyone becomes involved, not just your leaders."

The engineer says he will take his new safety education back to China and encourage similar practices within his company. He also hopes to impart some of this new-found knowledge to Chinese industry as a whole through newspaper and magazine articles.

"I also want to tell that BP is a very good company and treats its workers well," he says. "And I want to say that BP people are very kind and helpful. I want to say that from my heart."

Words: Tom Seslar

Source: Horizon Magazine, global publication for BP people. November 2002.

For Further Information:

http://www.iupac.org/projects/1993/011_11_93.html

General Information
Program Brochures
Application Forms
Links to Trainee Reports
Links to Published Articles on the Program

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